PERCEIVED CONTROL OF ACADEMIC EVENTS IN TURKISH AND ENGLISH ADOLESCENTS:

COMPARING CLASSICAL TEST THEORY AND ITEM RESPONSE THEORY TO DETECT ITEM BIASES ACROSS CULTURES.

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by

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ABSTRACT

Perceived control was investigated in secondary school adolescents from secular Turkish and British schools. Five published questionnaires were used. Perceived control was measured mainly with the Control beliefs, Means-Ends beliefs, and Agency Scale (CAMI - Skinner, Baltes, Chapman, 1988) As supplementary measures, Nowicki and Strickland's (1973) Internal-External Locus of Control for Children Scale (CNSIE) and Palenzuela's (1988) Multiple Academic Specific Locus of Control Scale (MASLOC) were also used. Two other questionnaires, measuring social antecedents, were included in the study. These were the Religiosity in Youth Scale (Rothbough & Jessor, 1976) and the F-Scale (Adorno, 1950; Christie, 1991).

In order to detect item biases within and between cultures, two procedures were followed:
a) The questionnaires were translated from English to Turkish, and then both versions were completed by a bilingual Turkish sample. Translation fidelity was tested using three different approaches: Generalizability theory (Cronbach et al., 1972; Shavelson & Webb, 1991), Classical Item Analysis (Nunnally, 1978) and Item Response Theory (Lord, 1980; Hambleton et al., 1990). The results are discussed in terms of consistency and the cost of the procedure.
b) The Turkish and English versions of the questionnaires were completed by unilingual Turkish and English samples in their own language. The purpose here was to detect similar (etic) and different (emic) functioning of the items across cultures using Classical and Modern item analysis. The questionnaires were found to be functioning similarly in the two cultures. But CNSIE was found to be a poor scale in both cultures and was not used in the next stage.

In the final part of the thesis perceived control was investigated as a function of culture, religion, religiosity, authoritarianism, age and gender. The perceived control scale showed significant cultural differences on 3 out of 10 subscales of CAMI. Agency beliefs and MASLOC showed significant effects of religion, religiosity, authoritarianism and gender. Generally, the Turkish sample was more Internal, more religious, and authoritarian. The gender differences were more inconsistent in terms of the direction of the relationship, with boys more internal on attribute while girls were more internal on unknown factors and effort.

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LIST OF ABBREVIATIONS

CAMI:	Control beliefs, Means-Ends and Agency beliefs
CNSIE:	Nowicki-Strickland's Internal External locus of control Scale for Children
MASLOC:	Multi Dimensional Academic Specific Locus of Control Scale in English
I-T or i-t:	Item - Total Correlation
GT:	Generalizability Theory
CT:	Classical Theory
IRT:	Item Response Theory
ICC:	Item Characteristic Curves
DIF:	Differential Item Functioning

CHAPTER 1: INTRODUCTION

INTRODUCTION

Perceived Control has been one of the most heavily researched areas in applied psychology in the last three decades. Perception of control has been widely studied in relation to education, health, business and sport. All these areas may benefit from investigation because of the potential value of perceived control in predicting behaviour. However, not many studies have looked at under what conditions it develops. Although assumptions have been made about the importance of environmental factors and experiences from a very early age the antecedents of an individual's perception of control have not been investigated to a great extent. This study is concerned with children and adolescents' development of perception of control in different, Turkish and English, cultures. It is particularly concerned with the methodological difficulties of cross-cultural studies and focuses on two main issues, the conceptual and item equivalence of the measurements.

Studies of perceived control (locus of control) have shown that there are clear cultural differences between people's experiences within their environment (Lefcourt, 1982; 1991). The differences in experiences are explained by environmental conditions such as the availability of resources (developing country against developed) and cultural differences (e.g. different religions, belief in chance or luck). The author's interest was aroused partly by changes over the years in the education system in Turkey. Recently, the number of religious secondary schools number has increased from 7% to 13% (Toker, 1992). Also in the 1980s they were given the status of state schools and students graduating from these schools were allowed to apply for any university degree instead of being restricted to related subjects such as higher education in the history of Islam. Since then these students' university choices have shifted from religious topics to politics and economics. Given that Turkey's population is mainly Moslem and run by a secular government, these changes may be expected to have some impact. Personal experience of these policy and other political changes made the author wonder if any changes in the general belief system have had any effects on the development of perceived control in specific areas.

The generalizability point of view stresses the importance of the comparability of cross-cultural studies (Berry, Poortinga, Segall, & Dasen 1992). Up to now non-western cultures have used well-developed western concepts and theories without questioning them. Although to a certain extent the communality of psychological theories and concepts can be accepted, clearly nowadays this view is not enough for most of the issues addressed in psychology. Particularly, when investigating environment related psychological issues such as perception of control, cross-cultural differences become more of an issue then ever.

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Another issue is to find the right methodology to deal with the problems of cross-cultural investigations. Nowadays, it is obvious that comparability between cultures can only be assured if the equivalence of the concepts and instruments are tested before the comparisons start. This comparability problem of cross-cultural comparison is addressed by many cross-cultural methodologists with different approaches, but what they have in common is that they all consider it important to investigate the similarities (etic) and differences (emic) between cultures to be able to make comparisons. The differences between methodologists occur in their view of the emic and etic that exist between different cultures. Triandis (1974) puts the emphasis on the differences, while Berry and others (1992) emphasise the similarities. To test these conceptual approaches available statistical methods are used. Given that the non-western cultures are already using the concepts and instruments they have borrowed from the West it is vital to test the validity of this adaptation to the non-western culture for two reasons: first to be sure that the differences detected between west and non-west are due to the culture and not to the noise in the instrument used to test the concept; second, and more importantly, to allow applied psychologists to use the instruments with confidence in making an assessment of specific situations.

It now seems clear that the psychological processes that link behaviour to its outcomes are responsible for different perceptions of the causes of outcomes (Locus of Control). In a special issue of "Psychological Monograph" Rotter (1966) explained Locus of Control within Social Learning theory and argued for the first time that individual's beliefs about the origins of control lie in the relationship between behaviour and its outcomes. Even though this subject has been studied for the last 25-30 years there is still a need to develop the concept of Locus of Control. Firstly, the similarities and differences between theories that use LOC (Locus Of Control) need to be made clear. For example Social Learning theory uses locus of control (LOC) and self-efficacy similarly and Attribution theory and Learned Helplessness share the same concept with Social Learning theory (Palenzuela, 1988). Secondly the conceptual definition needs to be reconsidered. These two revisions will enable the researcher to use the concept more meaningfully and apply it more usefully. Given that Locus of control (recently called perceived control) has proved to be a very predictive concept for more then one behaviour pattern (e.g. achievement, health behaviour etc.), it is important to investigate how it develops in an individual.

According to LOC individuals who believe that their own effort and ability control outcomes are classified as having internal locus of control while others who believe that outside factors are responsible are classified as having external locus of control. As we know, some individuals may think that outcomes are the result of their own efforts and so might nominate themselves for harder duties or put themselves forward as problem solvers. These individuals have usually had early experiences that made them believe that outcomes can be controlled by their own efforts. On the other hand, in

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communities where less responsibility is taken or where it is believed that outside factors control outcomes individuals will have difficulty in understanding the relationship between their efforts and outcomes and so might be less successful and think that outcomes are beyond their control (Lefcourt, 1991). Individuals from developing countries, where inequality and economic problems are frequently observed, have a tendency to explain outcomes in terms of chance and fate. It is very natural in these communities to perceive an individual's success as a result of luck or a protector. As a result of this, instead of using their own abilities and effort to achieve an outcome they pray or try to find an influential person or persons to achieve success (Lefcourt, 1991).

If we want to understand the development of locus of control we need to think about individuals learning the relationship between events and their causes from their environment. In explaining the theory of social learning we need to remember that people learn through their life experiences and form their perception of events within this system of experiences. Only then we can talk about the effects of an individual's perception of control on their characteristic behaviour.

There is no doubt that the differences in life experiences between young people in different societies will influence their general tendency towards perception of internal or external control. Pupils from different cultural backgrounds will have different perceptions of the relationship between outcomes and their causes. For example, a group of cross-cultural studies done with the Adult Nowicki-Strickland Internal-External Control Scale showed that Israeli and Western cultures were the most internal, with Hungarians almost as internal as Westerners and the Japanese the least internal of all (Lefcourt, 1982). But we need to remember that there will still be differences in individual behaviours because even in the same culture it is unlikely that all pupils will have had exactly the same life experiences.

1.1. DEVELOPMENT OF THEORIES

1.1.1. Overview

Social Learning theory developed as a reaction against biological and trait approaches to individual differences. Rotter (1966) was the pioneer of this approach and developed the theory in the early and mid sixties. Following him Bandura, Seligman, and Weiner made their contribution to this approach. Each of these researchers adopted slightly different theoretical frameworks but nevertheless their research tended to lead to similar conclusions (Lefcourt, 1981; 1982. 1991, 1992).

One way in which these different theories can be grouped is as cognitive or motivational theories. Rotter's and Bandura's theories are cognitive theories whereas Weiner's and Seligman's are more eclectic and motivational theories (Pervin & John, 1996). However, a historical perspective produces a similar classification and we will introduce theories of perceived control in historical order. First, their contributions, similarities and differences will be discussed. Then, methodological and conceptual improvements will be introduced and the implications discussed.

Five social learning theories address the concept of control. Historically these are: Social Learning theory, Social Cognition theory, Causal Attribution theory, Learned Helplessness, and Action theory. We will be giving priority to Rotter's Social Learning Theory, Bandura's Social Cognitive theory, Weiner's Causal Attribution theory, and Seligman's Learned Helplessness theory. Following, this we will be expanding on the new extensions and improvements found in Bandura's Action theory.

1.1.2. Perception of Control: Brief Historical Perspective and a Review of Some Key Theories.

1.1.2.1. Social Learning Theory

Social learning theory is mainly a behaviourist theory. The main differences between classical behaviourist theories and social learning theory is that social learning theory takes into account the values of reinforcement and combines this with the importance of cognition (Pervin & John, 1997). Reinforcement is also used in a more elaborate way than early learning theories. Therefore, studies related to locus of control also take into account the expectancy values of reinforcement. The needs, the value of the outcomes and the expectancy of outcomes all contribute to the outcome. Behaviour can only occur if the circumstances fulfil all of these conditions: high needs, high value, and high expectancy for the outcome. Social Learning theory serves to explain many behavioural patterns. In the Locus of Control case Rotter (1966) and his research students Phares and James were particularly interested in explaining relationships between events and their outcomes. They usually worked with

clinical patients and their aim was to develop a belief in the relationship between events and outcomes for the patient's benefit. They were aware of common patterns and tendencies and of individual differences in the population that make some people more capable of seeing relationships between their action and the consequences of their actions than others. Rotter, particularly, called this internal belief (belief in the person's own ability or effort). On the other hand, some people are not capable of seeing the causal link between their actions and outcomes and explain events with more external reasons (such as luck, chance, powerful others). This kind of tendency is called external (Rotter, 1966; Rotter, 1990).

Rotter was careful to attribute this behaviour pattern to his own culture:

> "When the reinforcement is <u>perceived</u> by the subjects as following some <u>action</u> of his own but not being entirely <u>contingent</u> upon his action, then, <u>in our culture</u>, it is typically perceived as the result of luck, chance, fate, as under the control of powerful others, or as unpredictable because of the great complexity of the forces surrounding him. When the event is interpreted in this way by an individual, we have labelled this a belief in <u>external control</u>. If the person perceives that the event is contingent upon his own relatively permanent characteristics, we have termed this a belief in <u>internal control</u>" (Rotter, 1966, p.1).

It seems he has changed his view very little since then. He used the same quote from his early work in his 1990 article in the American Psychologist.

Strickland (1989) is a follower of Rotter's conceptualisation of LOC. Her interest in locus of control began when she and a colleague studied children's achievement motivation. Nowicki & Strickland (1973) also developed scales for adult and young children to measure LOC. Strickland's (1989) new interest in the topic is the relationship between the concept and creativity. She argues that internality shares many attribute with creativity such as autonomy, seeking out information, independence of judgement and the taking of reasonable risks.

1.1.2.2. Social Cognition, Self-Efficacy

Within the same theoretical framework, Bandura (1986) also investigated self-efficacy, a term that is usually used in the same way as LOC. Unlike Rotter, his work, although it is highly related to action, is particularly concerned with the causes explained by cognitive process rather then just causal relationships between action and behaviour. In particular self-efficacy as a concept is highly related to the results of control rather then perception of control. Self-efficacy is more attributable to real life experiences rather than the perception of actual experiences, although initially it is internalised or is an interpreted version of the actual experiences (the relationships between thought and action). This theory has been improved in recent years and instead of one way determinism, this new Social Cognitive theory proposes a three way reciprocal relationship between agency and outcome via means. Ellen Skinner and her colleagues (1988) later called this approach Action theory. We will return to it later.

1.1.2.3. Causal Attribution

Between the development of the one way deterministic and the three way reciprocal approaches to Social Learning theory, Attribution theory made a noticeable contribution to the conceptualisation of LOC. Weiner (1979) introduced Causal Attribution theory to explain the causes of behaviour (or action) not only with internal and external causes but also with stable and unstable causes. This new concept of stability combined with the internal/external concept neatly (see table 1.1). According to this model internal causes are related to ability and effort. Ability is considered stable and effort unstable. On the other hand external causes are related to task difficulties and luck. Task difficulties are considered stable and luck unstable.

Table 1.1: Possible Causal Attribution for Success and Failure.

CAUSE	INTERNAL	EXTERNAL
Stable	Ability	Task Difficulties
Unstable	Effort	Chance or Luck

Source "A theory of Motivation for Some Classroom Experiences" by Weiner, 1979, Journal of Educational Psychology, 71.

Weiner's view was particularly welcomed by social psychologists and educationalists studying motivation and performance. For the first time causal attribution theory brought a cognitive perspective to LOC studies.

Causal attribution theory later took on some other features. Contemporary examples of these changes are Furnham, Hewstone and Lefcourt. Furnham (1988) was mainly concerned with describing lay persons' attributions. Hewstone's (1989) book on causal attribution clearly makes a distinction between micro and macro analyses of attribution. In his view attribution exists at four levels: intra-personal attribution (causal logic, cognitive process and knowledge structure), interpersonal attribution (from social interaction to close relationships), inter-group attribution (social categorisations) and finally societal attribution (collective beliefs and the explanation of societal events). Lefcourt (1981) took into account causal attribution and other theories to develop a more cohesive measurement technique. Therefore he took into account not only internal vs. external and stable vs. unstable but also positive and negative events within these domains (e.g. task difficulties).

Lefcourt's other contribution to the area was to bring all related studies on LOC together in three volumes of a book in the early 1980's. During this period deCharms in France (1968; 1980) was working on agency beliefs, which are again highly related to cognitive aspects of control. He particularly put an emphasis on an individual's needs and understanding of outcomes from his/her point

of view. At the same time, alongside Lefcourt's new measurement, Levenson (1982) and Paulhus (1983) also made big contributions with a new methodological approach to LOC. Levenson divided external control into two parts, one related to chance and luck and the other to powerful others who exist in the world. Therefore she brought a new dimension to the topic. That is, not only the beliefs or perceptions of individuals but also actual facts (powerful others). This conceptualisation also separated internal locus of control from external locus of control. LOC was no longer a bipolar concept. It was possible to be both internal and also external (belief in powerful others). Paulhus on the other hand, looked at locus of control from three aspects related to the micro and macro cosmos of individual relationships. This view can be seen in Hewston's later work as well. Paulhus' work grew as an opposition to Rotter's one dimensional testing of LOC. The literature strongly suggests that Rotter's LOC scale is multidimensional and not unidimensional as he said. A second factor, apart from internal vs. external beliefs, is political beliefs.

1.1.2.4. Learned Helplessness

Seligman's (1975) early work investigated behaviour under inconsistent circumstances. The early work in this area was carried out by Weiss, Stone & Harrell (1970) in the laboratory with rats. Under conditions where there was an unpredictable relationship between their behaviour and an electric shock rats stopped trying to avoid the shock. In some cases they became completely withdrawn and died. This behaviour was attributed to learned helplessness. It did not occur in a condition in which the shock was predictable and therefore controllable. Although Seligman's theory was particularly taken up by clinicians who worked with psychiatric patients with depression etc. Seligman's recent work is mainly orientated to the normal population and the learning of this negative behavioural pattern. His work with young school children and some retrospective studies with university students have shown that childhood experiences are crucial in the development of learned helplessness. He combined the results of these studies with his early animal work and with early behaviourist views on social learning theory and causal attribution. Finally he added one more new domain to the construct of perception of control-global vs. non-global. According to his theory internal vs. external causality and stable vs. unstable causes are not enough to explain the learned helplessness behaviour related to depression, but if these two domains are combined with an individual's explanatory style (global vs. non-global) then it is possible to understand negative thinking better. It becomes possible, in fact easy, to see the relationships between these three domains and possible conditions of depression. If a person has negative experiences at an early age and attributes this to internal, stable and global causes then they are more likely get depressed. Imagine a little girl who has lost her mother at the age of 8. She thinks her mother went away and will never come back again (stable) because of her (internal) and so she may start thinking that she is the cause of her death. More importantly she may generalise this sad experience to all other new experiences (global). Weiner's studies on controllability have shown that

"attributions of controllability for personal failure are associated with emotions such as guilt, shame, and humiliation, whereas attributions associated with uncontrolled ability for personal failure do not lead to such self-criticism" (Pervin & John, 1996).

1.1.3. Current contributions to the study of Perceived Control:

1.1.3.1. Action Theory

Action theory sees "actions instead of behaviours or responses as central units of analysis" (Skinner, 1995). From Bandura's (1986) attempt to establish the foundations of thought and action, three way reciprocal models of action theory were born. These are improved versions of social cognitive theory. According to his triadic reciprocal determinism, causal factors and action mutually interact with each other. The term mutual is often used to soften the meaning of the deterministic relationships between the three components of behaviour, cognitive and other personal factors, and environmental influences. Because of the multiplicity of the interactions in this model the same factors may cause different actions.

Skinner, Chapman, & Baltes (1988) took Bandura's version of the relationships between behaviour, cognition and environment and Intrinsic motivation theory (Stipek & Weisz, 1981) and elaborated the triadic interactions involving Agents, Means and Ends. The relationships between these three were also described in terms of three types of belief, namely Capacity beliefs (route between Agency and Means), Strategy beliefs (route between Means and Ends), and Control beliefs (route between Agent and Ends). Control, Capacity and Strategy beliefs are all general expectancies of a different form. For example, Control beliefs are a person's general expectancies about the self's ability to create desired events or avoid undesired events. Strategy beliefs are about certain means and causes that are conditions for certain ends or outcomes. Similarly Capacity beliefs are about a person's access to causes within themselves. While Control beliefs are general descriptions of one's perception of control of the relationship between actions and outcomes, strategy and capacity beliefs directly influence the actions in any kind of performance. They are both used to understand the meaning of success or failure (Skinner, 1995). Usually capacity expectations refer to beliefs about future performance; on the other hand strategy attributions are about past experiences. Both could be either domain general, or specific to certain circumstances. Another umbrella concept, which particularly covers capacity and strategy beliefs, is called competence. According to this argument perceived control simply "reflects the fundamental human need for competence" (Skinner, 1995). As Skinner (1995) and her colleagues did, it is possible to explore the theory in a specific academic (school) environment or for different life events (Skinner, Chapman, Baltes, 1988; Schmitz & Skinner, 1993).

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1.1.4. Some key issues in perception of control:

1.1.4.1. Positive vs. negative life events

There are well established research results that people's perception of control is different for positive and negative life events. The concept in an achievement related area such as education and sport is called success and failure. If the outcomes are positive the person's perception of control tends to be internal, if the outcomes are negative it tends to be external (Lefcourt, 1982; Findley & Cooper, 1983; Skinner et al., 1988). This contribution to the concept came mainly from studies based on causal attribution theory (Weiner, 1979, 1985). The results are very profound and persistent, regardless of which scale of perceived control is used or when or where the research took place. It is possible to explain them in terms of the innate capacity of coping and the striving attitudes of human beings. Therefore studies on health psychology try to explore the possible strategies and personality characteristics which may alter this natural balance toward more pessimistic tendencies (e.g. people with high neuroticism scores (Darvill & Ronald, 1991). Other studies done with Afro-American participants consistently found this group to be more external then their counterpart, but studies done by Hillman, Wood, and Sawilowsky (1994) showed that their perception of control, which was measured by an Attribution Style Questionnaire of positive life events, was more internal, stable and global. These results showed the necessity of taking this dimension into account as a separate variable in research in this area. Nowadays almost all perceived control measures have an equal number of items representing positive and negative life events (e.g. CAMI- Skinner et al, 1988; MASLOC-Palenzuela, 1989; MMCS-Lefcourt, 1981).

1.1.4.2. Stable vs. Unstable causes

Since Causal Attribution theory was brought into the subject area of locus of control, another dimension that has been acknowledged is that of Stable vs Unstable. According to Weiner (1979), it is possible to divide both Internal and External causes into two groups in terms of their consistency and stability. In Internal locus of control, ability can be considered to be more stable than effort. Within External locus of control we can identify more than one factor, some of which are more stable than others. Task difficulty is stable while luck is less stable. The problem with this conceptualisation is that there are possibly more factors than the ones mentioned and sometimes it is very difficult to categorise them on this dimension. For example, powerful others is the most frequent reason for external locus of control but it is hard to categorise clearly as stable or unstable. On the other hand perhaps fate will be very stable, but in terms of outcome will be very different from (stable) task difficulties. Later on, Weiner, Perry & Magnusson (1988) added the controllable vs. uncontrollable dimension to his theory. It seems that people's attitudes towards controllable and uncontrollable events differ. If they think that

events are controllable but nothing is done by the person to prevent them then they are reluctant to offer any help to the person (widely used examples of this people who are HIV positive, or hyperactivity). If they think a person can do nothing to prevent the outcome then they are more willing to help (e.g., learning disabilities, cancer etc.). This perception of controllability can be altered if related to attribution and the understanding of the problem. For example "homeless" can be used as a neutral term to try to eliminate the sort of bias that may attached to the condition.

1.1.4.3. Global vs. Non-global

Seligman's expectancy theory combined early social learning theory concepts, such as needs and the value of reinforcement, with causal attribution theory's concept of stable vs. unstable causes. It also added a new dimension called global vs. non-global. Global causes refer to some sort of domain generality of the attribution. If the person explains or rather attributes the experience to general reasons this may be more disturbing than if they explain the experience with specific reasons. Therefore Seligman's explanatory style which is mainly useful for clinical (depressive) cases will produce the worst scenario if the person uses an internal, stable and global explanatory style at the same time. In these circumstances they create the worst possible explanation of the experience, which is attributed to themselves (internal), can not change (stable), and always happens the same way (global) (Seligman, 1995).

1.1.4.4. Consistency vs. Inconsistency

Research shows that from the first days of life infants detect and respond with vigour and joy to control experiences. Even neonates detect contingencies between action and outcomes and respond to them with increased action and anticipatory reactions (Jones & Papusek, 1977; Papusek and Papusek, 1979; 1980). The idea that human organisms are sensitive to contingencies and are equipped to react adaptively to them, referred to as "contingency awareness" (Watson, 1966, cited in Skinner, 1995), is supported by both observational and experimental work. In one experiment, described in Watson (1971, cited in Skinner. 1995), the turning of a mobile was wired to a pressure-sensitive pillow placed under the infant's head or feet. The apparatus was used to compare the effects of contingent stimulation, non-contingent stimulation (in which the mobile turned independently of the baby's action), and no stimulation (stationary mobile). As early as 8 weeks of age, children detected and responded to contingency. Relative to both control groups, infants with the contingent mobiles were more behaviourally active and persistent.

Contingency between action and outcomes is a key feature of control experience. As Seligman (1975) argues,

> "I am convinced that certain arrangements of the environment and contingencies will produce a child who believes he is helpless-that he cannot succeed- and that other contingencies will produce a child who believes that his responses matter - that he can control his little world" p.137.

1.1.4.5. Competency System: Strategy and Capacity

Recent studies of Skinner and her colleagues re-define the concept of perceived control as a competence system. In this competence system they define two main concepts that were not distinguished in the early studies. These two concepts are Strategies, which are mediated by a person's perceptions of means-ends, and Capacities, which are the person's perception of themselves as an agency. Means-ends beliefs were perhaps the most widely represented in early measurements of perceived control (Nowicki-Strickland Internal - External Locus of Control Scale for Children (1973); Crandall and Katkovsky's Achievement for Intellectual Responsibility (1965)) but very few social learning theorists had considered Agency as a part of perceived control (deCharms, 1980). This new conceptualisation of a competence system allows us to see many different aspects of perceived control together in an elaborate way, such as the perception of one's own capacity as well as the perception of links between events and outcomes.

1.1.5. The models of the Perception of Control

1.1.5.1. Theoretical Models of Perception of Control

The last three decades of studies of perceived control have been based on several elementary principles of psychology. These principles are found in the one way deterministic model (used by Social Learning theory), the one way reciprocal model (used by Attribution theory), and the three way reciprocal model (used by Social Cognitive theory or Action theory).

Firstly Social Learning theory is based on behaviourist principles and the one way deterministic model of action. Actions lead to Outcomes. In this one way deterministic model, actions are regulated by the current stimulus and the person's past experiences in similar circumstances.

Causal Attribution moved further and suggested a reciprocal one way deterministic model, which accepts interactive relationships between the Person and Environment via perceived relationships between them. According to this the

> "person cannot effect the environment other than through their actions. Their actions take the dominant role in how people influence the situation which, in turn, will affect their thoughts, emotional reactions, and behaviour" (Bandura, 1986), p.18.

Thirdly, Social Cognitive theory or Action theory prefers " a conception of interaction based on triadic reciprocity" (Bandura, 1978; 1986). According to this model behaviour, cognitive and other personal factors, and environmental factors all work interactively. The term deterministic is used in a more flexible way in this model than in the others. It refers to more probabilistic relationships and interactions between all the components.

While Social Learning theory mainly focuses on learning via actions and experiences the only relationship between action and outcome is one way and is represented by the completion of learning shown in behaviour. Causal Attribution theory focuses on cognitive processes involved in the final behaviour or the perceptions created by the actions. Therefore it simply acknowledges the reciprocal relationships between the person's action and situations. But this reciprocal relationship still starts with the person and is directed from the person to the environment. It is clearly stated in the theory that the person's attributions can be of three types a. personal, b. situational, c. external. This is quite revolutionary and sensible perspective, which allows environmental effects to be taken into account on their own merit. Finally Social Cognitive theory particularly emphasises interactive relationships between all these three components, action, perception of action and environmental factors. This last approach not only acknowledges the effect of the environment on the individual but also the person's voluntary contributions that make changes in the environment.

The last model introduced here has recently been tested with some empirical data. These new empirically based models of perceived control and human action have influenced the development of the area. The reason why these empirical models came late is because nowadays it is easier to run multivariate statistical models to test multi-level and directional models using real data. Also theoretically, more progress has been made recently than in the last two decades. Therefore with a reasonable amount of experimental information it is more possible to come up with a working model of perceived control. Yet these models are still mainly subject specific (e.g. health models of perceived control or performance specific models of action).

The main early models of perceived control were more theoretical than empirical. Although the theories were established using experimental studies (e.g. Rotter's formula of potential behaviour, and Seligman's studies on learned helplessness) they were not complete enough to explain a large number of detailed circular (feedback) relationships between actions and outcomes. Today's models are more based on a large body of knowledge in the area and also on advanced multilevel statistical analysis that enables us to understand better the relationships between real and latent variables in empirical data (e.g. Skinner, Little, Oettingen (1993); Bandura's action theory and models).

1.1.5.2. An Empirical model of Perceived Control

Skinner (1995) developed two methodologies to test circular relationships and developmental changes in control belief systems. The first is testing the consistency over time of the competence system for an individual. This was done using time series data analysis which allowed the researchers to analyse the results at an individual (intra) as well as a group (inter) level (Schmitz & Skinner, 1993). The first investigation was of intra-individual relationships between control and action over time. The second one was of inter-individual differences in control beliefs and action over time. After 4 months there was a follow up study. The study investigated school children's graded assignments and their attributions after they received their results from the assignment. Their responses were recorded in terms of their attributions for correct answers and errors (e.g. to effort, ability, help, task difficulty and unknown factors). They were also given a standard intelligence test. The expected model was that perceived control, which is mediated by motivation and coping, would effect the engagement of the student, and that engagement, which is mediated by task difficulty and the anxiety of the child, would then affect performance. Performance would be internalised by the child as perceived performance, which depends mainly on how the child explains the performance to herself and this is related to her successful or unsuccessful attempts. Eventually these individual experiences would develop or alter the individual's perceived control.

The inter-individual findings mainly confirmed the model. But the differences expected for the intra-individual level were not found. These were effort-performance consistency and the control-effort link and the link between performance, attributions and control. Firstly, not all students showed effort-performance consistency. A high anxiety level sometimes created negative relationships between effort and performance for average or low performance students. Second, the control-effort link within individuals was not observed for the 4 months period of the study. The children who made a greater effort when they expected more control were those who already had high coping skills or high intrinsic motivation for the task. The positive explanation of this would be that the children did not change their effort level for a one-off experience but perhaps used cumulative control experiences to regulate their

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effort. This obviously could help them to keep their engagement level high even if they had had one or two negative experiences. Thirdly unlike the inter-individual findings successful students were more likely to use unknown causes to explain their mistakes. This result could also be explained if the students used similar cumulative strategies to protect themselves from one-off failures.

Therefore the mediators of motivation, coping and task difficulties that are inserted into the model are necessary to explain complicated relationships between previous perceived control and final perceived control, which is driven by recent experiences.

1.1.6. Conclusions of the theories

In the last thirty years of research, the definitions and understanding of perceived control have changed a lot but it is still possible to see the strong contribution of social learning theory to the concept in identifying two major components of perceived control (Internal vs. External locus of control). It is also to fair to say that if it was not for Rotter's (1966; 1975; 1990) strong definition of LOC (perceived control) perhaps the consensus today between different traditions and theories would not be possible at all. After theoretical refinement, measurement needed to be changed and that happened over the years through improvements in the conceptual structure - becoming more multidimensional than it was. The second major contribution came from Causal Attribution theory (Weiner, 1979) which was followed by Learned Helplessness (or Expectancy theory) and Social Cognition. The contributions of each approach can be seen in the conceptual dimension each added to the area. It is possible to say that Causal Attribution introduced the stable - unstable dimension and controllable - uncontrollable dimension. Learned Helplessness usually investigated the negative and health related aspects of the concept in the context of the global- non-global dimension. Finally Social Cognition theory evolved from the new developments and changes to the concept. This would be one way of reading the historical changes and development of perceived control. Perhaps another way is that all these theories more or less developed at the same time but grew in different directions and their emphasis was different in terms of the life events they studied. For perceived control it is fair to say that nowadays researchers are completely aware of the changes and the new conceptual developments. Nevertheless each study is mainly based on one of three theoretical backgrounds. What is really strange is that when we look at the literature most of the studies are still using the concept and measurement of Rotter (or Social Learning Theory) rather than its contemporary versions. This situation produces problems concerned with the reliability of measurement.

1.2. ACQUISITION OF PERCEPTION OF CONTROL IN CHILDHOOD AND ADULTHOOD

1.2.1. Overview

It is quite clear from the theoretical development of perceived control that the concept has grown towards a multidimensional structure over the years. Although many dimensions (e.g. internal for effort and ability; and external for luck, chance, powerful others, etc.) were identified early (Rotter, 1966), they were not presented in a factorial way in the early measurements (Levenson, 1981; Paulhus, 1983; Lefcourt, 1981). Later they were separated from each other and added to new measurement instruments e.g. Internal, Powerful Others, Chance (IPC - Levenson, 1981); Multidimensional Academic Specific Locus of Control Scale (MASLOC - Palenzuela, 1984 & 1988; Control, Agency and Means-Ends Beliefs Inventory (CAMI - Skinner et al, 1988). Additionally there were other changes in the scales which were related to theoretical changes so that most of the scales became subject specific (MASLOC - Palenzuela, 1988; CAMI - Skinner et al., 1988) rather than general (IPC - (Levenson, 1981; I-E - Lefcourt, 1981; CNSIE - Nowicki & Strickland, 1973). These progressive changes to perception of control and related theories cannot be completely separated from other theoretical developments. Age related changes in perceived control have recently also been taken into account (Langer, 1982; Flammer, 1995). Therefore the first focus in this section will be some developmental aspects of perceived control over the life span. We would like to consider some aspects of cognitive development and studies of domain specific and domain general functioning of the mind (Hirshfield & Gelman, 1994). Related to this we are interested in the causal deterministic concepts of children.

When children learn categories they use conceptual and theory like beliefs. These theory-like beliefs, according to Medin (1989), are based on children's essentialist beliefs about living things. What we will try to argue here is that essentialist thinking perhaps can be applied to children's categorisation of social or other environmental experiences (Rothbart & Taylor, 1996). Another belief system which develops during childhood is that of faith and religious beliefs, which are domain general. We believe that there are parallel lines between perceived control as a domain-specific belief and religious belief as a domain-general belief (Boyer, 1994). There are not many psychological theories that describe the development of religious beliefs. The one used here is Fowler's faith development model (1976 cited in McDargh, 1983).

1.2.2. Age related changes in perceived control:

Early social learning theorists (Rotter, 1966; Bandura, 1986) were not particularly interested in the curvilinear development of perception of control over the years. They only acknowledged and advocated the importance of internal perceived control. Therefore research was mainly focused on the predictive aspects of LOC and in some cases the progressive increase in internal LOC with age (Findley & Cooper, 1983). Recent developmental approaches have shown experimentally that perhaps the relationship between age and LOC is not as straightforward as had been thought. The developmentalist view was mainly backed up by many cognitive studies on perception and action. These provided evidence that the perception of control decreases around the age of 8 (Skinner & Chapman, 1987). At this age, children tend to overestimate the effects of their and others actions on outcomes. They are mainly positively biased about their ability and their power over events. This is called a magico-phenomenalism by Piaget (Piaget & Inhelder, 1975; Skinner & Chapman, 1987). In looking at the strategies domain (Means-Ends beliefs), Skinner & Chapman found that internal perceived control of strategies declined around the age of 8 and then started increasing again at the age of 10 and continued to increase. But the same phenomenon was not found in the external perception of control scores (e.g. powerful others or unknown factors), which declined until age 12 (the maximum age tested). These results made theorists re-think conceptual issues like whether Internal-External LOC is a bipolar concept, or whether we need to consider separately the many possible external causes such as powerful others, luck, faith, chance etc.

The second exploration of age differences during middle childhood showed that the dimensionality of beliefs increase with age. Investigations of means-ends beliefs have shown that 7-8 year old children can only discriminate two aspects (unknown and remaining causes), 9-10 year olds can use three dimensions (internal, external and unknown means), and 11-12 year olds four factors (effort, ability, external, and unknown causes) (Skinner & Schindler, 1990). These results were interpreted in terms of children's understanding of causality improving with experiences and cognitive development. These results are also consistent with Dweck's (1975) study: children's understanding of attributional causality and learned helplessness behaviour starts developing around the age of 11 or 12.

There are well established results that during childhood (after middle age) internal LOC gradually increases and is highly related to academic achievement in school. Afterwards the relationship between high perceived control and achievement is not significant (Findley & Cooper, 1983). On the other hand Little, Oettingen, Statsenko and Baltes's (1995) study with American, German and Russian children in grades 2-6 threw some doubts on the generalizability of American-dominated results to other cultures. Their American sample showed the same results as previous (American) research in that the children had the highest level of personal agency belief and control expectancy but their high perceived control

had the lowest correlation with their performance. This was not the case for the German and Russian children who showed high correlation between school performance and perceived control.

Langer's (1983) studies on perceived control particularly focused on changes in old age. It is expected that when people get older and their body starts to decline then the chances of losing control over many daily activities becomes inevitable. Her studies, which were done in nursing homes, found clear evidence of the importance of feeling under control. In one of her studies the residents of the nursing home were divided two groups. People in one group were given the chance to make their own choices in daily life decisions, while people in the other group were completely looked after by nurses. At the end, the latter groups death rate was much higher (Langer, 1983).

There are very few reviews of developmental changes in the literature. Stipek and Weisz (1981) reviewed studies done on elementary school age children and found slight increases in internal control over the years. Another, cross-sectional, study done by Skinner and Chapman (1987) showed that perception of control was inconsistent in middle childhood, increased from childhood to adulthood, and was constant from adulthood to old age. Other reviews (Gatz & Karel, 1993; Kogan, 1990; Lumpkin,1986, Lachman, 1986) of adulthood and old age showed that the results of changes in adulthood and old age are not consistent. However, some of these studies are cross-sectional or short term longitudinal studies (Gatz & Karel, 1993). Lachman's (1986) long term study of the effects of perceived control on memory performance in adulthood and old age showed that there were no age differences between young and old adults in control beliefs for the interpersonal and political domains. However for control in the health and intellectual ageing domains, the older adults had lower internal control than young and middle-aged adults. Most importantly an intervention programme aimed at memory improvement was mainly useful for young and middle age-adults but not much for older adults. Nelson (1993) studied adults perceived control in the cognitive, social and health domains. Although the validity of the domains was tested in advance there were no differences in control beliefs among domains within age groups (30s, 40s, 50s, 60s, 70s). Yet, people in their 70s showed lower perceived control in the cognitive domain than the other four age groups. In the health domain people in their 60s scored significantly low, and in the social domain people in their 40s and 50s scored lower then the rest. It was also the case that perceived control in all three domains was stable until the age of 70s.

On the basis of new emerging patterns of development of perceived control, Flammer (1995) suggested that 5 levels of perceived control develop during childhood. He also suggested a further 3 levels for adulthood. These levels are called: 1. Functional experience: the event schema, 2. Elementary action towards an effect: the causal schema, 3. Doing by oneself: attribution of internal causes,

4. Success and failure: personal achievement, 5. Distinguishing different causes: control beliefs. The other 3 levels of adult development of perceived control are called: 6. Self-esteem on the basis of personal control beliefs, 7. Contemplating and prioritising values and finally, 8. Confrontation of the decline in control and death. Each of these stages was backed up by different research results. Flammer did not match each level with a certain age but still made some suggestions about at what age each level occurs. Therefore it is possible to call his developmental model of perceived control a stage theory.

To sum up, the developmental changes in perceived control over the life span are far from being clear. Yet there are certain trends that seem quite consistent. These trends are also supported by other research such as cognitive studies of the relationship between perception and action and, of course, developmental psychology as well. According to these results children develop self-awareness of the outside word and the relationships between their action and the environment as early as 8 months old (Papusek, 1979). But it takes quite a while to develop realistic perception of control. It seems quite likely that they optimistically judge control over their own environment around the age of eight, but towards the ages of 10 and 12 their perception of control decreases in a way that is adjusted to reality and then gradually increases in a linear way depending on their own experiences. The evidence after adolescence (for adulthood) is more inconsistent. Mostly, after the age 20 until the 60s perceived control remains the same. After 60 it starts declining again, which is related to health conditions, memory losses etc. But it is difficult to collect long term longitudinal data and the short term longitudinal and cross-sectional data on adulthood are too inconsistent to make any clear conclusions (Gatz & Karel, 1993).

From the point of view of this research, there does not to appear to be a critical age in adolescence at which perceived control changes. One of our aims was to investigate the coming generation. Therefore it was thought quite sensible to work with teenagers in the 4th to 6th forms, at the second part of their secondary education.

1.2.3. Acquisition of concept development:

Children have a quite clear (perhaps innate) ability to learn and make sense of what is going on in their environment from a very early age. According to Gelman, Coley and Gottfried (1994), children in the first few years of life make sense of the real world in at least in two ways. Along with language development, children learn to classify objects in terms of their similarities. When they categorise objects they develop concepts and theories (belief systems) which cluster these similar things together. This applies to

"...where things come from, how things change over time, what causes an events to occur, and why. These belief systems include understanding causal relations, and they allow children to make predictions and provide explanations." (Gelman, Coley, & Gottfried, 1994, p.341).

During this conceptual learning, children have a theory (at least for living things) called essentialist belief, which is that all living things have an essence which makes them move (Medin, 1989). So the causal link between people (agents) and movements (events) are explained by this essence of the object. This belief is actually a false belief but nevertheless it helps children to understand the causal relationships between events and some principles of the world of living things. Medin and Ortony (1989) tried to explain the link between the surface (seen) and deep (unseen, perhaps abstract) similarities of objects understood and conceptualised by children (and adults). To do this they introduced essentialist psychology which denies the probabilistic (or random) similarities or togetherness of objects but instead uses a causal deterministic explanation (Vosniadou & Ortony, 1989). This essentialist belief although scientifically without foundations helps children, and perhaps also adults, to build up theories and concepts which enable them to understand the regularities in the world (ironically in a very unscientific way).

What is interesting from our point of view is that this essentialist psychology can be expanded to inanimate objects and social concepts as well. Gelman & Gottfried (1993) showed that children as young as four years old explained the movement of an animal, a toy and a transparent non-living object (a plastic paper mill) in terms of their essences, although they had seen that the objects were clearly being moved by hand. Over 90% of the children said that the animals moved by themselves. Even in the transparent object case many children attributed an internal mechanism to the object. If essentialist thinking was only applied to biological living things you may think that it was domain specific but this experiment shows that it is more general than that. Rothbart and Taylor (1996) further expanded Medin and Ortony's essentialist psychology to social domains and found evidence that essentialism is used for social categorisations and for theory-like thinking. Firstly they made a deduction from essentialist psychology that if the object has an essence it cannot belong to more than one category. But, on the other hand, we know that in the social domain objects or concepts do not stand on their own and

multiple categorisation is very common. For example in terms of social roles one person can be a father and a professional (dentist, businessman or actor) at the same time. Siegel, Slatz & Roskind (1967 cited in Rothbart & Taylor, 1996) showed that 63% of the children at the age of five thought that a father who studied to become a doctor would not be a father when he became a doctor. So they were denying the double categorisation (essence) of the same object. These experiments suggest that children's essentialist thinking may apply not only to living objects but also to non-living objects and to social categories. This seems to be domain general thinking.

This argument of how children may learn concepts and theories by using some simple theory-like but unscientific rule (essentialism) perhaps helps us to understand how the mind develops categories, rules and regulations that help the child to understand the unknown world. This argument also suggests a kind of conclusion that perhaps concept and theory learning go side by side rather than that concepts are followed by theories. Perhaps domain-specific thinking and domain general thinking are going on at the same time in the mind. This could explain how perceived control can be domain or subject specific (e.g. health, school, sport etc.) but at the same time domain general (Internal or External in all these areas) (Nelson, 1993). Perhaps experiences in one area alter opinions in another subject area. See below for further evidence on this issue.

1.2.4. Development of a faith belief:

In many modern societies, children grew up in a faith or belief system (Islam, Christianity, Judaism, Hinduism etc.). Religion helps parents to bring up a new generation within a certain ethic and moral order that allows them to live together, to share, and become an individual at the same time as they become a part of society (McDargh, 1983). Religion plays a big part this socialisation process. Fowler has developed a stage-like structural model of faith development to give an account of faith in God using Piaget's and Kohlberg's stage theories of cognitive and moral development. Although his theory is mainly based on a Western religious system - McDargh (1983) specifically called it Protestant belief- it is possible to accept for other religious systems as well. According to Fowler (1977 cited in McDargh, 1983), faith develops at six stages during the life span. They are: 1. Intuitive-Projective faith (age 4-7), 2. Mythic-Literal faith (age 6.5-11), 3. Synthetic-Conventional faith (age 12-adulthood), 4. Individuating-Reflective faith (age 18-adulthood), 5. Paradoxical-Consolidative faith (minimum around 30), 6. Universalising faith (minimum around 40). These stages are highly similar to Kohlberg's Moral stages, which are also based on Piaget's cognitive-structural stages. The moral equivalent of faith stages are: 1. Heteronomous morality, where rules of obedience and avoidance of physical damage to person and property are backed up by threat of punishment. 2. Instrumental morality, where a person follows the rules for their immediate interest, and to see fairness as an equal exchange. 3. Good child morality, where the child behaves as others behave in order to establish good social relationships. The

child's morality is characterised by having good motives, concern about others and having mutual friendships where trust, loyalty, respect and gratitude exist. 4. Law and order morality, where an individual is part of the society and the law specifies the rules to follow. 5. Social construct reasoning, where there is an awareness of other people's rules and values and a respect for them. 6. Universal ethical principles, where an individual has his own self-chosen ethical principles. As we know from the developmental psychology literature, these 6 stages are also described in three levels within which each of these two stages take place. These are: 1. Pre-conventional level, 2. Conventional level, 3. Post-conventional level (Cole & Cole, 1996).

The problem with this approach is that there is no solid scientific support that this age related categorisations are stable. It is also true that stage related structural theories mostly use semi-structured interviews (including Fowler, 1977). This allows them to explore the stages but it does not allow to make researcher to make further inferences. Stage theories may be nothing more than a template to work in. Still it is important to see parallels between different aspects of development and try to link them in an unusual way.

1.2.5. Conclusions

After establishing the developmental changes in perceived control, a second step was to advance some explanations for how these changes occur, and then to give some account of similar developmental changes in one other social developmental domains which may have some effect on the development of perceived control (religious beliefs). At another level, we also explored the possible interaction or parallelism between domain specific and domain general aspects of perceived control through the conceptual development. It seems that cognitive studies of conceptual development have got many parallels to the development of perceived control.

Gelman et al.'s (1994) explanation of conceptual development during childhood involves using the idea of essentialist thinking. This essentialist thinking seems closely linked to causal determinism. It was specifically applied to living objects but there is also evidence that the child applies the theory to inanimate objects (Hirschfield & Gelman, 1994) as well as social concepts (Semin & Fiedley, 1996). Therefore it may be a theory for concept learning of most life experiences.

Early knowledge of concepts is related to subordinate (domain specific) and superordinate (domain general) categorisations, which develop with children's judgements of similarities between objects and the use of surface and deep analogies (Medin & Ortony, 1989; Vosniadou & Ortony 1989). It seems that children's learning of these two levels of subordinate and superordinate, in other words word surface and deep analogies (similarities), goes in parallel instead of sequentially (Medin, 1989; Gelman

et al, 1994). So if we apply the same idea to the learning of perception of control, we see that the same or similar process may be involved.

First children up to age 8 may use surface analogies between domains and make an optimistic assessment of their capacity (Skinner, 1990). They are only able to discriminate 2 dimensions (unknown and remaining causes). At the age of 9-10 they discriminate three dimensions (internal, external and unknown means), and then at 11-12 years four dimensions (effort, ability, external, and unknown causes) (Skinner, 1990). It seems that, when new experiences come to the system, the specific concepts and general theory are reviewed at the same time and lead to new level/s of categorisation/s.

The link between developmental changes and domain specificity are also develop so that, when the child gets older, she is more likely to see more complex rules of how the environment and her own skills affect the outcome. S/he develops new complicated theories of similarities in different domains (taking into account more variables and criteria at the same time) but these will be like each other (domain general) because the experiences will be connected with each other. Also a child who revises her/his experiences in similar circumstances to previous experiences will be most likely to use parallel evaluations of the concepts they learn and theories they have already established. Therefore, the child's perception of control can be similar in different domains and become domain general.

Evidence that perception of control can be domain specific and domain general comes from Nelson's (1993) study of an adult sample. She found that in three domains of perceived control (cognitive, health, social) there were no differences in control beliefs between domains within age groups (30s, 40s, 50s, 60s, 70s). This can be taken as evidence for how domain specific and domain general aspects of perceived control work in parallel to each other, just as children's conceptual and theory like thinking work in parallel to each other.

1.3. CULTURAL AND DEMOGRAPHIC ASPECTS OF PERCEIVED CONTROL

1.3.1. Overview

In this section we introduce literature related with the variables being investigated. These are: SES and gender as demographic variables, and nationality, religion, religiosity and authoritarianism as culture related variables. It is possible to argue that these demographic variables are also cultural variables but for the purposes of this review they are covered separately.

1.3.2. Demographic Variables

The demographic variables considered in this study are socio-economic status (SES) and gender.

1.3.2.1. Socio-Economic Status (SES)

The investigation of socio-economic status (SES) has not specifically been done in relation to locus of control. Although the importance of SES had been acknowledged by people like Stipek and Weisz (1981), very little investigation has been carried out to clarify the relationship. It is quite sensible to think that, as a major environmental variable, the family's SES will have an important effect on children's experiences. This point of view is particularly defensible if we take the social learning point of view rather than that of attribution theory. Studies that have taken SES into account have mainly shown that there are positive and linear relationships between internal locus of control and SES (Maqsud & Rouhani, 1991; Brain, Holliman, & McCallum, 1989; Tripathi & Tripathi, 1984; Masqud, 1983). The age range covered by these studies is varied but most of them have been done with school age pupils. Brain, Holliman, & McCallum (1989) studied SES, LOC and achievement motivation effects on mastery scores in kindergarten and first year primary school. They found that SES scores were the best predictors of the children's mastery scores. Tripathi & Tripathi (1981) found that SES, LOC and the strength of the approval motive jointly influenced perceptual dependence in undergraduates. It is clear that SES has been used as a confounding variable in studies related to LOC but it doesn't seem to have been investigated as an antecedent variable. As an eclectic researcher (combining social learning and attribution theory), Lefcourt (1991) points out that people's perceived control develops within their immediate environment, but does not refer to any specific research on the issue. Therefore it seems it is quite important to investigate SES as a predictor of LOC and clarify the relationships between the two variables.

1.3.2.2. Gender

Studies relating gender and LOC have never come out with any clear results. Although some of them did find differences between girls and boys in schools and colleges it seems these differences are determined by child rearing and cultural factors (Hoffman & Kloska, 1995). While some of the studies

have found gender differences in perceived control (Mwamwenda, 1995; Wehmeyer, 1993; Furnham & Greaves, 1994; Duxbury, Higgins, & Lee, 1994; Roth & Amstrong, 1991) others are inconclusive or non-significant (Hoffman, Kloska, 1995; Choran, Antonucci, & Adelman, 1989; Chia, Moore, Lam & Chuang, 1995). Most of these study's samples were adults or adolescents. Although most of them have found males to be more internal some have found females to be more internal (Jayaratne & Ivey, 1983; Tsui, 1974 cited in Hui, 1982). It is difficult to come to a clear conclusion but it seems that females have a greater internal LOC if the sample is an adult or adolescent population. It is also possible that the results are highly related to the context and country in which the study took place (Hui, 1982). For example, studies in America, Japan, China, India, and Israel have found females to be more external in one or more domains of perceived control, whilst in Russia, Turkey and Greece no gender differences were found. This in itself is evidence that gender differences are heavily affected by experiences. The other important variable that needs to be taken into account is the year the study took place as Chia et al. (1995) emphasised that modernisation has caused social and sex role changes in all cultures. Their longitudinal study showed that in 1979 both American and Taiwanese girls scored more external than boys but in 1992-3 there was no significant differences between them even though the cultural differences remained. However, several recent studies have still found girls to be more external than boys (Mwamwenda, 1995; Wehmeyer, 1993; Furnham & Greaves, 1994; Duxbury, Higgins, & Lee, 1994; Roth & Amstrong, 1991).

1.3.3. Cultural Differences

The cultural variables considered in this study are religion, religiosity, and authoritarianism and nationality.

1.3.3.1. Religion and religiosity

Very few studies in the literature have looked at differences between religions regarding perceived control (Saeeduzzafar & Sharma, 1991; Asonibare, 1986) where Muslim students were found to be more external than their Christian peers. But there are a fair number of studies on religiosity and perceived control (LOC) (e.g. Kahoe, 1974; Silverman, 1979; Friederberg & Friederberg, 1985; Lesser & Painser, 1985). There are some contradictory results. While some of the studies have found high correlations between internal locus of control and religiosity (Shrauger & Silverman, 1971; Silvestri, 1979; Kahoe, 1974, 1977; Lesser & Painser, 1985; Gabbard, Howard, & Tageson, 1986) others have no significant differences (Friederberg & Friderberg, 1985; Ritzema, 1979; Purdy, Simari, Colon, 1983).

There are some explanations for the inconsistent results of the relationship between religious belief and perceived control. Firstly perhaps the measurements used to explore the relationships were not efficient

enough to link these two concepts (Friederberg & Friederberg, 1985; Furnham, 1982). Second, and more likely, is that the relationships between religiosity and perceived control are more complex than early studies expressed. As Friederberg & Friederberg (1985) said "It is likely that highly religious people may make attributions which reflect elements of both internality and externality". Adding to this is Lesser et al. (1985) and Furnham's (1982) finding that perhaps religious people can score high in certain sub-domains of internal attribution (e.g. ability) and external attribution (e.g. fate and powerful others or unknown depending on how they are defined).

Lesser and Painser (1985) studied 30 women. Half were members of a religious group and half were not. They were interested in the relationship between Piaget's concept of magical thinking, in which every event must have a cause, and his stage of formal operational thinking, in which causes are logical but not always known. They did not find any differences in terms of the formal operational level but they did find that the religious group had a stronger belief in the supernatural and personal responsibility and a higher internal locus of control. These two groups also differed in their conception of the operation of chance in human life. While the religious group believed in a universe in which every event has a 'meaning' the ordinary group accepted some randomness in the universe. These results are consistent with the Furnham's (1982) study of clergymen of the Church of England. The fundamentalists scored significantly lower than the liberals on the chance domain of Levenson's LOC scale. These results suggest that perhaps magical concepts of causality can develop into maturity in certain domains and exist side by side with logical thinking.

Skinner & Chapman (1987), using Piaget's magical thinking argument in a similar way, explain the development of perceived control in children. Their thinking procedures are at first irrational because they tend to attribute magical powers to themselves and others and therefore misjudge their capability and then become rational and less deterministic.

It is possible to use this co-existence argument to make inferences about why and which religious beliefs are linked to LOC. Lesser and Painser's study can be linked with Gelman et al's (1994) studies of the development of conceptual and theoretical thinking in childhood. It is possible to understand this better if we expect parallels in the development of human cognition at different stages. Perhaps like children's analogical thinking, religious thinking leads to simultaneous development of domain specific and general categories. It is possible to apply the same idea to adult thinking and therefore it is not odd or illogical to think that a general belief system such as religion develops into maturity along with logical thinking. Therefore it is legitimate to think that religious beliefs and a personal belief system such as perceived control can be linked with each other and/or co-exist during the life-span.

There is only one more line of investigation on religiosity, distinguishing intrinsic and extrinsic religiosity (Allport and Ross, 1968 cited in Kahoe, 1974). These studies, comparing different religions, have shown that intrinsic religiosity is related to internal locus of control. According to this study, intrinsic religiosity is described as an internalised belief system and the person lives by it. Extrinsic religiosity is a social aspect of religion and some people use religion for their own ends such as providing security, sociability etc. Kahoe's results showed that there were positive and moderate relationships between intrinsic religiosity and internal control ($r=.24$, $p<.01$), and negative relationships between extrinsic religiosity and internal locus of control ($r=-.25$, $p<0.01$). These results were also positively linked with the samples' intrinsic motivation and consequently achievement (high intrinsic religiosity, intrinsic motivation and internal locus of control). Ronald, Morris & Hood (1988) found that intrinsic religious orientation was generally consistent with healthy psychological characteristics such as self-consciousness and self-efficacy while extrinsic and orthodox beliefs tend to predict maladjustment.

1.3.3.2. Authoritarianism

It has been suggested that religion can be a breeding ground for authoritarianism and prejudice. But on the other hand there is established evidence that the relationship between religious service attendance and authoritarianism is curvilinear (Strueling, 1963; Friedrichs, 1959; Young, Benson, & Holtzman, 1960; Hoge & Carroll, 1973; Kilpatrick, Sutker, & Sutker, 1970 all cited in Wulff, 1991). So it is not necessarily the case that all religious people or church attenders are authoritarian. The other argument related to authoritarianism is that perhaps traditionally the concept and its measurement are both highly related to conservatism (Altemeyer, 1988 cited in Wulff, 1991). But studies reported by Christie (1991) provide evidence that the relationship between authoritarianism and political views is not straightforward. A comparison between three different countries on the Authoritarianism scale, on which high scores mean greater authoritarianism, showed that while communists in England and Netherlands scored an average of 2.8 and 3.4, in India they scored 4.4 which is almost higher than conservatives (3.9) in Britain and the same as fundamentalists in the Netherlands (Christie, 1991).

1.3.3.3. Cross-Cultural Studies

In cross-cultural studies of perceived control there is one extensive review (70 papers) and one small review (30 papers) in the early eighties (Hui, 1982; Furnham & Henry, 1980). There are also two chapters on studies of LOC in a cross-cultural context (Dyal, 1984) and recently one on explanatory style in the context of culture (Little, Oettingen, Statsenko & Baltes, 1995). Hui's study covers 70 articles that are published not only in main stream journals but also in nation specific journals. Therefore, it covers a wide range of relevant studies. Furnham & Henry reviewed 30 articles and mainly used the review as a rationale for the research they had done. Since then many articles have

been published in the area, mainly in single culture journals but we have not been able to reach them because of the locality of the studies or language differences. Therefore this review is restricted to journals written in English. The tendency seems that with one or two exceptions these studies are still affected by the main problems of cross cultural research such as measurement and comparability. The most widely used scale is still Rotter's (1966, 1975) I-E scale, which was the first to be developed (e.g. Furnham & Henry, 1980; Perussia, 1995; Smith, Trompenaars, & Dugan, 1995). The second most widely used scale is Levenson's (1981) Internal, Powerful Others & Chance Scale (e.g. Lao, 1977; Chia, Moore, Lam, Chuang, & Cgeng, 1995).

The studies in this area can be categorised in terms of when and where the research took place. From this study's point of view we are not covering ethnic, within-country research, which undoubtedly gathers valuable information. Nor will research done only in one non-western country be covered. Our interest in particular will be in cross-cultural (national) comparisons of more than one country.·

The studies in the area can be clustered in terms of the location of the country as western or non-western. It is also possible to divide the studies in terms of region or the number of countries compared. The main clustering that will be used here is based on the region of the second culture. For example the comparison between Indian and North American samples will be categorised as Asian, and a comparison between any European countries and North America will be considered European. There are some studies comparing Far East (Asian) samples against Australian and that group will called Asian as well (Hamid, 1994).

1.3.3.3.1. Studies In Asia

Although they are not necessarily identical to each other it is possible to cluster studies in the same region because of long term cultural similarities. In this group there are studies from Japan, China (mainly in Hong Kong), Taiwan, Malaysia, Korea and India. Studies in Israel, Russia and Turkey will be also considered in this part only for the reason that they are fairly close to each other in geographical terms. The contrast argument will be taken into account later on.

Japan

Early studies had shown that the Japanese are more external than their American counterparts (Bond & Tomatzky, 1973; Mahler, 1974; Krampten & Wieberg, 1981 cited in Hui, 1982) but the results are not necessarily that clear. When Mahler (1974) and Krampen & Widberger (1981) used Levenson's multidimensional LOC scale instead of Rotter's I-E scale they only found differences on Chance (Mahler) and Internal (Krampen & Widberger) but not on Powerful Others. A recent study in Japan (Yajima, Sato, Arai, 1996) investigated relationships between perceived control and achievement anxiety and found that motives for science and self-regulation seemed a good explanatory model of perceived control in junior school Japanese pupils.

Chinese

The results of studies with Chinese people are quite conflicting. Hsieh, Skybut & Lotsof (1969, cited in Hui, 1982) and Hamid (1994) found the Chinese to be more external than their American and New Zealand (respectively) counterparts. But on the other hand Tsui's study (1974 cited in Hui, 1982) showed that Chinese women college students (in Hong Kong) were more internal than their American counterparts. Similarly studies in Taiwan also showed no significant differences from American samples (Hung, 1974; Reitz & Groff, 1972 cited in Hui, 1982 & Dyal, 1984; Lao, 1977). But Dyal is suspicious about the representativeness of Lao's American sample, saying that Levenson's (1981) normative American sample were more internal than Lao's South Carolina White American group. The other studies that have been done in the same region found that countries like Malaysia and Korea and India were more Internal then their Western counterparts - Australian and Canadian respectively (Rafaei & Rahman, 1976; Carment, 1974 cited in Hui, 1982). Other studies have found that Taiwan Chinese are more external than their American counterparts. This includes a study by Chia, Moore, Lam, Chuang, & Cheng, 1995) who hypothesised that there would be no differences in perceived control due to the last 15 years of modernisation in both countries.

India

Carment's study (1974 cited in Hui, 1982 and Dyal, 1984) showed that an Indian sample of students and workers were more internal on the general factor of LOC than Canadian students and workers. But at the factorial level Indian students were more internal on control of ideology and system modification but more external on personal factors. A sample of Indian workers was also more internal on ideology and system modification but the same as the Canadians on personal factors. A study with religious samples, comparing India and America found no differences between them in terms of their LOC (Tyler & Sinha, 1986). Smith & Whitehead (1984) used Weiner's model rather than Rotter's and compared Indian and Americans attributions to job promotion and job demotion. In both cultures promotion was attributed to internal causes while demotion was attributed to external causes. These

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results are consistent with early studies and with Attribution theory. But they also found that Americans attributed both promotion and demotion more to internal causes than the Indians. This result is in the expected direction because promotion and demotion are more dependent on external causes in India. These two results indicate the cross-cultural validity of the concept.

1.3.3.3.2. Middle East and Russia

Cross-cultural studies of Russian children have shown that Soviet students are more external that their counterparts in America and Israel on almost all dimension of locus of control. For example, on the Luck/Fate, Academic achievement, Leadership/success and politics subscales Russian were more external, but on the Respect subscale American were more external (Rawdon, Willis, & Fincken, 1995). In a study of immigrants in Israel, Russian immigrants were more external than American immigrants on predictable world and just world factors, but not on the friendly world and politically responsive world factors, on a scale constructed from Rotter's LOC scale (Aviram & Milgram, 1977). A recent study has compared German (East and West separately), Russian and American children on the relationship between perceived control and academic achievement. They found that American children believed that effort was more important in producing school performance than did Russian and German children and also that the former communist countries' (East Berlin and Moscow) samples thought that unknown causes had more effect on school outcomes than did West Berlin and Los Angeles children (Little, Oettingen, Stetsenko, & Baltes, 1995). In this last study the new conceptual framework of Bandura's Action theory was used and the scale was CAMI (Control, Means-Ends, & Agency Scale), which is one of the new generation scales that have been used successfully in cross-cultural settings (Chapman, Skinner, & Baltes, 1988).

1.3.3.3.3. Europe

East Europe

Studies in East European countries have not found any significant differences compared with American, some Asian and other European samples (Reitz & Jewell, 1979; Rupp & Nowicki, 1978; Torestad, Olah, & Magnusson, 1989). Reitz & Jewell's (1979) study found that factory workers in Yugoslavia, America and Asia were similar on Locus of Control and job involvement. A study comparing Hungarian & American children on LOC and school achievement found a similar relationship between internality and school achievement (Rupp & Nowicki, 1979). Multi-dimensional comparisons of behavioural control and predictive control beliefs in Hungary, Italy and Yemen showed that, except for the Yemen, the other two countries' patterns of relationships between behavioural control, predictive control and anxiety level were similar, and locus of control played a mediating role in these relationships (Torestad, Olah, & Magnusson, 1989).

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Other comparisons between Western European countries have shown some differences between countries which are greater than those of confounding variables such as life style and social class. According to a comparison of six countries on LOC as a part of a large European Value System study, Germany and Denmark were the most Internal followed by the Irish, and British. In the middle were Spain, Belgium and France and the least Internals were Italy, and Holland. The data were presented in terms of raw scores and no post hoc results were given in the article therefore the sequence given here is completely based on mean scores (Jensen, Olsen, & Hughes, 1990).

Italy

Perussia (1995) recently questioned the validity of Rotter's concept in the cross-cultural context. She used three of Rotter's items with the highest item-total correlation, which were then embedded in an attitude scale. The results showed that in both adult and college (adolescent) samples the questions did not come out in the expected factors, instead they loaded on three different factors. This has been interpreted as the dimensionality of the scale, at least in Italy. But it is not clear in this study why the author did not test the factorial structure of Rotter's scale as a whole. Although there is no clear consensus in terms of the factors of Rotter's scale (Dyal, 1984), one thing which is quite clear is that there are consistent results showing the multidimensionality of the Rotter scale in cross-cultural settings as well as in America (see Smith, Trompenaars, & Dugan, 1995). Therefore, although very well designed and tested, Perussia's (1995) argument is not valid in the first place because of the existing evidence, mainly from cross-cultural studies, that Rotter's scale is multidimensional and not unidimensional.

Greece

A study has shown that a Greek sample scored like an American sample on the Personal domain measured by Levenson's IPC, but were more external on the Powerful Others and Chance domains. Given that the study took place just before the military coup in Greece this result is understandable (Malikiosi & Rykman, 1977 cited in Hui, 1980; Dyal, 1984).

Denmark

Two comparative studies of Denmark and America showed that the Danish sample overall were not significantly different from their American counterparts. But Krampen & Wieberger's (1981) study noticed some difference at the item level for the items related to governmental control, the Danes being more external. Schneider & Parsons (1970) found that out of five factors the Danes came out as more external only on the factor called "leadership and success".

One example of studies in Scandinavian countries is a teenage sample from Sweden, who were found to be the most external overall compared with the Japanese, Australians, Americans, and New Zealanders (McGinnies, Nordholm, Ward, & Bhanhumnavin, 1974). These results were criticised by Dyal (1984) who said that the Swedish sample was smaller and younger than the other samples. Therefore they had different characteristics developmentally and environmentally (e.g. still living with their parents).

German

West German samples have usually been found to be more internal then any other cultures (Maroldo & Flachmeier, 1978; Oettingen, Little, Lindenberger, & Baltes, 1994). Recently the CAMI scale, first developed in Germany distinguishes three major dimensions of locus of control namely, Agency, Means-Ends and Control beliefs. Within each of these domains there are ten scales for internal and external causes (e.g. effort and ability for internal; powerful others, luck and unknown for external) (Skinner, Chapman, & Baltes, 1988). Using this scale Little, Oettingen, Statsenko, & Baltes (1995) compared West & East Berlin, Moscow and Los Angeles children in terms of their perceived control and academic performance. The results revealed that although there were similarities cross-culturally in children's everyday causality beliefs about what factors produce school performance, differences were found on agency control, which is apparently the main predictor of achievement in school, and also on control expectancy. Americans in this study were found to be the most internal on agency beliefs and control expectancy. But the surprising result was that although Americans had the highest agency beliefs score this was not correlated with their actual performance in school as was expected. This result is fairly consistent with Findley & Cooper's (1983) review. On the other hand in the German and Russian samples agency belief was highly positively correlated with school performance. Particularly for the East Berlin sample, agency beliefs were found to be highly correlated with school performance. This result can be attributed to teaching and school system differences which will be discussed later.

1.3.3.3.4. Africa

South Africa

The studies done in South Africa have not always used representative samples but usually selected samples related to the purpose of the study. For example Furnham & Henry compared African, Indian and European Nurses LOC to test cultural differences while controlling occupation and gender. They found no significant differences on total scores but factor analyses were different for each subgroup. Given that the sample was small for each subgroup this part of their results will not discussed here. Another study did not find any significant differences between White and Indian origin South African school children when they used CNSIE (Nowicki & Strickand, 1973; Barling & Fincham, 1978).

The Other Studies in Africa

The main comparison made between African culture and other White cultures was by Reimanis & Posen's (1980) study in Nigeria, Zimbabwe, White Rodesia and America. The results showed that the Zimbabweans and Nigerians were more external than White Rhodesian and Americans. Hui (1982) reported in his review that studies in Africa showed that there was a strong positive relationship between supernatural beliefs and external beliefs (Jahoda, 1970; Plug, 1975 cited in Hui, 1982). But the relationships between religion or superstitious beliefs or religious beliefs and LOC is in the opposite direction in Western cultures (e.g. America) (Strickland & Shaffer, 1971; Tong, 1978 cited in Hui, 1982). These differences have been attributed to differences in the context and meaning of the supernatural beliefs. Supernatural beliefs in Africa can be seen as a way of coping with an unpredictable environment while in Western culture, where God is very personal (internal), the relationship between internal beliefs and religion appears. Not enough work has been done to investigate differences in the meaning of religion in different cultures. This will be a challenge for our research point of view.

Summary

It seems that Asian and African cultures/nations are more external compared with western (mainly American) cultures. Europeans with very few exceptions (Swedish and Greece) are as internal as Americans. But it is not always the case that all Asians cultures (e.g. Chinese and Indians) are external compared with their western counterparts. On the other hand it seems that Japanese are consistently more external than their western counterparts.

Most of these studies used Rotter's I-E LOC scale to measure perceived control. It seems that they usually missed the point that Rotter's scale is in fact multidimensional. The second most widely used LOC scale is Levenson's (1981) IPC and studies with this scale have found some evidence of the Internal domain being consistent but Powerful Others and Chance vary from one culture to another due to differences in experiences (Malikiosiki & Rykman, 1977 cited in Hui, 1982). But even the differences found in these domains with the multidimensional version of Rotter's scale were not always in expected direction, such as western cultures believing less in chance or powerful others. In some studies Asians have been found to be external but at the same time politically active (Pandey & Kahan, 1977; Navarro, 1975 cited in Hui, 1982), which is contradictory to western studies which have found politically active people to be more internal (Strickland, 1989). Navarro's study also found that political awareness and activity was highly related to external LOC. But this kind of externality needs to be discriminated from fatalism because it is created by real circumstances and is therefore highly goal-oriented.

1.3.4. Conclusions:

The social antecedents of perceived control can be classified as culture dependent and relatively culture independent. We have classified mainly religiosity, authoritarianism and culture (nationality in this study) as a culture dependent and SES and gender as relatively less culture dependent.

SES seems to have a clear linear relationship with perceived control - high SES being highly related with high internal perceived control. Gender studies have usually found that males are more internal then females but these results have not always been replicated. Some researchers have not found any gender differences.

The relationship between religiosity and LOC is not conclusive. High religiosity is sometimes related to internal control and some other times to external control. These results have made the author consider curvilinear relationships between the two variables. Authoritarianism is mainly linked with religiosity and cultural variables like the political regime of the country. The link made so far with religiosity is that generally the more religious the person the more likely they are to be authoritarian as well, but some curvilinear relationships also exist. The relationships between culture and authoritarianism have shown that culture has far more effect on a persons' authoritarianism than their political views (Christie, 1991). It may be that environmental constraints such as lack of facilities as well as the history of the nation may cause differences in the authoritarianism of the individual. This suggests the importance of the environment to the development of authoritarianism. The similarities expected between perceived control and authoritarianism suggest that high authoritarianism will be related to high external perceived control.

In terms of cultural differences, in general, western cultures are more internal than their Asian and African counterparts. But some findings are not so clear, either finding no significant differences or finding Asian cultures to be more internal than their counterparts in Canada or Australia. There is also evidence that detailed differences between domains are more complicated, such as personal control being constant between cultures but social and other environment-related domains being different.
The issues raised by these cross-cultural studies of perceived control are mainly related to measurement. It is not clear if the measures of perceived control are valid in most of the studies. This doesn't mean that the researchers were not aware of the problems of comparability but perhaps that the ways they tried to overcome them were not always adequate. For example most of these studies used Rotter's I-E LOC scale which was claimed to be unidimensional by Rotter (1975) and almost all of them (more then 50%) applied factor analysis to identify the differences between cultures. What was problematic and what has not been discussed much is that the factor solutions differed from one study to another, and all of these studies made cross-cultural comparisons on the basis of their own individual

factor solutions. This creates a problem. There have been very few attempts to develop culture specific scales (Aviram & Milgram, 1977; Skinner et al., 1988, Palenzuela, 1989) that were successful in later cross-cultural work (Skinner et al., 1988).

The second criticism of cross-cultural studies of perceived control is that because of the different times of the studies (mostly in the seventies, recently in nineties as well), there may have been changes within these cultures. This was partly shown by Chia et al.'s (1995) study of Taiwan and America 15 years apart (1979-1994). The results did not show any changes in the difference between the two samples. The Americans were more internal then the Taiwanese at both times. However, the gender differences for both cultures disappeared. This was explained by the modernisation of the societies over the years. There are likely to be other differences between past and recent studies now that improved knowledge of the area has led to more sophisticated measurements that are domain specific and multidimensional (Skinner et al., 1988; Little et al, 1995). We will try to take all these changes into account in this study. There are other general methodological problems of cross-cultural studies of Perceived Control which come from the comparability problems of cross-cultural data which will be explained in detail in the next section.

1.4. TECHNICAL ISSUES OF CROSS-CULTURAL STUDIES

1.4.1. Overview: History and Methodological Issues of Cross-Cultural Psychology

Up to now, the traditional way to investigate cross cultural differences is to use scales developed in the Western World to see whether the concept and theories developed in the USA or Europe are valid in more traditional societies (Triandis, 1974; Berry, 1980). This approach requires research done in different cultures to have enough dimensional similarities to enable use of the same theories or concepts (Frijda and Jahoda, 1966; in Berry 1980). Berry (1980) says that this dimensional identity can be obtained in two ways. In the first way, which is universal, it can be obtained by transforming sociology, anthropology, linguistic and biology to psychology. In the second way it can be obtained by demonstrating an experimental equivalence for the data collected from two or more cross-cultural studies. In this study the second way will be adopted.

1.4.2. Emic and Etic dilemma of cross-cultural studies:

The basic problem of cross-cultural psychology is whether the comparison between different cultures is possible or not. This problem of cross-cultural psychology is described as the emic and etic dilemma. The two concept were drawn from phonetics and phonemics approaches in linguistics (Berry, 1980; 1992). The conceptual analogy is here that phon*etics* describes more general, universal rules of the language while phon*emics* describes the sound system of a single language. So in cross-cultural psychology, while etics is used to describe general, universal rules across cultures (cultural similarities), emic focuses on culture specific issues. In other words if we are comparing two or more cultures with each other etic will be the similar behaviours and etic will be the differences.

Before making any psychological comparisons between cultures a researcher should make a choice between two strategies for identifying the etic and emic. These are Berry's Iterative model of the derived etic and Triandis's Combined emic-etic method.

1.4.2.1. Suggested Models of Emic & Etic Comparability:

Two models of cross-cultural comparability had been suggested. These are iterative model of derived etic (Berry et al., 1992) and combine emic and etic (Triandis, 1974). We will shortly introducing both. The one will be used in this study is Berrry's iterative model of drived etic.

1.4.2.1.1. Berry's Iterative model of derived etic:

According to this approach it is possible to start the research in one culture then transfer the information gained from this to another culture and eventually combine the similarities and the differences between them until common ground is reached. So, first of all we start to investigate the behaviour in our own culture, which is the emic approach. Then we transfer this to the other culture (usually by translation of the measurement material) and then, when we test the other culture with this translated instrument, we investigate the same behaviour in the new culture. In the third step we compare the two cultures which means comparing the two emics. Then, in a fourth step we look at whether comparison is possible or not. If it is possible, we can talk about derived etic which exists between two or more culture's emics (Berry, 1992). See figure 1.4.1 for the Venn Diagram.

Figure 1.4.1: Venn diagram; steps taken to operationalize emics and etics (Adapted from Berry, 1992).
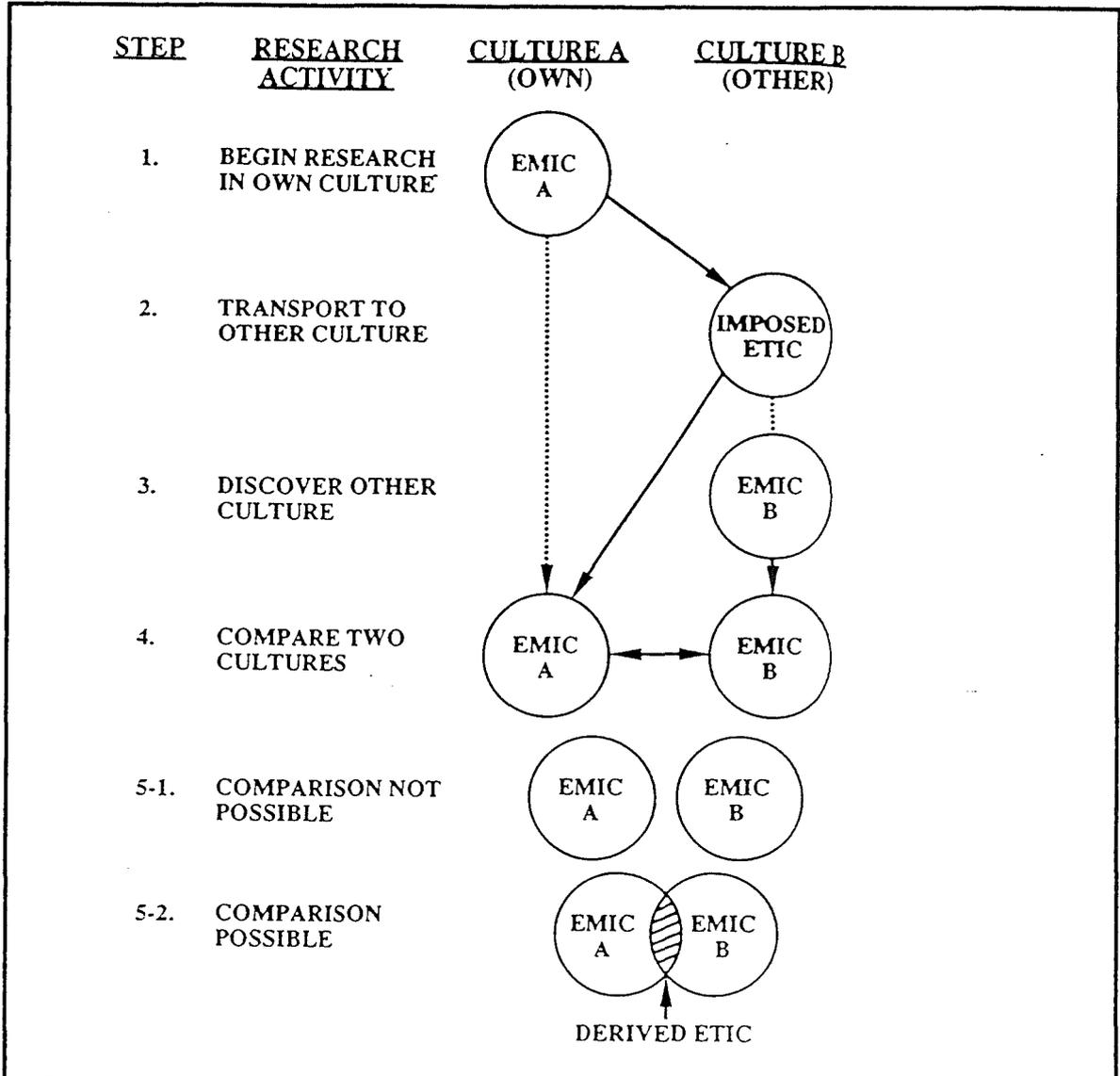
One of the criticisms of this approach is that the comparison gets very complicated if the number of cultures compared is more then two, even though this is theoretically possible. On the other hand the strategy gives practical guidelines for making psychological comparisons using psychological measurement techniques.

1.4.2.1.2. Triandis's model: Combine emic-etic

The second approach also uses the same conceptual analogy of emic and etic but suggests a different way to combine them. Triandis's (1980) model of cross-cultural comparison is called "combine emic-etic". This method is quite similar to Berry's iterative approach for derived etic. The difference with Triandis's approach is at the beginning of the model. It starts with constructing an etic by developing different scales for the different cultures at the same time. Then it develops emic ways of measuring in

each culture. Triandis (1974) points out that in this procedure the etic concepts such as race, nationality, religion, and occupation are much more general than the related emic concepts. So this method is trying to discover etic with emic instruments. For this reason it has been criticised by Van de Vijver & Poortinga (1982) and Brislin (1980) who argue that the Triandis's model produces validity problems that are very difficult to overcome. One reason why his method has been criticised is the statistical analysis that has been used to construct a combined emic and etic. He uses factor analysis to find out the similarities between two emics but, as Brislin (1980) points out, using factor analysis may increase the chance of misjudging the similarities between cultures because there is no best agreed method of factor rotation which will lead to the best fit of the model (e.g. varimax or oblique rotation). This will also have an effect on the number of factors constructed from the model. Additionally, sometimes it may well be case that the factor analysis can show that there could be a better set of etics than that originally proposed by the researcher.

On the other hand there are some successful uses of the model in the literature, one of which was recently published by Godin, Maticka-Tyndale, Adrien, Manson-Singer, Willms, & Cappom (1996). They tested the cross-cultural validity of three different social psychology theories of health specific risk-taking behaviour (Fishbein & Ajzen's theory of reasoned action, Ajzen's theory of planned behaviour, and Triandis's theory of interpersonal behaviour). They went through a quite difficult process of establishing conceptual validity in all three cultures they investigated (Latin America, English speaking Caribbean, and South Asian) and then developed a scale that would measure the same behaviour pattern for condom use in all these three cultures.

It is obvious that the choice of method is highly related to the purpose of the study and the target sample of the specific investigation. Still, if the methods were to be judged in terms of their practicality and applicability, our favoured model would be Berry's iterative model of the derived etic. The reason for this is that most of the time the theoretical model is established in one culture before its validity is tested in the second (imposed) culture with the existing measurement material. If Triandis's model is adopted the measurement instrument would have to be developed simultaneously in both cultures from the beginning, which seems rather impractical. The second criticism of this, as we have already mentioned, is that the validity of the comparison should be questioned because of the different materials used to collect the information. But of course recent studies with Triandis's model are more advanced and the final measure is a single scale which has been constructed from preliminary investigations in the target cultures (Godin et al., 1996). In some cases this has been done using back translation to decentralise the concepts in the scale. In this procedure the scale is translated and back translated several times until the concept is neutralised and represents the same meaning in all cultures. The details of this method will be given below in translation methods for conceptual equivalence.

To be able to compare two or more different cultures we need to know whether equivalency is possible between cultures, for instance conceptual equivalency, functional equivalency and metric equivalency. Without looking at these different kinds of equivalency criteria we wouldn't be able to compare different cultures reliably. It might be good idea to use some of these equivalency concepts as a main framework and to discuss the possible statistical techniques within this framework. In the cross-cultural literature, these equivalency concepts are frequently used (e.g. Klien, 1988; Berry and Dasen, 1974; Berry, 1980; Van de Vijver & Poortinga, 1982) but recently Berry (1992) has suggested that there has been some misuse of them. Although they are not perfect these are still concepts which will help to create criteria for cross-cultural research methodology in terms of comparability, reliability and less biased measurement.

1.4.3. Methodological Difficulties of Cross-Cultural Comparison:
Equivalency & Comparability Problems of Cross-Cultural Psychology

The approach that interests us constructs the basis of reliability through cross-cultural equivalence. Berry and Dasen (1974) argue that there are three different kinds of equivalence. These are 1. Functional, 2. Conceptual and 3. Metric equivalence. To supplement metric equivalence, Poortinga (1962) has added 3a. Scale equivalence and Hui has added 3b. Item equivalence.

1.4.3.1. Functional Equivalence
"Functional equivalence exists when two or more behaviours (in two or more cultural system) are related to functionally similar problems" (Berry, 1980). Triandis (1980) claims that "without this equivalence, it is suggested, no valid cross-cultural behavioral comparison may be made".

1.4.3.2. Conceptual Equivalence
"Conceptual equivalence is that the meaning of the research (stimuli, concept etc) or of behaviour must be equivalent before comparison is possible" (Berry, 1980). This involves the demonstration that concepts mean the same in the different cultures. Berry and Dasen (1974) and Berry (1980) have various suggestions how this can be achieved, although it is not a simple problem' (Brislin, 1980).

Conceptual equivalence is a precondition for comparison, like functional equivalence. The first study of our research concerns transliteral equivalence. At this stage the aim is to test the scales used in this study for equivalence across languages.

Three approaches have been identified in the literature to make this conceptual equivalency possible. These are Translation methods (Brislin, 1980, 1986), Osgood's Semantic differential analyses from 30 different countries (Osgood, 1965,1971,1977, cited in Brislin, 1980) and the Ethnoscience or cognitive tradition of anthropology (Tyler, 1969; Sturtevant,1964; Berry, 1980). Because it is directly relevant to this study, we will be considering Brislin's (1980) translation techniques in detail.

Brislin (1980) suggested and reviewed at least five different ways of testing translation quality. These are a. back translation, b. bilingual sample, c. committee approach, d. pre-test procedure and e. back translation for decentralisation.

1.4.3.2.1. Brislin's methods of translation for conceptual equivalence:

Brislin (1980) introduced five complementary approaches to methods of translation for cross-cultural studies. These are back translation, the bilingual approach, the committee approach, pre-test and decentralisation. Each of these will be discussed below.

1.4.3.2.1.1. Back translation, in which the researcher prepares material in one language and asks a bilingual to translate it into the other target language. A second bilingual independently translates the material back into the original language. The researcher then has two forms in the original language to examine and, even if s/he does not know the target language, can make a sound judgement about the quality of translation. The back translation method is nowadays a pretty standard procedure in cross-cultural comparisons but the validity of the method on its own is not always adequate. This method, for example, cannot overcome the problem of the connotational meaning of the word. Also it can give a false sense of security. Therefore it is important to have different methods, as well as back translation, to overcome this kind of problem. These methods can be used by people who do not know the target language, a common problem in cross-cultural research and especially difficult to avoid in studies comparing three or more cultures. In the following section, some alternative methods of translation are suggested to overcome the comparability problem of cross-cultural studies.

1.4.3.2.1.2. The bilingual approach, in which the bilingual takes the same test, or different groups take different halves of a test in two languages that they know. Items yielding different responses, or differing frequency of responses, can be easily identified. The advantage of the technique is its precision and that it can be analysed with complex statistics and the concepts tested with split half assessment. The disadvantage is that the research instrument is being developed using responses from an atypical group of bilingual people.

1.4.3.2.1.3. The committee approach, in which a group of bilinguals translates from the source to the target language. The mistakes of one member can be detected by others on the committee. The weakness of the method is that committee members may be uncritical of one another (Brislin, 1980).

1.4.3.2.1.4. Pre-test procedure. After a translation is completed it should be field tested to ensure that people will comprehend all material to which they will be expected to respond. There is no weakness per se with this method. Indeed, all translated material should be field tested (Brislin, 1980).

1.4.3.2.1.5. Procedure of decentralisation. The results of the decentering procedure can be related to emics and etics. Using the decentering approach, etic concepts would be those that 'survive' the translation / back translation procedure since the terms would have to exist in both languages if the concepts are to survive. Emic concepts would be those that are lost (like 'gossip' and 'daydreaming'), since after a concept is described in one language, losing it means that no equivalent could easily be found in the other language(s). Etic and emic concepts would then be interrelated through statistical techniques described earlier in this chapter (Brislin, 1980).

Decentralisation can be done in two ways. Using the back translation procedure several times is one way but the other one, suggested by Triandis (1980) to support his approach of combined emic-etic, is to investigate the cultures separately. Therefore the instruments are developed simultaneously to test the same concept with different materials and no translation or back translation procedures are involved. But the approach involves complex multivariate statistics and the reliability of the results has been criticised by others (Brislin, 1980; Berry, 1992).

1.4.3.3. Metric Equivalence

"Metric equivalence exists when the psychometric properties of the two (or more) sets of data from two (or more) cultural groups exhibit essentially the same coherence or structure" (Berry, 1980). For this reason two lines of argument have been developed: subsystem validation and scalar equivalence. Subsystem validation (Robert and Sutton-Smith, 1962) needs statistical relationships to remain fairly constant among independent and dependent variables, no matter if the variance available is used intra-culturally or cross-culturally. This first argument is mainly that covariation among variables should be stable regardless of the source of the variation. A second argument is that statistical relationships among dependent variables should be patterned similarly in two or more cultural groups before comparisons can be made. This argument attempts to demonstrate scalar equivalence (Van de Vijver & Poortinga, 1982; Irvine & Carroll, 1980). This can be demonstrated by similarity in the correlation matrices (Van de Vijver & Poortinga, 1982) or by common factor structures (Irvine, 1966, cited in Berry, 1992). In both cases, it requires behavioural measurements (observations, test data, etc.) to be

structured in similar ways within groups before comparisons across groups are allowed. Unlike functional and conceptual equivalency, metric equivalence can usually be established only after the data have been collected and analysed. This can be done in two ways. One is formulated by Van de Vijver & Poortinga (1982) and is called scalar equivalence and the other is formulated by Hui (1982) and is called item equivalence.

1.4.3.3.1. Scalar Equivalence

Van de Vijver & Poortinga's (1982) scalar equivalence can be demonstrated by the similarity in correlation matrices or by common factor structures. Both these cases require behavioural measurements (observations, test data etc.) to be structured in similar ways within groups before comparison across groups is allowed. This is done in the second part this thesis.

1.4.3.3.2. Item Equivalence

Item equivalence is a more detailed statistical investigation of the scale with Item Response theory (Triandis & Hui, 1987). Using this theory it is possible to detect items which function differently in the two cultures. This can be done by comparing Item Characteristics Curves of each sample. This comparison is called Differential Item Functioning (Holland & Weiner, 1993; Hambleton, Swaminathan & Rogers, 1991, de Gruijter & Van der Kamp, 1984).

In summary, comparability is a prerequisite for valid comparison; it may be constructed either by adopting universals (etics) from other disciplines (e.g. social anthropology or linguistics) or by demonstrating the equivalence of psychological concepts and data across groups. The latter is the one we adopted in this research. Which ever method is adopted to test the equivalence of psychological concepts, either Berry's "Derived Etic" or Triandis' "Combined Emic and Etic", it is important to remember that cross-cultural studies have two different levels to be investigated, the emic at a local level and the etic at a universal level.

1.4.3. Applications of equivalence to this study:

In our research, Brislin's (1980) suggestions for translation and back translation have been carried out, but instead of aiming at the decentralisation of items we work on each item individually in the target language to make sure the connotative as well as denotative meanings of items are the same for each culture. So, instead of decentering items, they have been the kept the same in the original questionnaire (as much as possible) but changed in the target language in terms of culture specific expressions. For example, in English the meaning of "homework" is functionally different from Turkish. In Turkish it refers to specific tasks given by the teacher for marking but not to all other preparation they do for

class. Therefore, in Turkish all uses of "homework" in the items have been changed to "all your school work at home".

In the psychometric literature there are three theories used to test the quality of measurement. These are Classical, Generalizability and Item Response theories. **Classical theory** is the one most widely used. The information gathered by this theory includes item difficulty, item discrimination, reliability and validity. It includes the use of factor analysis. **Generalizability theory** detects biases in the administration of a test. It can test for different sources of variability at the same time. For example it can test for the effects of different occasions of test administration and the use of different forms. **Item response theory** is able to test item difficulty and discrimination for each item independently from the rest of the items in the same scale using likelihood models. The parameters estimated from this analysis are more sophisticated than classical analysis and, to a certain extent, generalizability analysis.

Usually one of these psychometric analyses is used to test cross-cultural equivalence. For example, conceptual equivalence (item fidelity) can be tested by generalizability, classical or item response theory approaches with a bilingual sample. Metric equivalence can be tested by generalizability theory (Berry et al., 1992; Van de Vijver & Poortinga, 1982) and classical theory. Scalar equivalence can be tested by factor analysis (Poortinga & Van de Vijver, 1987). Item equivalence can be tested by item response theory (Hulin, Drasgow & Komocar, 1982). Unfortunately, although these methods are acknowledged in the literature, they are not used very often to test cross-cultural equivalence or to detect biases because they are not very cost effective. They all need a preliminary investigation and extra statistical analysis.

In this study all the major psychometric techniques are used for the cross-cultural comparison. But instead of making an early decision as to which method would be most useful for a particular aim, the three methods are compared against each other in terms of the quality of information gathered and the cost effectiveness (e.g. practicality, availability of the statistical packages etc.) as well. Recommendation will then be made.

In part one, the conceptual equivalence of the comparison is tested by three psychometric methods (Generalizability, classical, IRT). For this part of the study bilingual Turkish pupils were used to test item fidelities. Then the similarity and the efficiency of the results are discussed to make decisions on the item fidelities of the measures used.

In part two, metric equivalence and item equivalence are tested with classical theory and IRT. The validity of structure is also tested by exploratory factor analysis. For this part, counterbalanced Turkish

and English samples were used. At the end of this part the methods are used to draw a derived etic from both cultures samples.

Finally, in part three, the two culture's samples are compared on the basis of derived etic items and the relationships between variables identified between and within cultures with univariate (ANOVA) and multivariate (Canonical correlation, regression analysis) statistics.

1.5. THE CONTEXT OF THE STUDY: The Turkish and English educational System

1.5.1. Overview

In this section the author would like to give some information about the Turkish and English secondary education system in which the research took place. Although the study did not directly investigate any educational variable the hypotheses were made on the basis of the adolescent education setting and their experiences in the school related to perceived academic achievement. Therefore it is important to explain what kinds of educational legislation and school setting these adolescents are in.

1.5.2. Current Provisions for Education

1.5.2.1. Present structure and organisation of the English and Turkish Education System:
1.5.2.1.1.English:

In the United Kingdom schooling is compulsory between at the age of 5 and 16 and many pupils stay at the school longer than the minimum leaving age. Secondary school education starts around the age of 11 after primary school education. Then, around the age of 16, pupils sit the GCSE exam. After this students are free to stay in the schools to do their A levels or alternatively leave the school and to go to colleges to do their A levels which gives them a sense of belonging to the "real world". Colleges also give opportunities to mature students to do their A levels and some vocational courses as well. Average class size is usually 35 though this depends on the subject and level. Most of the subjects are taught in skill based groups within the class (e.g. maths). There are a total of 7368 secondary schools in the United Kingdom. This includes independent schools. The breakdown figures for the four countries are: England 6259, Wales 298, Scotland 552, Northern Ireland 259.

1.5.2.1.2. Turkish:

In Turkey schooling is compulsory between the ages of 7 and 11 but in reality many pupils start education earlier than age 7 and stay in education after 11. Particularly in the cities, nursery education starts around the age of three. After age 11 the majority of students continue their education to access universities later on. Secondary education starts at the age of 11 and finishes around the age of 17. But

if the student does not pass all the subjects they took during the year they are not allowed to proceed to the next stage. Instead they are asked to sit the exams again the next year or re-attend the same subjects until they are successful in all subjects. Students have to finish secondary school before they are allowed to take a university central exam to go to university.

There is a significant drop in the number of students from lower secondary school education (age 11 to 14) to the upper level but in recent years because of the high unemployment these drop out numbers have decreased and the number of students attending the upper level (lise) secondary school education has increased. This increase is also because of the increase in the young population in Turkey during the last 10-20 years (Gökce, 1996). Because of the limited number of available places in university, application to universities is regulated by a central organisation located in capital city of Ankara. This centre is called ÖSYM (Ögrenci Seçme ve Yerlestirme Merkezi - The centre of student selection and location). The centre organises the entrance exams (in two levels) and then locates the students according to their exam results. The choice of department and university is based on the availability of places for the particular degree course. Only 30% of the student get places at university and another 40% get places in Open University.

Average class size in secondary schools is 50 and this size is smaller if the school is privately run (around 30-40). Most of the subjects are taught in a whole class environment and this style applies to almost all the main subjects (e.g. maths, language, geography etc.) but not to subjects like music.

There are 4187 secondary schools in Turkey. These include the private schools (Toker, 1992; Mihcioglu, 1989). The breakdown figures of the schools for the regions are: Marmara 908, Ege 587, Mid-Anatolia 819, Blacksea 673, Mediterranean (the south) 448, South-East Anatolia 214, and East Anatolia 383.

1.5.2.2. Types of schools

1.5.2.2.1. In England:

We can put schools in U.K. into three categories: publicly funded schools, independent schools and city technology colleges. Publicly funded schools are funded via local authorities on the basis of their student numbers. One third of these schools are supported by Christian charities (Anglican or Catholic). Some of these schools have recently (1990) had an opportunity to become independent from local authorities and are directly funded by central governing (government) bodies. These call themselves grant-maintained schools. These schools are funded on the basis of their success rather that the number of the students. Independent schools, although they get some support from government, are privately run. Finally the city technology colleges are independently established outside of the main curriculum and funded partly by the private sector to educate students mainly in technical subjects (Brown, Coupland & Davies, 1993).

1.5.2.2.2. In Turkey:

We can put the schools in Turkey in three categories: publicly funded schools, private schools and vocational schools which are also publicly funded. Publicly funded schools account for the majority of secondary schools in Turkey and are funded directly by central government although managed by local authorities. Only 8.4% of publicly funded schools are seminary (Islamic) schools. They follow the national curriculum but also emphasise religious values. Although private schools get some funds from the government they are privately run. The vocational colleges are established within the state education system and students graduate with some form of vocational qualification at the end of standard secondary school education (6 years) or with one extra year. Some of these colleges are training schools for primary school teachers, some others are technical schools for technical subjects. When these colleges were established (1950-60) the idea was to give students a chance to qualify enough to start work around the age of 18. The rule in the past was that students who attend specific vocational schools could only apply for a related degree at university but now this rule has been changed to one of equal rights for all secondary school leavers to apply for any degree subject at university. Therefore the nature of the vocational schools has changed.

1.5.3. The importance of school success in Turkish society.

Although Turkey is a fairly industrialised country, 50% of the population live in villages and earn a living by agriculture. On the other hand, because of complicated government policy and individual needs, there are large numbers of internal immigrants from villages to cities. The difficult, ruthless circumstances in cities seem to have encouraged academic achievement. It is a well-known fact in Turkey that not only middle class families but also working class families are highly motivated and attach a high value to education.

1.5.4. Conclusion: Similarities and Differences Between English and Turkish Education Systems.

Both the secondary education systems have a similar school structure (e.g. public and private and vocational schools) but the funding system seems relatively different. In the UK it seems that the system is more locally organised, therefore the independence of schools is greater. For example vocational technical colleges are almost completely independent from the public system but in Turkey vocational schools are supported by public funds.

Religious organisations have some form of influence in education in both countries. It seems more of the schools in Britain are run or supported by religious (seminary) organisations (1/3 of public schools) and they follow the national curriculum. The ratio of religious (seminary) school is smaller in Turkey (8.4%) and they also follow the national curriculum, but these schools are more religious than their English counterparts and they are usually located in small cities or towns.

1.6. HYPOTHESES

This thesis investigates the social antecedents of perceived control, especially cultural differences. The antecedents considered are culture, religion (embedded in the culture), religiosity, authoritarianism, socio-economic status and gender. Except for the first two, this set of variables are not directly culture dependent, therefore the investigation of them will be done both within and between cultures.

The assumption behind these comparisons is the cross-cultural comparability of the concepts and their metric equivalencies. These assumptions have been tested by three different psychometric techniques namely, generalizability, classical item analysis and item response theory. Each technique is used to test the translation equivalency and similarities between cultures in terms of reliability of measurement.

Three sets of hypotheses were made to test a) the translation and conceptual equivalency of the scales, b) the metric equivalency (derived etic) and finally c) the differences between and within cultures.

Translation equivalency:

PART I

The translation equivalency of scales in cross-cultural studies historically has been tested with classical psychometric methods, but these techniques have problems because of the difficulties of comparing the results statistically (Ferguson, 1959; Ferguson & Tokane, 1989). Despite these problems there are still good practical reasons to use these techniques. They are the most widely used psychometric techniques in psychology so far. It is possible to improve the use of classical item analysis using Ferguson's (1959) significance test for the differences between correlation values. This is easy to calculate.

The Generalizability technique (mainly using GENOVA) is the second suggested psychometric technique to test for translation fidelity and cross-cultural comparisons (Poortinga & Van de Vijver, 1987). This technique is able to test for more than one error source. Generalizability theory uses analysis of variance to detect differences under different circumstances of testing e.g. different language forms or different instructions. It uses the nested design of ANOVA.

The third psychometric technique is called Item Response theory or Latent Trait theory. It uses an iterative algorithm to predict the best fitting model to given responses. This test allows us to compare item characteristic curves and uses the X^2 test to detect similarities and differences on the same item in different language forms and different samples. Because of the sophistication of the statistics this test has became widely used in cross-cultural studies. The future of this technique is greater then others. On the other hand the technique is based on highly sophisticated statistical analyses and the computer programs are made for a very specific purpose. For example the programs called BICAL, PML, RASCAL, BILOG and RIDA are only able to deal with single parameter data with one correct response point. Others such as ASCAL and LOGIST are able to deal with up to three parameters and are able to take into account item difficulties and estimated responses as well (Hambleton, Swaminathan, Rogers, 1991). The programme called MULTILOG can also be used on rating scales (Thissen, 1991; Thissen & Steinberg, 1984).

These three techniques compensate for each others weaknesses and so improve our measurement strategies in cross-cultural studies. Therefore, it is important to explore them from a specific research point of view and adopt the most efficient and least costly technique for future use. This will be one of the major considerations of this thesis. Van de Vijver and Hambleton (1996) published some practical guidelines for the cross-cultural psychologist, taking into account the inquiry of the International Test Commission (XXV International Psychology Conference in Madrid, 1994), which encouraged the researcher to use psychometric criteria to test cross-cultural equivalence. They specifically encourage the use of Item Response Theory.

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Please note that the three different psychometric techniques have been used twice, and each time they were used to test different hypotheses. These techniques were used first to investigate the differences between language forms in the same bilingual sample and second to investigate the differences between cultures in two monolingual samples.

1a) There will be no significant differences between the English and the Turkish translated version of the same items of CNSIE scores when answered by Turkish bilingual students in various orders.

1b) There will be no significant differences between the English and the Turkish translated version of the same items of MASLOC scores when answered by Turkish bilingual students in various orders.

1c) There will be no significant differences between the English and the Turkish translated version of the same items of CAMI scores when answered by Turkish bilingual students in various orders.

1d) There will be no significant differences between the English and the Turkish translated version of the same items of Religiosity Scale for Youth scores when answered by Turkish bilingual students in various orders.

1e) There will be no significant differences between the English and the Turkish translated version of the same items of Authoritarianism (F-Scale) scores when answered by Turkish bilingual students in various orders.

Comparability of metric equivalency (Derived Etic)

Part II

There are several possible ways of testing conceptual and metric equivalency of cross-cultural methods in psychology. One compares responses from one culture to another by item analysis, and the second looks at the factorial structure of the test in the two cultures. If the items are loaded on the same factors in both cultures this can be interpreted as structural (conceptual) equivalence. Item analysis can be done the classical way or by item characteristic curves which are part of Item Response (latent trait) theory. Both methods are used to back up each other and to compare the utilities of both for future studies. On this occasion Item Characteristics Curves (ICC's) are used for judgements by eye, but the main decisions about scales are made on the basis of X^2 analysis of the comparisons between ICC in both samples.

2a) There will be no significant differences between the English and the Turkish samples on CNSIE's scores at the item level. If there are any differences between the English and the Turkish samples they will be due to cultural differences.

2aa) There will be no significant differences between the English and the Turkish samples on CNSIE's factorial structure.

2aaa) There will be no differences between item characteristic curves of CNSIE's scores for the English and the Turkish samples.

2b) There will be no significant differences between the English and the Turkish samples on MASLOC's scores at the item level.

2bb) There will be no significant differences between the English and the Turkish samples on MASLOC's factorial structure.

2bbb) There will be no differences between item characteristic curves of MASLOC's scores for English and Turkish samples.

2c) There will be no significant differences between the English and the Turkish samples on CAMI's subscale scores at the item level.

2cc) There will be no significant differences between the English and the Turkish samples on CAMI's subscales factorial structure.

2ccc) There will be no differences between item characteristic curves of CAMI's items for the English and the Turkish samples.

2d) There will be no significant differences between the English and the Turkish samples on Religiosity for Youth's scores at the item level.

2dd) There will be no significant differences between the English and the Turkish samples on Religiosity for Youth's factorial structure.

2ddd) There will be no differences between item characteristic curves of Religiosity for Youth's scores for the English and the Turkish samples.

2e) There will be no significant differences between the English and the Turkish samples on Religiosity for Youth's scores at the item level.

2ee) There will be no significant differences between the English and the Turkish samples on Authoritarianism (F-Scale) scores factorial structure.

2eee) There will be no differences between item characteristic curves of Authoritarianism (F-Scale)'s scores for the English and the Turkish samples.

Main Hypotheses: Between and within subjects differences in both cultures.

Part III

This part of the hypothesis refers to differences between the two cultures on three sets of perceived control scales and on Religiosity and Authoritarianism.

3a) There will be significant differences between the English and the Turkish samples' CNSIE scores.

    3aa) Turkish schools children CNSIE scores will be significantly more external then their English counterparts.

3b) There will be significant differences between the English and the Turkish samples' MASLOC scores.

    3bb) Turkish schools children MASLOC scores will be significantly more external then their English counterparts.

3c) There will be significant differences between the English and the Turkish samples' CAMI subscale scores.

    3cc) Turkish schools children CAMI subscales' scores will be significantly more external then their English counterparts.

3d) There will be significant differences between the English and the Turkish samples' Religiosity for Youth scores.

    3dd) Turkish schools children Religiosity for Youth scores will be significantly more religious then their English counterparts.

3e) There will be significant differences between the English and the Turkish samples' Authoritarianism (F-Scale) scores.

    3ee) Turkish schools children Authoritarianism (F-Scale) scores will be significantly more authoritarian then their English counterparts.

Introduction/Hypotheses

Another set of hypotheses refers to the effects of culture and the individual variables of religion, religiosity, authoritarianism, SES and gender on the three sets of perceived control scales. The first assumption is that individuals' perceptions about outcomes will depend on their culture because of their different experiences. Additionally, these individual experiences will also be related to their social environment and individual beliefs.

4a) In Western cultures people are more likely to be internal than in Eastern cultures because they may perceive more causal links between their actions and outcomes (Lefcourt, 1991). In Eastern cultures people perceive or believe that they have less control on outcomes so they build fewer

expectations of affecting outcomes. They believe that environmental factors, powerful others, luck and fate are more likely to determine or affect outcomes than their own actions. Therefore, we expect the English sample to be more internal than the Turkish sample.

4b) Age, gender and socio-economic status affect perceived control. When a person gets older perceived control increases (Findley & Cooper, 1983; Skinner & Chapman, 1987; Skinner, 1990). Boys are more likely to be internal than girls because of different, gender related, social experiences (Hui, 1982; Jayaratne & Ivey, 1983; Mwamwenda, 1995). A working class background may mean that a person has less experience of competence and is therefore less likely to develop greater perceived control.

4c) It may be that people with different religious backgrounds have different perceptions about the relationship between behaviour and outcomes. People who are brought up in a Christian culture may be more internal than Muslims because the Muslim religion is more fatalist (Asonibare, 1986). Therefore we expect the Christian sample to be more internal than the Muslim sample

4d) It is expected that there will be a relationship between religiosity level and perception of control and that people who score high on religiosity the scale will score more external on the perceived control scales. Although the evidence on this issue is conflicting (Lesser & Painser, 1985; Gabbard, Howard & Tageson, 1986; Friederberg & Friederberg, 1985), we expect religious people to believe more in external causes. Some religions, such as Christianity and Islam, encourage individuals to take initiatives about their life. However, because of the belief in God and His/Her influence on their lives, religious people may be more likely to explain outcomes in terms of external factors such as fate and God.

4e) Similar to religiosity, we expect that there will be a relationship between authoritarianism and perceived control. We expect authoritarians to be more external because they are more likely to explain outcomes in terms of external factors, mainly powerful others.

CHAPTER 2: METHOD

CHAPTER 2: METHOD

2.1. OVERVIEW

In this chapter we will present the three different parts of the research methodology used in this research. The first and second parts are about the adaptation of the scales for use in two languages (English and Turkish). The third part is about comparing two cultures.

The purpose of the first part of this research is to establish conceptual equivalence for the scales used. Therefore a bilingual Turkish sample was used to test experimentally the validity of the translation (Brislin, 1980; Berry et al., 1992). This may not be successful if only the back translation method is used because there are times that translation does not preserve the actual meaning. The denotational and connotational meaning of a word can be different from one culture to another. Therefore, using additional experimental methods to back translation, it will be possible to detect changes in the meaning of the words. For example democracy has denotationally the same meaning in English and Russian but the connotational meaning may be completely different. Three psychometric methods (Generalizability, Classical, Item Response) will be used to test translation equivalence and then the information gathered from each of the methods compared in terms of consistency and cost. If any differences are detected between forms this will be due to lack of translation equivalence or other biases, which can then be further investigated.

The main purpose of part two is to establish a common ground for comparing the two cultures. This will help us to draw a derived etic from Berry's iterative method of emic-etic comparability (Berry, 1982; Berry et al., 1992). To succeed in this we have to apply metric equivalence which, in the recent literature, is divided into scalar and item equivalence. We will be adapting the item equivalence approach to fulfil the needs of comparability. We believe that without item comparability there will be no actual compatibility between measurement in the two cultures. The items of the scales were tested in both cultures and the differences in the variances were detected with classical and modern item analysis. The hypothesis is that there may be some differences between responses to the same items in the two cultures due to cultural differences between them. The items, which show differences will be considered as emic items which are culture specific.

The purpose of the third part of the study is to test if there are any differences between the two cultures after the derived etic of the two has been detected. In this part the main hypothesis of the study will be tested to identify the antecedents of perceived control in both cultures. To do this several univariate

(ANOVA) and multivariate tests (Canonical correlation and multiple regression) will be used to test similarity-relationships and differences on perceived control due to cultural and other social variables.

2.2. INSTRUMENTS

We used five different scales: a) the Control, Means-Ends and Agency Beliefs Scale (Skinner, Chapman, Baltes, 1988); b) the Nowicki-Strickland Internal-External Scale for Children (Nowicki and Strickland, 1973); c) the Multidimensional Academic Specific Locus of Control Scale (Palenzuela, 1988); d) the Religiosity in Youth Scale (Rohrbaugh and Jessor, 1976); and e) Authoritarianism Scale, California F Scale (60-65 Form) (Adorno et al., 1950; Robinson et al., 1992). These questionnaires were not all written in English and have not always been tested in English speaking countries. But regardless of in which language they were first developed they were also published in English. For example CAMI was simultaneously developed in German and English and has been tested in both cultures (Skinner et al., 1988). CNSIE and Religiosity for Youth was developed in the USA (Nowicki-Strickland, 1973; Rohrbaugh and Jessor, 1976). The Authoritarianism scale has been widely used in many different languages and countries (Christie, 1991). MASLOC was developed in Spain but has not been used in English speaking countries (Palenzuela, 1988).

2.2.1. Several criteria were used for the selection of these scales:

Several criteria were used for the selection of instruments. These were: a. suitability for the age range of the research sample, b. suitability to the life experiences of the research sample, c. multicultural applicability of the scales, d. theoretical foundations of the scale, especially important for the perceived control scales. For each scale there were additional considerations. For example, for the religiosity scale it was important that the scale is not religion specific and for the authoritarianism scale that it is general to all life events rather than specific to politics (Stogner, 1936; Levinson, Sanford, 1944, cited in Christie, 1991) or economics (Newcombe, 1943, cited in Christie, 1991). Cultural sensitivity was another variable which taken into account.

a. Age range was one of the most important variables taken into account in selection of the scales. They needed to be applicable to teenagers and adolescents. On some occasions, however, scales for young adults were used because other scales were unavailable.

CAMI was originally developed for pupil 5-14 year olds so some of the statements were adjusted to make it applicable to 14 to 18 year old pupils in secondary schools.

CANSIE was developed for 12 to 18 year olds.

MASLOC was developed and used with college students who are slightly older than our sample, but because the items were selected on the basis of academic experiences they are also applicable to secondary school children.

The Religiosity Scale has just been developed for secondary schools pupils and has been used in youth projects.

The Authoritarianism scale was developed for adults and has been used in many different samples, including young adults.

b. Suitability to the life experiences of the research sample: Except for the religiosity and authoritarianism scales all other scales' items are related to school experiences and so suitable to the life experiences of our sample who were all attending secondary school. The religiosity and authoritarianism scales are general enough to be applicable to this sample.

c. Multi cultural applicability of the scales: Each of the scales used in this study were developed for the European and North American traditions and have been used in more than one culture. They therefore seem to be suitable to this study.

CAMI was used in three different cultures (German, Canadian, American) when it was developed. Since then it has been translated into two more languages (Polish and Russian).

CANSIE is another very widely used scale. It has been translated into many languages e.g. Polish, Turkish and Greek (Dyal, 1984).

MASLOC was developed in Spain.

The Religiosity scale was developed in North America to be used in multicultural schools and communities so it is not connected to any specific culture or religion.

The Authoritarianism scale has been used in many different languages and countries e.g. German, North American, Turkish, Greek, Dutch, Norwegian, Indian etc.

d. The theoretical foundations of the scales were particularly important for the perceived control scales. Because the concept of locus of control has evolved towards perceived control, the measurement of the concept has also changed over the years. However, the changes in theory have not always been quickly reflected in measurement. An example is Rotter's (1966) scale. Although he himself pointed out problems with the concept, his original scale is the most widely used, even today. Furnham and Steel (1993) listed the problems related to the concept and its measurement such as reinforcement value, domain specificity, defensive externality, good and bad dichotomy, single or multiple belief systems (e.g. self-others), and the contribution of other concepts, such as cause, responsibility versus blame and stability versus temporability, to the measurement.

One problem that is is frequently addressed in the literature is multidimensionality. Rotter (1970) agreed that his scale is meant to be unidimensional but it is actually multidimensional (Furnham and Steele, 1993). As a result recent studies have tried to develop new mutidimensional LOC scales. Levenson's (1981) Internal, Chance and Powerful Others scale is one of the first examples of this.

Domain specificity, like multidimensionality, is another major variable, which is taken into account nowadays. The new scales have started taking into account possible differences in life experiences, so many recent LOC scales tend to be subject specific e.g. school related (Lefcourt, 1980; Skinner et al., 1988), health related (Wallston, Wallston & DeVellis, 1978), and work related etc.

CAMI (age 7-14 yrs. old)

The Control, Means-Ends and Agency scales were chosen because they are one of the most recently developed LOC scales which represent new theories. Therefore they are domain specific (school related) and multidimensional (effort, ability, powerful others etc).

CANSIE (Age 12 to 18 yrs. old)

This is general and based on Rotter's conceptualization of Locus of Control. It doesn't discriminate any specific factor related to Internal or External locus of control. Items represent various life experiences of children in the age range in school, sport and at home.

This is multi dimensional and domain specific. It is multi dimensional because it measures three different dimensions of perceived control (internal, helplessness and luck). It is also based on a new integrated model of LOC (Palenzuela, 1988). It is domain specific because all of the items are related to academic experiences.

2.2.2. Psychometric Characteristic of the Instruments:

In this part, we describe the scales in terms of their psychometric characteristics. The reliability and validity of the scales in the literature will be given.

2.2.2.1. Control, Means-ends, and Agency Beliefs - CAMI (Skinner, Chapman & Baltes, 1988).

Conceptually this scale was developed from the Action-theory perspective which suggest a distinction between Control, Mean-Ends and Agency beliefs. This scale was constructed using these three different kinds of belief for school related subjects. The age range is 7 to 12 years old. Item analyses were done for German and US populations at the same time. These three belief systems are related schematically as follows:

Figure 2.2.2.1: Two ways deterministic reciprocal model of action theory.
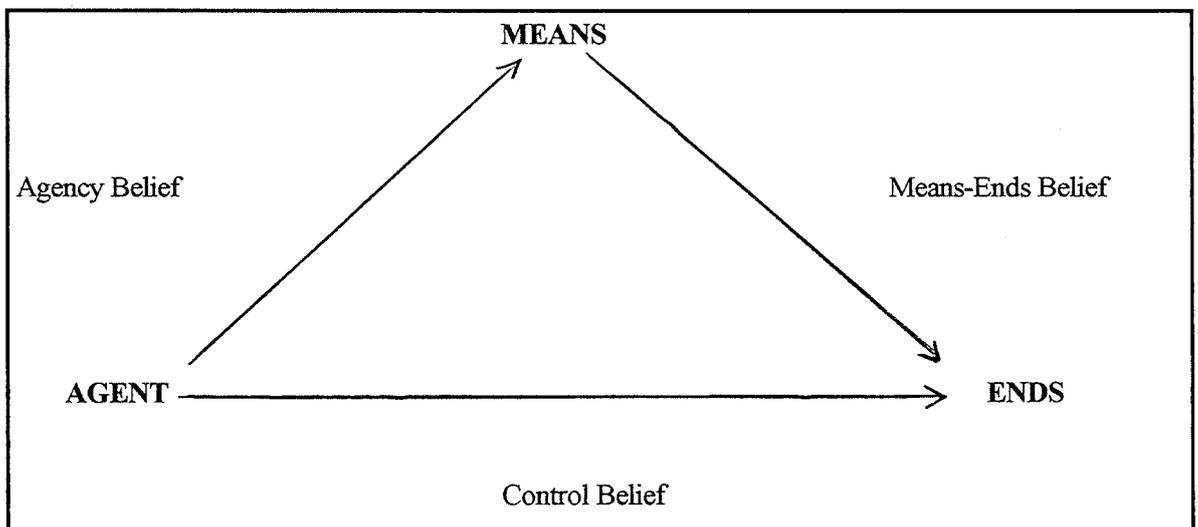
Control beliefs refer to beliefs about the relationship between the agent and a desired outcome or class of outcomes (the ends). They are defined as the individual's (agent's) expectancies about the extent to which he or she can obtain desired outcomes, with no explicit reference to the means used. Means-Ends beliefs refer to beliefs about the relationship between the means and the ends. They are defined as an individual's expectancies about the extent to which a certain class of potential courses are

effective in producing desired outcomes or ends. Agency beliefs refer to beliefs about the relationship between the agent and certain potential means. They are defined as an individual's expectancies about the extent to which he or she possesses these means.

CAMI was developed as a 64 item questionnaire for children between seven and twelve years old (Skinner et al., 1988; Chapman, Skinner & Baltes, 1990). The current version of 10 subscales refers to domains of school performance: Control beliefs (8 items); Means-Ends beliefs for Effort (8 items), for Attributes (8 items), for Powerful Others (8 items), for Luck (8 items), and for Unknown Causes (8 items); Agency beliefs for Effort (4 items), for Attributes (4 items), for Powerful Others (4 items), and for Luck (4 items). The Control and Means-Ends beliefs subscales contain twice as many items as the Agency scales because these two scales include an equal number of items which do not specify outcomes. The items assessing them do not include outcome valences. Skinner et al. (1988) carried out factor analysis and reliability and validity studies for the scale.

Factor analysis: When the original study used factor analysis its aim was to test "whether the structure of children's responses would correspond to the three hypothesised sets of beliefs, namely Control, Means-Ends and Agency" (Skinner, Baltes and Chapman, 1988). To do this they ran a separate factor analysis for each domain of perceived control (i.e. Luck, Attribute, Effort, Powerful Others, Unknown Factors), expecting to come out with three factors each time which would represent the three sets of beliefs. In our study we are interested in whether these three sets of beliefs will emerge in our Turkish and English samples. Considering that the scale has already been tested in the German and American cultures simultaneously we at least expect to find a similar factor structure in the English sample.

Reliability study: As indicated by split-half reliabilities and internal consistencies, all of the scales have moderate to high reliability (average M= .76). Although adequate, the consistencies are lower for Means-Ends for Powerful Others and for four items of the Agency subscales. The test-retest correlations for all samples were moderate (p< .001, min= .37, max= .81) in a nine week period.

Concurrent validity: Correlations were with the Bialer Locus of Control scale (Bialer, 1961) and the Nowicki-Strickland Internal-External Scale for Children (Nowicki-Strickland, 1973). Only the CAMI Means-Ends subscales were highly correlated with the Bialer LOC and CANSIE scales (M= .24) but the Control beliefs and Agency beliefs subscales were not. This means that the CAMI overlaps with some other measures of control-related beliefs (Means-Ends beliefs) but also contains a unique part (e.g. Control and Agency beliefs) (Skinner et al., 1988).

Scoring: All the subscales were scored so that high scores represented external perceived control and low scores internal perceived control. See appendix A for the English and the Turkish version of the Scale.

2.2.2.2. Nowicki-Strickland Locus of Control Scale for Children - CNSIE (Nowicki & Strickland, 1973)

In this scale, there are 40 items in yes/no format and a large number of the items are based on Rotter's I-E scale (1966). This scale has been found reliable and valid in many studies because it has been translated into more than a dozen languages and also adapted to some of them. The age range is 9 to 18 years old.

Factor analysis: The scale was intended to be unidimensional. Factor analysis supports this. One main factor explains at least one-third of the variance. It is usually called "general helplessness" (Lefcourt, 1991).

Reliability: Reliability studies have shown that the internal consistency of the scale is between .60 and .88 (Lefcourt, 1991).

Concurrent validity: The correlation with the Intellectual Achievement Responsibility Questionnaire (IAR) is significant (r= .41). Also, CNSIE scores were not related to social desirability or the gender of the subject. Demographic variables were related to CNSIE in an attempt to fill in the construct validity picture. For instance, it was expected and found that externality was more common among children in the lower socio-economic groups and among black and brown children in the USA.

Scoring: All the subscales were scored so that high scores represented external perceived control and low scores internal. See appendix A for the English and the Turkish version of the Scale.

2.2.2.3. Multidimensional Academic Specific Locus of Control Scale (Palenzuela, 1988).

The development of this scale began in the 1970's and was aimed at investigating psychological constructs related to the psychology of control (Langer, 1982). The scale was developed in Spain. The age range is adolescent and young adult. Palenzuela tried to separate the locus of control concept from its cognate and related concepts because he thought that they were muddled and the cause of conceptual confusion.

Factor analysis: The early version of this scale (Palenzuela, 1984) contained five dimensions: Internality, luck, external agent, unresponsive environment and helplessness. In the last version the factors were reduced to three using factor rotations: Internality or Contingency, Helplessness or non-contingency and Luck or Chance. Each of these dimensions is represented in three separate subscales of 5 items, each with a 9 point Likert format.

Reliability: The internal consistencies are 0.81 for Internality, 0.82 for Helplessness and 0.84 for Luck (Cronbach's alpha coefficient). There were strong correlations between Internality and Helplessness and between Helplessness and Luck, which allows one to speak in terms of a single construct underlying all of them.

Construct validity: The scale has shown strong construct and predictive validity. The construct validity results showed that the Luck scale was positively related to the Helplessness scale. Also, that the Internality subscale was related to Rosenbaum's Self Control scale but the two other subscales (Helplessness and Luck) were not (Palenzuela, 1988). This could again be interpreted as evidence of the independence of the dimensions of Internality and Luck. At the same time, while internal control may be related to self control they are clearly independent constructs.

Scoring: All the subscales were scored so that high scores represented external perceived control and low scores internal. See appendix A for the English and the Turkish version of the Scale.

2.2.2.4. Religiosity in Youth (Rohrbaugh & Jessor, 1976).

This scale was developed by Rohrbaugh and Jessor in 1976 as a part of a longitudinal research project which was called "The Socialization of Problem Behaviour in Youth". The age range is middle childhood and adolescence.

The Religiosity questionnaire included 8 questions which represented four operational dimensions: (a) Ritual religiosity ("How often did you attended religious services during the past year?"), (b) Consequential religiosity ("When you have a serious personal problem how often do you take advice or teaching into consideration?"), (c) Ideological religiosity ("Which of the following statements comes closest to your belief about God?", from a) "I am sure that God really exists and that He is active in my life." to e) "I don't believe in a personal God or in a higher power.") and (d) Experimental religiosity ("During the past year, how often have you experienced a feeling of religious reverence or devotion?").

Reliability: Cronbach's alpha was .90 and the response variance was broad with an almost eight point variation in total scores. Scoring for each item varied from 0 to 4, with high scores representing greater religiosity.

Validity studies: Four different approaches were used to establish the validity of the religiosity measure. Known-groups validity was investigated by age and gender. Females were more religious then males and the young more religious the old, so known-group validity was high. For external validity self reported religiosity and the subscale's scores were highly correlated (.78 to .84). For internal validity the inter-correlation between the four religiosity subscales averaged 0.69. This indicates high correlation between the subscales and therefore justifies the validity of the total score. The discriminant validity was assessed by examining the relationships of the four subscales to two separate measures of the perceived religious environment, social support from peers (friends) and adults (relatives) for religious involvement. The results showed that all four subscales were highly correlated with each other and less correlated with perceived religious environment. This was taken as evidence for the unidimensionality of the scale.

Scoring: The scale was scored so that high scores were represented high religiosity. See appendix A for the English and the Turkish version of the Scale.

2.2.2.5. Authoritarianism 'F' Scale 40-45 or 60A form (Adorno et al., 1950 cited in Christie, 1991).

The F scale was designed to measure ethnic prejudice and "prefascist tendencies' simultaneously without mentioning members of minority groups or having specific reference to fascist ideology. The age range is throughout adulthood. In this study the 40-45 form of Adorno's F-Scale is used. This scale contains 30 items scored on a 6 point rating scale and high scores indicate high authoritarianism.

Reliability: The reliability of this form ranges from 0.81 to 0.97 with a mean of 0.90 (Christie, 1991).

Validity: In several studies in the literature Authoritarianism was found to be different for individuals with the different political orientations. This was the case for the USA, England and the Netherlands (Christie & Garcia, 1951; Rokeach, 1960; Meloen & Middendorp, 1988, cited in Christie, 1991). It was also found that in some countries (e.g. India) the average scores were higher than in other countries (e.g. England) (Bushan, 1969, cited in Christie, 1991). These studies are taken as evidence for the conceptual validity of the scale (Christie, 1991).

Scoring: High scores represent high authoritarianism. See appendix A for the English and the Turkish version of the Scale.

2.2.3. Review of the English form and Translation of the Scales:

Although these scales were written in English, except for the F-Scale none of them have been used in Britain. For this reason each scale was reviewed before they were given to the English sample. First, the English forms of the scales were given to 13 secondary school students in the 5th form in Hampstead State school in London. Students were asked to write down their opinions about each scale and its items and then the author approached some of them informally to ask them about these opinions. Additionally, several psychologist colleagues were also asked about the scales' suitability to English students. As a result of this it was decided to make several changes to the scales. The MASLOC 9 point rating scale was reduced to 6 points. All references to "kids" in the CAMI scale were changed to "students" (e.g. Item 51 "When kids have problems in school, is it usually because of the teacher?" was changed to "When students have problems in school, is it usually because of the teacher?") and all references to "smart" changed to "clever" (e.g. Item 40 "Do you think it is better to be smart than to be lucky?" changing to "Do you think it is better to be clever than to be lucky?").

First each questionnaire was translated into Turkish by the author and checked by another Turkish colleague. The validity of this translation was tested using the back-translation technique. This was done by a bilingual Turk with a degree in English Literature. This back-translation was compared with the original scale and revisions made if necessary. Then the scales were sent to a Turkish linguist for review. Lastly, a psychologist who had experience with schools in Turkey reviewed the scales again. So after several revisions for better face validity, the final version was obtained. For the purpose of the main investigation of cross-cultural comparison some changes were made to both languages forms (details are given later).

2.3. PART I: METHOD OF THE FIRST STUDY: TRANSLATION/CONCEPTUAL EQUIVALENCY

2.3.1. Overview

In the first study, we were concerned with the adaptation of the Turkish version of the scales. For this reason, it was given to bilingual subjects in Turkey. Four different experimental forms of the scales were created. These were an English form, a Turkish form, a half English/half Turkish form and a half Turkish/half English form. These were given to four different groups of bilingual students. Each group

were given two forms on different occasions. The results were analysed using Generalizability theory, Classical theory, and Item Response theory and are presented in chapters 3, 4 and 5 respectively.

2.3.2. Design: Translation Equivalency of the Turkish Form of the Scales

As mentioned above four forms of each scale were used. The first form was the original English scale ("Form A") and the second form was the translated Turkish scale ("Form B"). The remaining two forms, "Form C" and "Form D", were split-language scales. Half of the items were in English and the other half were in Turkish (see table 2.3.4 in procedure section).

2.3.3. Sample: Bilingual Sample for Translation Equivalency:

Two hundred and four bilingual Turkish schoolchildren participated in this study. They were between 14 and 18 years old. The data were collected from two different secondary schools. One was a state school (Bornova Anadolu Lisesi; $N = 133$), the other was a private school (American College; $N = 71$). See table 2.1. The motivation of the students of the two schools was generally high. In the state school the number of subjects in each class was more than in the private school. The quality of the second language education in the American College might be better than in the state school. However, students in both schools are selected by a central admission examination and may be better educated and of above average IQ. In terms of socio-economic background the state school has children from low middle class to upper class and the private school from middle to upper class. After one year of preparatory English, the majority of courses in both schools are taught in English.

Table 2.3.3: Composition of the bilingual sample according to School and Gender.

	Bornova Anadolu Lisesi	American College	Total
Females	59	53	112
Males	74	16	90
Total	133	69	202

2.3.4. Procedure

The four forms (A,B,C,D) of the test were administered to four different groups in a counterbalanced design. Actually each group was one class of students. Each group responded to two forms of the questionnaire, within an interval of approximately two weeks. In this way, each subject responded to every item both in English and Turkish. The order of four experimental forms can be seen in detail in table 2.3.4.

Table 2.3.4: The Order of Performance of Four Experimental Forms

GROUP	GENDER		First testing	Second testing	TOTAL
	Female	Male			
I	15	41	A	B	56
II	32	18	B	A	50
III	34	9	C	D	43
IV	22	31	D	C	53
TOTAL	90	112			202

A= English Form;   B= Turkish Form   C= Half English-Half Turkish Form ;   D= Half Turkish-Half English Form.

2.3.5. Statistical Analysis

Three different psychometric approaches, Generalizability, Classical and Item Response Theory used to test translation equivalency.

2.3.5.1. Generalizability Theory

Generalizability theory allows assessment of multiple sources of error variance (e.g. times/occasion differences as well as forms) therefore it has got some advantages over Classical Theory. Generalizability Theory is like Classical Theory because it uses the dependability of the behavioural measurement as a statistical theory (Shavelson & Webb, 1991). The statistical test used is ANOVA. Because of the design we were able to test the effects of different occasions (first and second) and different language forms (A, B, C, D) at once within a univariate ANOVA. The design was an Occasions (2) x Forms (4) ANOVA mixed design.

If the scales had been well translated then the same variables will affect all forms equally and therefore there should not be any differences between occasions and forms. If the items were translated well and were meaningful for the Turkish bilingual students then there should be no differences between different language forms. Any significant differences between the language forms will be caused by poor translation fidelity. It was also expected that there would be a high correlation between the English and Turkish Scales scores. High correlation would indicate the equivalence of the English and Turkish scales.

2.3.5.2. Classical Item Analysis-Psychometric Theory

Classical theory (CT) is known and widely used for testing the psychometric quality of self-report measures. It tests the reliability and validity of the tests used. Because Classical theory can only look at

one source of error at a time (e.g. occasions or test-retest but not conditions and fatigue effects etc. simultaneously) it has been criticised by Cronbach and his colleagues (1972). In order to test the translation fidelity of cross-cultural measures in this research the times/occasions and language forms of the questionnaires are made different. Therefore, although it is possible to investigate form differences with Classical theory, it is better if it is also confirmed by a more sophisticated psychometric analysis. For this reason Generalizability and Item Response Theory (IRT) were also used to test item fidelity.

To use classical item analysis we ignored possible time and form effects and combined data from the different conditions. In the design of the study every subject received every item once in Turkish and once in English. The only difference between subjects in different conditions receiving Turkish items is how they received them (on one single language form or on two split forms) and when they received them (first or second). The same subjects also received the same items in English but again in different forms and times depending on condition. Therefore, if we ignore form and time differences, for each subject we have responses to English and Turkish versions of the same items. Although this procedure eliminates time and order effects it allows the researcher to investigate the scales at the item level and to compare items in the two language forms. See figure 2.3.5.2.

Figure 2.3.5.2: Design of the new data file.

Scale	Language Form 1	Language Form 2
CAMI	English	Turkish
CANSIE	English	Turkish
MASLOC	English	Turkish
RELIGIOSITY	English	Turkish
F-Scale	English	Turkish

Differences between the English and Turkish forms were tested with Ferguson's t-test (Ferguson, 1959; Ferguson & Takone, 1989), so the differences in item-total correlation coefficients between language forms was investigated at the item level. Although the occasion differences between applications were ignored the method allowed us to investigate the items rather than only total scores. Any significant differences between language forms can be attributed to poor item fidelity.

2.3.5.3. Item Response Theory

Item Response Theory allows the researcher to test items in the scales independent from each other, unlike Classical Theory (CT) and Generalizability Theory (GT). It tries to find the best fitting parameters for each item and then allows us to test differences between these parameters. This is called

Differential Item Functioning. DIF can be tested with a program called MULTILOG (Thissen, 1991). In this study DIF is used in a very specific way. First the program is run when the parameters are free for each item and then the parameters are constrained to be the same for each item in the different language forms. Finally, the difference between Chi-squares is compared for both runs. If the difference between Chi-squares is found to be significant this is presumed to result from translation problems.

2.4. PART II: DERIVING ETIC AND EMIC/ METRIC EQUIVALANCE

2.4.1. Overview
In this part of the study two monolingual (English and Turkish) samples were tested. Metric equivalence was tested with two main psychometric approaches, Classical and Modern Item analysis. Classical item analysis was first used in the context of factor analysis to find similarities between the factors structures of the scales in the different cultures. It was then used to detect differences between items in the two cultures. Then, Modern item analysis was used to detect the differences between the Item Characteristic Curves (ICC) of the two cultures using differential item functions (DIF). The important point is that, after this process, we will be able to demonstrate the iterative model of the derived etic suggested by Berry et al. (1992). Because translation fidelity has already been investigated any differences detected in this second part should be due to cultural differences and could perhaps be considered the emic aspect of the culture. At this stage we will also find out if some scales or items are problematic in terms of the psychometric information they produce in one or other sample. Therefore we will be able to refine the measurements for the main study (part 3) by using only items or scales that seem to be comparable and which have the same variances in both cultures.

The data were analysed using classical item analysis, explanatory factor analysis and item response theory. The results are presented in chapters 6, 7 and 8.

2.4.2. Design:
For the Classical Item Analysis the two cultures were compared for each scale and subscale using criteria we set such as the similarities of the reliability tests and the similarities of the item-total correlation for each item. For details see chapter 6.

For the Factor analysis of MASLOC, CNSIE, Religiosity and Authoritarianism the scale's factors for the English and Turkish samples were compared in terms of factor structure. For CAMI the Control,

Means-Ends and Agency beliefs subscales were factor analysed in five subsets: for Effort, Attribute, Powerful others, luck and Unknown Factors. For details see chapter 7.

For Item Response Theory, Thissen'. Steinberg & Wainer's (1993) suggested data design was used to test the similarities between parameters. To do this the data for the two samples was redesigned and analysed together for each scale and subscale. For details see chapter 8.

2.4.3. Samples

Three hundred and sixty two/eight English pupils (163 girls and 197 boys) and 420/6 Turkish pupils (262 girls and 164 boys) were tested. These were secondary school students, with ages ranging from 14 to 18. There were more 18 years olds in the Turkish sample (124 vs. 56) because in two of the Turkish schools there is a preparation year to learn English which means that the pupils graduate when one year older then their peers. All the schools were secular.

The Turkish data was collected from Izmir, the third biggest city in Turkey. Four different schools were involved in the data collection and were selected to represent different social classes to make the data fairly heterogeneous in this respect. Two of these were state schools, containing middle and working class children. The other two schools recruited upper-middle and upper class children. These two schools selected students for their academic performance and they were taught in English for most subjects, particularly mathematics and science. In the following table you can see the distribution of the Turkish sample according to school. Suphi Koyuncuoglu and Sidika Rodop Secondary Schools are state schools, Bornova Anadolu Secondary School is a government supported private school and the American College is a charity supported private school. See table 2.4.3.a.

Table 2.4.3.a: Description of the Turkish sample according to school and gender (N=426).
SAMPLE I

SCHOOLS	GIRLS	BOYS	TOTAL
Suphi Koyuncuoglu	66	28	94
Sidika Rodop	84	46	130
Bornova Anadolu	59	74	133
American College	53	16	69
TOTAL	262	164	426

Data collection in Britain was done in London. Five different schools were involved in the research which again represented all social classes. The schools involved in the research were all from London

boroughs: Alleyns, Westminster, Pimlico, Sedgehill and Haydon Secondary Schools. The first two of them are private schools, students coming from upper and upper-middle class families. The following two are state schools, their students coming from middle and working class backgrounds. The last school, Haydon, used to be a grammar school but is now a grant-maintained school and the students there are likely to come from middle class families. See table 2.4.3.b.

Table 2.4.3.b: Description of the English Sample according to Gender and School (N=368).
SAMPLE II

SCHOOLS	GIRLS	BOYS	TOTAL
Alleyn School	66	61	127
Westminster School	3	37	40
Pimlico School	21	26	47
Sedgehill School	18	32	50
Haydon School	55	41	96
TOTAL	163	197	360

In the Turkish sample 93.98 % (442 out of 449) of the sample said they were Moslem and 5.34 % considered themselves non-religious. There were also 1 Jewish and 2 Christian (self-reported) students in the sample. In the English sample 54.64 % (194 out of 355) of the sample said they were Christian, 32.78 % were non religious, 5.35% were Moslem, 4.23 % Jewish and 3.11 % were from other religious background such as Hindu or Sikh.

2.4.4. Administration (procedure):

The questionnaire was administered to groups in their school environment. Students filled in the questionnaire in the same order in both countries with the same instructions. The instruction was given to the students by the author or her helper in the same way. After the questionnaire had been distributed to each student, the researcher informed the participants about the purpose of the research. It was made clear that this was not a test and that it was not measuring their ability and that there were no correct or incorrect answers. Each test occasion took about one hour.

2.4.5. Statistical Analysis

For the details of the Classical analysis and Item Response Theory see the Method for part I described earlier (2.3.5.2 and 2.3.5.3).

2.5. PART III: COMPARISON BETWEEN TWO CULTURES

2.5.1. Overview

In this part of the study the scales and items which were derived from the early cross-cultural comparison were used to test the main hypotheses of this study. These are concerned with the effects of several social antecedents on perceived control.

At this stage, we made some alterations to the instruments, such as dropping some of the scales or items completely. Then univariate and multivariate analyses were applied to test the hypotheses. Any differences on the perception of control scales should be due to actual effects of the antecedent variables without having any noise effects from extraneous factors or translation infidelity or from the non-comparable sources of the cultures.

The same samples and data used in part two were used here (apart from CNSIE, and some items from MASLOC and Authoritarianism). Therefore there is no sample or procedure described in this part of the study. The statistical analyses applied were ANOVA, regression analysis and canonical correlation. Each of these analysis was used to test the main hypotheses.

2.5.2. Design.

The independent variables, with codings, were: Culture (Turkish (1), English (2)); Religion (Christian (1) Muslim (2) Jewish (3) Others (4)); Religiosity level (High scores were more religious); Authoritarianism (High scores were more authoritarian); SES (Low (1), Middle (2) Upper Middle (3), Upper (4)); Gender (Girls (1), boys (2)); Age (up to 15 yrs. (1), 15 yrs. (2), 16 yrs. (3), 17+ yrs. (4)). SES was decided by the catchment area of the school for ethical reasons and because it was also considered more reliable than the school records of the parents' occupations or income.

Additional variables were created for regression and canonical analysis to eliminate small numbers in the religious groups (e.g. Jews and Sikhs). So Muslims and Christians were coded as separate binary variables, so that non-religious, or minority religion groups such as Jewish, Sikh etc. were coded as non- Muslim or non-Christian.

The dependent variables were eleven perceived control subscales or scales used to test perception of control. These were CAMI: Control beliefs; Means Ends for Effort, Attribute, Powerful Others, Luck and Unknown factors; Agency beliefs for Effort, Attribute, Powerful Others, Luck and MASLOC. All the subscales and scales were scored so that high scores were External.

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2.5.3. Sample: As part II.

2.5.4. Procedure: As part II.

2.5.5. Statistical Analysis:

Three statistical analyses are used in this part. These are: ANOVA, Canonical correlation and regression analysis.

2.5.5.1. ANOVA

In this study ANOVA gives us preliminary information about the effects of some of the independent variables. These are age, gender, SES and culture. But ANOVA is not appropriate for Religiosity and Authoritarianism because of their interval nature, unless they are categorised, which would reduce the information gathered. Their effect on perceived control was investigated in the second step. Nevertheless for validity reasons Religiosity and Authoritarianism were investigated as dependent variables in this first step.

2.5.5.2. Canonical correlation analysis

In the second step a multivariate data analysis was used to investigate the relationships between age, gender, culture, religion, religiosity and authoritarianism and perceived control. Religion was broken down into two variables, Muslim and Christian, because of the number of non-religious and other religions in the samples. Canonical correlation were used to identify the major effects of the independent variables on the dependent variable after the effect of the covariance had been eliminated (Hair, Anderson, Tatham, Black, 1995).

Canonical correlation analysis is usually used to see the functional relationships between dependent variables and latent functions derived from the independent variables. It is useful when the variables are measured in several ways, e.g. some interval, some ordinal. But, sometimes the results of canonical correlation analysis are not replicable and the validity of the test has to be tested. There are different methods for doing this. The one we used is the omission of independent variables from the model one at a time.

There are several outcomes of the analysis that can be interpreted. These are canonical weights, canonical loadings, and canonical cross-loadings. Of those the most reliable is canonical cross-loadings but because we used SPSS-x to run this analysis we only had the results for canonical weights and canonical loadings. Therefore our interpretations will be based on canonical loadings because they are

relatively more stable and reliable than weights. Once the loadings are calculated the canonical functions and the loadings of the independent and dependent variables on these functions are interpreted in the same way that factor loadings are interpreted (Hair et al., 1995).

2.5.5.3. Regression Analysis:

Regression analysis gives valuable information when the dependent variables are not much related with each other. It helps to identify the causal relationships between independent variables and each of the dependent variables.

2.6. Summary

In part one, we tested item fidelity with bilingual Turkish sample. We used three different psychometric methods to make these comparisons. The results of the Generalizability approach are presented in chapter 3, the Classical approach in chapter 4, and Item Response theory in chapter 5.

In part two, we tested the comparability of the concepts underlying the scales in the English and Turkish samples. We used two psychometric methods to make these comparisons: Classical theory (item and factor analysis) and Item Response theory. The results of classical item analysis are presented in chapter 6, factor analysis in chapter 7, and Item Response analysis in chapter 8.

In part three, we tested the relationships between perceived control and its social antecedents. We used three statistical analyses. These were ANOVA, canonical correlation analysis and regression analysis. The results of all these analyses are given in chapter 9.

PART I
TRANSLATION FIDELITY

CHAPTER 3: GENERALIZABILITY THEORY

PART 1

DETECTING THE TRANSLATION FIDELITY OF DIFFERENT LANGUAGE FORMS

3.0. GENERAL INTRODUCTION

Although the methodological problems of cross-cultural research have been identified clearly in detail (Berry et al., 1980; Berry et al., 1992), the application of the methods are rarely seen in the literature (Van de Vijver, 1982; Katerberg, Smith and Hoy, 1977; Hulin, Drasgow, & Komocar, 1982, Hulin, 1987). The first obvious problem comes from translation fidelity. Brislin (1980) discussed several possible methods for testing the reliability of the translation such as back translation and the use of bilingual samples. Brislin (1980) and Triandis (1980) first introduced translation and back translation for decentralisation of the language. It is still the most widely used method to deal with comparability problem (e.g. Leondari, 1992; Smith et al., 1995).

It is clearly acknowledged by the cross-cultural psychology literature that the metric equivalence of an instrument is essential for the reliable comparison of two cultures. Therefore Scalar equivalence (Van de Vijver & Poortinga, 1982) or Metric equivalence (Hui & Triandis, 1983) are introduced as additional necessities to the use of the back-translation procedure to detect possible sources of bias with statistical methods. Poortinga & Van de Vijver (1987) and Katerberg, Smith and Hoy (1977) used generalizability theory to deal with the translation fidelity problem of cross-cultural studies.

In this study we will be using back translation. We will investigate the questionnaires' metric translation equivalence to make sure that the cross-cultural materials (five scales) are reliable in the imposed culture (Turkish). To do this we will use three psychometric approaches, generalizability theory, classical test theory, and latent trait or item response theory. First, we will present the results of the translation equivalence obtained with each psychometric approach. Second, we will discuss the usefulness of each approach from the cross-cultural point of view. Third we will use the results to make decisions about each questionnaire and the items that survive translation. Finally we will use the new version of the questionnaires in the main body of research, which is a comparison of the two cultures.

CHAPTER 3: GENERALIZABILITY THEORY.

3.1. INTRODUCTION

Generalizability theory is a statistical theory about the dependability of behavioural measurement (Shavelson & Webb, 1991). It was first introduced by Cronbach, Gleser, Nanda, & Rajaratnam (1972) as an alternative to Classical theory. Classical theory can estimate only one source of error at a time (e.g. test-retest for occasions, or internal consistency for a form), but with Generalizability theory it is possible to test for multiple sources of error such as the use of different forms or testing on different occasions in one single analysis (Shavelson & Webb, 1991). This advantage of generalizability theory can be used to investigate the comparability problem of cross-cultural data. We can test for translation fidelity using a bilingual sample as Brislin (1980) suggested.

Generalizability theory was first suggested by Van der Kamp (Van de Vijver & Poortinga, 1982) as a psychometric solution to the comparability problem of cross-cultural data. It was also used to test translation fidelity by Katerberg, Smith, and Hoy (1977) in a 2 (forms) x 2 (occasions) x 128 (subjects) mixed design. They tested the item fidelity of a Job description Index in two different language forms (English and Spanish) on two different occasions with a bilingual Hispanic sample. Although the generalizability approach is known to cross-cultural researchers, mainly methodologists such as Van de Vijver & Poortinga, it is very rarely used.

In our study, which is similar to Katerberg et al. (1977), we used four language forms (between subjects) presented on two occasions (within subjects) to subjects. Ideally, presenting the same items in two different language forms or on different occasions shouldn't make a difference to bilingual subjects. However, if the translation is not good or if the subjects' circumstances change between occasions then differences will occur. The improvement in this design compared with Katerberg & his colleagues is that this research takes into account biases created by the use of single language forms and creates two more new forms in which half the questions are presented in Turkish and the other half in English. Thus we created four language forms rather than two. This enables us to check the consistency of responses to items across four different types of form rather than just two.

So, with this design we are trying to investigate the error sources for different language forms of the same questionnaire. If we have a good translation of the questionnaire and if participants understood the questions equally well in both languages, then any differences between the four language forms is likely to come from meaning differences of the items in the two languages or from cultural differences. However, cultural differences will be reduced or eliminated at this stage by using subjects from the

same cultural (bilingual Turkish) background. The differences due to the subjects' characteristics (between subjects design) will be reduced or eliminated by matching the groups carefully for age gender, social class and type of school.

3.2. METHOD

3.2.1. Design for Analysis

A mixed 4 (between) x 2 (within) design was used. The first independent variable was the different language forms of the scales. The four conditions for the forms were: English, Turkish, Half English-half Turkish, and half Turkish-half English forms of the scales. This variable was tested with different groups of subjects. The second independent variable was the different occasions or times on which two forms of the questionnaires were given to each subject. So, in group 1, participants received the English form first and the Turkish form second. In group 2, they received the Turkish form first and the English form second. In group 3, the participants received the English-Turkish forms first and the Turkish-English forms second. In group 4, they received the Turkish-English first and the English-Turkish forms second. So, each subject answered the same questions once in English and once in Turkish.

3.2.2. Analysis

A 4x2 mixed subject design ANOVA was used to analyse the results. At this stage of the research only total scores are investigated. Language form differences, occasion differences, and the interaction between these two were investigated for each scale and subscale. The results for each analysis are presented in two tables in Appendix B. The language form effects in the between subjects table and the occasions and interaction in the within subjects table. For a summary of F scores and results of the Box's M test of homogeneity of variance see table 3.3.

3.2.3. Instruments

The questionnaires used were: (a) Control, Means-Ends, and Agency Beliefs (CAMI); (b) Nowicki-Strickland Internal-External Scale for Children (CNSIE); (c) Multivariate Academic Specific Locus of Control Scale (MASLOC); (d) Religiosity Scale; (e) Authoritarianism Scale (60-65 Form).

3.2.4. Sample

Two hundred and four bilingual Turkish schoolchildren from two schools participated in this study. See the Method chapter for details.

3.2.5. Procedure

For details of the presentation of the four different forms to four groups of participants see the Design section above and the Method chapter. The order in which the questionnaires were presented was CAMI, CNSIE, MASLOC, Religiosity and Authoritarianism.

3.2.6. Hypothesis

According to Generalizability theory testing the same subjects on different occasions should be one error source. But if the items mean the same in both languages then, apart from the time difference of just a week, there should not be any differences between the two scores. In the same way presenting the same test in different language forms should not make a difference if the items mean the same in both languages, but using different subjects for each form may be a main error source.

H1:   There will be differences between forms due to the different languages.

H01:   There will be no differences between forms due to the different languages.

H2:   There will be differences between occasions.

H02:   There will be no differences between occasions.

H3:   There will be an interaction between forms and occasions.

H03:   There will be no interaction between forms and occasions.

3.3. RESULTS: Detecting Error Variances in Different Language Forms

In this part we report the descriptive and inferential statistics from each ANOVA for each scale and subscale in the order in which it was presented in the questionnaire. Note that only differences significant at the $p < 0.01$ level will be counted as significant. However, all results will be reported in the text and in the summary table 3.3.

Table 3.3: Summary of the MANOVA for the analysis of forms (4) by occasions (2) with the bilingual sample. The p values are given.

SCALES	Sig. of F Between Subjects for the Forms	Sig. of F Within Subjects for the Times	Sig. of F for the Interaction of Times by Forms	Box M
CONTROL, MEANS-ENDS, AGENCY BELIEFS				
Control Beliefs	0.02	0.02	0.03	0.01 *
Means-Ends Beliefs				
Effort	0.01 *	0.02	0.04	0.44
Luck	0.13	0.00 **	0.06	0.88
Unknown Factors	0.02	0.15	0.49	0.07
Attribute	0.04	0.02	0.03	0.29
Powerful Others	0.60	0.87	0.67	0.28
Agency Beliefs				
Effort	0.40	0.78	0.15	0.76
Luck	0.27	0.01	0.77	0.51
Attribute	0.10	0.05	0.17	0.48
Powerful Others	0.66	0.51	0.06	0.00 **
CANSIE Nowicki-Strickland LOC Scale	0.99	0.23	0.08	0.09
MASLOC Palenzuela's LOC Scale				
Internal	0.67	0.52	0.48	0.43
Helplessness	0.63	0.00 **	0.00 **	0.02
Luck	0.40	0.30	0.00 **	0.03
RELIGIOSITY SCALE	0.59	0.87	0.63	0.17
AUTHORITARIANISM SCALE	0.34	0.03	0.65	0.36

$p < 0.01$ *, $p < 0.001$ **

3.3.1. Control, Means-Ends, and Agency Beliefs (Skinner et al., 1988).

There are 10 subscales: Control beliefs; Means-Ends beliefs for Effort, Luck, Attribute and Powerful Others; and Agency beliefs for Effort, Attribute, Powerful Others and Luck. See table 3.3. for p values of F scores and results of Box's M. See appendix B for ANOVA tables.

3.3.1.1. Control Beliefs Subscale:

The results of the ANOVA showed that there was a significant different for occasions ($F(1,196) = 9.81$, $p = 0.00$). There were no significant differences for forms ($F(3,196) = 3.44$, $p = 0.02$) or the interaction between forms and occasions ($F(3,196) = 3.08$, $p = 0.03$). The Box's M test for homogeneity of variance was significant (Box $= 23.09$, $F(9,349681) = 2.52$, $p = 0.01$).

The conclusion is that when the control beliefs subscale was presented, the different occasions (times) did make a difference to scores. Also, the Box test found that variances across the cells of the ANOVA were not equal and therefore the assumption of homogeneity of variance was not satisfied. The next step was to investigate these differences at the item level with two other approaches - classical item analysis and item response theory.

Table 3.3.1.1: Means and Standard Deviations from tests of different language forms (A, B, C, D) on different occasions for Control Beliefs Subscale in the CAMI (N=200).

Experimental Groups	Experimental Forms	N	Means	SD
I	A	55	13.82	3.56
	B	55	15.25	3.10
II	B	49	14.12	3.03
	A	49	13.86	3.57
III	C	41	13.90	3.62
	D	41	14.34	4.05
IV	D	55	15.29	4.12
	C	55	16.49	4.49

3.3.1.2. Means-Ends Beliefs for Effort Subscale:

The results of the ANOVA showed that there was a significant differences for language forms ($F(3,196) = 4.17$, $p = 0.01$). There were no significant differences for occasions ($F(1,196) = 10.12$, $p = 0.02$) or the interaction between forms and occasions ($F(3,196) = 2.91$, $p = 0.04$). Box's M test for

homogeneity of variance was not significant (Box M = 9.18, $F_{(9,353173)}$ = 1.00, p = 0.44). See table 3.3.1.2. for means and standard deviations.

The results show that within this subscale at least some of the items had been understood differently in the different language forms. These results suggest that this subscale needs further investigation at the item level.

Table 3.3.1.2: Means and Standard Deviations from tests of different language forms (A, B, C, D) on different occasions for Means-Ends Beliefs for Effort subscale in the CAMI (N=200).

Experimental Groups	Experimental Forms	N	Means	SD
I	A	55	16.75	3.12
	B	55	17.78	3.20
II	B	50	18.14	2.97
	A	50	17.90	2.61
III	C	41	16.90	2.87
	D	41	17.42	3.52
IV	D	54	18.07	2.98
	C	54	19.46	2.77

3.3.1.3. Means-Ends Beliefs for Attribution Subscale:

The results of the ANOVA showed that there were no significant differences between forms ($F_{(3,197)}$ = 30.02, p = 0.036), occasions ($F_{(1,197)}$ = 5.85, p = 0.02) or the interaction between forms and occasions ($F_{(3,197)}$ = 3.06, p = 0.03). The Box's M test was not significant (Box's M = 16.25, $F_{(9,334950)}$ = 1.77, p = 0.07). See table 3.3.1.3. for means and standard deviations.

This subscale was understood similarly in the different language forms and on different occasions and there was no interaction effect between forms and occasions either. The variances were homogenous. We can therefore conclude that this subscale's items survived the translation.

Table 3.3.1.3: Means and Standard Deviations from tests of different language forms (A, B, C, D) on different occasions for Means-Ends Beliefs for Attribution Subscale in the CAMI (N=201).

Experimental Groups	Experimental Forms	N	Means	SD
I	A	55	21.91	2.91
	B	55	21.78	2.28
II	B	50	23.10	2.48
	A	50	22.80	2.30
III	C	43	22.33	2.58
	D	43	22.37	2.28
IV	D	53	23.59	3.00
	C	53	22.36	2.60

3.3.1.4. Means-Ends Beliefs for Powerful Others Subscale:

The results of the ANOVA showed that there were no significant differences between forms $(F(3,197)$ $= 0.63$, $p = 0.60)$ or occasions $(F(1,197) = 0.03$, $p = 0.87)$ and no interaction between forms and occasions $(F(3, 197) = 0.51$, $p = 0.67)$. The Box's M test was not significant (Box m = 11.14, $F(9,351977) = 1.22$, $p = 0.28)$. See table 3.3.1.4. for means and standard deviations.

This subscale was understood similarly in the different language forms and on different occasions and there was no interaction effect between forms and occasions either. The variances were homogenous. We can therefore conclude that this subscale's items survived the translation.

Table 3.3.1.4: Means and Standard Deviations from tests of different language forms (A, B, C, D) on different occasions for Means-Ends Beliefs for Powerful Others Subscale in the CAMI (N=201).

Experimental Groups	Experimental Forms	N	Means	SD
I	A	56	15.86	3.08
	B	56	16.29	3.65
II	B	50	15.80	3.12
	A	50	15.74	3.14
III	C	41	15.37	2.84
	D	41	15.22	2.45
IV	D	54	15.98	3.54
	C	54	15.89	3.20

3.3.1.5. Means-Ends Beliefs for Luck Subscale:

The results of the ANOVA showed that there was a significant difference between occasions ($F(1,194)$ = 25.38, p = 0.00). There was no significant difference between forms ($F(3,194)$ = 1.94, p = 0.13) or for the interaction between forms and occasions ($F(3,194)$ = 2.58, p = 0.06). Box's M was not significant (Box's M = 4.5, $F(9,317466)$ = 0.49, p = 0.88). See table 3.3.1.5. for means and standard deviations.

The results show that this subscale was understood in the same way when presented in different language forms but presenting the same material at different times did make a difference. There was no interaction between forms and occasions and the variances were homogeneous. Because of the differences between occasions this subscale might need further investigation at the item level.

Table 3.2.1.5: Means and Standard Deviations from tests of different language forms (A, B, C, D) on different occasions for Means-Ends Beliefs for Luck Subscale in the CAMI (N=198).

Experimental Groups	Experimental Forms	N	Means	SD
I	A	56	12.45	2.73
	B	56	14.79	3.90
II	B	50	12.96	2.82
	A	50	13.54	3.89
III	C	39	11.95	3.26
	D	39	12.87	3.56
IV	D	53	11.98	2.83
	C	53	13.15	3.64

3.3.1.6. Means-Ends Beliefs for Unknown Factors Subscale:

The results of the ANOVA showed that there were no significant differences between forms $(F(3,193) = 3.26, p = 0.02)$, or between occasions $(F(1,193) = 2.1, p = 0.15)$, or for the interaction between forms and occasions. The Box's M test was not significant (Box's M = 16.26, $F(9,334950) = 15.95$, p= 0.07). See table 3.3.1.6. for means and standard deviations.

This subscale was understood similarly in the different language forms and on different occasions and there was no interaction effect between forms and occasions either. The variances were homogenous. We can therefore conclude that this subscale's items survived the translation.

Table 3.3.1.6: Means and Standard Deviations from tests of different language forms (A, B, C, D) on different occasions for Means-Ends Beliefs for Unknown Factors Subscale in the CAMI (N=197).

Experimental Groups	Experimental Forms	N	Means	SD
I	A	54	14.39	3.18
	B	54	15.42	3.70
II	B	49	14.08	3.32
	A	49	14.18	2.95
III	C	40	13.08	3.31
	D	40	13.08	3.20
IV	D	54	14.13	3.42
	C	54	14.52	3.75

3.3.1.7. Agency Beliefs for Effort Subscale:

The results of the ANOVA showed that there were no significant differences between forms ($F(3,197)$ = 1.00, p = 0.40) or occasions ($F(1,197)$ = 0.08, p = 0.78). There was also no interaction between forms and occasions ($F(3,197)$ = 1.81, p = 0.15). The Box's M test was not significant (Box's M = 5.88, $F(9,380510)$ = 0.64, p = 0.76). See table 3.3.1.7. for means and standard deviations.

This subscale was understood similarly in the different language forms and on different occasions and there was no interaction effect between forms and occasions either. We can therefore be satisfied that this subscale's items survived the translation.

Table 3.3.1.7: Means and Standard Deviations from tests of different language forms (A, B, C, D) on different occasions for Agency Beliefs for the Effort Subscale in the CAMI (N=201).

Experimental Groups	Experimental Forms	N	Means	SD
I	A	56	9.45	2.42
	B	56	9.74	2.56
II	B	49	9.67	2.95
	A	49	9.86	2.60
III	C	43	9.14	2.42
	D	43	8.72	2.60
IV	D	53	9.36	2.55
	C	53	9.43	2.37

3.3.1.8. Agency Beliefs for Attribution Subscale:

The results of the ANOVA showed that there were no significant differences for forms (F(1,198) = 2.14, p = 0.10) or occasions (F(1,198) = 3.75, p = 0.06) and there was no significant interaction between forms and occasions (F(3,198) = 1.69, p = 0.17). The Box's M test was not significant (Box M = 8.69, F(9,368672) = 0.95, p = 0.48). See table 3.3.1.8. for means and standard deviations.

This subscale was understood similarly in different language forms and on different occasions and there was no interaction effect between forms and occasions either. We can be satisfied that all this subscale's items survived the translation.

Table 3.3.1.8: Means and Standard Deviations form tests of different language forms (A, B, C, D) on different occasions for Agency Beliefs for Attribution Subscale in the CAMI (N=202).

Experimental Groups	Experimental Forms	N	Means	SD
I	A	56	9.64	1.39
	B	56	9.80	1.33
II	B	50	9.78	1.27
	A	50	9.34	1.33
III	C	42	9.54	1.19
	D	42	9.24	1.28
IV	D	54	10.04	1.39
	C	54	9.83	1.30

3.3.1.9. Agency Beliefs for Powerful Others Subscale:

The results of the ANOVA showed that there were no significant differences between forms ($F(1,199)$ = 0.53, p = 0.66) or occasions ($F(3,199)$ = 0.43, p = 0.51) or for the interaction effect between forms and occasions ($F(3, 199)$ = 2.58, p = 0.06). The Box' M test was significant (Box's M = 25.42, $F(9,368274)$ = 2.77, p = 0.00). See table 3.3.1.9. for means and standard deviations.

The results show that this subscale was understood similarly when presented in different languages forms and presenting the same scale in different times did not make a difference either. There was no interaction between forms and occasions. However, because the variances were not homogeneous and so failed to meet one of the assumptions of the analysis this subscale needs further investigation.

Table 3.3.1.9: Means and Standard Deviations from tests of different language forms (A, B, C, D) on different occasions for Agency Beliefs for Powerful Others Subscale in the CAMI (N=203).

Experimental Groups	Experimental Forms	N	Means	SD
I	A	56	11.60	1.64
	B	56	11.05	2.06
II	B	50	11.12	2.31
	A	50	10.62	2.54
III	C	42	11.17	2.59
	D	42	11.48	2.62
IV	D	55	11.09	2.86
	C	55	11.16	2.49

3.3.1.10. Agency Beliefs for Luck Subscale:

The results of the ANOVA showed that there was no significant difference between forms $(F(3,197) = 1.32, p = 0.27)$, but there was a significant difference between occasions $(F(1,197) = 7.30, p = 0.01)$. There was no interaction between forms and occasions $(F(3,197) = 0.38, p = 0.77)$. Box's M test was not significant (Box's $M = 8.36$, $F(9,385997) = 0.91$, $P = 0.51$). See table 3.3.1.10 for means and standard deviations.

The results show that this subscale was understood the same when presented in different languages forms, but testing on different occasions did make a difference. There was no interaction between forms and occasions and the variances were homogeneous. Because of the difference between occasions this subscale needs further investigation at the item level.

Table 3.3.1.10: Means and Standard Deviations from tests of different language forms (A, B, C, D) on different occasions for Agency Beliefs for Luck Subscale in the CAMI (N=201).

Experimental Groups	Experimental Forms	N	Means	SD
I	A	54	9.52	2.07
	B	54	9.89	1.90
II	B	50	9.18	1.91
	A	50	9.72	2.15
III	C	43	9.86	1.81
	D	43	10.16	2.17
IV	D	54	9.24	2.05
	C	54	9.41	2.14

3.3.2. Nowicki-Strickland's Internal and External Locus of Control for Children (Nowicki and Strickland, 1973).

This scale's ANOVA results showed that there were no significant differences between forms ($F(3,183) = 0.04$, $p = 0.99$) or occasions ($F(1,183) = 1.47$, $p = 0.23$), and no significant interaction between forms and occasions ($F(3,183) = 2.33$, $p = 0.08$). The Box's M test was not significant (Box's M = 15.28, $F(9,351637) = 1.66$, $p = 0.09$). See table 3.3.2 for means and standard deviations. See appendix B for ANOVA tables.

We can conclude that the Nowicki-Strickland Locus of Control scale was understood similarly when presented in different language forms and on different occasions. The variances were homogeneous. We can conclude that this scale survived translation.

Table 3.3.2: Means and Standard Deviations from tests of different language forms (A, B, C, D) on different occasions for Nowicki-Strickland Locus of Control Scale for Children (N=187).

Experimental Groups	Experimental Forms	N	Means	SD
I	A	50	84.10	7.52
	B	50	83.64	9.43
II	B	45	82.24	7.80
	A	45	85.16	8.11
III	C	42	84.64	7.49
	D	42	83.55	8.48
IV	D	50	82.80	7.69
	C	50	84.32	11.47

3.3.3. Multidimensional Academic Specific Locus of Control Scale (Palenzuela, 1988)

See appendix B for ANOVA tables.

3.3.3.1. Multidimensional Academic Specific Locus of Control Scale's Internal Subscale.

The ANOVA results showed that there were no significant differences for forms ($F(3,195) = 0.52$, $p = 0.67$) or occasions ($F(1,195) = 0.41$, $p = 0.52$). There was no interaction effect between forms and occasions either ($F(3,195) = 0.82$, $p = 0.48$). The Box's M test was not significant (Box's $M = 9.31$, $F(9,370603) = 1.02$, $p = 0.43$). See table 3.3.3.1 for means and standard deviations.

The MASLOC's Internal subscale was understood similarly when presented in different language forms and also on different occasions. The variances were homogenous. We can conclude that the subscale survived translation.

Table 3.3.3.1: Means and Standard Deviations from tests of different language forms (A, B, C, D) on different occasions for Internal Subscale of Multidimensional Academic Specific Locus of Control Scale (N=199).

Experimental Groups	Experimental Forms	N	Means	SD
I	A	53	10.40	3.89
	B	53	10.49	4.12
II	B	50	10.34	2.74
	A	50	10.66	3.86
III	C	42	10.42	3.45
	D	42	9.55	3.33
IV	D	54	10.89	3.68
	C	54	10.65	3.66

3.3.3.2. Multidimensional Academic Specific Locus of Control Scale's Helplessness Subscale.

The ANOVA results showed that there was no significant differences between forms $(F(3,195) = 0.58, p = 0.63)$ but that there was a significant difference between occasions $(F(1,195) = 14.35, p = 0.00)$ and an interaction effect between forms and occasions $(F(3,195) = 8.66, p = 0.00)$. The Box's M test was not significant (Box's M = 9.31, $F(9,329947) = 2.15, p = 0.02$). See table 3.3.3.2 for means and standard deviations.

The results show that this subscale was understood the same when presented in different language forms but that testing on different occasions did make difference. There was also an interaction between forms and occasions. So even though the subscale was understood similarly in the different language forms this subscale needs further investigation.

Table 3.3.3.2: Means and Standard Deviations from tests of different language forms (A, B, C, D) on different occasions for Helplessness Subscale of Multidimensional Academic Specific Locus of Control Scale (N=194).

Experimental Groups	Experimental Forms	N	Means	SD
I	A	53	13.68	3.83
	B	53	15.60	3.09
II	B	47	12.26	3.93
	A	47	15.70	3.19
III	C	40	14.70	3.38
	D	40	13.55	4.56
IV	D	54	14.33	4.79
	C	54	14.94	3.54

3.3.3.3. Multidimensional Academic Specific Locus of Control Scale's Luck Subscale.

The ANOVA results showed that there were no significant differences between forms ($F_{(3,194)}$ = 1.00, p = 0.40), or occasions ($F_{(1,194)}$ = 1.08, p = 0.30). There was an interaction effect between forms and occasions ($F_{(3,194)}$ = 16.25, p = 0.00). The Box's M test was not significant (Box's M = 19.42, $F_{(9,371864)}$ = 2.11, p = 0.03). See table 3.3.3.3 for means and standard deviations.

The results show that this subscale was understood the same when presented in different language forms and that testing on different occasions did not make any difference either. However, there was an interaction between forms and occasions. Therefore we think this subscale needs further investigation.

Table 3.3.3.3: Means and Standard Deviations from tests of different language forms (A, B, C, D) on different occasions for Luck Subscales of Multidimensional Academic Specific Locus of Control Scale (N=198).

Experimental Groups	Experimental Forms	N	Means	SD
I	A	53	16.11	3.47
	B	53	13.94	4.04
II	B	47	14.21	3.51
	A	47	17.38	3.39
III	C	43	16.19	4.09
	D	43	15.93	3.53
IV	D	55	15.47	3.45
	C	55	15.87	3.58

3.3.4. Religiosity in Youth Scale (Rohrbaugh and Jessor, 1976).

The ANOVA results showed that there were no differences between forms ($F_{(3,190)} = 0.64$, $p = 0.59$) or occasions ($F_{(1,190)} = 0.03$, $p = 0.87$). There was also no interaction effects between forms and occasions ($F_{(3, 190)} = 0.58$, $p = 0.63$). The Box's M test was not significant (Box's M = 13.00, $F_{(9,347720)} = 1.42$, $p = 0.17$). See table 3.3.4 for means and standard deviations. See appendix B for ANOVA tables.

This scale was understood similarly when presented in different language forms and also on different occasions. The variance and covariance matrices were homogenous. We can conclude that this scale's translation was satisfactory.

Table 3.3.4: Means and Standard Deviations from tests of different language forms (A, B, C, D) on different occasions for Religiosity Scale (N=194).

Experimental Groups	Experimental Forms	N	Means	SD
I	A	53	23.60	4.63
	B	53	23.79	5.17
II	B	45	22.49	6.63
	A	45	22.64	6.72
III	C	42	22.43	5.34
	D	42	21.91	5.33
IV	D	54	22.50	6.32
	C	54	22.85	6.11

3.3.5. Authoritarianism 'F' Scale (Adorno et al., 1950).

The ANOVA results showed that there were no significant differences between forms $(F(3,158) = 1.13, p = 0.34)$, or occasions $(F(1,158) = 4.68, p = 0.03)$, or for the interaction effect between forms and occasions $(F(3, 158) = 0.55, p = 0.65)$. The Box's M test was not significant (Box's M = 10.10, F with (9,268722), DF = 1.10, p = 0.36). See table 3.3.5 for means and standard deviations. See appendix B for ANOVA tables.

The Authoritarianism 'F' Scale 60-65 form (Adorno, 1950) was understood similarly when present in different language forms and on different occasions. The variances were homogenous. We can conclude that this scale's translation was satisfactory.

Table 3.3.5: Means and Standard Deviations from tests of different language forms (A, B, C, D) on different occasions for California F Scale (Authoritarianism Scale) (N=162).

Experimental Groups	Experimental Forms	N	Means	SD
I	A	45	115.64	15.00
	B	45	118.62	13.52
II	B	39	113.08	17.63
	A	39	117.64	17.45
III	C	38	111.26	16.21
	D	38	113.68	16.84
IV	D	40	111.68	17.00
	C	40	111.95	21.44

3.4. SUMMARY

We have investigated how each scale and subscale has survived translation in the second language by comparing Turkish bilingual subjects' answers to the different language forms (English, Turkish, and split forms) on different occasions. We also carried out tests for homogeneity of variance. If the scale or subscale didn't show any differences according to these criteria (forms, occasions, interaction and homogeneity) then we concluded that translation was good. On the other hand if all these criteria were not fulfilled we concluded that at least some of the items needed further investigation.

Differences between forms: Only one out of ten CAMI subscales showed a significant difference between language forms (Means-Ends for Effort). All other scales and subscales (CNSIE, MASLOC, Religiosity, Authoritarianism) did not show any form differences.

Differences between occasions: Five out of all 16 scales and subscales were significantly different (Control beliefs, Means-Ends for Effort, Means-Ends for Luck and Agency for Luck in CAMI; Helplessness in MASLOC). All other differences were non significant.

Interaction effects between times and occasions: There were significant interactions for two out of all 16 scales and subscales (Helplessness and Luck in the MASLOC). Post hoc analysis of these two subscales showed that the interaction occurred between Groups I and II which had both received complete language forms on each occasion. It seems that, in both groups, they scored high if the form was in English.

Homogeneity of Variance. Two of the 16 scales and subscales did not show homogeneity of variance (Control beliefs and Agency for Powerful Others in CAMI).

3.5. CONCLUSIONS

Overall, seven out of 16 scales or subscales were found to be in need of further investigation. These were: Control beliefs; Means-Ends for Effort and for Luck; Agency for Luck and for Powerful Others and MASLOC's Helplessness and Luck.

Because we used total scores rather than item scores in the analysis, we are not able to detect which items are causing these differences in these results (Shavelson and Webb, 1990; Poortinga & Van der Vijver, 1987). Brislin (1980) strongly recommend using experimental methods for translation fidelity. This was done in this study. But Brislin also criticised the use of bilingual samples. He suggested that bilingual responses are different from monolingual responses because the bilingual student's thinking processes and life experiences expand the two language borders. Also, in many cases the bilingual students came from very similar backgrounds such as middle, or upper middle class families who encourage high school achievement. This criticism of using a bilingual sample may be compensated for if the biased items remain in the study until they are tested with monolingual samples in both cultures, as we did in this study. We should also bear in mind that this criticism has very little effect on the actual results of this study because there are some subscales which clearly function differently from one language form to another. Therefore it is quite possible that in these subscales some of the items were understood in a different way in different language forms.

Lastly we can conclude that using our experimental design to test item fidelity in a bilingual Turkish sample is a good idea. As far as the literature is concerned, although it has been introduced as an alternative technique to back translation by Brislin (1980), there are not many examples of it (Katerberg et al, 1977). In the author's experience this experimental design gives more information than back-translation.

However, a criticism could be that the method chosen has got problems of two types. Firstly although Brislin's (1980) experimental model was used the actual experimental design created by the author went well beyond the experimental design suggested by him. Instead of a 2 (forms) x 2 (occasions) design, we used the expanded design of 4 (forms) x 2 (occasions). The two extra forms added to the design contained two languages but on the other hand kept one variable constant in that every subject responded to the same item in both languages. However, testing more possible variations of the same

item also introduced new variance into the design and it is not clear where this comes from - the English or Turkish items. Remember that we were using total scores of the split forms. A second criticism of this design is that because of the overwhelming number of items in the study we chose to use the total scores of each scale or subscale. Therefore our final information is restricted. This decision did not violate Brislin's (1980) model but changes the way we used Generalizability theory (Shavelson et al., 1991) as a psychometric approach to test bias variances. Therefore, in the end the information we gathered was restricted by these decisions.

So generalizability theory has been useful for detecting language differences between different language forms within time. But the results have shown that some of the subscales need more investigation at the item level. So we will also use conventional and modern item analysis. We are going to present these results in the next two chapters.

CHAPTER 4: CLASSICAL ITEM ANALYSIS

CHAPTER 4: CLASSICAL ITEM ANALYSIS FOR TRANSLATION FIDELITY

4.1. INTRODUCTION

In this part of the translation equivalence study we look at Classical item analysis of the English, Turkish and split form versions of the questionnaires. The problem with classical item analysis is that it cannot compare items across different forms and times. The aim of using the Classical approach as well as the Generalizability approach is to compare the results of the different approaches and maximise the information about items. We did not want to drop any scales or subscales which seemed to have a problem according to the generalizability analyses so to deal with this problem of classical item analysis we have ignored possible form and time differences and combined results from the different language forms and from different times to produce two sets of data (English and Turkish). These have been analysed independently to see if items contribute to the total score and to the reliability of the scales or subscales.

4.2. METHOD

4.2.1. Design for Analysis

The previous 4 x 2 mixed design was altered in such a way that items could be analysed in either the English or Turkish forms. To use classical item analysis we ignored possible time and form effects and combined data from the different conditions. In the design of the study every subject has received every item, once in Turkish and once in English. The only difference between subjects in different conditions receiving the Turkish items is how they received them (on one single language form or on two split forms) and when they received them (first or second). The same subjects also received the same items in English but again in different forms and times depending on condition. Therefore, if we ignore form and time differences, for each subject we have responses to English and Turkish versions of the same items. Although this procedure eliminates time and order effects it allows the researcher to investigate the scales at the item level and to compare items in the two language forms. This "new" design then produces two language forms of the same scales, which can then be compared.

Figure 4.2.1: Design of the new data file:

Scale	Language Form 1	Language Form 2
CAMI	English	Turkish
CANSIE	English	Turkish
MASLOC	English	Turkish
RELIGIOSITY	English	Turkish
F-Scale	English	Turkish

4.2.2. Analysis

In this analysis the same raw data from the same scales and subscales were used. However, as explained earlier the data were collapsed to produce Turkish and English responses to each scale and subscale. The average means, standard deviations and item-total correlations were calculated for each item in each language. Also, to measure internal consistency, Cronbach's Alpha was calculated for each scale and subscale.

For each scale and subscale, items in English and Turkish were compared using the absolute values of the item-total correlations, the difference between the item-total correlations and a measure of internal consistency (Cronbach's alpha). The first criterion used to decide if an item is "good" or "bad" is whether the item-total correlation is 0.30 or bigger (Nunnally, 1978). The second criterion is whether the difference between the item-total correlations in the two languages is significant using Ferguson's (1959) independent-correlations significant differences formula. Significant differences obtained by this formula are displayed at the 0.05 and 0.01 level of significance but for the purposes of assessing translation fidelity only differences at 0.01 will be considered. The third criterion is the absolute value of Cronbach's alpha. If alpha is less than 0.6 it is considered "poor". If it is between 0.6 and (<) 0.7 it is considered "medium"; if it is between 0.7 and (<) 0.8 it is considered "good" and if it is 0.8 or greater it is considered "very good". The fourth criterion is whether the difference between Cronbach's Alpha in the two language forms of a subscale is more than two standard deviations from the mean of all difference scores. i.e. the mean and standard deviation were calculated from the sixteen difference scores (one for each scale or subscale). The mean of the differences was -0.001 and the sd was 0.04. Therefore the criterion values were 0.08 (Turkish better than English) and -0.08 (English better than Turkish). This criterion has been set because of the unavailability of any other criterion to assess the significance of a difference between two values of Cronbach's Alpha.

4.2.3. Instruments

The questionnaires were CAMI, CANSIE, MASLOC, Religiosity, and Authoritarianism.

4.2.4. Sample

In this study, like in the Generalizability approach, the same 204 bilingual Turkish student participated (see Method chapter).

4.2.5. Procedure

See Method chapter.

4.2.6. Hypothesis

If translation fidelity is good then there will not be any differences between the two language forms. The differences between the English and Turkish forms in the bilingual sample's results, in terms of means, standard deviations and item-total correlations, will be non-significant. The scales and subscales will be internally consistent (reliable) in both languages. If these criteria are met then the items are functioning similarly in the two language. If any item is functioning significantly differently in the two languages then it was not translated properly into the second language.

4.3. RESULTS: Detecting Item Bias with Classical Item Analysis

4.3.1. CAMI

4.3.1.1. Control Beliefs Subscale: See table 4.3.1.1. for item-total correlations and Cronbach alpha. Item-Total correlations: The results showed that when these 8 items were presented in English the minimum item-total correlation was 0.40 (item 5), and the maximum was 0.68 (item 35). When the same items were presented in Turkish, the minimum item-total correlation was 0.37 (item 7), and the maximum was 0.63 (item 35). There was a significant difference ($p<0.01$) between item-total correlations in the two languages for item 41 ($r= .67$ in English, $r= .49$ in Turkish). These results show that both English and Turkish items were "good" because all item-total correlations were above 0.30 and that one item (item 41) had poor translation fidelity. Item 41 is "If you want to can you keep from doing badly in school?".

Reliability: The reliability coefficients (alpha) for the English and Turkish forms of this subscale were 0.85 and 0.78 respectively. According to our criterion value this difference (0.07) is not significant and they have high and good reliability so the translation fidelity is good.

Table 4.3.1.1: Item-Total Correlations, and Cronbach's Alpha for English and Turkish Forms for CAMI's Control Beliefs Subscale.

CONTROL BELIEFS SUBSCALES' ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH FORM CRONBACH ALPHA=0.85	ITEM-TOTAL CORRELATIONS IN TURKISH FORM CRONBACH ALPHA=0.78
7. If you decide to sit down and learn really hard, can you do it?	0.55	0.35
10. Can you get good grades when you really want to?	0.62	0.52
42. Can you get all the problems (e.g. in spelling) right, when you want to?	0.63 ·	0.56
35. If you want to do well in school, can you?	0.68	0.63
3. If you really make up your mind not to get any bad grades, can you do it?	0.52	0.37
5. Is there anything you can do stop yourself getting bad grades?	0.40	0.43
34. If you really decide that you are going to get any problems wrong (e.g. in maths or spelling) can you do it?	0.59	0.49
41. If you want to can you keep from doing badly in school?	0.67 (*)	0.49 (*)

N=202 in both English and Turkish forms. P <0.01 (*). The p value represents the significance of the differences between the two I-T correlations in the two language forms.

4.3.1.2. Means-Ends for Effort Subscale: See table 4.3.1.2 for item-total correlations and Cronbach alpha.

Item-Total correlations: The results showed that when these 8 items were presented in English, the minimum item-total correlation was 0.25 (item 23), and the maximum was 0.43 (item 64). When the same items were presented in Turkish, the minimum item-total correlation was 0.32 (item 56) and the maximum was 0.43 (item 61). There were no significant differences between item-total correlations in the two language forms. Two item-total correlations on the English scale were below 0.30 (16, and 23). No Turkish item-total correlations were below 0.30. These results show that all Turkish items were "good" items and that all items had good translation fidelity. The "poor" English items are probably because of the level of bilingualism.

Reliability: The reliability coefficients for the English and Turkish forms of this subscale were 0.66 and 0.70 respectively. The difference between the two forms of the subscale (-0.04) is not significant and they have medium and good reliability so the scale has survived translation.

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Table 4.3.1.2: Item-Total Correlations, and Cronbach's Alpha for English and Turkish Forms for CAMI's Means- Ends Beliefs for Effort Subscale.

MEANS-ENDS BELIEFS FOR EFFORT SUBSCALE'S ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH FORM CRONBACH ALPHA=0.66	ITEM-TOTAL CORRELATIONS IN TURKISH FORM CRONBACH ALPHA=0.70
23. Is the usual reason that students do well at school that they try really hard?	0.25	0.38
20. If a student knows a lot about something, is it usually because he or she has worked hard at learning it?	0.38	0.40
61. When a student does well in school, is it usual because he/she works very carefully?	0.38	0.43
64. Paying attention and listen carefully, is the usual reason that students understand what the teachers say?	0.43	0.40
19. When a student doesn't understand something at school, is it usually because he or she doesn't pay enough attention?	0.42	0.39
16. If students give the wrong answers on a test is it usually because they don't work carefully?	0.25	0.41
56. When students don't learn very much in class, is it usually because he/she doesn't work very hard?	0.34	0.32
47. When a teacher asks a question and student gives the wrong answer, is this usually because the student isn't trying hard enough?	0.40	0.37

N=202 in both English and Turkish forms.

4.3.1.3. Means-Ends for Attribution Subscale: See table 4.3.1.3 for item-total correlations and Cronbach alpha.

Item-Total correlations: The results showed that when these 8 items were presented in English, the minimum item total correlation was 0.19 (item 53), and the maximum was 0.47 (item 49). When the same items were presented in Turkish, the minimum item-total correlation was 0.26 (item 17) and maximum was 0.51 (item 18). There were no significant differences in the item-total correlations in the two languages. Two item-total correlations in the English form were below 0.30 (item 22, and 53) and one item in the Turkish form (item 17). Overall, for this subscale translation fidelity was "good" but two English and one Turkish items were poor. Item 17 is "if students get bad grades, is it usually because they are no good at school?" Item 22 is "When a student does badly in school is the main reason usually that he or she is no very bright?" Item 53 is "If students understand things quickly, is it because they are very good at school?"

Reliability: The reliability coefficients for the English and Turkish forms of this subscale were 0.68 and 0.68 respectively. There was no difference between the two forms of the subscale and they both have medium reliability so the scale has survived translation.

Table 4.3.1.3. Item-Total Correlations, and Cronbach's Alpha for English And Turkish Forms for CAMI's Means-Ends Beliefs for Attribute Subscale.

MEANS-ENDS BELIEFS FOR ATTRIBUTIONS SUBSCALE'S ITEM	ITEM-TOTAL CORRELATIONS IN ENGLISH FORM CRONBACH ALPHA=0.68	ITEM-TOTAL CORRELATIONS IN TURKISH FORM CRONBACH ALPHA=0.68
18. If a student does well in school, is it usually because he or she is just clever?	0.41	0.51
13. When students give the right answer to questions in class, is it usually only because they are good students?	0.31	0.29
50. When a student manages to learn something, is it just because he/she is clever?	0.43	0.40
53. If students understand things quickly, is it because they are very good at school?	0.19	0.36
17. If students get bad grades, is it usually because they are no good at school?	0.40	0.26
22. When a student does badly in school is the main reasons usually that he or she is just not very bright?	0.26	0.45
49. When students don't understand something, is it because they are just no good at school?	0.47	0.33
52. If a student gives the wrong answer to teachers' question, is it usually because s/he is just not smart?	0.37	0.37

N= 202 in both English and Turkish forms.

4.3.1.4. Means-Ends for Powerful Others Subscale: See table 4.3.1.4 for item-total correlations and Cronbach alpha.

Item-Total correlations: The results showed that when the 8 items were presented in English, the minimum item-total correlation was 0.16 (item 14) and the maximum was 0.54 (item 21). When the same items were presented in Turkish, the minimum item-total correlation was 0.31 (item 45), and the maximum was 0.58 (item 21). There were no significant differences between the two forms. One English item (item 14) but no Turkish items were below 0.30. These results show that the subscale had good translation fidelity and that all Turkish items were good. One English item was poor. Item 14 is "Do some students do well at school just because their teachers help them?"

Reliability: The reliability coefficients for the English and Turkish forms of this subscale were 0.71 and 0.75 respectively. The difference between the two forms of the subscale is not significant and they both have good reliability so the scale has survived translation.

Table 4.3.1.4: Item-Total Correlations, and Cronbach's Alpha for English and Turkish Forms for CAMI's Means-Ends Beliefs for Powerful Others Subscale.

MEANS-ENDS BELIEFS FOR POWERFUL OTHERS SUBSCALE'S ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH FORM CRONBACH ALPHA=0.71	ITEM TOTAL CORRELATIONS IN TURKISH FORM CRONBACH ALPHA=0.75
24. When a students gets good grades, is it usually because he or she gets along well with the teacher?	0.53	0.46
14. Do some students do well at school just because their teachers help them?	0.16	0.35
60. When a student does well in school, is it usually because he/she gets along well with the teachers?	0.47	0.55
45. When students do really well in school, is it usually just because of the teacher?	0.30	0.31
15. If a student gets bad grades, is it usually because the teacher doesn't like them?	0.43	0.51
21. If a student does badly in school, is it usually because the teacher doesn't really like him/her very much?	0.54	0.58
63. When students do badly in a subject, is it usually because the teachers just don't help them very much?	0.44	0.51
51. When students have problems in school, is it usually because of the teacher?	0.42	0.38

N= 203 in both English and Turkish forms.

4.3.1.5. Means-Ends for Luck Subscale: See table 4.3.1.5 for item-total correlations and Cronbach alpha.

Item-Total correlations: The results showed that when these 8 items were presented in English, the minimum item total correlation was 0.26 (item 25) and the maximum was 0.66 (item 58). When the same items were presented in Turkish, the minimum item-total correlation was 0.30 (item 25) and the maximum was 0.60 (item 57). There were no significant differences between item-total correlations in the two language forms. One item-total on the English scale (item 25) but no Turkish items were below 0.30. These results show that this subscale has good translation fidelity and all the Turkish items were good.

Reliability: The reliability coefficients for the English and Turkish forms of this subscale were 0.82 and 0.81 respectively. The difference between the two forms of the subscale was not significant and they both have high reliability so the scale has survived translation.

Table 4.3.1.5: Item-Total Correlations, and Cronbach's Alpha for English and Turkish Forms for CAMI's Means-Ends Beliefs for Luck Subscale.

MEANS-ENDS BELIEFS FOR LUCK SUBSCALE'S ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH FORM CRONBACH ALPHA=0.82	ITEM-TOTAL CORRELATIONS IN TURKISH FORM CRONBACH ALPHA=0.83
28. Is doing well at school usually a matter of luck?	0.58	0.59
25. Some students learn things more easily than other students. Is it because they are luckier?	0.26	0.30
57. Is getting good grades just a matter of luck?	0.64	0.59
48. If a teacher calls on a student and student knows the right answer, would you say it's just because the student is lucky?	0.47	0.54
29. If a students get bad grades, is it just they have bad luck?	0.66	0.58
32. If a teacher asks a student a question and the student doesn't know the answer, is this simply because the student's unlucky?	0.57	0.53
58. When a student finds it difficult to learn something, is it usually because he/she is unlucky?	0.66	0.57
62. When a student has a hard time learning something, is it usually because the student is unlucky?	0.58	0.60

N= 201in both English and Turkish forms.

4.3.1.6. Means-Ends for Unknown Factors Subscale: See table 4.3.1.6 for item-total correlations and Cronbach alpha.

Item-Total correlations: The results showed that when these 8 items were presented in English, the minimum item-total correlation was 0.35 (item 59) and the maximum was 0.54 (item 54). When the same items were presented in Turkish, the minimum item-total correlation was 0.32 (item 59) and the maximum was 0.53 (item 55). There were no significant differences between item-total correlations in the two language forms. All English and Turkish item-total correlations were above 0.30. These results show good translation fidelity and all Turkish and English items were good.

Reliability: The reliability coefficients for the English and Turkish forms of this subscale were 0.75 and 0.76 respectively. The difference between the two forms of the subscale was not significant and they both have good reliability so the scale has survived translation.

Table 4.3.1.6: Item-Total Correlations, and Cronbach's Alpha for English and Turkish Forms for CAMI's Means-Ends Beliefs for Luck Subscale.

MEANS-ENDS BELIEFS FOR UNKNOWN FACTORS SUBSCALE'S ITEM	ITEM-TOTAL CORRELATIONS IN ENGLISH FORM CRONBACH ALPHA= 0.75	ITEM-TOTAL CORRELATIONS IN TURKISH FORM CRONBACH ALPHA= 0.76
30. When a students do better than usual in as object, is it difficult to tell why?	0.40	0.47
26. If the teacher asks a student a hard question and he or she answers correctly, is it usually difficult to work out why the student gave the right answer?	0.42	0.48
46. If a student get a good grades in school, is it hard to know the reason why?	0.50	0.51
55. Is it hard to know why a student does really well on a test?	0.51	0.53
31. If students do badly in school, is it hard to work out why this has happened?	0.52	0.41
27. When a student makes a lot of mistakes (e.g., in a spelling test), is it hard to know the reason why?	0.36	0.44
54. When students give the wrong answer to teachers' questions, do you find it hard to know why it has happened?	0.54	0.51
59. Is it difficult to know why a student does worse than usual in a subject?	0.35	0.32

N= 203 in English form; N= 198 in Turkish form.

4.3.1.7. Agency for Effort Subscale: See table 4.3.1.7 for item-total correlations and Cronbach alpha. Item-Total correlations: The results showed that when these 4 items were presented in English, the minimum item-total correlation was 0.49 (item 37) and the maximum was 0.70 (item 33). When the same items were presented in Turkish, the minimum item-total correlation was 0.57 (item 37)and the maximum was 0.66 (item 33). There were no significant differences between item-total correlations in the two language forms and all English and Turkish items were good.

Reliability: The reliability coefficients for the English and Turkish forms of this subscale were 0.81 and 0.79 respectively. The difference between the two forms of the subscale is not significant and they have high and good reliability so the scale has survived translation.

Table 4.3.1.7: Item-Total Correlations, and Cronbach's Alpha for English and Turkish Forms for CAMI's Agency Beliefs for Effort Subscale.

AGENCY BELIEFS FOR EFFORT SUBSCALE'S ITEM	ITEM-TOTAL CORRELATIONS IN ENGLISH FORM CRONBACH ALPHA= 0.81	ITEM-TOTAL CORRELATIONS IN ENGLISH FORM CRONBACH ALPHA= 0.79
1. Do you try as hard as you can in school?	0.65	0.58
4. Do you pay attention in class?	0.67	0.62
37. When it comes down to it; do you really work hard on your homework?	0.49	0.57
33. Do you listen very carefully to what your teacher says?	0.70	0.66

N=201 in English form; N=204 in Turkish form.

4.3.1.8. Agency for Attribution Subscale: See table 4.3.1.8 for item-total correlations and Cronbach alpha.

Item-Total correlations: The results showed that when these items were presented in English, the minimum item-total correlation was 0.33 (item 44) and the maximum was 0.58 (item 2). When the same items were presented in Turkish, the minimum item-total correlation was 0.47 (item 44) and the maximum was 0.57 (item 9). There were no significant differences between item-total correlations in the two language forms and all English and Turkish items were good.

Reliability: The reliability coefficients for the English and Turkish forms of this subscale were 0.69 and 0.73 respectively. The difference between the two forms of the subscale is not significant and they both medium and good reliability so the scale has survived translation.

Table 4.3.1.8: Item-Total Correlations, and Cronbach's Alpha for English and Turkish Forms for CAMI's Agency Beliefs for Attributes Subscale.

AGENCY BELIEFS FOR ATTRIBUTES SUBSCALE'S ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH FORM CRONBACH ALPHA= 0.69	ITEM-TOTAL CORRELATIONS IN TURKISH FORM CRONBACH ALPHA= 0.73
2. Can you learn things you need to for school quickly, without really having to work on them?	0.58	0.54
9. Are you successful in your school work even without having to study hard?	0.55	0.57
39. Do you get problems right (e.g. in maths), even if you don't try hard?	0.45	0.50
44. Can you understand the teachers' lesson easily?	0.34	0.47

N=203 in both English and Turkish forms.

4.3.1.9. Agency for Powerful Others Subscale: See table 4.3.1.9 for item-total correlations and Cronbach alpha.

Item-Total correlations: The results showed that when these 4 items were presented in English, the minimum item-total correlation was 0.47 (item 43) and the maximum was 0.65 (item 12). When the same items were presented in Turkish, the minimum item-total correlation was 0.45 (item 12) and the maximum was 0.57 (item 43). There was a significant difference (p<0.01) between item-total correlations in the two language forms for item 12 (r= .65 in English, r= .45 in Turkish). These results show that all Turkish and English items were good but that one item (12) was poorly translated. Item 12 is "When you want them to, will your teachers help to see that you do well in school?"

Reliability: The reliability coefficients for the English and Turkish forms of this subscale were 0.73 and 0.72 respectively. The difference between the two forms of the subscale is not significant and they both have good reliability so the scale has survived translation.

Table 4.3.1.9: Item-Total Correlations, and Cronbach's Alpha for English and Turkish Forms CAMI's Agency Beliefs for Powerful Others Subscale.

AGENCY BELIEFS FOR POWERFUL OTHERS SUBSCALE'S ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH FORM CRONBACH ALPHA=0.73	ITEM-TOTAL CORRELATIONS IN TURKISH FORM CRONBACH ALPHA=0.72
12. When you want them to, will your teachers help to see that you do well in school?	0.65 (*)	0.45 (*)
11. On the whole, do your teachers like you?	0.48	0.50
40. Do you have teachers who will help you when you want them to?	0.51	0.53
43. When you think about it, would you say that your teacher satisfied with you?	0.47	0.57

N=204 in English form; N=203 in Turkish form. P <0.01 (*). The p value represents the significance of the differences between the two I-T correlations in the two language forms.

4.3.1.10. Agency for Luck Subscale: See table 4.3.1.10 for item-total correlations and Cronbach alpha.

Item-Total correlations: The results showed that when these 4 items were presented in English, the minimum item-total correlation was 0.25 (item 8) and the maximum was 0.56 (item 36). When the same items were presented in Turkish, the minimum item-total correlation was 0.40 (item 38; item 8) and the maximum was 0.49 (item 36). There were no significant differences between the two forms. One English item but no Turkish items were below 0.30. These results show that translation of the subscale was good and that all Turkish items were also good. Only one English item was poor. Item 8 is "When the teacher calls on you, are you usually lucky in knowing the right answer?"

Reliability: The reliability coefficients for the English and Turkish forms of this subscale were 0.61 and 0.64 respectively. The difference between the two forms of the subscale is not significant and they both have medium reliability so the scale has survived translation.

Table 4.3.1.10: Item-Total Correlations, and Cronbach Alpha of English and Turkish Forms for CAMI's Agency Beliefs for Luck Subscale.

AGENCY BELIEF FOR LUCK SUBSCALE'S ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH FORM CRONBACH ALPHA=0.61	ITEM-TOTAL CORRELATIONS IN TURKISH FORM CRONBACH ALPHA=0.64
6. Are you the sort of person who has luck with their homework?	0.31	0.40
8. When the teacher calls on you, are you usually lucky in knowing the right answer?	0.25	0.40
38. When it comes to learning something hard, do you usually have luck on your side?	0.49	0.40
36. Are you usually lucky, when it comes to schoolwork?	0.56	0.49

N=201 in English form; N=204 in Turkish form.

4.3.2. Nowicki-Strickland LOC Scale for Children (CNSIE) (Nowicki and Strickland, 1973). See table 4.3.1.10 for item-total correlations and Cronbach alpha.

Item-Total correlations: The results showed that when these 40 items were presented in English, the minimum item-total correlation was -0.09 (item 4) and the maximum was 0.35 (item 35). When the same items were presented in Turkish, the minimum item-total correlation was -0.07 (item 10) and the maximum was 0.41 (item 36). There was a significant difference between item-total correlations in the two language forms for Item 36 (r= .19 in English, r= .40 in Turkish) at 0.01. Most item-total correlations in both English (33/40) and Turkish (34/40) were below 0.30 (see table 4.3.2). These results show that only one item 36 "Do you feel that when someone doesn't like you there is little you can do about it?" had poor translation fidelity. The majority of items in both in English and Turkish forms were poor.

Reliability: The reliability coefficients for the English and Turkish forms of this subscale were 0.68 and 0.67 respectively. The difference between the two forms of the subscale is not significant and they both have medium reliability so the scale has survived translation.

We shall discuss this scale later.

Table 4.3.2: Item-Total Correlations, and Cronbach's Alpha for English and Turkish Forms for Nowicki-Strickland Internal-External Locus of Control Scale for Children (CNSIE).

NOWICKI-STRICKLAND'S LOCUS OF CONTROL SCALE ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH FORM CRONBACH ALPHA= 0.68	ITEM-TOTAL CORRELATIONS IN TURKISH FORM CRONBACH ALPHA= 0.67
1. Do you believe that most problems will usually sort themselves out in time?	0.03	-0.01
2. Do you believe that you can stop yourself from catching a cold?	0.10	0.24
3. Are some children just born lucky?	0.10	0.23
4. Most of the time do you feel that getting good grades means a great deal to you?	-0.09	-0.06
5. Are you often blamed for things that just aren't your fault?	0.26	0.24
6. Do you believe that if somebody studies hard enough he or she can pass any subject?	0.25	0.18
7. Do you feel that most of the time it doesn't pay to try because things never turn out right anyway?	0.38	0.22
8. Do you feel that if things start out well in the morning it's going to be a good day no matter what you do?	0.12	0.12
9. Do you feel that, most of the time, parents listen to what their children have to say?	0.00	0.00
10. Do you believe that good things can be made to happen simply by wishing them?	0.12	-0.08
11. When you get punished does it usually seem to be for no good reason at all?	0.25	0.25
12. Most of the time do you find it hard to change a friend's opinion?	0.24	0.09
13. Do you think a team is helped to win more by cheering than by luck?	0.20	0.19
14. Do you feel that it's nearly impossible to change your parent's mind about anything?	0.33	0.22
15. Do you believe that your parents should allow you to make of your own decisions?	0.06	0.22
16. Do you feel that when you do something wrong there is very little you can do to make it right?	0.18	0.38
17. Do you believe that some children are just born good at sports?	0.07	0.12
18. Are most of the others children your age stronger than you are?	-0.04	0.19
19. Do you feel that one of the best ways to handle most problems is just not to think about them?	0.16	0.25
20. Do you feel that you have a lot of choice in deciding who your friends are?	0.30	0.18
21. If you find a four-leaf clover do you believe that might bring you good luck?	0.08	0.00
22. Do you feel that whether you do your homework has much to do with what kinds of grades you get?	0.12	0.07

23. Do you feel that when another teenager your age decides to hit you, there is little you can do stop him or her?	0.16	0.18
24. Have you ever had a good luck charm?	-0.00	-0.04
25. Do you believe that whether or not people like you depends on how you act?	0.15	0.20
26. Will your parents usually help you if you ask them to?	0.34	0.38
27. Have you felt that when people were mean to you it was usually for no reason at all?	0.21	0.37
28. Most of the time, do you feel that you can change what might happen tomorrow by what you do today?	0.26	0.11
29. Do you believe that when bad things are going to happen no matter what you do to try to stop them?	0.21	0.21
30. Do you think that children can get their own way if they just keep trying?	0.28	0.32
31. Most of the time do you find it useless to try to get your own way at home?	0.29	0.09
32. Do you feel that when good things happen they happen because of hard work?	0.23	0.16
33. Do you feel that when somebody your age wants to be your enemy there is little you can do to change matters?	0.27	0.38
34. Do you feel that it is easy to get friends to do what you want them to?	0.27	0.12
35. Do you usually feel that you have little to say about what you get to eat at home?	0.35	0.27
36. Do you feel that when someone doesn't like you there is little you can do about it?	0.19 (*)	0.41 (*)
37. Do you usually feel that it is almost useless to try in school because most other children are just cleverer than you are?	0.23	0.25
38. Are you the kind of person who believes that planning ahead makes things turn out better?	0.27	0.20
39. Most of the time, do you feel that you have little say in what your family decides to do?	0.32	0.28
40. Do you think it is better to be clever than to be lucky?	0.30	0.18

N=193 in English from; N=198 in Turkish form. P <0.01 (*). The p value represents the significance of the differences between the two I-T correlations in the two language forms.

4.3.3. MASLOC (Palenzuela, 1988).

4.3.3.1. MASLOC for Internal Subscale: See table 4.3.3.1 for item-total correlation and Cronbach's alpha.

Item-Total correlations: The results showed that when these 5 items were presented in English, the minimum item-total correlation was 0.40 (item 7) and the maximum was 0.55 (item 11). When the same items were presented in Turkish, the minimum item-total correlation was 0.34 (item 7) and the maximum was 0.48 (item 10). There were no significant differences between item-total correlations in the two language forms. All English and Turkish items were above 0.30. These results show good translation fidelity of the subscale and that all items were good.

Reliability: The reliability coefficients for the English and Turkish forms of this subscale were 0.70 and 0.64 respectively. The difference between the two forms of the subscale is not significant and they have a good and medium reliability so the scale has survived translation.

Table 4.3.3.1: Item-Total Correlations, and Cronbach's Alpha for English and Turkish Forms for MASLOC's Internal Subscale.

MASLOC INTERNAL SUBSCALE'S ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH FORM CRONBACH ALPHA= 0.70	ITEM-TOTAL CORRELATIONS IN TURKISH FORM CRONBACH ALPHA= 0.64
2. The grade I get at the end of the year will always be closely related to what I do during the year.	0.46	0.46
5. I am convinced that the grades I will get depend on how well or badly I do in my exams.	0.40	0.38
7. The kind of grades I will get in my studies depends on how capable I am in preparing my self.	0.40	0.34
10. If I want to get a good academic record I have to be competent and I must work hard.	0.54	0.48
11. In general, I believe that, if one is competent and works hard one will get good result.	0.55	0.40

N=203 in English form; N=200 in Turkish form.

4.3.3.2. MASLOC for Helplessness Subscale: See table 4.3.3.2 for item-total correlation and Cronbach's alpha.

Item-Total correlations: The results showed that when these 5 items were presented in English, the minimum item-total correlation was 0.18 (item 15) and the maximum was 0.32 (item 14). When the same items were presented in Turkish, the minimum item-total correlation was -0.12 (item 8) and the maximum was 0.43 (item 14). There was a significant difference between item-total correlations in the two language forms for item 8 (r= .22 in English, r= -.12 in Turkish) at 0.01. The majority of English (4/5) and Turkish (3/5) item-total correlations were below 0.30. These results show that only item 8 had poor translation fidelity. Item 8 is "I do not think it is worthwhile studying hard since the grades I will get will be completely manipulated"). The majority of items in both in English and Turkish forms were poor.

Reliability: The reliability coefficients for the English and Turkish forms of this subscale were 0.45 and 0.40 respectively. The difference between the two subscale was not significant but the reliability of the subscale in both languages is poor. We will discuss this subscale later.

Table 4.3.3.2: Item-Total Correlations, and Cronbach's Alpha for English and Turkish Forms for MASLOC's Helplessness Subscale.

MASLOC HELPLESSNESS SUBSCALE'S ITEMS	ITEM-TOTAL CORRELATION IN ENGLISH FORM CRONBACH ALPHA=0.45	ITEM-TOTAL CORRELATION IN TURKISH FORM CRONBACH ALPHA=0.40
4. It is an absolute waste of time for me to make any effort, since there is no relationship between my capability, how hard I work, and the grades I will get.	0.22	0.28
8. I don't think it is worthwhile studying hard since the grades I will get will be completely manipulated.	0.23 (*)	-0.12 (*)
9. I am convinced that whatever I do my teacher will always give me the grades they want to.	0.25	0.22
14. It makes absolutely no difference whether I prepare well for a subject or not since in the long run teachers are "out to catch you".	0.32	0.43
15. Regarding my academic life I just don't know what to do. Anything might happen: may be I will do an exam well and fail or may be I will do it badly and pass.	0.18	0.33

N=199 in both English and Turkish forms. P <0.01 (*). The p value represents the significance of the differences between the two I-T correlations in the two language forms.

4.3.3.3. MASLOC for Luck Subscale: See table 4.3.3.3 for item-total correlation and Cronbach's alpha.

Item-Total correlations: The results showed that when these 5 items were presented in English, the minimum item-total correlation was 0.07 (item 6) and the maximum was 0.45 (item 12). When the same items were presented in Turkish, the minimum item-total correlation was 0.13 (item 6) and the maximum was 0.51 (item 12). There were no significant differences between item-total correlations in the two language forms. The majority of English (3/5) and Turkish (3/5) item-total correlations were below 0.30. These results show that even though this subscale had good translation fidelity, the majority of items in both in English and Turkish forms were poor.

Reliability: The reliability coefficients for the English and Turkish forms of this subscale were 0.46 and 0.55 respectively. The difference between the two subscales is -0.09, with the reliability of the English version less. This is greater than our criterion value of -0.08 so the difference is significant. Also the reliability of the subscale in both languages is poor.

We will discuss this subscale later.

Table 4.3.3.3: Item-Total Correlations, and Cronbach's Alpha for English and Turkish Forms for MASLOC's Luck Subscale.

MASLOC LUCK SUBSCALE'S ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH FORM CRONBACH ALPHA=0.46	ITEM-TOTAL CORRELATIONS IN TURKISH FORM CRONBACH ALPHA=0.55
1. If I want to obtain a good exam record it is essential that I should have good luck.	0.34	0.37
3. Whatever the quality of my work I am always lucky when it comes to examinations.	0.17	0.29
6. My getting good or bad grades in my exams is related to whether the precise the topics I have studied come up in exam.	0.07	0.13
12. Luck is decisive in the kind of grades I get in my studies.	0.45	0.51
13. The grades I get are always determined by a series of random circumstances.	0.20	0.29

N=199 in English form; N=203 in Turkish form.

4.3.4. Religiosity Scale (Rohrbaugh and Jessor, 1976): See table 4.3.3.3 for item-total correlation and Cronbach alpha.

Item-Total correlations: The results showed that when these 8 items were presented in English, the minimum item-total correlation was 0.49 (item 2) and the maximum was 0.67 (item 8). When the same items were presented in Turkish, the minimum item-total correlation was 0.45 (item 2) and the maximum was 0.66 (item 9). There were no significant differences in item total correlations between the two language forms. All item-total correlations in both English and Turkish were above 0.30. These results showed that this subscale had good translation fidelity and that all items were good.

Reliability: The reliability coefficients for the English and Turkish forms of this scale were 0.84 and 0.83 respectively. The difference between the two forms of the subscale is not significant and they both have high reliability so the scale has survived translation.

Table 4.3.4: Item-Total Correlations, and Cronbach's Alpha for English and Turkish Forms for MASLOC's Luck Subscale.

RELIGIOSITY SCALE'S ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH FORM CRONBACH ALPHA=0.84	ITEM-TOTAL CORRELATIONS IN TURKISH FORM CRONBACH ALPHA=0.83
2. How often have you attended religious services during the past year?	0.49	0.45
3. Which of the following best describe your views on prayer or religious meditation?	0.57	0.58
4. When you have a serious personal problem how often do you take religious advice or teaching into consideration?	0.53	0.53
5. How much of an influence would you say that religion has on the way that you choose to act or the way that you choose to spend your time each day?	0.58	0.53
6. Which one of the following statements comes closest to your belief about God?	0.64	0.56
7. Which of the following statements comes closest to your beliefs about life after death (immortality)?	0.51	0.55
8. During the past year, how often have you experienced feeling of religious reverence or devotion?	0.67	0.56
9. Do you agree with the following statement: "Religion gives me great amount of comfort and security"	0.61	0.66

N= 195 in English form; N=200 in Turkish form.

4.3.5. Authoritarianism Scale (Adomo, 1954; Robinson, Shaver and Wrightsman, 1991): See table 4.3.5 for item-total correlation and Cronbach alpha.

Item-Total correlations: The results showed that when these 30 items were presented in English, the minimum item-total correlation was 0.16 (item 2) and the maximum was 0.52 (item 17). When the same items were presented in Turkish, the minimum item-total correlation was 0.09 (item 2) and the maximum was 0.51 (item 8). There were no significant differences between item-total correlations of the two forms. Seven out of thirty items in English (items 2, 4, 6, 19, 26, 28 and 29) and eight out of thirty items in Turkish (items 2, 4, 6, 9, 13, 16, 18, 19 and 23) had correlations below 0.30. These results show that even though this subscale had good translation fidelity, some items in both English and Turkish forms were poor.

Reliability: The reliability coefficients for the English and Turkish forms of this scale were 0.83 and 0.82 respectively. The difference between the two forms of the subscale is not significant and they both have high reliability so the scale has survived translation.

Table 4.3.5: Item-Total Correlations, and Cronbach's Alpha for English and Turkish Forms for Authoritarianism 'F' Scale.

AUTHORITARIANISM SCALE'S ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH FORM CRONBACH ALPHA=0.83	ITEM-TOTAL CORRELATIONS IN TURKISH FORM CRONBACH ALPHA=0.82
1. Obedience and respect for authority are the most important virtues children should learn.	0.38	0.38
2. No weakness or difficult can holds us back if we have enough will power.	0.16	0.09
3. Science has its place but there are many important things that can never be understood by the human mind.	0.41	0.37
4. Human nature being what it is, there will always be war and conflict.	0.21	0.03
5. Every person should have complete faith in some supernatural power whose decisions are obeyed without question.	0.35	0.33
6. When a person has a problem or worry, it is best for him not to think about it, but to keep busy with more cheerful things.	0.22	0.21
7. A person who has no manners, bad habits, and poor breeding can hardly expected to get along with decent people.	0.35	0.36
8. What youth needs most is strict discipline, rugged determination, and the will to work and fight for family and country.	0.39	0.51
9. Some people are born with an urge to jump from high places.	0.31	0.28
10. Nowadays when so many different kinds of people move around and mix together, a person has to protect himself carefully especially against catching an infection or disease from them.	0.50	0.34

11. An insult to our honour should always be punished.	0.31	0.34
12. Young people sometimes get rebellious ideas but as they grow up they ought to get over them.	0.45	0.40
13. It is essential for learning or effective work that our teacher or bosses outline in detail what is to be done and exactly how to do it.	0.38	0.27
14. What this country needs most, more than laws and political programmes, is a few courageous, tireless leaders in whom the people can put their faith.	0.31	0.37
15. Sex crimes, such as rape and attacks on children, deserve more than mere imprisonment; such criminal ought to be publicly whipped, or worse.	0.38	0.44
16. People can be divided into two distinct classes: the week and strong.	0.34	0.23
17. There is hardly anything lower than a person who does not feel a great love, gratitude, and respect for his parents.	0.52	0.46
18. Some day it will probably be shown that astrology can explain a lot of things.	0.33	0.10
19. Some leisure is necessary but it is good hard work makes life interesting and worthwhile.	0.26	0.26
20. Nowadays more and more people are prying into matters that should remain personal and private.	0.35	0.31
21. Wars and social troubles may someday be ended by an earthquake of flood that will destroy the whole world.	0.38	0.46
22. Most of our social problems could be solved if we could somehow get rid of immoral, crooked, and feebleminded people.	0.35	0.38
23. The wild sex life of the old Greeks and Romans was tame compared to some of the goings-on in this country, even in places where people might least expect it.	0.40	0.28
24. If people would talk less and work more, everybody would be better off.	0.43	0.37
25. Most people don't realise how much our lives are controlled by plots hatched in secret places.	0.31	0.33
26. Homosexuals are hardly better than criminals and ought to be severely punished.	0.21	0.33
27. Books and videos ought not to deal so much with the unpleasant and seamy side of life: they ought to concentrate on themes that are entertaining or uplifting.	0.37	0.34
28. No sane, normal, decent person could ever think of hurting a close friends and relative.	0.20	0.35
29. Familiarity breeds contempt.	0.27	0.38
30. When you come right down to it, it is human nature never to do anything without an eye to profit.	0.40	0.33

N=181 in English form; N= 179 in Turkish form.

4.4. SUMMARY

4.4.1. Item comparisons between forms:

CAMI: Only one item in the Control beliefs subscale (item 41: "If you want to can you keep from doing badly in school?") and one in the Agency beliefs for Powerful Others (item 12: "When you want them to, will your teachers help to see that you do well in school?") were significantly different.

CNSIE: For CNSIE one item (item 36) showed a significant difference between the two language forms ("Do you feel that when someone doesn't like you there is little you can do about it?").

MASLOC: There was only one significant difference. This was in the MASLOC for Helplessness subscale (item 8: "I don't think it is worthwhile studying hard since the grade I will bet will be completely manipulated?").

RELIGIOSITY: There were no significant differences between the language forms.

AUTHORITARIANISM: There were no significant differences between the language forms.

Overall, investigation of the items for differences between language forms have shown that two out of sixty four items in CAMI, one out of forty in CNSIE, and one out of fifteen in MASLOC were significantly different in the two language forms. The Religiosity and Authoritarianism items were fine. These results indicate that classical item analysis has shown good item fidelity in these scales and subscales.

4.4.2. Absolute values of item-total correlations ($r<0.30$). The item-total correlations were low for some of the items.

CAMI: In CAMI nine out one hundred and twenty eight item-total correlations were lower then .30. Most of these items (7/64) were in the English form: two items in M-E for Effort (items 23, 16); two in M-E for Attribute (items 53, 22); one item in M-E Powerful others (item 14) and one for M-E for Luck (item 25); one in Agency for Luck (item 8). There were only 2 items (2/64) which showed low item-total correlations in the Turkish sample. These were in the Means-Ends for Attributions (items 13, 17subscale.

CANSIE: In CANSIE twenty eight out of forty items did not function well in both of the language forms. Items which showed less then .30 item-total correlations in both language are follows: Items 1-6, 8, 9, 11-15, 17-19, 21-25, 28-29, 31-32, 34, 37-38. There were also some items which showed

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lowcorrelations in only one form. These were: Items 5, 27, 33, 36 in English and items 7, 10, 19, 29, 37 in Turkish. There were only three out of forty items (items 16, 26, 39) which were good in both language forms.

MASLOC: Six out of fifteen items showed low item-total correlations in both language forms. These were in the Helplessness subscale (items 4, 8, and 9) and the Luck subscale (items 3, 6 and 13). Item 15 was low only in English.

AUTHORITARIANISM: In both scales fifteen out of sixty items showed low correlations. Four of them were low in both language forms (items 2, 4, 6, 19). Two items were low in the English form (items 28, 29) and five more were low in the Turkish form (items 9, 13, 16, and 18).

4.4.3. Means, SD and Reliability:

The minimum and maximum average means in English were 1.60 and 3.79 respectively. In Turkish they were 1.64 and 3.79. The differences were not significant. Note that a four 4 point rating scale used for CAMI and CANSIE and a six point rating scale for used for MASLOC, with a high score representing high internal perceived control; a five point scale was used for Religiosity and a four point rating scale for the F-Scale, with high scores representing high religiosity and high authoritarianism respectively. The minimum and maximum standard deviations for English were 0.41 and 2.00, respectively and those for Turkish 0.42 and 1.95. These also were not different. The mean scores and standard deviations of all the scales and subscales were very similar in the two language forms. See table 4.4.3.

The internal consistency of the scales was medium or better (alpha > 0.60). The minimum and maximum values were 0.45 and 0.85 in English and 0.40 and 0.83 in Turkish. There were two exceptions which were MASLOC's Helplessness (0.45 in English and 0.40 in Turkish) and Luck subscales (0.46 in English and 0.55 in Turkish). In MASLOC for Luck the reliability of the English form was less than the Turkish form.

Table 4.4.3: Summary table of Item Means, Standard Deviations and Internal Consistencies of the Scales and Subscales in the English and Turkish Forms and in the Literature.

SCALES	No. of Items	MEANS		STANDARD DEVIATIONS		INTERNAL CONSISTENCY		
		ENGLISH	TURKISH	ENGLISH	TURKISH	ENGLISH	TURKISH	LITERATURE
CONTROL, MEANS-ENDS, AGENCY BELIEFS								
Control Belief	8	1.83	1.85	0.53	0.53	0.85	0.78	0.81
Means-Ends Beliefs								
Effort	8	2.23	2.23	0.48	0.48	0.66	0.70	0.77
Luck	8	1.60	1.64	0.41	0.42	0.82	0.81	0.90
Unknown Factors	8	1.76	1.78	0.48	0.51	0.75	0.76	0.82
Attribute	8	2.82	2.85	0.47	0.46	0.68	0.68	0.81
Powerful Others	8	1.97	1.98	0.44	0.46	0.71	0.75	0.70
Agency Beliefs								
Effort	4	2.35	2.37	0.70	0.60	0.81	0.79	0.67
Luck	4	2.40	2.40	0.56	0.55	0.61	0.64	0.69
Attribute	4	2.41	2.36	0.53	0.47	0.69	0.73	0.76
Powerful Others	4	2.79	2.71	0.68	0.62	0.73	0.72	0.61
CANSIE								

Nowicki-Strickland LOC Scale	40	2.12	2.08	0.66	0.61	0.68	0.67	0.64-0.91
MASLOC Palenzuela's LOC Scale								
Internal	5	2.09	2.06	1.19	1.20	0.70	0.64	0.81
Helplessness	5	2.82	2.93	2.12	2.21	0.45	0.40	0.82
Luck	5	3.27	2.96	1.68	1.56	0.46	0.55	0.84
RELIGIOSITY SCALE	8	2.85	2.85	1.16	1.21	0.84	0.83	0.90
AUTHORITARIANISM SCALE	30	3.79	3.79	2.00	1.95	0.83	0.82	0.81-0.97

4.5. CONCLUSIONS

Low item-total correlations in both language forms for the same item could be explained by the fact that these items were completed by bilingual students in Turkey. The other possibility is that the items are not as good as the literature suggests (Skinner et. al., 1988; Nowicki-Strickland, 1973, Palenzuela, 1988; Christie, 1991). The only way of finding this out is to repeat the study with other samples. The results of such a cross-cultural comparison at the item level will be presented in the second part of this study (see chapter 6). The low item-total correlations in the English form could be explained partly by the students' level of bilingualism or by the good quality of translation. It is quite possible that the latter reasoning is correct.

It seems that, although the classical theory approach cannot take into account biases such as time and some form differences, as the generalizability approach does, it can help us to investigate the items of different language forms. If we compare the number of differences detected by the generalizability approach (5/16 scales or subscales) with the classical approach (4/16 scales or subscales) we can see the advantages of using the generalizability approach against the classical approach for our purposes.

On the other hand it is important to know that false alarms can be given by the ANOVA analysis because of the sensitivity of the statistics, even though Classical theory is not a sensitive way of measuring differences at the item level (Algina & Crocker, 1989).

Reliability in the Literature: The reliabilities for CAMI's Means-Ends for effort, luck, unknown factors and attribute, Agency for luck and attribute; and all MASLOC's subscales were lower than the original studies in both language forms (Skinner et al., 1988; Palenzuela, 1988) but only the MASLOC subscales were much less than in the original study (Palenzuela, 1988). The subscales for CAMI's Means-Ends for powerful others and Agency for effort and powerful others were more reliable than in the original sample (Skinner et al., 1988). See table 4.4.3. This can be attributed to the good adaptation and translation fidelity of these subscales. Other possible reasons, such as a high relationship between agency and outcomes in the Turkish culture, will be discussed later on (see chapter 9).

Also, when the reliabilities were compared with the literature we mainly found that CAMI's reliability was similar to others reported in the literature. In the Agency beliefs subscale the results of the Turkish bilingual sample was even better (e.g. for the Agency for effort subscale the reliability of the English form was 0.79 and that of the Turkish form was 0.81. In the literature it is 0.67 (Skinner et al., 1988). See table 4.4.3. for the summary. For MASLOC the reliabilities were lower than the literature, particularly for the Helplessness and Luck subscales (Palenzuela, 1988) (see the summary table). The

Religiosity (Rohrbaugh & Jessor, 1976) and Authoritarianism (Christie, 1991) scales were fine. CNSIE's reliability was at the lower range of the many reported in the literature but most importantly most of the items had low item-total correlations in both forms. Therefore use of the scale is questioned. No decision will be made until further investigation with Item Response theory (IRT) in the next chapter.

Comparisons between language forms of this study have shown that CAMI's Control beliefs subscale and MASLOC's Internal subscale reliabilities were better in the English form. CAMI's means-ends for effort, powerful others, Agency for attribute and MASLOC's Luck subscales reliabilities were better in the Turkish form.

Reliability indices were compared using Cronbach's alpha. Only MASLOC's luck subscale showed a large difference between the two language forms. The other scales had very similar reliabilities in both languages.

To conclude it can be said that apart from the Helplessness and Luck subscales MASLOC's translation fidelity seems fine according to classical item analysis. These results are slightly different from the earlier analysis using the generalizability approach. According to the ANOVA results in the previous chapter, most of the scales needed further investigation. The discrepancies between these two different methods may be because there were more sources of variance to be detected in the Generalizability analysis (forms, occasions, interaction) than in the Classical analysis (forms only). Collapsing the data from four language forms to two language forms for the Classical analysis removed the occasion differences and order effects which were a source of variance (Shavelson & Webb, 1991, Hambleton et al., 1991; Algina & Crocker, 1989). The item level analysis will be taken further using Item Response theory (see chapter 7)

CHAPTER 5: ITEM RESPONSE THEORY

CHAPTER 5: ITEM RESPONSE THEORY: DETECTING TRANSLATION FIDELITY WITH ITEM RESPONSE THEORY

5.1. INTRODUCTION

In the third part of the item fidelity study, item response theory has been used to detect bias in the translated CAMI, CANSIE, MASLOC, Religiosity, and Authoritarianism questionnaires.

Item response theory has been developed as an alternative to classical test theory in psychometrics over the last 29 years (Lord, 1968). It produces item characteristic curves which show the probability of giving a particular response to an item as a function of the respondent's position on the dimension being measured. One other important characteristic of Item Response theory is that, like classical item analysis, it measures parameters of the item. These are (a) item discrimination, (b) item difficulty and, for some models, (c) guessing. The parameters estimated depend on the situation (e.g., whether there are two or more response alternatives) and the precise model chosen by the analyst (Thissen, Steinberg & Wainer 1993; Algina & Crocker, 1989; Hambleton et al., 1991).

5.2. METHOD

5.2.1. Design

Data from the four conditions and two occasions or times were combined in the same way as for the classical item analysis.

5.2.5. Analysis

Thissen's (1991) Multilog package was used to fit Samejima's (1969) Graded Model to the items of each subscale in the questionnaires. The MULTILOG analysis treats the two language forms of each scale or subscale as one scale. For example, the CAMI-Control Beliefs subscale consists of 8 items but this is analysed as a scale with 16 items. MULTILOG estimates the parameters for each item on this combined scale which fits the data best. For any scale/subscale the number of parameters depends on the number of alternative responses (e.g. strongly disagree, strongly agree) represented on a monatomic rating scale. If there are n alternative responses then there are n parameters. One parameter, the "a" parameter, always measures the discriminating power of the item. The remaining n-1 parameters are "b" parameters and show the location of the cut-off points between each response and the other. In CAMI and CANSIE there are four parameters (one "a", three "b"). The religiosity scale has five parameters (one "a", four "b") and MASLOC and the Authoritarianism scale has 6 parameters (one "a", five "b").

The programme is run once in free form and once in constrained form. In the free form parameters are estimated for each item independently. In the constrained form the programme estimates parameters for each item which are the same for both the English and Turkish versions of that item. For each run of the programme it calculates a X^2 statistic of goodness of fit. The difference between these two values is then looked up to see if they are significantly different. If they are not significantly different then the English and Turkish versions of the scale are considered equivalent. If they are significantly different then further investigation of each item is required. See Figure 5.2.5 illustration of data design.

Figure 5.2.5: Illustration of data design for DIF analysis of the two language forms investigated.

	EI1	EI2	EI3	EI4	TI1	TI2	TI3	TI4
				Items				
S1	2	1	3	4	2	1	3	4
S2	1	1	3	3	2	2	4	4
S3	2	1	4	3	2	1	3	4
.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.

EI1..n: Item no in English, TI1...n: Item no in Turkish, S1..n: participants.

The aim of the item investigation is to identify the items responsible for the difference, so the parameters for the English and Turkish forms from the free run are compared. If the item characteristic curves for each version of the item are different then this item is marked as possibly responsible for the difference. Items are rank ordered in terms of the differences between ICCs. The X^2 for the constrained run of the programme is calculated again but this time the item with the biggest difference is allowed to be free and all others are still constrained. If this X^2 is still significantly different from the free X^2 then the process is repeated, with two items (with the two biggest differences) being allowed to be free. This process is repeated until there is no significant difference between the totally free and partially free X^2. As a result of this the items contributing to the difference between the two versions of the scale have been identified.

In the IRT literature, the investigation of differences between item functions is called differential item functioning (DIF) (Hambleton et al., 1991, Holland and Wainer, 1993). DIF identifies the testing bias of the item by comparing the response to it by different groups or subgroups. Different methods have been introduced to do this. Two major method are: (a) comparison of item parameters "a" and "b"s (Lord, 1980; Hambleton, 1991) and (b) comparison of the ICCs rather than their parameters (Rudner, Getson & Knight, 1980; Raju, 1988, 1990). When the area between the ICCs is not zero DIF is present. The area to test for differences between ICCs can be chosen arbitrarily and can be calculated

with a formula. The problem with the first method is that because the differences are tested by the chi-square statistic, there is a high chance of getting a false-positive (Mc Laughlin & Drasgow, 1987; Hambleton et al., 1991). The problem of using ICCs is that they use cut-off values to detect the DIF which may be unstable from one sample to another (Hambleton et al. 1991; Rogers & Hambleton, 1989). There are other DIF methods introduced recently from outside IRT (e.g. Mantel-Haenszel (Holland & Thayer, 1988; Holland and Wainer, 1993) and there is the logistic regression procedure (Swaminathan & Rogers, 1990) but these will not be discussed here.

In this study we are going to use a combined method. Firstly, we test "a" and "b" differences at the scale or subscale level rather than at the item level using X^2. Secondly, we looked at "a" and "b"s in terms of their item information value in order to assess each item's contribution to the scale. IRT uses item information functions I_i (theta) to detect the amount of information gathered from an item. Item information is highly dependent on an item's discriminating power. The value of I_i (theta) is high if the person is not guessing and it is a good indicator of the utility of test items. According to these criteria information is higher when the "b" value is close to theta than when the "b" value is far from theta and information is generally higher when the "a" parameter is high (Hambleton, Swaminathan & Rogers, 1991 p.91). These two criteria (a and b) are equivalent to the r<0.30 criterion used in the classical approach. Good and bad items are assessed using a criterion value. This is whether the "a" value is bigger than 0.50. For high item discrimination the optimum value is about 2. The value of "a" (item difficulty) increases and gets close to the optimum value of 2 when the responses to each item are well distributed and get smaller when the responses accumulate on one rating point. When the value of "a" is small, the value of bs is large and will not give any information and therefore should be ignored. An item discrimination value ("b" parameters) may also get bigger if very few subjects use a particular rating point. This is because there will be a big discrepancy between the expected and real response frequencies for this rating point and therefore the information gathered from this rating point will be low.

5.2.2. Instruments

The questionnaire used were CAMI, CANSIE, MASLOC, Religiosity and Authoritarianism as described in previous chapter.

5.2.3. Subjects

The same 204 Turkish bilingual students. See the Method chapter.

5.2.4. Procedure

This was the same as in the previous analysis.

5.2.5. Hypothesis

If the items have been well translated there will not be any differences between the parameters-free and parameters-constrained runs of the programme. By examining chi-square difference values from these two analyses, any significant differences in the behaviour of the items in the two languages can be identified.

5.3. RESULTS: Detecting Item Bias With Item Response Theory

5.3.1. CAMI (Skinner et al., 1988)

5.3.1.1. Control Beliefs

The results showed that this subscale was similar in the two language forms (the differences between $X^2=52.1$, df=32, N.S.). The items were also fine in terms of the absolute values of the parameters (for all items: a>0.50). See table 5.3.1.1.

For a graphical illustration of an item with different English and Turkish ICCs see figure 5.3.1. (item 7) . For a graphical illustration of an item with similar English and Turkish ICCs see figure Figure 5.3.2. (item 5) .

Figure 53: Item Characteristics Curves for Item 5 in English and Turkish Languages, as an Example of One Unsuccessfully Translated Item.

Control Beliefs Subscale
Item 5 in English Form

Response posibility

Subjects z score on item (Theta)
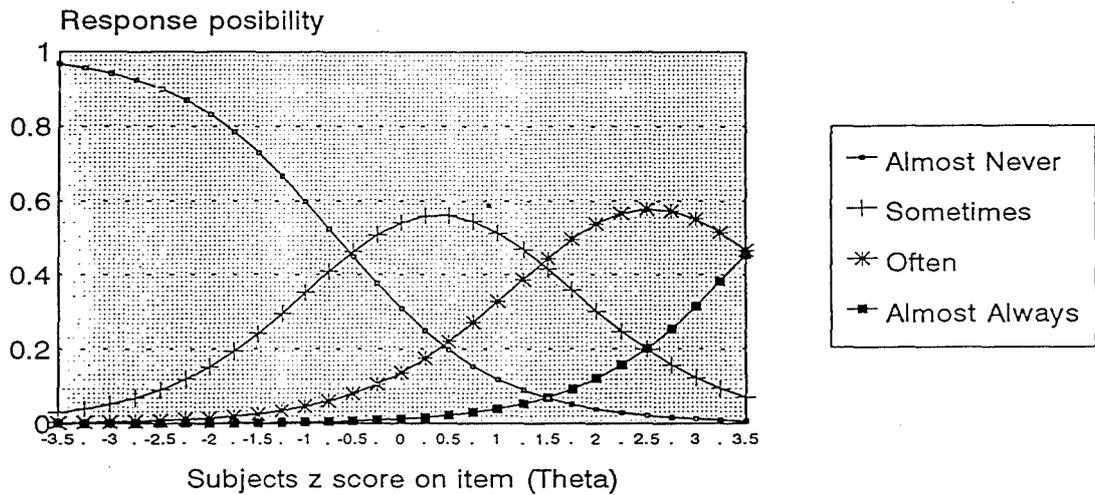
Q. 3: If you really make up your mind not to get any bad grades, can you do it?

Control Beliefs Subscale
Item 5 in Turkish Form

Response probability

Subjects z score on item (Theta)
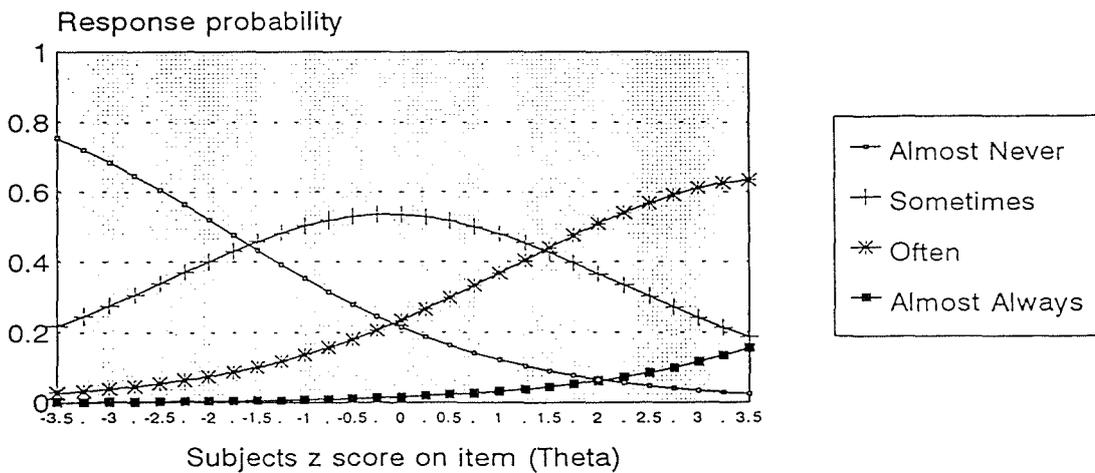
Q. 3: Dusununki ogretmen size bir soru sordu ve siz cevabi bilemediniz. Bunun basiniza gelmemesi icin yapabileceginiz bir sey var midir?

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Figure 5.32 Item Characteristics Curves for Item 3 in English and Turkish Languages, as an Example of One Successfully Translated Item.

Control Beliefs Subscale
Item 3 in English Form
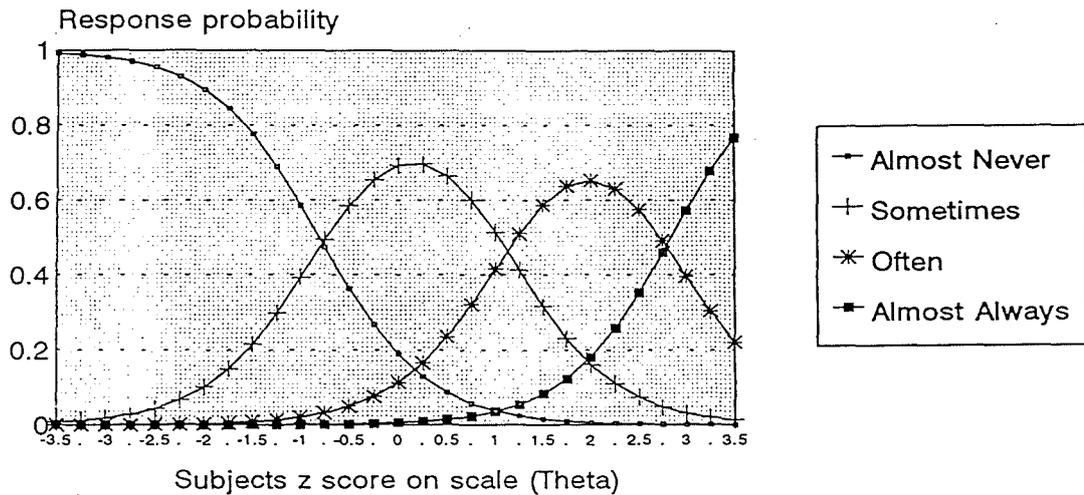
Q.42: Can you get all the problems (for example in spelling) right, when you want to?

Control Beliefs Subscale
Item 3 in Turkish Form
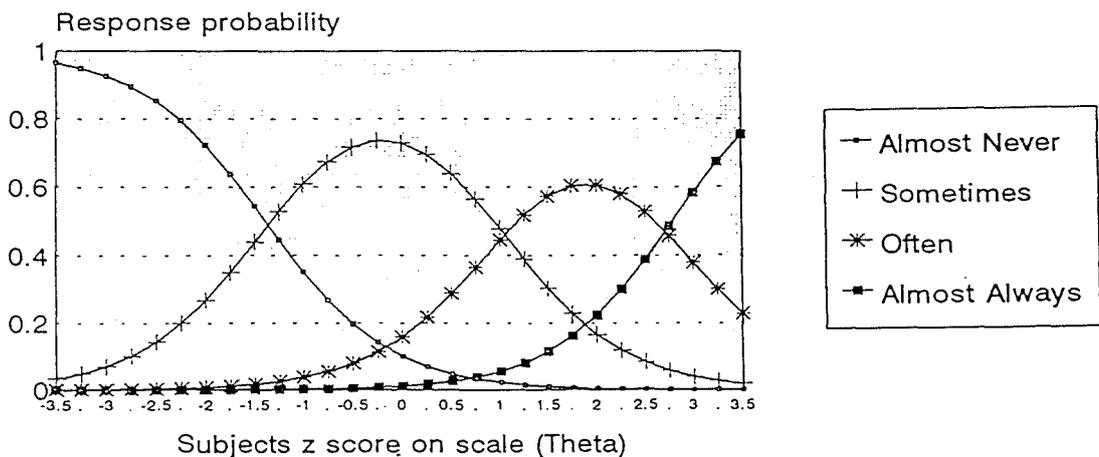
Q.42: Istediginiz zaman (ornegin imla ve gramer konusunda) butun sorulari dogru yapabilen birisi misiniz?

Table 5.3.1.1: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Forms of the CAMI's Control Beliefs Subscale with Samejima's Model of IRT.

ITEMS	ENGLISH FORM				TURKISH FORM			
	A	B1	B2	B3	A	B1	B2	B3
CAMI7	1.37	-.43	1.59	4.07	0.69	-1.15	2.39	8.05
CAMI10	2.00	-.13	1.58	3.29	1.65	-.36	1.79	3.61
CAMI42	1.79	-.79	1.15	2.90	1.56	-1.38	1.04	2.85
CAMI35	1.93	-.25	1.62	3.67	2.18	-.37	1.63	2.78
CAMI3	1.19	-.65	1.48	3.70	.69	-1.87	1.63	6.05
CAMI5	.83	-1.01	2.23	6.85	.94	-.42	2.39	6.10
CAMI34	1.29	-1.17	1.30	4.21	1.66	-.87	1.32	3.31
CAMI41	1.73	-.39	1.47	2.69	1.58	-.56	1.44	2.92

5.3.1.2. Means-Ends for Effort

The results showed that this subscale was similar in the two language forms (differences $X^2=34.6$, df=32, N.S.). The items were also fine in terms of the absolute values of the parameters (for all items: a>0.50). See table 5.3.1.2.

Table 5.3.1.2 : Item Discrimination (A) and Difficulties (Bs) for English and Turkish Forms of the CAMI's Means-Ends for Effort Subscale with Samejima's Model of IRT.

ITEMS	ENGLISH FORM				TURKISH FORM			
	A	B1	B2	B3	A	B1	B2	B3
CAMI23	0.79	-2.56	1.39	5.72	1.04	-2.13	1.51	4.00
CAMI20	0.85	-2.34	1.37	5.38	0.97	-1.96	1.31	5.22
CAMI61	1.35	-1.43	1.78	3.53	1.07	-1.86	1.33	3.94
CAMI64	1.10	-1.00	2.02	4.30	1.17	-1.21	1.28	3.88
CAMI19	0.84	-2.14	0.90	5.40	1.08	-2.08	0.61	3.32
CAMI16	0.78	-2.89	0.94	4.17	1.08	-2.00	0.82	3.85
CAMI56	0.95	-3.53	-0.09	2.91	0.94	-3.79	-0.21	3.09
CAMI47	1.16	-2.78	-0.10	2.79	0.92	-3.02	-0.27	3.39

5.3.1.3. Means-Ends for Attribute

The results showed that this subscale was similar in the two language forms (X^2=14.8, df=32, N.S.). In terms of absolute values, item 13 showed very low a and high bs in both language forms (a=0.03, b1=-85.9, b2=12.18, b3=89.45; a=0.04, b1=-66.9, b2=4.82, b3=69.88 in English and Turkish, respectively). When the item discrimination (a) value is very low the bs do not give any meaningful information. On this occasion a very small number of subjects selected the first and fourth rating points on the scale. See table 5.3.1.3.

Table 5.3.1.3: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Forms of the CAMI's Means-Ends for Attribution Subscale with Samejima's Model of IRT.

	ENGLISH FORM				TURKISH FORM			
ITEMS	A	B1	B2	B3	A	B1	B2	B3
CAMI18	0.98	-3.64	-0.27	3.22	1.48	-3.00	-0.10	2.27
CAMI13	0.03	-85.9	12.18	89.45	0.04	-66.9	4.82	69.88
CAMI50	1.34	-2.73	-0.23	2.05	1.33	-2.92	-0.17	2.39
CAMI53	0.68	-4.46	-0.34	3.35	0.66	-5.59	0.25	4.03
CAMI17	0.87	-4.61	-1.21	2.58	0.84	-5.03	-1.36	2.74
CAMI22	1.48	-3.52	-1.71	0.87	1.34	-3.51	-1.90	1.01
CAMI49	1.19	-4.47	-2.14	0.67	1.01	-4.63	-1.90	1.18
CAMI52	1.28	-4.71	-2.37	0.39	1.15	-5.15	-2.14	0.91

5.3.1.4. Means-Ends for Powerful others

The results showed that this subscale was similar in two language form (X^2=31.8, df=32, N.S.). In terms of absolute values, item 14 showed a low "a" in the English form (a=0.40, b1=-2.5, b2=3.57, b3=9.54; a=0.65, b1=-1.64, b2=2.41, b3=5.48 in English and Turkish, respectively). See table 5.3.1.4.

Table 5.3.1.3: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Forms of the CAMI's Means-Ends for Powerful Others Subscale with Samejima's Model of IRT.

ITEMS	ENGLISH FORM				TURKISH FORM			
	A	B1	B2	B3	A	B1	B2	B3
CAMI24	1.46	-1.00	1.36	4.00	1.32	-1.17	1.63	3.71
CAMI14	0.40	-2.50	3.57	9.54	0.65	-1.64	2.41	5.48
CAMI60	1.43	-1.26	1.52	4.59	1.47	-0.94	1.19	3.49
CAMI45	0.60	-2.54	2.32	6.53	0.67	-2.48	1.76	5.60
CAMI15	1.20	-0.60	2.36	3.78	1.82	-0.51	2.24	4.04
CAMI21	1.77	-0.59	1.94	3.63	2.18	-0.41	2.10	3.33
CAMI63	1.13	-2.35	1.32	3.74	1.45	-2.05	1.13	2.76
CAMI51	1.05	-2.48	1.91	4.16	0.94	-3.05	1.58	3.89

5.3.1.5. Means-Ends for Luck

The results showed that the subscale was significantly different in the two language form (X^2=60.4, df=32, p<0.01). The parameters and ICCs showed that item 28 (a=1.41, b1=-0.03, b2=2.54, b3=14.48 in English form; a=1.22, b1=-0.08, b2=2.46, b3=5.03 in Turkish form) and item 29 (a=1.87, b1=0.18, b2=2.56, b3=8.67 in English form; a=1.25, b1=-0.27, b2=2.83, b3=4.29 in Turkish form) were functioning differently in the two language forms. These items were fine in terms of absolute value (all items: a>0.50). See table 5.3.1.5.

Table 5.3.1.5: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Forms of the CAMI's Means-Ends for Luck Subscale with Samejima's Model of IRT.

ITEMS	ENGLISH FORM				TURKISH FORM			
	A	B1	B2	B3	A	B1	B2	B3
CAMI28	1.41	-0.03	2.54	14.48	1.22	-0.08	2.46	5.03
CAMI25	0.69	0.61	3.52	5.45	0.70	0.24	3.09	4.78
CAMI57	1.91	-0.07	2.62	3.09	1.65	-0.40	1.84	3.62
CAMI48	1.45	-1.00	2.43	3.90	1.55	-1.05	2.00	3.93
CAMI29	1.87	0.18	2.56	8.67	1.25	-0.27	2.83	4.29
CAMI32	1.41	-0.09	2.63	4.52	1.17	-0.34	2.52	3.92
CAMI58	1.53	0.53	2.57	3.57	1.53	0.01	2.33	3.68
CAMI62	1.64	0.14	2.56	4.09	1.52	-0.08	2.15	3.50

5.3.1.6. Means-Ends for Unknown Factors

The results showed that the subscale was not significantly different in the two language forms ($X^2=14.8$, df=32, N.S.). The items were fine in terms of absolute value, which means that for all items a>0.50. See table 5.3.1.6.

Table 5.3.1.6: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Forms of the CAMI's Means-Ends for Unknown Factors Subscale with Samejima's Model of IRT.

ITEMS	ENGLISH FORM				TURKISH FORM			
	A	B1	B2	B3	A	B1	B2	B3
CAMI30	0.89	-0.57	2.24	3.79	1.35	-0.39	1.40	3.14
CAMI26	1.06	-0.46	2.19	4.71	1.29	-0.68	1.70	3.33
CAMI46	1.37	-0.11	2.14	3.81	1.68	-0.22	1.81	2.65
CAMI55	1.41	0.16	2.40	3.82	2.20	-0.13	1.47	2.32
CAMI31	1.29	-0.78	2.02	3.13	1.24	-0.95	1.91	3.83
CAMI27	0.84	-1.03	2.43	4.25	1.29	-0.54	1.70	3.15
CAMI54	1.27	-0.58	2.58	4.61	1.80	-0.76	1.96	2.75
CAMI59	0.62	-2.06	2.92	5.58	1.38	-0.80	1.71	3.29

5.3.1.7. Agency for Effort

The results showed that this subscale was similar in the two language forms ($X^2=23.8$, df=16, N.S.). The items were also fine in terms of the absolute value (all items: a>0.50). See table 5.3.1.7.

Table 5.3.1.7: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Forms of the CAMI's Agency Beliefs for Effort Subscale with Samejima's Model of IRT.

ITEMS	ENGLISH FORM				TURKISH FORM			
	A	B1	B2	B3	A	B1	B2	B3
CAMI1	2.30	-1.43	-0.20	1.46	1.93	-1.71	-0.16	1.83
CAMI4	2.94	-1.32	-0.03	1.60	2.66	-1.67	0.14	1.77
CAMI37	1.33	-1.59	0.36	2.28	1.59	-1.28	0.31	2.13
CAMI33	2.73	-1.56	0.27	1.59	2.76	-1.35	0.12	2.01

5.3.1.8. Agency for Attribute

The results showed that this subscale was similar in two language form ($X^2=14.8$, df=16, N.S.). In terms of absolute value item 9 showed a low "a" and high "bs" in both language forms (a=0.03, b1=-91.6, b2=-4.07, b3=78.37; a=0.03, b1=-96.9, b2=-4.77, b3=73.39 in English and Turkish,

respectively). Due to a very low discrimination value (a) this item did not function well in either of the samples. See table 5.3.1.8.

Table 5.3.1.8: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Forms of the CAMI's Agency Beliefs for Attribution Subscale with Samejima's Model of IRT.

	ENGLISH FORM				TURKISH FORM			
ITEMS	A	B1	B2	B3	A	B1	B2	B3
CAMI2	2.05	-1.83	0.20	2.11	1.93	-1.71	0.33	2.37
CAMI9	0.03	-91.6	-4.07	78.37	0.03	-96.9	-4.77	73.39
CAMI39	1.19	-3.46	-0.41	2.50	1.38	-2.32	-0.17	2.33
CAMI44	1.38	-1.36	1.01	3.16	1.89	-1.18	0.84	3.04

5.3.1.9. Agency for Powerful Others

The results showed that the subscale was significantly different in the two language forms (X^2=46.2, df=16, p<0.01). The parameters showed that item 12 (a=2.58, b1=-1.67, b2=-0.29, b3=0.95 in English form; a=1.99, b1=-2.20, b2=-0.30, b3=1.23 in Turkish form) was functioning differently in the two language forms. When the programme was run with item 12 free the differences between X2 became non significant. The items were fine in terms of absolute value (all items: a>0.50). See table 5.3.1.9.

Table 5.3.1.9: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Forms of the CAMI's Agency Beliefs for Powerful Others Subscale with Samejima's Model of IRT.

	ENGLISH FORM				TURKISH FORM			
ITEMS	A	B1	B2	B3	A	B1	B2	B3
CAMI12	2.58	-1.67	-0.29	0.95	1.99	-2.20	-0.31	1.23
CAMI11	1.39	-3.07	-1.14	0.83	1.38	-2.87	-0.68	1.54
CAMI40	1.89	-1.88	-0.42	1.09	2.26	-1.84	-0.03	1.12
CAMI43	1.58	-2.05	-0.42	2.21	1.48	-2.70	-0.40	1.58

5.3.1.10. Agency for Luck

The results showed that this subscale was similar in the two language forms (X^2=23.8, df=16, N.S.). The items were fine in terms of absolute value (all items: a>0.50). See table 5.3.1.10.

Table 5.3.1.10: Items Discrimination (A) and Difficulties (Bs) for English and Turkish Forms of the CAMI's Agency Beliefs for Luck Subscale with Samejima's Model in IRT.

ITEMS	ENGLISH FORM				TURKISH FORM			
	A	B1	B2	B3	A	B1	B2	B3
CAMI6	0.98	-1.98	0.68	2.59	1.21	-1.33	0.59	2.34
CAMI8	1.08	-4.12	-0.27	3.00	1.19	-4.40	-0.14	2.72
CAMI38	1.69	-2.03	0.38	2.54	1.41	-2.21	0.19	2.38
CAMI36	1.57	-2.08	0.53	2.84	2.14	-1.67	0.33	2.02

5.3.2. Nowicki-Strickland Internal vs External Locus of Control Scale (CNSIE) (Nowicki and Strickland, 1974).

This test has no subscales and consists of 40 items. The English and Turkish versions combined have 80 items. Because the programme was not designed for so many items there are no results for this scale when the parameters were fixed. We believe this occurred for two reasons. Firstly, the number of subjects was small for the size of the scale (204 subjects for 80 items). We know from the literature that it is better to have a large sample and small number of question to get the best-fit for the model (Lord, 1980, Hambleton at al., 1991). Secondly, both the classical analysis and the free run of the programme suggest that this may be a poor scale. If this is true then the responses to the individual items will have been inconsistent and affected the estimation of the best-fit for the model. Even the free run did not seem to run efficiently. The maximum inter-cycle parameter change (which gives the overall level of parameter fitness) was greater than the expected value of 0.05. So the results of the analysis for this scale have to be treated carefully. See table 5.3.2.

Investigation of the individual items from the results of the free run showed that 11/40 items had very low discrimination values in both language forms (e.g. item 1, 3, 4, 8, 9, 10, 17-19, 21 and 24), 2/40 had low discrimination value in the Turkish form (7, 14) and 14/40 had low discrimination values in the English form (6, 15, 16, 22, 25, 27, 29, 32-35, 38, 39 and 40). The remaining items (13/40) functioned well.

Table 5.3.2: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Forms of the Nowicki-Strickland Internal vs External Scale for Children with Samejima's Model of IRT.

ITEMS	ENGLISH FORM				TURKISH FORM			
	A	B1	B2	B3	A	B1	B2	B3
NOV1	0.11	-22.4	0.62	18.17	0.09	-33.8	-5.54	18.97
NOV2	0.58	-2.93	0.81	4.47	0.75	-2.65	1.19	3.76
NOV3	0.08	-28.1	4.55	20.27	0.16	-12.3	2.88	10.98
NOV4	0.03	-49.4	14.74	83.98	0.06	-23.3	8.26	43.91
NOV5	0.60	-2.76	2.77	6.06	0.80	-2.55	2.17	4.07
NOV6	0.73	-0.15	3.71	7.58	0.82	0.00	3.59	5.99
NOV7	1.10	-1.23	1.88	3.60	0.60	-2.53	2.02	6.09
NOV8	0.12	-11.7	3.49	22.98	0.06	-31.2	5.57	39.27
NOV9	0.16	-11.7	1.00	16.12	0.05	-53.1	-6.77	41.57
NOV10	0.07	-26.7	12.24	39.96	0.04	-49.8	6.90	52.78
NOV11	0.65	-2.81	1.60	4.49	0.69	-3.40	1.18	4.55
NOV12	0.88	-2.47	0.96	3.40	0.52	-4.01	1.70	6.09
NOV13	0.44	-4.46	0.87	5.53	0.55	-3.02	0.89	5.01
NOV14	0.78	-2.17	1.28	2.89	0.44	-3.38	1.70	5.90
NOV15	0.32	-3.81	1.50	7.37	0.53	-2.41	1.55	5.42
NOV16	0.50	-3.16	2.97	6.19	0.81	-2.24	1.87	3.95
NOV17	0.08	-17.2	1.05	20.08	0.12	-18.4	-2.81	11.16
NOV18	0.04	-24.9	43.80	79.79	0.23	-5.79	6.74	15.27
NOV19	0.39	-0.81	3.13	5.94	0.69	-0.03	2.36	4.42
NOV20	1.05	-1.18	0.74	2.86	0.87	-1.38	1.15	3.30
NOV21	0.01	-28.8	71.98	188.8	0.02	-40.3	50.74	123.0
NOV22	0.05	-30.7	10.73	50.80	0.43	-2.10	1.66	7.07
NOV23	0.07	-4.68	20.11	38.39	0.54	-0.83	2.72	5.72
NOV24	0.02	-89.7	39.67	146.7	0.02	-93.7	45.62	178.5
NOV25	0.14	-5.10	9.19	23.71	0.58	-1.38	2.44	7.02
NOV26	0.74	0.44	2.80	5.98	1.09	0.26	1.90	4.01
NOV27	0.27	-7.10	5.84	11.21	0.82	-2.05	2.37	4.42
NOV28	0.69	-2.45	0.88	3.92	0.81	-2.20	0.61	3.97
NOV29	0.07	-16.0	16.06	39.01	0.57	-2.73	1.92	5.64
NOV30	0.66	-1.53	2.43	6.62	1.62	-0.51	1.36	3.44
NOV31	0.57	-1.52	2.92	7.14	0.62	-1.39	2.82	6.56

	ENGLISH FORM				TURKISH FORM			
ITEMS	A	B1	B2	B3	A	B1	B2	B3
NOV1	0.11	-22.4	0.62	18.17	0.09	-33.8	-5.54	18.97
NOV2	0.58	-2.93	0.81	4.47	0.75	-2.65	1.19	3.76
NOV32	0.04	-57.2	10.34	70.75	0.54	-3.22	1.57	6.44
NOV33	0.34	-3.02	4.02	8.41	0.98	-1.12	1.78	3.93
NOV34	0.32	-6.03	0.73	7.55	1.22	-1.04	0.78	3.66
NOV35	0.08	-0.72	19.08	30.06	1.52	0.16	1.36	2.16
NOV36	0.49	-2.52	2.88	6.49	1.01	-1.34	1.68	4.25
NOV37	0.80	0.57	4.02	4.93	0.78	0.33	3.25	5.02
NOV38	0.37	-3.27	2.89	7.39	0.98	-1.40	1.28	3.62
NOV39	0.32	-2.48	4.06	8.73	0.99	-0.68	1.57	2.84
NOV40	0.20	-1.96	5.87	15.87	0.44	-0.98	0.76	2.84

5.3.3. MASLOC (Palenzuela, 1988).

5.3.3.1. MASLOC's Internal Subscale

The results showed that this subscale was significantly different in the two language form ($X^2=62.0$, df=30, p<0.01). The Parameters and ICCs showed that item 10 (a=1.95, b1=0.11, b2=1.49, b3=2.26, b4=2.61, b5=2.91 in English form; a=1.08, b1=-0.05, b2=1.57, b3=2.99, b4=13.32, b5=-4.66 in Turkish form) and item 11 (a=1.66, b1=-0.14, b2=1.42, b3=2.30, b4=2.81, b5=3.51 in English form; a=1.08, b1=-0.01, b2=2.22, b3=3.00, b4=4.37, b5=8.80 in Turkish form) were functioning differently in the two language forms. When the program run after freeing item 10 and 11 but still constraining the other items, X^2 became non-significant. All the items were fine in terms of absolute value (all items: a>0.50). See table 5.3.3.1.

5.3.3.2. MALSOC's Helplessness Subscale

The results showed that this subscale was not significantly different in the two language forms ($X^2=46.9$, df=30, N.S.). In terms of absolute value item 8 showed "a" low a and therefore high "bs" in both language forms (a=0.08, b1=-23.35, b2=-10.57, b3=-2.84, b4=5.30, b5=17.55; a=0.14, b1=-13.05, b2=-3.96, b3=0.91, b4=5.36, b5=15.01 in English and Turkish, respectively). Item 15 showed a low "a" and a high "b" in Turkish only (a=0.84, b1=-1.84, b2=-0.37, b3=0.31, b4=1.94, b5=3.76; a=0.30, b1=-1.84, b2=-0.37, b3=0.31, b4=1.94, b5=3.76, b4=1.94, b5=7.71 in English and Turkish respectively). See table 5.3.3.2.

5.3.3.3. MASLOC's Luck Subscale

The results showed that this subscale was significantly different in the two language forms ($X^2=89.6$, df=30, p<0.01). The parameters and ICCs showed that item 13 was functioning differently in the two language forms (a=0.23, b1=-6.34, b2=-2.27, b3=1.17, b4=7.41, b5=14.56; a=1.42, b1=-0.52, b2=0.64, b3=1.12, b4=2.01, b5=2.81 in English and Turkish forms respectively). When the program was run after freeing item 13 but still constraining the other items X^2 became non-significant. See table 5.3.3.3.

In terms of absolute values, item 3 and 13 functioned poorly in the English form (Item 3: a=0.41, b1=-3.45, b2=-0.09, b3=2.09, b4=6.29, b5=11.33; a=0.62, b1=-2.87, b2=-0.07, b3=1.23, b4=3.91, b5=7.07 in English and Turkish form respectively. Item 13 see above). Item 6 was poor in the Turkish form (a=0.60, b1=-7.91, b2=-4.31, b3=-2.65, b4=-0.05, b5=3.33 for English; a=0.36, b1= -10.85, b2=-6.01, b3=-4.18, b4=0.55, b5= 4.44 in Turkish).

Table 5.3.3.1: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Forms of the MASLOC's Internal Subscale with Samejima's Model of IRT.

ITEMS	ENGLISH FORM						TURKISH FORM					
	A	B1	B2	B3	B4	B5	A	B1	B2	B3	B4	B5
MASLOC 2	1.11	-0.67	1.02	1.63	2.53	3.98	1.57	-0.76	0.82	1.62	2.04	2.65
MASLOC 5	1.07	-1.30	0.83	2.16	3.57	5.45	0.93	-1.45	0.97	1.77	2.61	3.68
MASLOC 7	0.93	-1.66	0.76	2.48	3.35	5.38	0.94	-2.14	0.68	1.94	3.36	4.90
MASLOC 10	1.95	0.10	1.48	2.24	2.59	2.90	1.55	-0.06	1.56	2.98	9.13	-3.88
MASLOC 11	1.67	-0.14	1.41	2.28	2.79	3.49	1.08	-0.02	2.21	2.98	4.35	8.68

Table 5.3.3.2: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Forms of the MASLOC's Helplessness Subscale with Samejima's Model of IRT.

ITEMS	ENGLISH FORM						TURKISH FORM					
	A	B1	B2	B3	B4	B5	A	B1	B2	B3	B4	B5
MASLOC 4	0.79	-0.54	0.62	1.49	2.78	4.21	0.75	-0.55	0.88	1.69	2.63	5.55
MASLOC 8	0.20	-9.38	-4.32	-1.20	2.11	7.07	0.30	-6.39	-1.95	0.41	2.58	7.20
MASLOC 9	1.53	-0.90	0.38	1.00	1.77	2.76	1.31	-1.44	0.20	0.92	2.26	3.33
MASLOC 14	1.67	-1.17	-0.12	0.62	1.72	2.62	0.94	-1.19	0.24	1.11	2.79	4.83
MASLOC 15	0.84	-1.85	-0.38	0.31	1.93	3.76	0.30	-6.32	-2.01	0.18	3.88	7.66

Table 5.3.3.3: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Forms of the MASLOC's Luck Subscale with Samejima's Model of IRT.

ITEMS	ENGLISH FORM						TURKISH FORM					
	A	B1	B2	B3	B4	B5	A	B1	B2	B3	B4	B5
MASLOC 1	0.82	-2.70	-0.59	0.29	2.58	6.00	1.63	-1.52	-0.25	0.56	1.96	3.56
MASLOC 3	0.49	-2.96	-0.09	1.78	5.34	9.60	0.73	-2.53	-0.07	1.06	3.39	6.12
MASLOC 6	0.62	-7.69	-4.21	-2.60	-0.06	3.22	0.45	-8.70	-4.90	-3.41	0.46	3.65
MASLOC 12	0.75	-2.76	-0.20	1.11	3.55	6.46	2.86	-0.99	0.09	0.60	1.64	2.20
MASLOC 13	0.36	-4.05	-1.48	0.70	4.62	8.97	1.30	-0.56	0.66	1.16	2.09	2.94

5.3.4. Religiosity Scale (Rohrbaugh and Jessor, 1976).

The results showed that this scale worked well in both languages without showing any difference between different language forms (X^2=43.2, df=40 N.S.). All absolute values for all item of this scale were fine. See table 5.3.4.

5.3.5. Authoritarianism (Christie, 1991).

This scale has no subscales and has 30 items. Like the Nowicki-Strickland we found it difficult to run the programme because the analysis is designed for 50 items and the English and Turkish versions combined have 60 items. The scale showed significant differences between the two runs (X^2=277.6, df=180, p<0.01). However, the value of X^2 when the parameters were fixed was 0.0. The expectation usually is that X^2 increases when the parameters are fixed. It does not seem that we can use this result. Investigation of the individual items from the results of the free run showed that 3/30 items had very low discrimination values in both language forms (e.g. item 2, 4, 18); 1/30 had low discrimination value in the Turkish form (item 20) and 4/30 had low discrimination values in the English form (3, 16, 19, 25). The remaining items (22/30) functioned well. See table 5.3.5.

Table 5.3.4: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Forms of the Religiosity Scale with Samejima's Model of IRT.

ITEMS	ENGLISH FORM					TURKISH FORM				
	A	B1	B2	B3	B4	A	B1	B2	B3	B4
RELIGIOSITY 1	1.73	-0.38	1.62	2.26	2.42	1.28	-0.74	1.59	2.10	2.65
RELIGIOSITY 2	1.55	-2.14	-1.19	-0.82	0.95	1.71	-2.16	-1.08	-0.94	0.87
RELIGIOSITY 3	1.53	-0.35	0.74	1.87	3.22	1.47	-0.28	0.91	1.76	3.12
RELIGIOSITY 4	1.82	-0.66	0.37	1.29	2.65	1.59	-0.67	0.50	1.67	2.83
RELIGIOSITY 5	1.59	-2.98	-2.08	-1.08	0.36	1.93	-2.64	-1.81	-0.94	0.38
RELIGIOSITY 6	1.49	-2.51	-1.36	0.62	1.04	1.44	-2.43	-1.36	0.51	0.87
RELIGIOSITY 7	1.78	-1.31	0.40	1.49	2.57	1.98	-0.87	0.54	1.95	2.79
RELIGIOSITY 8	1.71	-1.96	-1.10	0.00	2.08	2.22	-1.86	-1.12	0.02	1.54

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Table 5.3.5: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Forms of the Authoritarianism Scale with Samejima's Model of IRT.

ITEMS	ENGLISH FORM						TURKISH FORM					
	A	B1	B2	B3	B4	B5	A	B1	B2	B3	B4	B5
AUTO 1	1.04	-1.51	-0.48	0.04	1.15	2.78	0.95	-1.58	-0.61	0.30	1.75	3.24
AUTO 2	0.17	-26.1	-15.4	-12.1	-5.11	4.27	0.21	-21.6	-15.7	-9.04	-4.54	5.81
AUTO 3	0.59	-6.11	-3.29	-2.32	-0.50	2.52	0.74	-5.02	-2.83	-1.86	-0.10	2.47
AUTO 4	0.23	-14.8	-10.1	-7.09	-2.09	3.45	0.19	-21.9	-15.1	-8.84	-3.83	4.86
AUTO 5	0.86	-2.13	-0.85	0.15	1.52	3.53	0.76	-2.63	-1.14	-0.29	1.45	3.45
AUTO 6	0.55	-3.54	-1.37	-0.31	1.63	4.81	0.59	-2.56	-0.50	0.50	2.64	5.07
AUTO 7	0.75	-3.84	-2.16	-0.71	0.95	3.40	0.84	-2.77	-1.10	0.03	1.45	4.74
AUTO 8	1.13	-1.51	-0.45	0.27	1.72	3.00	1.22	-1.95	-0.68	0.03	1.30	2.78
AUTO 9	0.65	-3.87	-2.31	-1.38	0.69	3.28	0.58	-4.88	-2.95	-1.83	0.93	3.81
AUTO 10	0.91	-3.83	-2.52	-1.78	-0.28	1.41	0.58	-7.49	-4.49	-2.66	-0.32	2.00
AUTO 11	0.80	-3.42	-2.54	-1.08	-0.05	1.85	0.87	-4.97	-2.89	-1.39	0.08	1.70
AUTO 12	1.10	-2.20	-1.07	-0.08	1.11	2.38	0.96	-2.06	-0.58	0.44	1.77	4.20
AUTO 13	1.20	-2.90	-1.35	-0.66	0.80	2.54	0.56	-8.53	-4.99	-2.68	0.37	4.64
AUTO 14	0.71	-4.14	-2.55	-1.34	0.26	2.15	0.62	-5.91	-4.06	-2.32	-0.25	1.89
AUTO 15	0.93	-2.87	-1.57	-0.73	0.38	1.87	0.89	-2.25	-1.26	-0.47	0.64	2.06
AUTO 16	0.47	-2.35	-0.31	1.43	3.44	5.37	0.53	-2.33	-0.52	0.84	2.72	4.77
AUTO 17	1.40	-1.79	-0.68	-0.06	0.79	1.76	1.11	-2.50	-0.97	-0.24	0.84	2.52
AUTO 18	0.30	-5.23	-2.42	0.29	4.56	9.36	0.50	-3.02	-1.01	0.43	3.78	6.66
AUTO 19	0.41	-8.05	-4.33	-2.04	1.13	5.00	0.61	-5.30	-2.85	-1.44	0.88	4.58
AUTO 20	0.70	-5.92	-3.83	-1.80	0.71	2.98	0.44	-7.01	-5.75	-3.02	0.30	4.38
AUTO 21	0.80	-2.74	-1.73	-0.97	0.69	2.59	0.80	-3.48	-1.97	-0.79	0.66	2.76
AUTO 22	0.89	-4.36	-2.59	-1.54	0.04	1.78	0.58	-5.74	-4.40	-2.62	-0.61	2.52
AUTO 23	0.53	-5.38	-3.72	-0.74	2.11	5.40	0.83	-4.35	-2.09	-0.63	1.47	3.52
AUTO 24	0.87	-3.22	-2.10	-0.94	0.51	1.96	1.10	-3.06	-1.48	-0.61	0.56	2.44
AUTO 25	0.30	-8.46	-4.15	-1.10	2.59	6.62	0.76	-3.34	-1.80	-0.48	1.35	3.95
AUTO 26	0.94	-0.79	0.19	1.04	1.87	3.49	0.80	-0.83	0.64	1.35	2.26	4.11
AUTO 27	1.15	-1.38	-0.41	0.37	1.52	2.80	0.89	-1.52	-0.24	0.54	1.85	4.12
AUTO 28	0.62	-3.89	-2.61	-1.00	0.46	2.70	0.99	-3.08	-1.93	-0.58	0.14	1.74
AUTO 29	0.69	-2.97	-1.96	-0.75	1.44	4.57	0.72	-2.89	-1.10	-0.23	1.77	4.04
AUTO 30	0.73	-4.28	-2.97	-1.32	0.60	3.40	0.92	-3.18	-1.80	-0.83	1.23	3.04

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5.4. SUMMARY

Two out of ten CAMI subscales (Means-Ends for Luck and Agency for Powerful Others), the CNSIE scale, 2/3 MASLOC subscales (Internal, Luck) and the Authoritarianism scale showed significant differences between the two runs. The results of CNSIE and Authoritarianism need to be treated with caution. We were unable to run CNSIE when the parameters were fixed. Although we ran Authoritarianism when the parameters were fixed, it seems that the results are not reliable. This is probably due to the large number of the items (originally 30, 60 in the analysis) and the relatively small sample (N=202). See table 5.4 for a summary of the results.

Table 5.4: Detecting Item Bias in the Bilingual Sample by Comparison of the Differences Between Item Characteristics when are the Parameters Free and Fixed.

SCALES	χ^2 PARAMETERS CONSTRAINED	χ^2 PARAMETERS FREE	χ^2 DIFF.	DF	P<.01 critical value
CONTROL, MEANS-ENDS, AGENCY BELIEFS					
Control Belief	3836.8	3784.7	52.1	32	55.3
Means-Ends Beliefs					
Effort	4242.8	4208.2	34.6	32	55.3
Luck	2995.7	2935.3	60.4*	32	55.3
Unknown Factors	3803.3	3757.2	46.1	32	55.3
Attribute	4099.5	4070.8	28.7	32	55.3
Powerful Others	3624.4	3592.6	31.8	32	55.3
Agency Beliefs					
Effort	0964.1	0940.3	23.8	16	32.0
Luck	1081.8	1067.1	21.3	16	32.0
Attribute	1088.4	1073.6	14.8	16	32.0
Powerful Others	1219.4	1173.2	46.2*	16	32.0
CNSIE Nowicki-Strickland LOC Scale		1001.3		160	203.7
MASLOC Palenzuela's LOC Scale					
Internal	2828.1	2766.1	62.0*	30	50.9
Helplessness	4382.0	4335.1	46.9	30	50.9
Luck	4042.0	3952.4	89.6*	30	50.9
RELIGIOSITY SCALE	5194.8	5151.6	43.2	40	
AUTHORITARIANISM SCALE	0.0	277.6	277*	180	226.3

CAMI

Two out of ten CAMI subscales (Means-Ends for Luck, Agency for Powerful others) showed significant differences between the two language forms. The results showed that three out of a total of sixty-four items in CAMI were biased (28, 29 in Means-Ends for Luck; 12 in Agency for Powerful Others). For the two subscales showing significant differences between program runs the programme was rerun, allowing the biased items to be free in both languages and forcing the other item to be equal. The results showed that there weren't any differences between the two forms on the two scales.

In terms of the absolute value of the parameters, 7/64 items functioned badly in one or other or both language forms. Items 3 and 7 were bad in the Turkish form. Items 14 and 29 were bad in English. Items 5, 9, 13 were bad in both language forms.

CNSIE

CNSIE cannot be assessed in terms of significant differences between the two runs because the programme wasn't run with parameters fixed. Therefore decisions about the items are based on item information functions (a and bs) from the free parameters run. In terms of the absolute value of parameters, 27/40 items functioned badly in one or another or both language forms. Items 7 and 14 were bad in the Turkish form. Items 6, 15, 16, 22, 25, 27, 29, 32-35, and 38-40 were bad in English. Items 1, 3, 4, 8-10, 17-19, 21, 24 were bad in both language forms. There were only 13/40 items which functioned well in both language forms (items 2, 5, 11-13, 20, 23, 26, 28, 30, 31, 36, 37).

MASLOC

Two out of three MASLOC's subscales showed significant differences in the two language forms. The significant differences were found for the Internal and Luck subscales (p<0.01). The results showed that 4 out of the 15 items were biased (items 10, 11, 8, 13). In terms of the absolute value of parameters, 4/15 items function badly in one or another or both language forms. Item 13 and 3 were bad in English. Items 6 was bad in Turkish, 8 was bad in both language forms. There were only 10 out of 15 items which functioned well in both language forms.

RELIGIOSITY

The Religiosity scale did not show any differences between the two language forms.

AUTHORITARIANISM

This scale cannot be assessed in terms of significant differences between the two runs because it wasn't possible to get reliable results when the parameters were fixed. Therefore the decision about items is based on item information functions (a and bs) from the free parameters run. In terms of the absolute value of parameters, 8/30 items functioned badly in one or other or both language forms. Item 20 was bad in the Turkish form. Items 13, 16, 19, 25 were bad in English. Items 2, 4, 18 were bad in both language forms. There were only 8/30 items which functioned badly in both language forms. Nevertheless most of the items functioned well in both forms (22/30).

5.5. CONCLUSIONS

IRT analysis has shown similarities with the other two analyses (generalizability, and classical) for most of the scales (e.g. CAMI's Agency for Powerful others; MASLOC's Luck subscales). In some cases IRT detected differences which were not detected by the other analyses (e.g. MASLOC's Internal subscale). At the item level there were also some similarities and some differences between the results of the different approaches. Examples of similarities are: Agency beliefs item 12, MASLOC's item 13, Authoritarianism item 18. Example of dissimilarities is the Helplessness item 14.

5.0. CONCLUSION FOR PART I

The conclusions for part one, which was about the item fidelity of the scales, are of two kinds. First, about the results obtained from the three methods and second about the strengths and weaknesses of the three methods.

1. Conclusions about the Item fidelity of the scales.

Overall these three methods consistently detected some translation fidelity problems for CAMI's Agency for Powerful Others subscale, MASLOC's Luck subscale and the Authoritarianism scale. For CNSIE it was found that at the item level it was not a good scale in either form, although both forms were understood similarly. These results were also confirmed by the Classical item analysis (see chapter 4). The future of this scale in this study needs to be considered but the decision about its use will be postponed until the scale has been applied and analysed in the monolingual samples. This will give us a chance to see the performance of the scale with more heterogeneous samples.

A criticism is that the IRT analysis and Differential Item Functioning is limited by the range of the statistical program used (MULTILOG). There are some other problems with the method. First, using English and Turkish forms of the same item as different items of the same scale may artificially increase the reliability of the whole scale, but because the same subjects answered the questions in both languages this had to be done. Therefore the reliability score of the scale, at least when the parameters were free, has to be treated with caution. Second, the program could not be run when the parameters were fixed for the two scales which had many items (CNSIE, F-Scale). Although there were technical reasons for this (limitations of the programme and not having enough subjects to overcome the reliability of the number of iterations) it doesn't help us to overcome the problem of comparing these scales in the two languages efficiently.

2. Comparison of the three psychometric methods.

Generalizability theory detects translation infidelity by allowing the researcher to detect major differences such as occasions and language forms. However, note that this study adjusted Generalizability theory so that it could be used for total scores.

Classical theory, used for translation fidelity, allowed us to compare the different language forms but ignored occasion differences, which were detected by the Generalizability analysis.

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Item response theory allowed us to get the best fit of the two given language forms. It was possible to constrain the parameters and force different versions of the same item (e.g. English and Turkish), answered by the same subjects, to be the same. To a very large extent it was possible to get the best information from the available data. However, IRT requires a lot of data (about 1000 participants) to fix the parameters if the scale has a large number of questions. In this study we only had two hundred participants. Furthermore, the reliability index probably became artificially increased because the number of items were doubled for the analysis (i.e. the English and Turkish versions were combined. See figure 5.2.5. Finally, because χ^2 is so sensitive it is possible that detected differences were false alarms rather than genuine (e.g. the Internal subscale of MALSOC, which was only different in the IRT analysis).

In conclusion our results suggested that while IRT is the best method of detecting translation infidelity, its sensitivity may cause false alarms, which are more likely to occur in cross cultural data because of the number of sources of variance. This over sensitivity can be compensated for by also using one of the other two methods.

PART II
DETECTING CROSS-CULTURAL DIFFERENCES

CHAPTER 6: CLASSICAL THEORY

PART TWO
DETECTING CROSS CULTURAL DIFFERENCES

6.0. GENERAL INTRODUCTION

In the second part of the research project we are trying to deal with the problem of comparison between cultures at the item level and to detect possible biases and differences. To do this we again use three different types of analysis and two major psychometric approaches.

First, with the classical psychometric approach, to detect item differences between the two cultures (English and Turkish) we compared the item-total correlations between cultures using Ferguson's formula for the significant difference between the correlation coefficients of different samples (Ferguson, 1959).

Second, with the classical psychometric approach, we compared the factor structures between two samples. Instead of using confirmatory factor analysis we used oblimin rotation for all scales to be able to compare the results with the original studies (Ferguson & Takane, 1989).

Third, with the modern psychometric approach (item response theory), we looked at differential item functioning for the two samples and compared the X^2 results with parameters constrained equal and free for both samples (Thissen, 1991; Thissen, Steinberg, Wainer, 1993).

We are going to present the results of each of these analyses and then summarise and discuss the results. These analyses will be the last investigations of bias detection before we compare the two different samples on an emic (comparable similarity) bases. We will also compare the results of the bilingual sample from the first part with these results. We will be able to attribute the differences between the two samples in this part to cultural differences, etic, because translation bias was detected in part one.

The next task will be to make a comparison between variables on the basis of similarity between two.

CHAPTER 6: CLASSICAL ITEM ANALYSIS. DETECTING CROSS-CULTURAL DIFFERENCES WITH CLASSICAL THEORY

6.1. INTRODUCTION

In this chapter we are going to detect item differences between the two samples with classical item analysis. The results will be presented for each scale and subscale and then discussed.

6.2. METHOD

6.2.1. Design for Analysis

Item analysis is applied to English and Turkish samples to measure the internal consistency (reliability) of each scale/subscale for each sample, to detect the differences between the samples in terms of their responses to individual items and to identify the information level of each item of both samples. This analysis will help us to make decisions for the emic and etic of each sample, and so help us to a derived etic basis on which to compare the results of groups.

6.2.2. Analysis

Classical item analysis has been used to detect item difficulties between English and Turkish samples. The differences between samples for each scale and subscale are detected by two sets of criteria. The first sets of criteria consist of the absolute value of Cronbach's alpha in the two samples and the difference between Cronbach's alpha in the two samples. See chapter 4 for details. The mean of the differences between the sixteen scales was 0.02 and the standard deviation was 0.09. Therefore the criterion values were 0.2 (English better than Turkish) and -0.16 (Turkish better than English). The second set of criteria consists of the difference between item-total correlations, tested by Ferguson's (1959) independent correlations significant differences formula, and the absolute value of item-total correlations which must be greater than 0.30 for the item to be considered a "good" item.

6.2.3. Instruments

The questionnaires were CAMI, CNSIE, MASLOC, Religiosity, and Authoritarianism.

6.2.4. Sample

365 English and 402 Turkish students participated in the study. The information was collected from five English and four Turkish secondary schools. For details of the samples see the Method Chapter.

6.2.5. Hypothesis

Except for items which in Part 1 were found to have poor translation fidelity, the differences between English and Turkish samples in terms of their response to individual items will be due to cultural differences.

6.3. RESULTS

6.3.1. CAMI

6.3.1.1. Control Beliefs. See table 6.3.1.1 for item-total correlation and Cronbach's alpha. Item-Total correlations: Items 3, 7, 10 and 4 were significantly different in the two samples ($p <$ 0.01). This suggests that these items were functioning differently in the two samples. Items 3 and 7 also showed low item-total correlations in the Turkish sample ($r < 0.30$).

Reliability: Cronbach's alpha was very good for the English sample (0.81) and medium for the Turkish sample (0.69). See table 6.3.1.1. This difference (0.12) was less than the criterion value of 0.20 and so is not considered significant.

Table 6.3.1.1: Item-Total Correlations and Cronbach's Alpha for English and Turkish Samples for CAMI's Control Beliefs Subscale.

CONTROL BELIEFS SUBSCALES' ITEMS	ITEM -TOTAL CORRELATIONS IN ENGLISH SAMPLE	ITEM-TOTAL CORRELATIONS IN TURKISH SAMPLE
7. If you decide to sit down and learn really hard, can you do it?	0.48 (*)	0.28 (*)
10. Can you get good grades when you really want to?	0.61 (*)	0.38 (*)
42. Can you get all the problems (e.g. in spelling) right, when you want to?	0.57	0.45
35. If you want do well in school, can you?	0.52	0.58
3. If you really make up your mind not to get any bad grades, can you do it?	0.56 (*)	0.29 (*)
5. Is there anything you can do stop yourself getting bad grades?	0.45	0.32
34. If you really decide that you are going to get any problems wrong (e.g. in maths or spelling) can you do it?	0.51	0.44
41. If you want to can you keep from doing badly in school?	0.58 (*)	0.37 (*)
CRONBACH ALPHA	0.81	0.69
NUMBER OF THE SUBJECTS	362	444

$P<0.01$ (*). The p value represents the significance of the differences between the two I-T correlations in the two samples.

6.3.1.2. Means-Ends Beliefs for Effort. see table 6.3.1.2 for item-analysis and Cronbach's alpha.

Item-Total correlations: There were no significant differences between the English and Turkish samples and all item-total correlations were greater than 0.30.

Reliability: This subscale's reliability was medium for both samples (0.59 for English; 0.64 for Turkish) and the difference between the two values (-0.05) of alpha was less than our criterion value (-0.16). See table 6.3.1.2.

Table 6.3.1.2: Item-Total Correlations and Cronbach's Alpha for English and Turkish Samples for CAMI's Means- Ends Beliefs for Effort Subscale.

MEANS-ENDS BELIEFS FOR EFFORT SUBSCALE'S ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH SAMPLE	ITEM-TOTAL CORRELATIONS IN TURKISH SAMPLE
23. Is the usual reason that students do well at school that they try really hard?	0.30	0.31
20. If a student knows a lot about something, is it usually because he or she has worked hard at learning it?	0.26	0.30
61. When a student does well in school, is it usual because he/she works very carefully?	0.35	0.35
64. Paying attention and listen carefully, is the usual reason that students understand what the teachers say?	0.38	0.27
19. When a student doesn't understand something at school, is it usually because he or she doesn't pay enough attention?	0.27	0.33
16. If students give the wrong answers on a test is it usually because they don't work carefully?	0.25	0.29
56. When students don't learn very much in class, is it usually because he/she works very carefully?	0.25	0.39
47. When a teacher ask a student gives the wrong answer, is it usually because the student isn't trying hard enough?	0.28	0.42
CRONBACH ALPHA	0.59	0.64
NUMBER OF THE SUBJECTS	367	445

6.3.1.3. Means-Ends Beliefs for Attributes. See table 6.3.1.3 for item-total correlations and Cronbach's alpha.

Item-Total correlations: All the items were functioning similarly in both samples and the item-total correlations were greater than 0.3.

Reliability: The reliabilities were almost the same in both samples (0.65 for English; 0.66 for Turkish, respectively). Both values were of medium reliability.

Table 6.3.1.3: Item-Total Correlations and Cronbach's Alpha for English And Turkish Samples for CAMI's Means-Ends Beliefs for Attribute Subscale.

MEANS-ENDS BELIEFS FOR ATTRIBUTIONS SUBSCALE'S ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH SAMPLE	ITEM-TOTAL CORRELATIONS IN TURKISH SAMPLE
18. If a student does badly in school, is it usually because he or she is just smart?	0.31	0.46
13. When students give the right answer to questions in class, is it usually only because they are good students?	0.20	0.31
50. When a students manages to learn something, is it just because he/she is clever?	0.43	0.48
53. If students understand things quickly, is it because they are very good at school at school?	0.35	0.30
17. If students get bad grades, is it usually because they are no good at school?	0.27	0.25
22. When a student does badly in school is the main reason usually that he or she is just not very bright?	0.35	0.34
49. When students don't understand something, is it because they are just no good at school?	0.39	0.31
52. If a person gives the wrong answer to teachers' question, is it usually s/he is just not smart?	0.42	0.34
CRONBACH ALPHA	0.65	0.66
NUMBER OF THE SUBJECTS	362	448

6.3.1.4. Means-Ends Beliefs for Powerful Others. See table 6.3.1.4 for item-total correlations and Cronbach's alpha.

Item-Total correlations: There were no significant differences between the two samples but two items (14 and 45) had low item-total correlations in both samples ($r < 0.30$).

Reliability: The internal consistency was medium (0.63) for the English sample and good for the Turkish sample (0.7). The difference between the samples (-.07) was not significant.

Table 6.3.1.4: Item-Total Correlations and Cronbach's Alpha for English and Turkish Samples for CAMI's Means-Ends Beliefs for Powerful Others Subscale.

MEANS-ENDS BELIEFS FOR POWERFUL OTHERS SUBSCALE'S ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH SAMPLE	ITEM TOTAL CORRELATIONS IN TURKISH SAMPLE
24. When a students gets good grades, is it usually because he or she gets along well with the teacher?	0.41	0.48
14. Do some students do well at school just because their teachers help them?	0.04	0.22
60. When a student does well in school, is it usually because he/she gets along well with the teachers?	0.39	0.53
45. When students do really well in school, is it usually just because of the teacher?	0.17	0.19
15. If a students gets bad grades, is it usually because the teacher doesn't like them?	0.38	0.43
21. If a student does badly in school, is it usually because the teacher doesn't really like him/her very much?	0.41	0.48
63. When students do badly in a subject, is it usually because the teachers just don't help them very much?	0.43	0.45
51. When students have problems in school, is it usually because of the teacher?	0.40	0.39
CRONBACH ALPHA	0.63	0.70
NUMBER OF THE SUBJECTS	360	444

6.3.1.5. Means-Ends Beliefs for Luck. See table 6.3.1.5 for item-total correlations and Cronbach's alpha.

Item-Total correlations: This subscale was working well in both language forms and showed no differences between the two samples.

Reliability: Cronbach's alpha for the two samples was similar. It was high for the English sample (0.8) and good for the Turkish sample (0.79).

Table 6.3.1.5: Item-Total Correlations and Cronbach's Alpha for English and Turkish Samples for CAMI's Means-Ends Beliefs for Luck Subscale.

MEANS-ENDS BELIEFS FOR LUCK SUBSCALE'S ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH SAMPLE	ITEM-TOTAL CORRELATIONS IN TURKISH SAMPLE
28. Is doing well at school usually a matter of luck?	0.54	0.54
25. Some students learn things more easily than other students.	0.41	0.32
57. Is getting good grades just a matter of luck?	0.55	0.54
48. If a teacher calls on a student and student knows the right answer, would you say it's just because the student is lucky?	0.48	0.50
29. If a students get bad grades, is it just they have bad luck?	0.55	0.53
32. If a teacher asks a student a question and the student doesn't know the answer, is this simply because the student's unlucky?	0.48	0.47
58. When a student finds it difficult to learn something, is it usually because he/she is unlucky?	0.52	0.60
62. When a student has a hard time learning something, is it usually because the student is unlucky?	0.60	0.60
CRONBACH ALPHA	0.80	0.79
NUMBER OF THE SUBJECTS	358	446

6.3.1.6. Means-Ends Beliefs for Unknown Factors Subscale. See table 6.3.1.6 for item-total correlations and Cronbach's alpha.

Item-Total correlations: This subscale was working well in both language forms and showed no differences between the two samples.

Reliability: Cronbach's alpha was similar and good in both samples (alpha= 0.71 and 0.73 for the English and Turkish samples respectively).

Table 6.3.1.6: Item-Total Correlations and Cronbach Alpha for English and Turkish Samples for CAMI's Means-Ends Beliefs for Unknown Factors Subscale.

MEANS-ENDS BELIEFS FOR UNKNOWN FACTORS SUBSCALE'S ITEM	ITEM-TOTAL CORRELATIONS IN ENGLISH SAMPLE	ITEM-TOTAL CORRELATIONS IN TURKISH SAMPLE
30. When a students do better than usual in as object, is it difficult to tell why?	0.54	0.46
26. If the teacher asks a student a hard question and he or she answers correctly, is it usually difficult to work out why the student gave the right answer?	0.27	0.37
46. If a student get a good grades in school, is it hard to know the reason why?	0.43	0.44
55. Is it hard to know why a student does really well on a test?	0.45	0.51
31. If students do badly in school, is it hard to work out why this has happened?	0.33	0.36
27. When a student makes a lot of mistakes (e.g., in a spelling test), is it hard to know the reason why?	0.39	0.39
54. When students give the wrong answer to teachers' questions, do you find it hard to know why it has happened?	0.45	0.51
59. Is it difficult to know why a student does worse than usual in a subject?	0.37	0.35
CRONBACH ALPHA	0.71	0.73
NUMBER OF THE SUBJECTS	361	440

6.3.1.7. Agency Beliefs for Effort Subscale. See table 6.3.1.7 for item-total correlations and Cronbach's alpha.

Item-Total correlations: This subscale was working well in both language forms and showed no differences between the two samples.

Reliability: Reliabilities were similar and good in both samples (alpha= 0.78 and 0.78 for the English and Turkish samples respectively).

Table 6.3.1.7: Item-Total Correlations and Cronbach's Alpha for English and Turkish Samples for CAMI's Agency Beliefs for Effort Subscale.

AGENCY BELIEFS FOR EFFORT SUBSCALE'S ITEM	ITEM-TOTAL CORRELATIONS IN ENGLISH SAMPLE	ITEM-TOTAL CORRELATIONS IN ENGLISH SAMPLE
1. Do you try as hard as you can in school?	0.61	0.60
4. Do you pay attention in class?	0.60	0.57
37. When it comes down to it; do you really work hard on your homework?	0.53	0.57
33. Do you listen very carefully to what your teacher says?	0.60	0.63
CRONBACH ALPHA	0.78	0.78
NUMBER OF THE SUBJECTS	366	452

6.3.1.8. Agency Beliefs for Attribute Subscale. See table 6.3.1.8 for item-total correlations and Cronbach's alpha.

Item-Total correlations: This subscale was working well in both language forms and showed no differences between the two samples.

Reliability: Reliabilities were similar and medium in the two samples (alpha = 0.6646 and 0.6447 for the English and Turkish samples respectively).

Table 6.3.1.8: Item-Total Correlations and Cronbach Alpha for English and Turkish Samples for CAMI's Agency Beliefs for Attributes Subscale.

AGENCY BELIEFS FOR ATTRIBUTES SUBSCALE'S ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH SAMPLE	ITEM-TOTAL CORRELATIONS IN TURKISH SAMPLE
2. Can you learn things you need to for school quickly, without really having to work on them?	0.50	0.44
9. Are you successful in your schoolwork even without having to study hard?	0.54	0.45
39. Do you get problems right (e.g. in maths), even if you don't try hard?	0.40	0.39
44. Can you understand the teachers' lesson easily?	0.34	0.43
CRONBACH ALPHA	0.66	0.64
NUMBER OF THE SUBJECTS	365	449

6.3.1.9. Agency Beliefs for Powerful Others Subscale. See table 6.3.1.9 for item-total correlations and Cronbach's alpha.

Item-Total correlations: This subscale was working well in both language forms and showed no differences between the two samples.

Reliability: Cronbach's alpha was similar for both samples and medium (0.68) or good (0.70) for the English and Turkish samples respectively.

Table 6.3.1.9: Item-Total Correlations and Cronbach's Alpha for English and Turkish Samples CAMI's Agency Beliefs for Powerful Others Subscale.

AGENCY BELIEFS FOR POWERFUL OTHERS SUBSCALE'S ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH SAMPLE	ITEM-TOTAL CORRELATIONS IN TURKISH SAMPLE
12. When you want them to, will your teachers help to see that you do well in school?	0.53	0.48
11. On the whole, do your teachers like you?	0.52	0.49
40. Do you have teachers who will help you when you want them to?	0.42	0.48
43. When you think about it, would you say that your teacher satisfied with you?	0.39	0.48
CRONBACH ALPHA	0.68	0.70
NUMBER OF THE SUBJECTS	367	446

6.3.1.10. Agency for Luck Subscale. See table 6.3.1.10 for item-total correlations and Cronbach's alpha.

Item-Total correlations: This subscale was working well in both language forms and showed no differences between the two samples.

Reliability: Cronbach's alpha was similar in the two samples and medium (0.60) or low (0.58) in the English and Turkish samples respectively.

Table 6.3.1.10: Item-Total Correlations and Cronbach's Alpha for English and Turkish Samples for CAMI's Agency Beliefs for Luck Subscale.

AGENCY BELIEF FOR LUCK SUBSCALE'S ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH SAMPLE	ITEM-TOTAL CORRELATIONS IN TURKISH SAMPLE
6. Are you the sort of person who has luck with their homework?	0.39	0.32
8. When the teacher calls on you, are you usually lucky in knowing the right answer?	0.33	0.34
38. When it comes to learning something hard, do you usually have luck on your side?	0.37	0.36
36. Are you usually lucky, when it comes to school work?	0.45	0.44
CRONBACH ALPHA	0.60	0.58
NUMBER OF THE SUBJECTS	365	448

6.3.2. Nowicki-Strickland Locus of Control Scale for Children (CNSIE). See table 6.3.2 for item-total correlations and Cronbach's alpha.

Item-Total correlations: Six out of 40 items showed significant differences ($p < 0.01$) between the two samples (items 4, 10, 15, 24, 30, 34).

The item-total correlations for this scale were overall very low in both samples. For the English sample only 8 out of 40 items were highly correlated with the total score. These were: items **7** ($r=.50$), **10** ($r=.35$), **16** ($r=.41$), **19** ($r=.33$), **26** ($r=.31$), **29** ($r=.31$), **37** ($r=.43$), **39** ($r=.33$). For the Turkish sample 7 out of 40 items were highly correlated with the total score. These were: items **5** ($r=.33$), **16** ($r=.33$), **26** ($r=.36$), **27** ($r=.35$), **33** ($r=.32$), **36** ($r=.37$), **39** ($r=.33$). Only three items (item **16, 26,** and **39**) were highly correlated with the total score in both samples.

Reliability: This scale also had similar and medium reliability for both samples (alpha= 0.60 and 0.66 for the English and Turkish samples respectively). Considering that there were 40 items in the scale, this reliability is low. This is because most of the items had very low correlations with the total score in both samples..

Table 6.3..2: Item-Total Correlations and Cronbach's Alpha for English and Turkish Samples for Nowicki-Strickland Internal-External Locus of Control Scale for Children (CNSIE).

NOWICKI-STRICKLAND'S LOCUS OF CONTROL SCALE ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH SAMPLE	ITEM-TOTAL CORRELATIONS IN TURKISH SAMPLE
1. Do you believe that most problems will usually sort themselves out in time?	0.12	-0.05
2. Do you believe that you can stop yourself from catching a cold?	-0.04	0.16
3. Are some children just born lucky?	0.24	0.28
4. Most of the time do you feel that getting good grades means a great deal to you?	0.16 (*)	-0.12 (*)
5. Are you often blamed for things that just aren't your fault?	0.28	0.33
6. Do you believe that if somebody studies hard enough he or she can pass any subject?	0.11	0.10
7. Do you feel that most of the time it doesn't pay to try because things never turn out right anyway?	0.51	0.19
8. Do you feel that if things start out well in the morning it's going to be a good day no matter what you do?	0.23	0.15
9. Do you feel that most of the time parents listen to what their children have to say?	0.25	0.17
10. Do you believe that good things can be made to happen simply by wishing them?	0.35 (*)	-0.05 (*)
11. When you get punished does it usually seem to be for no good reason at all?	0.22	0.26
12. Most of the time do you find it hard to change a friend's opinion?	0.07	0.17
13. Do you think a team is helped to win more by cheering than by luck?	0.03	0.05
14. Do you feel that it's nearly impossible to change your parent's mind about anything?	0.26	0.28
15. Do you believe that your parents should allow you to make of your own decisions?	-0.18 (*)	0.26 (*)
16. Do you feel that when you do something wrong there is very little you can do to make it right?	0.41	0.33
17. Do you believe that some children are just born good at sports?	0.04	0.11
18. Are most of the others children your age stronger than you are?	0.21	0.15
19. Do you feel that one of the best ways to handle most problems is just not to think about them?	0.33	0.18
20. Do you feel that you have a lot of choice in deciding who your friends are?	0.09	0.19
21. If you find a four-leaf clover do you believe that might bring you good luck?	0.22	0.10
22. Do you feel that whether you do your homework has much to do with what kinds of grades you get?	0.15	0.05

23. Do you feel that when another teenager your age decides to hit you, there is little you can do stop him or her?	0.26	0.16
24. Have you ever had a good luck charm?	0.20 (*)	-0.02 (*)
25. Do you believe that whether or not people like you depends on how you act?	0.06	0.14
26. Will your parents usually help you if you ask them to?	0.31	0.36
27. Have you felt that when people were mean to you it was usually for no reason at all?	0.24	0.35
28. Most of the time, do you feel that you can change what might happen tomorrow by what you do today?	0.17	0.11
29. Do you believe that when bad things are going to happen no matter what you do to try to stop them?	0.31	0.25
30. Do you think that children can get their own way if they just keep trying?	-0.02 (*)	0.21 (*)
31. Most of the time do you find it useless to try to get your own way at home?	0.17	0.11
32. Do you feel that when good things happen they happen because of hard work?	0.18	0.11
33. Do you feel that when somebody your age wants to be your enemy there is little you can do to change matters?	0.25	0.32
34. Do you feel that it is easy to get friends to do what you want them to?	-0.08 (*)	0.16 (*)
35. Do you usually feel that you have little to say about what you get to eat at home?	0.21	0.25
36. Do you feel that when someone doesn't like you there is little you can do about it?	0.28	0.37
37. Do you usually feel that it is almost useless to try in school because most other children are just cleverer than you are?	0.43	0.27
38. Are you the kind of person who believes that planning ahead makes things turn out better?	0.04	0.21
39. Most of the time, do you feel that you have little say in what your family decides to do?	0.33	0.33
40. Do you think it is better to be clever than to be lucky?	0.25	0.14
CRONBACH ALPHA	0.69	0.66
NUMBER OF THE SUBJECTS	330	419

P<0.01 (*). The p value represents the significance of the differences between the two I-T correlations in the two samples.

6.3.3. Palenzuela's Multidimensional Academic Specific Locus of Control Scale (MASLOC)

6.3.3.1. MASLOC's Internal Subscale. See table 6.3.3.1 for item-total correlations and Cronbach's alpha.

Item-Total correlations: There was a significant difference between English and Turkish samples for item 5. This item also showed a low item-total correlation in the English sample (r < 0.30).

Reliability: The reliabilities of the subscales were similar and medium (alpha= 0.60 and 0.66 for the English and Turkish sample respectively).

Table 6.3.3.1: Item-Total Correlations and Cronbach's Alpha for English and Turkish Samples for MASLOC's Internal Subscale.

MASLOC INTERNAL SUBSCALE'S ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH SAMPLE	ITEM-TOTAL CORRELATIONS IN TURKISH SAMPLE
2. The grade I get at the end of the year will always be closely related to what I do during the year.	0.35	0.42
5. I am convinced that the grades I will get depend on how well or badly I do in my exam.	0.20 (*)	0.44 (*)
7. The kind of grades I will get in my studies depends on how capable I am in preparing my self.	0.33	0.40
10. If I want to get a good academic record I have to be competent and I must work hard.	0.47	0.43
11. In general I believe that if one is competent and works hard one will get good results.	0.47	0.41
CRONBACH ALPHA	0.60	0.66
NUMBER OF THE SUBJECTS	356	438

P<0.01 (*). The p value represents the significance of the differences between the two I-T correlations in the two samples.

6.3.3.2. MASLOC's Helplessness Subscale. See table 6.3.3.2 for item-total correlations and Cronbach's alpha.

Item-Total correlations: All items in Turkish were significantly less correlated with the total score when compared with English (p<0.01). Item 8 functioned very badly in Turkish (r=0.60 and 0.06 in the English and Turkish samples respectively).

Reliability: The reliability was good for the English sample but poor for the Turkish sample (alpha = 0.77 and 0.48 for English and Turkish respectively). According to our criterion value for differences (0.2) this difference (0.29) is significant.

Table 6.3.3.2: Item-Total Correlations and Cronbach's Alpha for English and Turkish Samples for MASLOC's Helplessness Subscale.

MASLOC HELPLESSNESS SUBSCALE'S ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH SAMPLE	ITEM-TOTAL CORRELATIONS IN TURKISH SAMPLE
4. It is an absolute waste of time for me to make any effort, since there is no relationship between my capability, how hard I work, and the grades I will get.	0.58 (*)	0.32 (*)
8. I don't think it is worthwhile studying hard since the grades I will get will be completely manipulated.	0.59 (*)	0.06 (*)
9. I am convinced that whatever I do my teacher will always give me the grades they want to.	0.55 (*)	0.24 (*)
14. It makes absolutely no difference whether I prepare well for a subject or not since in the long run teachers are "out to catch you".	0.66 (*)	0.41 (*)
15. Regarding my academic life I just don't know what to do. Anything might happen: may be I will do an exam well and fail or may be I will do it badly and pass.	0.38 (*)	0.28 (*)
CRONBACH ALPHA	0.77	0.48
NUMBER OF THE SUBJECTS	359	434

P<0.01 (*). The p value represents the significance of the differences between the two I-T correlations in the two samples.

6.3.3.3. MASLOC's Luck Subscale. See table 6.3.3.3 for item-total correlations and Cronbach's alpha.

Item-Total correlations: There were no significant differences between the two samples but item 3 and 6 were not highly correlated with the total score in either sample (item 3 r = 0.23 and 0.29; item 6 r = 0.12 and 0.13, in English and Turkish samples respectively.

Reliability: This subscale showed similar and poor internal consistency in both samples (alpha = 0.57 and 0.57 in the English and Turkish samples respectively).

Table 6.3.3.3: Item-Total Correlations and Cronbach's Alpha for English and Turkish Samples for MASLOC's Luck Subscale.

MASLOC LUCK SUBSCALE'S ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH SAMPLE	ITEM-TOTAL CORRELATIONS IN TURKISH SAMPLE
1. If I want to obtain a good exam record it is essential that I should have good luck.	0.49	0.37
3. Whatever the quality of my work I am always lucky when it comes to examinations.	0.23	0.29
6. My getting good or bad grades in my exams is related to whether the precise the topics I have studied come up in exam.	0.12	0.13
12. Luck is decisive in the kind of grades I get in my studies.	0.48	0.52
13. The grades I get are always determined by a series of random circumstances.	0.37	0.35
CRONBACH ALPHA	0.57	0.57
NUMBER OF THE SUBJECTS	354	446

6.3.4. Religiosity Scale. See table 6.3.4 for item-total correlations and Cronbach's alpha.
Item-Total correlations: In three out of 8 items the item-total correlations were significantly different (item 3, 5, and 7). All item-total correlations were high in both samples.

Reliability: This scale showed similar and very good internal consistency in both samples (alpha=0.88 and 0.82, in English and Turkish samples respectively).

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Table 6.3.4: Item-Total Correlations and Cronbach's Alpha for English and Turkish Samples for MASLOC's Luck Subscale.

RELIGIOSITY SCALE'S ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH SAMPLE	ITEM-TOTAL CORRELATIONS IN TURKISH SAMPLE
2. How often have you attended religious services during the past year?	0.59	0.46
3. Which of the following best describe your views on prayer or religious meditation?	0.64	0.52
4. When you have a serious personal problem how often do you take religious advice or teaching into consideration?	0.69 (*)	0.54 (*)
5. How much of an influence would you say that religion has on the way that you choose to act or the way that you choose to spend your time each day?	0.67	0.56
6. Which one of the following statements comes closest to your belief about God?	0.74 (*)	0.56 (*)
7. Which of the following statements comes closest to your beliefs about life after death (immortality)?	0.55	0.46
8. During the past year, how often have you experienced feeling of religious reverence or devotion?	0.76 (*)	0.63 (*)
9. Do you agree with the following statements: "Religion gives me great amount of comfort and security"	0.61	0.67
CRONBACH ALPHA	0.88	0.82
NUMBER OF THE SUBJECTS	357	439

P<0.01 (*). The p value represents the significance of the differences between the two I-T correlations in the two samples.

6.3.5. Authoritarianism Scale (F-Scale). See table 6.3.5 for item-total correlations and Cronbach's alpha.

Item-Total correlations: Only two out of 30 items showed significant differences between samples. These were items 16 and 18.

For the English sample seven out of 30 items showed low correlations with the total score: These items were: 2, 3, 4, 23, 27, 28 and 30. For the Turkish sample nine out of 40 items showed low correlations with the total score: These were: 2, 3, 4, 5, 6, 16, 18, 19 and 25. Five of them showed low item-total correlations in both samples. These were items 2, 3, 4, 23 and 30. See table 4.5.

Reliability: This scale showed similar and very good internal consistency in both sample (alpha=0.84 and 0.80, in English and Turkish samples respectively).

Table 6.3.5: Item-Total Correlations and Cronbach's Alpha for English and Turkish Samples for Authoritarianism 'F' Scale.

AUTHORITARIANISM SCALE'S ITEMS	ITEM-TOTAL CORRELATIONS IN ENGLISH SAMPLE	ITEM-TOTAL CORRELATIONS IN TURKISH SAMPLE
1. Obedience and respect for authority are the most important virtues children should learn.	0.45	0.36
2. No weakness or difficult can hold us back if we have enough will power.	0.27	0.14
3. Science has its place but there are many important thin that can never be understood by the human mind.	0.25	0.29
4. Human nature being what it is, there will always be war a conflict.	0.13	-0.03
5. every person should have complete faith in some supernatural power whose decisions are obeyed without question.	0.32	0.22
6. When a person has a problem or worry, it is best for him not to think about it, but to keep busy with more cheerful things.	0.31	0.19
7. A person who has no manners, bad habits, and poor breeding can hardly expected to get along with decent people.	0.43	0.34
8. What youth needs most is strictly discipline, rugged determination, and the will to work and fight for family and country.	0.50	0.48
9. Some people are born with an urge to jump from high places.	0.30	0.33
10. Nowadays when so many different kinds of people move around and mix together, a person has to protect himself especially carefully against catching an infection or disease from them.	0.45	0.39
11. An insult to our honour should always be punished.	0.44	0.38
12. Young people sometimes get rebellious ideas but as they grow up they ought to get over them.	0.40	0.47
13. It is essential for learning or effective work that our teacher or bosses outline in detail what is to be done and exactly how to do it.	0.30	0.33
14. What this country needs most, more than laws and political programmes, is a few courageous, tireless leaders in whom the people can put their faith.	0.34	0.34
15. Sex crimes, such as rape and attacks on children, deserve more than mere imprisonment; such criminal ought to be publicly whipped, or worse.	0.40	0.43
16. People can be divided into two distinct classes: the week and strong.	0.37 (*)	0.16 (*)
17. There is hardly anything lower than a person who does not feel a great love, gratitude, and respect for his parents.	0.48	0.51
18. Some day it will probably be shown that astrology can explain a lot of things.	0.36 (*)	0.09 (*)
19. Some leisure is necessary but it is good hard work makes life interesting and worthwhile.	0.41	0.29
20. Nowadays more and more people are prying into matters that should remain personal and private.	0.30	0.32

21. Wars and social troubles may someday be ended by an earthquake or flood that will destroy the whole world.	0.40	0.32
22. Most of our social problems could be solved if we could somehow get rid of immoral, crooked, and feebleminded people.	0.53	0.40
23. The wild sex life of the old Greeks and Romans was tame compared to some of the goings-on in this country, even in places where people might least expect it.	0.26	0.29
24. If people would talk less and work more, everybody would be better off.	0.42	0.35
25. Most people don't realise how much our lives are controlled by plots hatched in secret places.	0.31	0.28
26. Homosexuals are hardly better than criminals and ought to be severely punished.	0.30	0.37
27. Books and videos ought not to deal so much with the unpleasant and seamy side of life: they ought to concentrate on themes that are entertaining or uplifting.	0.25	0.38
28. No sane, normal, decent person could ever think of hurting a close friends and relative.	0.27	0.38
29. Familiarity breeds contempt.	0.38	0.32
30. When you come right down to it, it is human nature never to do anything without an eye to profit.	0.27	0.21
CRONBACH ALPHA	0.84	0.80
NUMBER OF THE SUBJECTS	313	392

P<0.01 (*). The p value represents the significance of the differences between the two I-T correlations in the two samples.

6.4. SUMMARY and DISCUSSION

The Classical item analysis has shown that most of the CAMI subscales, the Religiosity scale and the Authoritarianism scale were, generally acceptable in terms of our criteria. But CNSIE and MASLOC were not. Most of CNSIE's items showed low item-total correlations and MASLOC's helplessness subscale functioned differently in the two samples.

CAMI

Four out of 8 items for the control beliefs showed significant differences between samples (items 3, 7, 10, 41) and two of these (items 7 and 3) also showed low item-total correlations in the Turkish sample. Of these four items one (item 41) also showed significant differences in the Turkish bilingual sample (see chapters 4) and items 3, and 7 showed significant differences in Turkish sample (see chapter 5). Therefore it seems that some of the differences detected here are due to item fidelity (items 3, 7 and 41). Only the difference on item 10 may be due to cultural differences (emic).

The Means-Ends (M-E) subscales showed medium or good or high reliability and none of them were significantly different on alpha values between samples. The item-total correlations did not show any significant differences at the 0.01 level either. However, on four out of five of the Means-Ends (M-E) subscales there were some items which showed low item-total correlations in one or other sample. In the M-E for Effort subscale there were 5/8 items in English (items 16, 19, 20, 47, 56) and 2/8 items in Turkish (item 16 and 64) which showed low item-total correlations. In M-E for Attribute 2/8 items (item 13 and 17) showed low item-total correlations in English sample and 1/8 (item 17) in Turkish sample. In M-E for Powerful Others the same 2 items (item 14 and 45) showed low item-total correlations in both samples. In M-E for Unknown Factors 1/8 items (item 26) showed low item-total in the English sample.

In terms of differences between samples these M-E scales functioned well. Therefore the items in these subscales were comparable (etic) for the two cultures. However, there were some items (8/45 item in English and 2/45 item in Turkish) which were not good items. This means that not much information is gathered from these items.

All the Agency Beliefs subscales showed a very similar structure in both samples. All reliability scores were good or medium and similar, with small differences between them. Also, all items were similar in terms of their item-total correlations and all of the item-total's were higher then .30.

CNSIE

The reliability of the scale in both samples was medium and similar. Only 6 out of 40 items (items 4, 10, 15, 24, 30, 34) were significantly different in the two cultures. However, most of the items showed low item-total correlations in one or both samples. Thirty three out of 40 items in English and thirty four out of forty in English functioned poorly ($r<.30$).

It seems that this scale is less reliable then expected in both samples. Although in the literature (Lefcourt, 1982) CNSIE is used very widely and mentioned in 200 articles in a 12 year period between 1984-1996, in this study it will be difficult to use CNSIE to derive inferences about our two samples. Although it seems that the items are similar in both culture, the locus of control dimension measured by the scale is not clear.

MASLOC

Internal

The reliabilities were medium and similar in both samples. No item showed significant differences between samples. Only 1/5 (item 5) item showed a low item-total correlation in the English sample.

Helplessness

The reliability was significantly different between samples with the Turkish sample's being lower. All the items (item 4, 8, 9, 14, 15) were different in the two samples and three out of 5 items (item 8, 9, 15) showed low item-total correlations in Turkish sample. Item 8 was different in the Bilingual sample as well so therefore this difference is probably due to translation infidelity.

Luck

The reliabilities in both samples were marginally lower than medium in both samples but they were similar. All item-total correlations were similar. Two out of 5 items (item 3 and 6) showed a low item-total correlation in both samples. This was consistent with the bilingual sample results as well (see Ch. 2). We can say that although the items are etic (compatible with each other) two of them are inconsistent in both samples.

RELIGIOSITY

The reliabilities were high and similar in both samples. Three out of 8 items (item 4, 6, 8) were significantly different in the two samples. All items showed high item-total correlations. These

results show that these three item differences are due to cultural differences. They all showed good translation fidelity in the early study (see chapter 3, 4, 5).

AUTHORITARIANISM

The reliabilities were high and similar in the two samples. Only two out of 30 items (item 16 and 18) showed significant differences between samples. But 4/30 items in English (items 23, 27, 28, 30), 6/30 items in Turkish (items 5, 6, 16, 18, 19, 25) and 3/30 items in both samples (items 2, 3, 4) showed low item-total correlations. The differences for item 18 "Some day it will probably be shown that astrology can explain a lot of things" could be due to item infidelity but the differences in item 16 "People can be divided into two distinctive classes: the weak and strong" are explained by cultural or emic differences.

CHAPTER 7: FACTOR ANALYSIS

CHAPTER 7: FACTOR ANALYSIS
CROSS-CULTURAL COMPARISON USING FACTOR ANALYSIS

7.1. INTRODUCTION

In this chapter we will investigate the validity of the scales across cultures with factor analysis. The five scales have been factor analysed separately for each culture and then the results compared. The differences and similarities between factors will be discussed. If the scale did not show a similar factor structure it has not been used subsequently.

For CAMI the Control, Means-Ends and Agency Beliefs subscales were factor analysed in five subsets: Effort, Attribute, Powerful Others, Luck and Unknown. Each time the Control Beliefs items and items from the different domains of Means-Ends and Agency Beliefs were put into the factor analysis. For example, for the Effort analysis all the Control Beliefs items, the Means-Ends for Effort items and the Agency for Effort items were analysed. Similarly, for the Attribute analysis all the Control Beliefs items, the Means-Ends for Attribute items and the Agency for Attribute items were analysed. So, the Control Beliefs items were always the same but the Means-Ends and Agency items were changed according to the domains analysed. This procedure follows the original study which was concerned with the subdomains in which perceived control operates such as Effort, Attribute, Powerful Others, Luck and Unknown factors.

Nowicki-Strickland's Locus of Control Scale for Children (CNSIE) was also factor analysed. All forty items were in the analysis. Because there is no agreement between researchers about the factor structure of this scale (Watters, Thomas & Streiner, 1990; Walters & Klein, 1990), the author based the comparison on two cultures, English and Turkish.

The Multidimensional Academic Specific Locus of Control Scale (MASLOC) was also factor analysed and compared with the original results. The expectation is that three factors will appear after the oblimin rotation is applied (e.g. Internal, Helplessness, Luck).

The Religiosity scale showed a clear one factor structure in the original sample. Although the original sample was a heterogeneous American sample (Rohrbaugh & Jessor, 1976) the items are neutral in terms of religion so the same result is expected from the two different cultures tested here. The scale has never been tested on a homogeneous Muslim sample.

There is no factor analytic study in recent studies of the Authoritarianism scale (F Scale). The assumption is that there is only one main common factor. This will also be checked in our samples.

The items were subjected to a principal component analysis factor analysis followed by oblique rotations. The oblique rotations were used for all questionnaires to make a comparison between previous samples and this study's samples. The number of factors extracted was determined by Cattell's (1978) Scree test rather than Keiser's minimum eigenvalue criterion, where only the factors having latent roots (eigenvalues) equal or greater than one are extracted (Cattell & Vogelman, 1977).

7.2. METHOD
7.2.1. Design for Analysis
The data from the two samples were tested separately. For CAMI five analyses were carried out in the way explained above. For the other scales all items were put into the factor analysis.

7.2.2 Analysis
In all the analyses the Scree test was used to decide the number of factors in the model. In all cases exploratory factor analyses were carried out. The percentage of variance explained by each factor came from principal component analysis but the factor loadings were based on oblique rotation.

7.2.3. Instruments
The questionnaires were CAMI, CNSIE, MASLOC, Religiosity for Youth and Authoritarianism.

7.2.4. Sample
In this present study, 368 English and 420 Turkish secondary school students participated. The social class of the samples was heterogeneous. The sample has already been described in the Method chapter.

7.2.5. Procedure
As previously described in the Method chapter.

7.2.6. Hypothesis
The expectation was that if the structures of the original scales were applied to these study's two samples then each of samples' factor structure will be the same as or similar to the original study.

This part of the results may support the validity of the scale as well as the internal consistency. Any differences in factor structure can be attributed to differences between cultures.

7.3. RESULTS OF FACTOR ANALYSIS

The results of each the factor analysis of each scale in each sample will be presented and the results compared with the original studies (Skinner, Chapman & Baltes, 1988; Nowicki & Strickland, 1973; Palenzuela, 1988; Rohrbaugh & Jessor, 1976; Christie, 1991).

7.3.1. Control, Means-Ends and Agency Beliefs (CAMI):

When the original study used factor analysis its aim was to test "whether the structure of children's responses would correspond to the three hypothesised sets of beliefs, namely Control, Means-Ends and Agency" (Skinner, Chapman & Baltes, 1988). To do this for each domain of perceived control (i.e. Luck, Attribute, etc.) they ran a factor analysis, expecting to come out with three factors which would represent the three sets of beliefs. In our study we are interested in whether these three sets of beliefs will emerge in our Turkish and English samples. Considering that the scale has already been tested in the German and American cultures simultaneously we expect to find a similar factor structure in the English sample. An exploratory factor analysis was conducted on the item scores using principal component analysis and oblique rotations to test the factor structure in the English and Turkish samples.

Five factor analyses were conducted for the 64 item scale. For the first four of them 21 items were used for a three factor solution. In each one the control beliefs items were consistent, but the means-ends and agency beliefs items changed for the respective cause (e.g. means-ends and agency beliefs for the powerful others causes). For the fifth factor analysis, only 16 items were included for a two factor solution (Control beliefs and Means-ends beliefs for unknown causes). The Agency belief for unknown causes items were not included because no agency belief is possible for unknown causes.

The expectations were that if the original structure of Control, Means-Ends, and Agency beliefs were also applied to these English and Turkish samples then each of the first four factor analyses would also result in a three factor solution. See table 7.3.1.1.a to 7.3.1.4.b. The final factor analysis would result in a two factor solution (i.e. Control and Means-Ends). See table 7.3.1.5.a. and 7.3.1.5.b.

7.3.1.1. Factor Analysis Results for Effort

Three factors emerged in the English sample. The order was Control Beliefs first (19.6% of variance explained)), Agency beliefs second (11.5% of the variance explained) and Means-Ends beliefs third (9.3% of the variance explained). The overall, cumulative percentage of the variance explained was 41.4%. See table 7.3.1.1.a.

Three factors also emerged for the Turkish sample but the order of the factors was slightly different: Agency beliefs first (17.5%), Control beliefs second (11.3%) and Means-Ends beliefs third (9.6%). The overall, cumulative percentage of the variance explained was 38.4%. See table 7.3.1.1.b.

7.3.1.2. Factor Analysis Results for Attribute

For the Attribute causes in the English sample three factors emerged. The order of the factors was Control beliefs first (21.7%), Means-Ends beliefs second (12.2%) and Agency beliefs third (6.3%). The overall, cumulative percentage of the variance explained was 40.2%. The Agency beliefs items had negative factor loadings . See table 7.3.1.2.a.

Three factors also emerged for the Turkish sample but the order of the factors was different: Agency beliefs first (17.3%), Means-Ends beliefs second (12.2%) and Control beliefs third (7.3%). The overall, cumulative percentage of the variance was explained was 36.8%. Half of the Control beliefs items loaded on the Agency beliefs for Attribute factor . These results are consistent with the classical item analysis results (see chapter 4). See table 7.3.1.2.b.

7.3.1.3. Factor Analysis Results for Powerful Others

Three factors emerged in the English sample. The order of the factors was Control beliefs first (21.0%), Means-Ends beliefs second (12.9%) and Agency beliefs third (7.9%). The overall cumulative percentage of the variance explained was 41.8%. See table 7.3.1.3.a.

The same three factors also emerged for the Turkish sample but the order of the factors was Means-Ends beliefs first (18.1%), Control beliefs second (12.9%)and Agency beliefs third (9.2%). The overall, cumulative percentage of the variance explained was 40.2%. See table 7.3.1.3.b.

7.3.1.4. Factor Analysis for Luck

Three factors emerged in the English sample. The order of the factors was Control beliefs first (20.2%), Means-Ends beliefs second (17.1%), Agency beliefs third (7.3%). The overall, cumulative percentage of the variance explained was 44.6%. See table 7.3.1.4.a.

Three factors also emerged for the Turkish sample. The order of the factors was Means-Ends beliefs first (20.0%), Control beliefs second (13.3%), Agency beliefs third (7.2%). The overall, cumulative percentage of the variance explained was 40.5%. Control beliefs items had a negative factor loading. Five items were loaded on agency instead of control belief . See table 7.3.1.4.b.

7.3.1.5. Factor Analysis Results for Unknown Causes

Two factors emerged in the English sample. The order of the factors was Control beliefs first (21.9%)and Means-Ends beliefs second (16.9%). The overall, cumulative percentage of the variance explained was 38.8%. See table 7.3.1.5.a.

These two factors also emerged for the Turkish sample but the order of the factors was Means-Ends beliefs first (20.3%) and Control beliefs second (14.2%). The overall, cumulative percentage of the variance explained was 34.5%. See table 7.3.1.5.b.

For CAMI overall, all five factor analyses confirmed that there was lot of similarity between the factors in each sample. The exception was the Means-Ends beliefs for Attribute causes in the Turkish sample.

Table 7.3.1.1.a: Control beliefs, Means-Ends and Agency for Effort. Factor loadings in the English Sample (N=368).

ITEMS	FACTOR LOADINGS		
	F1	F3	F2
Control Beliefs (Factor 1)	Control	Means-ends	Agency
Positive events			
7. If you decide to sit down and learn really hard, can you do it?	0.55		
10. Can you get good grades when you really want to?	0.73		
42. Can you get all the problems (e.g. in spelling) right, when you want to?	0.69		
35. If you want do well in school, can you?	0.62		
Negative events			
3. If you really make up your mind not to get any bad grades, can you do it?	0.72		
5. Is there anything you can do stop yourself getting bad grades?	0.59		
34. If you really decide that you are going to get any problems wrong (e.g. in maths or spelling) can you do it?	0.65		
41. If you want to can you keep from doing badly in school?	0.68		
Means-Ends beliefs for effort (Factor 3)			
Positive events			
23. Is the usual reason that students do well at school that they try really hard?		0.49	
20. If a student knows a lot about something, is it usually because he or she has worked hard at learning it?		0.48	
61. When a student does well in school, is it usual because he/she works very carefully?		0.57	
64. Paying attention and listen carefully, is the usual reason that students understand what the teachers say?		0.61	
Negative events		0.49	
19. When a student doesn't understand something at school, is it usually because he or she doesn't pay enough attention?			
16. If students give the wrong answers on a test is it usually because they don't work carefully?		0.45	
56. When students don't learn very much in class, is it usually because he/she works very carefully?		0.44	
47. When a teacher ask a student gives the wrong answer, is it usually because the student isn't trying hard enough?		0.49	
Agency beliefs for effort (Factor 2)			
1. Do you try as hard as you can in school?			0.80
4. Do you pay attention in class?			0.78
37. When it comes down to it; do you really work hard on your homework?			0.69
33. Do you listen very carefully to what your teacher says?			0.76
EIGENVALUES	3.92	2.30	1.86
PERCENTAGE OF THE VARIANCES	19.6	11.5	9.3

Table 7.3.1.1.b: Control beliefs, Means-Ends and Agency for Effort. Factor loadings in the Turkish Sample (N=453).

ITEMS	FACTOR LOADINGS		
	F2	F3	F1
Control Beliefs (Factor 2)			
Positive events			
7. If you decide to sit down and learn really hard, can you do it?	0.51		
10. Can you get good grades when you really want to?	0.47		
42. Can you get all the problems (e.g. in spelling) right, when you want to?	0.68		
35. If you want do well in school, can you?	0.74		
Negative events			
3. If you really make up your mind not to get any bad grades, can you do it?	0.36		
5. Is there anything you can do stop yourself getting bad grades?	0.33		
34. If you really decide that you are going to get any problems wrong (e.g. in maths or spelling) can you do it?	0.67		
41. If you want to can you keep from doing badly in school?	0.61		
Means-Ends beliefs for effort (Factor 3)			
Positive events			
23. Is the usual reason that students do well at school that they try really hard?		0.52	
20. If a student knows a lot about something, is it usually because he or she has worked hard at learning it?		0.58	
61. When a student does well in school, is it usual because he/she works very carefully?		0.48	
64. Paying attention and listen carefully, is the usual reason that students understand what the teachers say?		0.39	
Negative events		0.60	
19. When a student doesn't understand something at school, is it usually because he or she doesn't pay enough attention?			
16. If students give the wrong answers on a test is it usually because they don't work carefully?		0.46	
56. When students don't learn very much in class, is it usually because he/she works very carefully?		0.59	
47. When a teacher ask a student gives the wrong answer, is it usually because the student isn't trying hard enough?		0.59	
Agency beliefs for effort (Factor 1)			
1. Do you try as hard as you can in school?			0.79
4. Do you pay attention in class?			0.78
37. When it comes down to it; do you really work hard on your homework?			0.77
33. Do you listen very carefully to what your teacher says?			0.73
EIGENVALUES	3.49	2.27	1.91
PERCENTAGE OF THE VARIANCES	17.5	11.3	9.6

Table 7.3.1.2.a: Control beliefs, Means-Ends and Agency for Attributes. Factor laodings in the English Sample (N=368).

ITEMS	FACTOR LOADINGS		
	F1	F2	F3
Control Beliefs	Control	Means-Ends	Agency
Control Beliefs			
Positive events			
7. If you decide to sit down and learn really hard, can you do it?	0.59		
10. Can you get good grades when you really want to?	0.71		
42. Can you get all the problems (e.g. in spelling) right, when you want to?	0.66		
35. If you want do well in school, can you?	0.67		
Negative events	0.68		
3. If you really make up your mind not to get any bad grades, can you do it?			
5. Is there anything you can do stop yourself getting bad grades?	0.51		
34. If you really decide that you are going to get any problems wrong (e.g. in maths or spelling) can you do it?	0.59		
41. If you want to can you keep from doing badly in school?	0.72		
Means-ends beliefs for attributes			
Positive events			
18. If a student does badly in school, is it usually because he or she is just smart?		0.43	
13. When students give the right answer to questions in class, is it usually only because they are good students?		0.34	
50. When a students manages to learn something, is it just because he/she is clever?		0.65	
53. If students understand things quickly, is it because they are very good at school at school?		0.53	
Negative events		0.44	
17. If students get bad grades, is it usually because they are no good at school?			
22. When a student does badly in school is the main reason usually that he or she is just not very bright?		0.56	
49. When students don't understand something, is it because they are just no good at school?		0.62	
52. If a person gives the wrong answer to teachers' question, is it usually s/he is just not smart?		0.68	
Agency for attribute			
2. Can you learn things you need to for school quickly, without really having to work on them?			-0.77
9. Are you successful in your school work even without having to study hard?			-0.74
39. Do you get problems right (e.g. in maths), even if you don't try hard?			-0.56
44. Can you understand the teachers' lesson easily?			-0.38
EIGENVALUES	4.34	2.43	1.26
PERCENTAGE OF THE EXPLAINED VARIANCES	21.7	12.2	6.3

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Table 7.3.1.2.b: Control beliefs, Means-Ends and Agency for Attributes. Factor laodings in the Turkish Sample (N=453).

ITEMS	FACTOR LOADINGS		
	F3	F2	F1
Control Beliefs (Factor 3 and 1)			
Positive events			
7. If you decide to sit down and learn really hard, can you do it?			0.41
10. Can you get good grades when you really want to?	0.46		
42. Can you get all the problems (e.g. in spelling) right, when you want to?			0.56
35. If you want do well in school, can you?	0.51		0.48
Negative events	0.54		
3. If you really make up your mind not to get any bad grades, can you do it?			
5. Is there anything you can do stop yourself getting bad grades?	0.55		
34. If you really decide that you are going to get any problems wrong (e.g. in maths or spelling) can you do it?	0.32		0.47
41. If you want to can you keep from doing badly in school?			0.36
Means-ends beliefs for attributes			
Positive events			
18. If a student does badly in school, is it usually because he or she is just smart?			
		0.66	
13. When students give the right answer to questions in class, is it usually only because they are good students?		0.48	
50. When a students manages to learn something, is it just because he/she is clever?		0.70	
53. If students understand things quickly, is it because they are very good at school at school?		0.42	
Negative events		0.35	
17. If students get bad grades, is it usually because they are no good at school?			
22. When a student does badly in school is the main reason usually that he or she is just not very bright?		0.55	
49. When students don't understand something, is it because they are just no good at school?		0.47	
52. If a person gives the wrong answer to teachers' question, is it usually s/he is just not smart?		0.59	
Agency for attribute			
2. Can you learn things you need to for school quickly, without really having to work on them?			0.68
9. Are you successful in your school work even without having to study hard?			0.64
39. Do you get problems right (e.g. in maths), even if you don't try hard?			0.60
44. Can you understand the teachers' lesson easily?			0.60
EIGENVALUES	3.46	2.43	1.45
PERCENTAGE OF THE EXPLAINED VARIANCES	17.3	12.2	7.3

Table 7.3.1.3.a : Control beliefs, Means-Ends and Agency for Powerful Others. Factor laodings in the English Sample (N=368).

ITEMS	FACTOR LOADINGS		
	F1	F2	F3
Control beliefs			
Positive events 7. If you decide to sit down and learn really hard, can you do it?	0.64		
10. Can you get good grades when you really want to?	0.71		
42. Can you get all the problems (e.g. in spelling) right, when you want to?	0.68		
35. If you want do well in school, can you?	0.63		
Negative events 3. If you really make up your mind not to get any bad grades, can you do it?	0.70		
5. Is there anything you can do stop yourself getting bad grades?	0.50		
34. If you really decide that you are going to get any problems wrong (e.g. in maths or spelling) can you do it?	0.69		
41. If you want to can you keep from doing badly in school?	0.60		
Means-ends for powerful others			
Positive events 24. When a students gets good grades, is it usually because he or she gets along well with the teacher?		0.57	
14. Do some students do well at school just because their teachers help them?		0.07	
60. When a student does well in school, is it usually because he/she gets along well with the teachers?		0.62	
45. When students do really well in school, is it usually just because of the teacher?		0.30	0.38
Negative events 15. If a students gets bad grades, is it usually because the teacher doesn't like them?		0.61	
21. If a student does badly in school, is it usually because the teacher doesn't really like him/her very much?		0.64	
63. When students do badly in a subject, is it usually because the teachers just don't help them very much?		0.64	
51. When students have problems in school, is it usually because of the teacher?		0.61	
Agency beliefs for powerful others			
12. When you want them to, will your teachers help to see that you do well in school?			0.67
11. On the whole, do your teachers like you?			0.74
40. Do you have teachers who will help you when you want them to?			0.57
43. When you think about it, would you say that your teacher satisfied with you?			0.65
EIGENVALUES	4.19	2.57	1.58
PERCENTAGE OF THE EXPLAINED VARIANCE	21.0	12.9	7.9

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Table 7.3.1.3.b: Control beliefs, Means-Ends and Agency for Powerful Others. Factor laodings in the Turkish Sample (N=453).

ITEMS	FACTOR LOADINGS		
	F2	F1	F3
Control beliefs			
Positive events			
7. If you decide to sit down and learn really hard, can you do it?	0.49		
10. Can you get good grades when you really want to?	0.53		
42. Can you get all the problems (e.g. in spelling) right, when you want to?	0.67		
35. If you want do well in school, can you?	0.75		
Negative events			
3. If you really make up your mind not to get any bad grades, can you do it?	0.41		
5. Is there anything you can do stop yourself getting bad grades?	0.44		
34. If you really decide that you are going to get any problems wrong (e.g. in maths or spelling) can you do it?	0.64		
41. If you want to can you keep from doing badly in school?	0.56		
Means-ends for powerful others			
Positive events			
24. When a students gets good grades, is it usually because he or she gets along well with the teacher?		0.69	
14. Do some students do well at school just because their teachers help them?		0.33	0.53
60. When a student does well in school, is it usually because he/she gets along well with the teachers?		0.70	
45. When students do really well in school, is it usually just because of the teacher?		0.29	0.50
Negative events		0.66	
15. If a students gets bad grades, is it usually because the teacher doesn't like them?			
21. If a student does badly in school, is it usually because the teacher doesn't really like him/her very much?		0.66	
63. When students do badly in a subject, is it usually because the teachers just don't help them very much?		0.64	
51. When students have problems in school, is it usually because of the teacher?		0.59	
Agency beliefs for powerful others			
12. When you want them to, will your teachers help to see that you do well in school?			0.71
11. On the whole, do your teachers like you?			0.48
40. Do you have teachers who will help you when you want them to?			0.63
43. When you think about it, would you say that your teacher satisfied with you?			0.46
EIGENVALUES	3.61	2.58	1.83
PERCENTAGE OF THE EXPLAINED VARIANCE	18.1	12.9	9.2

Table 7.3.1.4.a: Control beliefs, Means-Ends and Agency for Luck. Factor laodings in the English Sample (N=368).

ITEMS	FACTOR LOADINGS		
	F1	F2	F3
Positive Events			
7. If you decide to sit down and learn really hard, can you do it?	0.54		
10. Can you get good grades when you really want to?	0.78		
42. Can you get all the problems (e.g. in spelling) right, when you want to?	0.69		
35. If you want do well in school, can you?	0.67		
Negative events	0.70		
3. If you really make up your mind not to get any bad grades, can you do it?			
5. Is there anything you can do stop yourself getting bad grades?	0.51		
34. If you really decide that you are going to get any problems wrong (e.g. in maths or spelling) can you do it?	0.58		
41. If you want to can you keep from doing badly in school?	0.67		
Means-Ends beliefs for luck			
Positive events			
28. Is doing well at school usually a matter of luck?		0.64	
25. Some students learn things more easily than other students.		0.45	
57. Is getting good grades just a matter of luck?		0.73	
48. If a teacher calls on a student and student knows the right answer, would you say it's just because the student is lucky?		0.56	
Negative events		0.63	
29. If a students get bad grades, is it just they have bad luck?			
32. If a teacher asks a student a question and the student doesn't know the answer, is this simply because the student's unlucky?		0.58	
58. When a student finds it difficult to learn something, is it usually because he/she is unlucky?		0.69	
62. When a student finds difficulty in learning something, is it usually because he/she is unlucky?		0.79	
Agency for luck			
6. Are you the sort of person who has luck with their homework?			0.73
8. When the teacher calls on you, are you usually lucky in knowing the right answer?			0.45
38. When it comes to learning something hard, do you usually have luck on your side?			0.53
36. Are you usually lucky, when it comes to school work?			0.71
EIGENVALUES	4.04	3.41	1.46
PERCENTAGE OF THE VARIANCES	20.2	17.1	7.3

Table 7.3.1.4.b: Control beliefs, Means-Ends and Agency for Luck. Factor laodings in the Turkish Sample (N=453).

ITEMS	FACTOR LOADINGS		
	F2	F1	F3
Positive Events			
7. If you decide to sit down and learn really hard, can you do it?	-0.49		
10. Can you get good grades when you really want to?	-0.37		
42. Can you get all the problems (e.g. in spelling) right, when you want to?	-0.66		
35. If you want do well in school, can you?	-0.71		
Negative events 3. If you really make up your mind not to get any bad grades, can you do it?	-0.32		
5. Is there anything you can do stop yourself getting bad grades?	-0.25		-0.30
34. If you really decide that you are going to get any problems wrong (e.g. in maths or spelling) can you do it?	-0.75		
41. If you want to can you keep from doing badly in school?	-0.61		
Means-Ends beliefs for luck			
Positive events 28. Is doing well at school usually a matter of luck?		0.67	
25. Some students learn things more easily than other students.		0.44	
57. Is getting good grades just a matter of luck?		0.68	
48. If a teacher calls on a student and student knows the right answer, would you say it's just because the student is lucky?		0.64	
Negative events 29. If a students get bad grades, is it just they have bad luck?		0.68	
32. If a teacher asks a student a question and the student doesn't know the answer, is this simply because the student's unlucky?		0.60	
58. When a student finds it difficult to learn something, is it usually because he/she is unlucky?		0.72	
62. When a student finds difficulty in learning something, is it usually because he/she is unlucky?		0.72	
Agency for luck			
6. Are you the sort of person who has luck with their homework?			0.68
8. When the teacher calls on you, are you usually lucky in knowing the right answer?			0.59
38. When it comes to learning something hard, do you usually have luck on your side?			0.54
36. Are you usually lucky, when it comes to school work?			0.76
EIGENVALUES	4.01	2.66	1.44
PERCENTAGE OF THE VARIANCES	20.0	13.3	7.2

Table 7.3.1.4.a: Control beliefs, Means-Ends and Agency for Unknown factors. Factors loadings in the English Sample (N=368).

ITEMS	FACTOR LOADING	
	F1	F2
Control Beliefs		
Positive items		
7. If you decide to sit down and learn really hard, can you do it?	0.54	
10. Can you get good grades when you really want to?	0.73	
42. Can you get all the problems (e.g. in spelling) right, when you want to?	0.69	
35. If you want do well in school, can you?	0.65	
Negative items	0.69	
3. If you really make up your mind not to get any bad grades, can you do it?		
5. Is there anything you can do stop yourself getting bad grades?	0.58	
34. If you really decide that you are going to get any problems wrong (e.g. in maths or spelling) can you do it?	0.63	
41. If you want to can you keep from doing badly in school?	0.71	
30. When a students do better than usual in as object, is it difficult to tell why?		0.72
26. If the teacher asks a student a hard question and he or she answers correctly, is it usually difficult to work out why the student gave the right answer?		0.43
46. If a student get a good grades in school, is it hard to know the reason why?		0.63
55. Is it hard to know why a student does really well on a test?		0.63
31. If students do badly in school, is it hard to work out why this has happened?		0.46
27. When a student makes a lot of mistakes (e.g., in a spelling test), is it hard to know the reason why?		0.53
54. When students give the wrong answer to teachers' questions, do you find it hard to know why it has happened?		0.65
59. Is it difficult to know why a student does worse than usual in a subject?		0.55
EIGENVALUES	3.51	2.69
PERCENTAGE OF THE VARIANCES	21.9	16.9

Table 7.3.1.4.b: Control beliefs, Means-Ends and Agency for Unknown factors. Factors loadings in the Turkish Sample (N=453).

ITEMS	FACTOR LOADING	
	F2	F1
Control Beliefs		
Positive items		
7. If you decide to sit down and learn really hard, can you do it?	0.51	
10. Can you get good grades when you really want to?	0.51	
42. Can you get all the problems (e.g. in spelling) right, when you want to?	0.65	
35. If you want do well in school, can you?	0.76	
Negative items	0.40	
3. If you really make up your mind not to get any bad grades, can you do it?		
5. Is there anything you can do stop yourself getting bad grades?	0.44	
34. If you really decide that you are going to get any problems wrong (e.g. in maths or spelling) can you do it?	0.66	
41. If you want to can you keep from doing badly in school?	0.54	
30. When a students do better than usual in as object, is it difficult to tell why?		0.61
26. If the teacher asks a student a hard question and he or she answers correctly, is it usually difficult to work out why the student gave the right answer?		0.47
46. If a student get a good grades in school, is it hard to know the reason why?		0.65
55. Is it hard to know why a student does really well on a test?		0.66
31. If students do badly in school, is it hard to work out why this has happened?		0.49
27. When a student makes a lot of mistakes (e.g., in a spelling test), is it hard to know the reason why?		0.54
54. When students give the wrong answer to teachers' questions, do you find it hard to know why it has happened?		0.71
59. Is it difficult to know why a student does worse than usual in a subject?		0.49
EIGENVALUES	3.25	2.27
PERCENTAGE OF THE VARIANCES	20.3	14.2

7.3.2. Factor Analysis Results for Nowicki-Strickland Internal and External Locus of Control for Children (CNSIE):

Using Cattell's (1978) Scree test, it was difficult to decide between a two and four factor solution. The cumulative percentage of the variance explained in each case was: (1) two factor - 16.2% for Turkish and 18.3% for English, (2) four factor - 25.3% for Turkish and 27.8% for English.

In the literature there is no agreement about the factor structure of the scale. Some of the research indicates a three factor solution with the varimax rotation (Barling, 1980; Nowicki, 1976; Piotrowski & Dunman, 1983) while others came up with the short version of the scale (20 items) and the four factor solution with the varimax rotation (Raine, Derek & Venables, 1981) or with oblimin rotation (Lindal & Venables, 1983). Also, the items emerged in different factors in different studies (Watters et al., 1990). Some of the researchers found Helplessness to be a first main factor (Wolf, Sklow, Hunter & Brenson, 1982), as Nowicki (1976) suggested. Watters and his colleagues (1990) have argued that it is almost impossible to replicate the factor structure of CNSIE in different samples. Because of a certain level of compatibility with the literature the results presented here are based on the four factor solution. Overall, we decided to compare results within our samples (Turkish/English) instead of with the literature. It was possible to came up with a fairly consistent four factor solution which applied to both samples.

Although the order of the four factors and the number of items is different, they are still consistent. Therefore we eliminated the items which were not present in the same factor in the two samples. Finally we identified the same items in the same factors in each sample. The total number of items which emerged in these four factors for both samples was 27. We call these factors: Relationships with peers (containing the six items 12, 18, 23, 27, 33, 36); Powerful Others (containing the six items 5, 11, 14, 15, 19, 31); Internal (containing the seven items 4, 6, 22, 25, 28, 32, 40), and Luck (containing the eight items 1, 3, 8, 7, 10, 17, 21, 24). See table 7.3.2 for summary. The order of the factors and the number of the items in each factors are given in the following paragraphs for each sample.

Table 7.3.2: Nowicki-Strickland Internal-External Locus of Control Scale for Children Summary table for Common Four Factors solution (Total Questions=27).

Factors/Samples	F1(Turkish)/ F3(English)	F2(Turkish)/ F4(English)	F3(Turkish)/ F2(English)	F4(Turkish)/ F1(English)
Items	12, 18, 23, 27, 33, 36	5, 11, 14, 15, 19, 31	4, 6, 22, 25, 28, 32, 40	1, 3, 7, 8, 10, 17, 21, 24
Explained Percentage of the Variance	Turkish 9.2% English 5.3%	Turkish 7.0% English 4.2%	Turkish 4.8% English 7.2%	Turkish 4.4% English 11.1%

F1(Turkish)/F3(English): Relations with peer.
F2(Turkish)/F4(English): Powerful others, avoidance, fatalism.
F3(Turkish)/F2(English): Internal (Effort, ability, and skill)
F4(Turkish)/F1(English): Luck, fatalism, and avoidance.

In the English sample the order of the four factors was: Luck, containing eight items which explained 11.1% of the variance, Internal, containing eleven items and explaining 7.2% of the variance, Relationships with Peers, containing eight items and explaining 5.3% of the variance and Powerful Others, containing seven items and explaining 4.2% of the variance. Together they explained 27.8% of the variance. See table 7.3.2.a.

The same four factors also emerged for the Turkish sample but in a different order. The order of the factors was: Relationships with Peers, containing eleven items and explaining 9.2% of the variance, Powerful Others, containing eight items and explaining 7.0% of the variance, Internal, containing nine items and explaining 4.8% of the variance and Luck, containing ten items and explaining 4.4% of the variance. The overall, explained cumulative percentage of the variance explained was 25.3%. See table 7.3.2.b.

Table 7.3.2.a: Four factors solution with varimax rotation, for the English sample for Nowicki-Strickland Internal-External Locus of Control Scale for Children (CNSIE).

NOWICKI-STRICKLAND'S LOCUS OF CONTROL SCALE ITEMS	FACTOR LOADINGS			
	F1	F2	F3	F4
1. Do you believe that most problems will usually sort themselves out in time?	0.33			
2. Do you believe that you can stop yourself from catching a cold?	-0.31			
3. Are some children just born lucky?	0.66			
4. Most of the time do you feel that getting good grades means a great deal to you?		0.52		
5. Are you often blamed for things that just aren't your fault?				0.64
6. Do you believe that if somebody studies hard enough he or she can pass any subject?		0.45		
7. Do you feel that most of the time it doesn't pay to try because things never turn out right anyway?	0.51			0.38
8. Do you feel that if things start out well in the morning it's going to be a good day no matter what you do?	0.54			
9. Do you feel that most of the time parents listen to what their children have to say?		0.34		0.44
10. Do you believe that good things can be made to happen simply by wishing them?	0.52			
11. When you get punished does it usually seem to be for no good reason at all?				0.56
12. Most of the time do you find it hard to change a friend's opinion?			0.36	
13. Do you think a team is helped to win more by cheering than by luck?		0.22		
14. Do you feel that it's nearly impossible to change your parent's mind about anything?			0.31	0.40
15. Do you believe that your parents should allow you to make of your own decisions?				-0.53
16. Do you feel that when you do something wrong there is very little you can do to make it right?	0.35			0.36
17. Do you believe that some children are just born good at sports?	0.30			
18. Are most of the others children your age stronger than you are?			0.56	
19. Do you feel that one of the best ways to handle most problems is just not to think about them?	0.48			
20. Do you feel that you have a lot of choice in deciding who your friends are?		0.32		
21. If you find a four-leaf clover do you believe that might bring you good luck?	0.42			
22. Do you feel that whether you do your homework has much to do with what kinds of grades you get?		0.55		
23. Do you feel that when another teenager your age decides to hit you, there is little you can do stop him or her?			0.49	
24. Have you ever had a good luck charm?	0.37			
25. Do you believe that whether or not people like you depends on how you act?		0.56		
26. Will your parents usually help you if you ask them to?		0.47		0.33
27. Have you felt that when people were mean to you it was usually for no reason at all?			0.40	
28. Most of the time, do you feel that you can change what might happen tomorrow by what you do today?		0.41		
29. Do you believe that when bad things are going to happen no matter what you do to try to stop them?	0.35		0.30	

30. Do you think that children can get their own way if they just keep trying?	-0.27			
31. Most of the time do you find it useless to try to get your own way at home?				0.28
32. Do you feel that when good things happen they happen because of hard work?		0.57		
33. Do you feel that when somebody your age wants to be your enemy there is little you can do to change matters?			0.66	
34. Do you feel that it is easy to get friends to do what you want them to?	-0.41			
35. Do you usually feel that you have little to say about what you get to eat at home?			0.42	
36. Do you feel that when someone doesn't like you there is little you can do about it?			0.60	
37. Do you usually feel that it is almost useless to try in school because most other children are just cleverer than you are?	0.51			
38. Are you the kind of person who believes that planning ahead makes things turn out better?		0.28		
39. Most of the time, do you feel that you have little say in what your family decides to do?			0.46	0.36
40. Do you think it is better to be clever than to be lucky?		0.41		
EIGENVALUE	4.5	2.9	2.1	1.7
PERCENTAGE OF THE VARIANCE	11.1%	7.2%	5.3%	4.2%
NUMBER OF THE SUBJECTS	368			

Table 7.3.2.b: Four factors solution with varimax rotation, for the Turkish sample for Nowicki-Strickland Internal-External Locus of Control Scale for Children (CNSIE).

NOWICKI-STRICKLAND'S LOCUS OF CONTROL SCALE ITEMS	FACTOR LOADINGS			
	F1	F2	F3	F4
1. Do you believe that most problems will usually sort themselves out in time?				0.39
2. Do you believe that you can stop yourself from catching a cold?			0.22	
3. Are some children just born lucky?				0.58
4. Most of the time do you feel that getting good grades means a great deal to you?			0.34	
5. Are you often blamed for things that just aren't your fault?		0.42		
6. Do you believe that if somebody studies hard enough he or she can pass any subject?			0.41	
7. Do you feel that most of the time it doesn't pay to try because things never turn out right anyway?				0.35
8. Do you feel that if things start out well in the morning it's going to be a good day no matter what you do?				0.51
9. Do you feel that most of the time parents listen to what their children have to say?		0.44		
10. Do you believe that good things can be made to happen simply by wishing them?				0.51
11. When you get punished does it usually seem to be for no good reason at all?		0.47		
12. Most of the time do you find it hard to change a friend's opinion?	0.32			
13. Do you think a team is helped to win more by cheering than by luck?				-0.24
14. Do you feel that it's nearly impossible to change your parent's mind about anything?		0.57		
15. Do you believe that your parents should allow you to make of your own decisions?		0.55		
16. Do you feel that when you do something wrong there is very little you can do to make it right?	0.47			
17. Do you believe that some children are just born good at sports?				0.38
18. Are most of the others children your age stronger than you are?	0.33			
19. Do you feel that one of the best ways to handle most problems is just not to think about them?				0.20
20. Do you feel that you have a lot of choice in deciding who your friends are?	0.36			
21. If you find a four-leaf clover do you believe that might bring you good luck?				0.50
22. Do you feel that whether you do your homework has much to do with what kinds of grades you get?			0.52	
23. Do you feel that when another teenager your age decides to hit you, there is little you can do stop him or her?	0.44			
24. Have you ever had a good luck charm?				0.37
25. Do you believe that whether or not people like you depends on how you act?			0.52	
26. Will your parents usually help you if you ask them to?		0.62		
27. Have you felt that when people were mean to you it was usually for no reason at all?	0.49			
28. Most of the time, do you feel that you can change what might happen tomorrow by what you do today?			0.33	
29. Do you believe that when bad things are going to happen no matter what you do to try to stop them?	0.36			

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30. Do you think that children can get their own way if they just keep trying?			**0.41**	
31. Most of the time do you find it useless to try to get your own way at home?		0.26		
32. Do you feel that when good things happen they happen because of hard work?			**0.56**	
33. Do you feel that when somebody your age wants to be your enemy there is little you can do to change matters?	**0.52**			
34. Do you feel that it is easy to get friends to do what you want them to?	**0.48**			
35. Do you usually feel that you have little to say about what you get to eat at home?		**0.38**		
36. Do you feel that when someone doesn't like you there is little you can do about it?	**0.57**			
37. Do you usually feel that it is almost useless to try in school because most other children are just cleverer than you are?	**0.44**			
38. Are you the kind of person who believes that planning ahead makes things turn out better?			**0.55**	
39. Most of the time, do you feel that you have little say in what your family decides to do?		**0.56**		
40. Do you think it is better to be clever than to be lucky?			**0.50**	0.30
EIGENVALUE	3.67	2.80	1.91	1.76
PERCENTAGE OF THE VARIANCE	9.2%	7.0%	4.8%	4.4%
NUMBER OF THE SUBJECTS 453				

7.3.3. Factor Analysis Results for Multidimensional Academic Specific Locus of Control Scale (MASLOC):

This scale showed a fairly clear three factor solution in both samples. The factors are compatible with the original study. The Turkish sample result was more like the original sample. In the original sample the first factor was Internality, the second factor was Luck and the third factor was Helplessness. Also, the first factor before extraction explained most of the variance (Palenzuela, 1988).

The order of the factors was different in our samples. For the English sample, Helplessness was the first factor (third in the original) and explained 26.7% of the variance. Items pooled in this factor were 4, 8, 9, 12, 13, 14 15 (items in the original were 4, 8, 9, 14, 15). The second factor was Luck and explained 12.1% of the variance. The items in this factor were 1, 3, 5, 6, 12 and 13 (items in the original factor were 1, 3, 6, 12, 13). Items 1, 3, 6, 12 and 13 were negatively loaded. Items 12 (-0.43) and 13 (-0.29) had a negative and high factor loading on this factor but also appeared in Factor 1. Factor three, called Internality, explained 8.1% of the variance and contained the items 2, 7, 10, 11 (items in the original were 2, 5, 7, 10, 11). Although item 5 (0.24) appeared in the second factor (called luck) it was also loaded on this factor. The other item which seems highly loaded on this third factor was item 3 (0.46). When we looked at the first factor extracted before rotation all items except 2 (0.27), 5 (0.16) and 6 (.-0.05) were above the 0.30 limit. See table 7.3.3.a.

For the Turkish sample, Luck was the first factor and explained 26.7% of the whole variance. The items pooled in this factor were 1, 3, 4, 12, 13 (items in the original factor were 1, 3, 6, 12, 13). Item 6 appeared in this (0.32) and the second (0.44) factor, which was Internality in the original study. The second factor was Internality and explained 10.7% of the whole variance. The items (2, 5, 6, 7, 10, 11) were mostly negatively loaded (items in the original were 2, 5, 7, 10, 11). Factor three, called Helplessness, explained 8.9% of the whole variance. The items were 8, 9, 14, 15 (items in the original were 4, 8, 9, 14, 15). Although item 13 (0.48) appeared in the first factor (called luck) it was also loaded on factor three (helplessness). When we looked at the first factor extracted before rotation all items, except 3 (0.26), 6 (0.01) and 8 (0.25) were above the 0.30 limit. See table 7.3.3.b.

Although item 6 ("My getting good or bad grades in my exams is related to whether the precise topics I have studied come up in the exam") loaded on the Luck subscale in both samples it seems

to have made very little contribution to the one factor solution. Also it loaded not only highly but also positively on the Internality subscale in the Turkish sample.

It seems that this is related to differences in the education system and therefore the connotation meaning of the whole sentence. It seems that thinking of selecting certain subjects to study for the exam depends on their skills and effort as well as luck.

Table 7.3.3.a: MASLOC Scale. Factors loadings in the English Sample.

| MASLOC ITEMS | FACTOR LOADINGS | | | |
	F1	F2	F3	1st Factor Extracted
1. If I want to obtain a good exam record it is essential that I should have good luck.	.24	-.62	.14	0.44
2. The grade I get at the end of the year will always be closely related to what I do during the year.	-.17	-.05	.72	0.27
3. Whatever the quality of my work I am always lucky when it comes to examinations.	-.04	-.48	.46	0.33
4. It is an absolute waste of time for me to make any effort, since there is no relationship between my capability, how hard I work, and the grades I will get.	.68	.06	.13	0.70
5. I am convinced that the grades I will get depend on how well or badly I do in my exams.	.11	.41	.24	0.16
6. My getting good or bad grades in my exams is related to whether the precise the topics I have studied come up in exam.	-.06	-.61	-.21	-0.05
7. The kind of grades I will get in my studies depends on how capable I am in preparing myself.	.00	.16	.61	0.32
8. I don't think it is worthwhile studying hard since the grades I will get will be completely manipulated.	.74	.18	.08	0.70
9. I am convinced that whatever I do my teacher will always give me the grades they want to.	.73	.04	-.09	0.62
10. If I want to get a good academic record I have to be competent and I must work hard.	.35	.09	.54	0.62
11. In general I believe that if one is competent and works hard one will get good result.	.19	.03	.62	0.53
12. Luck is decisive in kind of grades I get in my studies.	.46	-.43	.15	0.61
13. The grades I get are always determined by a series of random circumstances.	.56	-.29	-.08	0.54
14. It makes absolutely no difference whether I prepare well for a subject or not since in the long run teachers are "out to catch you".	.85	.10	-.06	0.73
15. Regarding my academic life I just don't know what to do. Anything might happen: may be I will do an exam well and fail or may be I will do it badly and pass.	.48	-.27	.01	0.52
EIGENVALUE	4.01	1.81	1.22	
PERCENTAGE OF VARIANCE	26.7	12.1	8.1	
NUMBER OF THE SUBJECTS 368				

Table 7.3.3.b.: MASLOC Scale. Factors loadings in the Turkish Sample.

MASLOC ITEMS	FACTOR LOADINGS			
	F1	F2	F3	1st Factor Extracted
1. If I want to obtain a good exam record it is essential that I should have good luck.	.66	.01	.00	0.45
2. The grade I get at the end of the year will always be closely related to what I do during the year.	-.05	-.55	-.26	0.50
3. Whatever the quality of my work I am always lucky when it comes to examinations.	.63	.12	.17	0.26
4. It is an absolute waste of time for me to make any effort, since there is no relationship between my capability, how hard I work, and the grades I will get.	.45	-.20	-.14	0.53
5. I am convinced that the grades I will get depend on how well or badly I do in my exams.	-.02	-.58	-.24	0.53
6. My getting good or bad grades in my exams is related to whether the precise the topics I have studied come up in exam.	.32	.44	-.19	0.01
7. The kind of grades I will get in my studies depends on how capable I am in preparing myself.	.03	-.63	.08	0.43
8. I don't think it is worthwhile studying hard since the grades I will get will be completely manipulated.	.38	-.28	.40	0.25
9. I am convinced that whatever I do my teacher will always give me the grades they want to.	-.05	-.07	-.55	0.31
10. If I want to get a good academic record I have to be competent and I must work hard.	.13	-.66	.05	0.53
11. In general I believe that if one is competent and works hard one will get good result.	.14	-.61	-.06	0.57
12. Luck is decisive in kind of grades I get in my studies.	.71	-.08	-.16	0.64
13. The grades I get are always determined by a series of random circumstances.	.48	-.10	-.31	0.57
14. It makes absolutely no difference whether I prepare well for a subject or not since in the long run teachers are "out to catch you".	.16	-.15	-.64	0.56
15. Regarding my academic life I just don't know what to do. Anything might happen: may be I will do an exam well and fail or may be I will do it badly and pass.	.11	.03	-.69	0.43
EIGENVALUE	3.26	1.60	1.33	
PERCENTAGE OF VARIANCE	26.7	10.7	8.9	
NUMBER OF THE SUBJECTS 453				

7.3.4. Religiosity Scale for Youth:

Factor analysis of this scale showed a clear one factor solution for both samples. The factor explained 55.6% of the total variance in the English sample and 45.8% of the total variance in the Turkish sample. Overall, except for item 9 ("Do you agree with the following statements: "Religion gives me a great amount of comfort and security"), it seems that all other items were more highly loaded on the factor in the English sample than in the Turkish sample. See table 7.3.4.

Table 7.3.4: Religiosity Scale. Factor loadings for the English (N=368) and the Turkish Samples (N=453).

	FACTOR LOADINGS	
RELIGIOSITY SCALE'S ITEMS	ENGLISH	TURKISH
2. How often have you attended religious services during the past year?	0.69	0.58
3. Which of the following best describe your views on prayer or religious meditation?	0.74	0.66
4. When you have a serious personal problem how often do you take religious advice or teaching into consideration?	0.78	0.67
5. How much of an influence would you say that religion has on the way that you choose to act or the way that you choose to spend your time each day?	0.75	0.69
6. Which one of the following statements comes closest to your belief about God?	0.80	0.67
7. Which of the following statements comes closest to your beliefs about life after death (immortality)?	0.63	0.59
8. During the past year, how often have you experienced feeling of religious reverence or devotion?	0.83	0.74
9. Do you agree with the following statements: "Religion gives me great amount of comfort and security"	0.70	0.76
EIGEN VALUE	4.45	3.66
PERCENTAGE OF THE VARIANCE	55.6	45.8
NUMBER OF THE SUBJECTS	368	453

7.3.5. Authoritarianism (F-Scale):

Cattell's (1978) Scree test for both samples suggested that one, two and four factor solutions were possible for Adorno's F-scale. For the English and Turkish samples respectively, the percentage of the variance explained by the first factor was 17.0% and 16.7%; for the second factor 7.4% and 6.9%; for the third factor 5.2% and 6.0% and for the fourth factor 4.8% and 4.6%. Because the amount of variance explained was the most in the first factor and because there was a clear cut-off on the scree between the first factor and the others we decided to use the one factor solution for this scale. See table 7.3.5.

For the English sample, all but four items were highly loaded on the first factor (items 2 (0.29), 3 (0.22), 4 (0.12) and 23 (0.26)). See table 7.3.5. In the Turkish sample eight items were below the 0.30 limit. These were items 2 (0.14), 4 (-0.07), 5 (.20), 6 (0.26), 16 (0.14), 18 (0.06), 25 (0.26), 30 (0.23). Item 2 and 4 were low in both samples, and this is also supported by the item analysis results (see Ch 2, 3, 4). These two quite old fashioned items, "No weakness or difficulty can hold us back if we have enough will power" (item 2) and "Human nature being what it is, there will always be war and conflict" (item 4),do not seem very good for measuring authoritarianism in today's adolescent.

On the other hand item 3, "Science has its place but there are many important things that can never be understood by the human mind" are connotationally different in English schools. Nowadays in

western culture, but not in Turkey, alternative medicine etc. is fairly well known and therefore has status here but not in Turkey. For this reason, this item didn't appear clearly in the first factor and may be highly loaded on another sub factor. Item 23, "The wild sex life of the old Greeks and Romans was tame compared to some of the goings-on in this country, even in places where people might least expect it" was not understood by some of the students in English schools. Perhaps their selective knowledge of Greek and Roman civilisations left them in ambiguity. This applied to a certain extent to Turkish pupils as well. In our view, this statement is very biased and reflects bygone opinions about Greek and Roman cultures (this test was first published in 1954).

In the Turkish sample, we believe item 16 " People can be divided into two distinct classes: the weak and strong", has a different connotational meaning for the pupils. They may not agree with this kind of statement because of high mobility between classes. Item 18, "Some day it will probably be shown that astrology can explain a lot of things" did not work because of the translation difficulty. The term astrology includes the meaning of "agony aunt" ("yildiz fali") in Turkish and this may have misled the subjects.

Table 7.3.5: Authoritarianism 'F' Scale. Factor loadings for the English (N=368) and the Turkish Samples (N=453).

AUTHORITARIANISM SCALE'S ITEMS	FACTOR LOADINGS	
	ENGLISH	TURKISH
1. Obedience and respect for authority are the most important virtues children should learn.	0.53	0.53
2. No weakness or difficult can hold us back if we have enough will power.	0.29	0.14
3. Science has its place but there are many important thin that can never be understood by the human mind.	0.22	0.33
4. Human nature being what it is, there will always be war a conflict.	0.12	-0.07
5. every person should have complete faith in some supernatural power whose decisions are obeyed without question.	0.37	0.20
6. When a person has a problem or worry, it is best for him not to think about it, but to keep busy with more cheerful things.	0.38	0.26
7. A person who has no manners, bad habits, and poor breeding can hardly expected to get along with decent people.	0.52	0.43
8. What youth needs most is strictly discipline, rugged determination, and the will to work and fight for family and country.	0.56	0.60
9. Some people are born with an urge to jump from high places.	0.34	0.35
10. Nowadays when so many different kinds of people move around and mix together, a person has to protect himself especially carefully against catching an infection or disease from them.	0.50	0.47
11. An insult to our honour should always be punished.	0.50	0.47
12. Young people sometimes get rebellious ideas but as they grow up they ought to get over them.	0.48	0.62

13. It is essential for learning or effective work that our teacher or bosses outline in detail what is to be done and exactly how to do it.	0.33	0.45
14. What this country needs most, more than laws and political programmes, is a few courageous, tireless leaders in whom the people can put their faith.	0.38	0.40
15. Sex crimes, such as rape and attacks on children, deserve more than mere imprisonment; such criminal ought to be publicly whipped, or worse.	0.42	0.52
16. People can be divided into two distinct classes: the week and strong.	0.40	0.14
17. There is hardly anything lower than a person who does not feel a great love, gratitude, and respect for his parents.	0.55	0.64
18. Some day it will probably be shown that astrology can explain a lot of things.	0.39	0.06
19. Some leisure is necessary but it is good hard work makes life interesting and worthwhile.	0.49	0.41
20. Nowadays more and more people are prying into matters that should remain personal and private.	0.34	0.37
21. Wars and social troubles may someday be ended by an earthquake of flood that will destroy the whole world.	0.43	0.34
22. Most of our social problems could be solved if we could somehow get rid of immoral, crooked, and feebleminded people.	0.58	0.50
23. The wild sex life of the old Greeks and Romans was tame compared to some of the goings-on in this country, even in places where people might least expect it.	0.26	0.30
24. If people would talk less and work more, everybody would be better off.	0.49	0.44
25. Most people don't realise how much our lives are controlled by plots hatched in secret places.	0.34	0.26
26. Homosexuals are hardly better than criminals and ought to be severely punished.	0.37	0.47
27. Books and videos ought not to deal so much with the unpleasant and seamy side of life: they ought to concentrate on themes that are entertaining or uplifting.	0.34	0.51
28. No sane, normal, decent person could ever think of hurting a close friends and relative.	0.33	0.52
29. Familiarity breeds contempt.	0.41	0.35
30. When you come right down to it, it is human nature never to do anything without an eye to profit.	0.31	0.23
EIGEN VALUE	5.11	5.02
PERCENTAGE OF THE VARIANCE	17.00	16.7
NUMBER OF THE SUBJECTS	368	453

7.4. SUMMARY

The factor analysis results indicated that the CAMI scale shows the factor structure suggested by the original study (Skinner, Chapman & Baltes, 1988). In the English sample the factors always came out in the same order as the original study. In the Turkish sample the order was different. In the Turkish sample's Attribute subscale, three Control Beliefs items (items 7, 42 & 41) loaded on Agency. Also, in the Turkish sample's Powerful Others subscale, items 14 and 45, which are Means-End items in the original, loaded on both Means-End and Agency. The same structure occurred in the English sample only for item 45.

The CNSIE functioned poorly and showed a different factor structure for the two samples. Still, a four factor solution was identified for both of the samples in this study. The factors were Luck, Internal, Relationships with peers, and Powerful others.

MASLOC showed a fairly clear three factor solution, as in the original. Only the order of the factors was different from the original. Also it seems that the results of the Turkish sample are more like the original in terms of the order of the factors and the valence of the sign (e.g. Internality loaded negatively in both the original and the Turkish sample). As the original study was done in Spain, which is a Mediterranean culture, one could hypothesise a greater similarity between Spain and Turkey than between Spain and Britain.

The Religiosity Scale (Rohrbaugh & Jessor, 1976) was the most successful scale of the five scales used in this research. The factors were clear and similar in both this sample and the original.

The Authoritarianism scale (F-scale) (Adorno et al. 1950; Christie, 1991) was the second best functioning scale. A one factor solution emerged for both samples. Items 2 and 4 were loaded low (less than the 0.30 limit) in both samples and this was also supported by the item analysis (see chapter 6). Items 3 and 23 were lower than .30 in the English sample and items 5, 6, 16, 18, 25, 30 also seemed to have a low factor loading in the Turkish sample. Therefore 10 of the 30 items were dropped from this scale.

7.5. CONCLUSIONS

It was decided that for the main body of this research there are some modifications to be made before any cross-cultural comparison can be made. From the factor analysis results it seems that CAMI and the Religiosity scale showed the same factorial design as the original study. The Authoritarianism scale showed a one factor solution after eliminating 10 of the items from the scale. CNSIE gave no clear factor solution, which is consistent with the literature, but it was possible to come out with a fairly stable four factor solution for both samples in this study. MASLOC had a three factor solutions as in the original but there were problems with the order and the location of the questions in the factors. This scale was also found to have a consistent one factor solution.

For the CAMI scale 5 factor analyses were run as in the original to confirm three domains (Control, Means-Ends, Agency) of the CAMI scale. Although the order of the factors sometimes differed from one sample to another nevertheless they appeared to be the same. This can interpreted as suggesting that the scales' conceptual validity also applies to this study's samples. Given that in this study an older age group, between 15 and 18 years old, was compared with the original sample who were between 7 and 12 years old (Skinner et al., 1988) it is encouraging and reassuring to find the same domains as the early study. This factor analysis showed that the CAMI has conceptual validity for different cultures and different age groups. Additionally, these results can be taken as evidence for the theoretical developments of the concept of, at least for children and adolescents (see the argument for the domain specificity of the concept in chapter 1).

CNSIE did not show a one factor solution for either of the samples. It is certainly not a one factor scale as Nowicki and Strickland (1973) originally suggested. After several tries a four factor solution seemed to be best for both our samples. These four factors were Luck, Helplessness, Relationships with Peers and Powerful Others. This fits with later studies which say that there is more than one factor to investigate (Nowicki, 1976; Lefcourt, 1981, 1991). The problem is that although it is possibly multidimensional there is no evidence of a stable factor structure from one sample to another (Watters et al., 1990). It is also difficult to make a decision about how many factors exist (Watters et al., 1990) or whether the factors apply to different subgroups based on gender (Kearney & Kearney, 1983; Nowicki, 1976; Wolf et al., 1982), age, grades (Nowicki, 1976; Wolf et al., 1982; Piotrowski & Dunham, 1983), or race (Wolf et al., 1982).

The inconsistent results in the literature and in this study create doubt about the quality of the scale. Firstly the evidence that it is not unidimensional invalidates the total-score studies done with

the scale. Secondly the inconsistent factorial structure in the literature and in this study works against attempts to establish a multifactorial measurement of perceived control. These results may well be evidence of changes in the structural validity of the concept. Perhaps the early studies and measurement only took into account one domain (internal/external) and tested this in different life domains in an unplanned way. For example CNSIE did not make any attempt to represent equally the Luck, Helplessness or Powerful Others domains. So because the conceptual validity of the scale is doubtful it is not valid for this study or for new studies of perceived control.

MASLOC showed one and three factors solutions. It seems that the one factor solution is more stable than the three factor solution in the two samples. This result seems rather ironic because MASLOC attempts to be a multidimensional scale but in our study it appear to be unidimensional. Palenzuela's (1988) conceptual analysis of perceived control led him to develop the new domain specific multidimensional scale. In his early study the early versions of the same scale appear to have four factors as well one main factor (Palenzuela, 1984). Perhaps our study supports his early finding. Additionally, it was interesting to see more similarities between our Turkish and the original (Spanish) sample than between English and Spanish. This may be explain as showing either the validity of the scale in Mediterranean cultures or the poor translation of the English version.

The RELIGIOSITY scale had a clear one factor solution. Astonishingly clear and successful measurement was found in the original American sample, our English, predominantly Christian sample and our Turkish, predominantly Muslim sample. The scale seems to be valid for different cultures and religions. The scale was originally developed to test the relationships between individual and social variables and drug use in adolescents in America. It proved to be very predictive and valid in these studies in the early seventies (Jessor & Jessor, 1974) and late eighties as well (Jessor, Donovan & Costa, 1994). This scale was the most successful of all the measurements used in the study cross-culturally.

AUTHORITARIANISM There was a one factor solution after ten omissions. Given that the scale was developed in the early fifties it was expected that some of the items would not be valid for today's adolescents. In fact the results were more positive than we expected. The cultural differences were minimum at the item level, opposite to our expectation. These results show that regardless of the age of the scale it is a valid and reliable one factor measure of authoritarianism.

CHAPTER 8: ITEM RESPONSE THEORY

CHAPTER 8: DIFFERENTIAL ITEM FUNCTIONING BETWEEN CULTURES

8.1. INTRODUCTION

In this third part of the cross-cultural comparison, detecting item bias between cultures has been done using Item Response Theory (IRT). There are at least two ways of comparing item characteristics using IRT. First there is a comparison of parameters such as a, item discrimination, b, item difficulty and c, pseudo guessing (Linn, Levine, Hasting, and Wardrop, 1981). Second there is a calculation of the area between the curves (ICCs) (Rudner, Getson, and Knight, 1980; Raju, 1988). In this study the differences between responses for the same item were detected with the Differential Item Functioning (DIF) model using the parameters of Item Response Theory (IRT) for rating scales. This is called Samejima's graded model and has been tested by Thissen (1991) and Thissen, Steinberg & Wainer (1993). The common accepted definition of Differential Item Functioning (DIF) is that "an item shows DIF if individuals having the same ability, but from different groups, do not have the same probability of getting the item right." (Hambleton, Swaminathan & Rogers, 1991). DIF rather than item bias has been used at this stage to clarify possible misunderstandings about the concept tested by the scale. DIF only presents empirical evidence of the difference between samples whereas item bias includes inferences about this difference.

To compare item parameters (a, b and sometimes c) for two groups a chi-square statistic is computed. The statistic may or may not include c parameters depending on the model that has been used. There are clear advantages and disadvantages to chi-square statistics. An advantage is that it is a known distribution but on the other hand it may give a high false-positive rate because of robustness of the test (Hambleton et al., 1991).

8.2. METHOD

8.2.1. Design

For the analyses the two samples are treated as one sample containing two groups. The data design for this analysis was adapted from Thissen, Steinberg & Wainer (1993) differential item functioning model. An example of the data organisation (plan) for this analysis is given in figure 8.2.1.

Figure 8.2.1: Arrangement of the data for Differential Item Functioning analysis of English and Turkish samples.

Items							
English sample	items			Turkish sample items			
EI1	EI2	EI3	EI4	TI1	TI2	TI3	TI4-
2	3	1	1				
1	2	2	2				
2	4	1	1				
1	4	2	1				
				1	4	2	2
				1	3	1	1
				2	4	2	2
				2	3	1	2

EI1: English sample response to the item 1, TI1: Turkish sample response to the item 1.

8.2.2. Analysis

Again Thissen's (1991) MULTILOG package program was used to fit Samejima's (1969) Graded Model to the data. This model applies if the items have more then one possible response, like, in our case, a monotonic rating scale. The program was first run when the parameters were free for each item (e.g. CAMI: for each item, one item discrimination value (a) and three item difficulty values (bs) for each cut-off between responses on the four point rating scale). Then the same analyses were run with these parameters constrained to be equal for both samples of each item.

8.2.3. Instruments

The questionnaires were CAMI, CNSIE, MASLOC, Religiosity, and Authoritarianism (see Method chapter).

8.2.4. Sample

Eight hundred and twenty students' data from two samples redesign to test item functioning. Same sample as before (see Method chapter).

8.2.5. Procedure

Here we report the results of using MULTILOG (1991) to detect Differential Item Functioning (DIF) between the two samples for each questionnaire. As we mentioned before (chapter 3), for CAMI and CNSIE there are four alternative responses to each item, representing a monotonic rating scale. For MASLOC and the Authoritarianism Scale there are six alternative responses, and for the Religiosity in Youth scale there are five alternative responses to each item. The parameters estimated are therefore four, five or six, according to the number of responses represented on the

scale. The a parameter reflects the discriminating power of the item. The other three or four or five (according to the scale) show the location of the cut off point between one response and the next for the rating scale (Samejima, 1969; Thissen, 1991). These parameters in each scale are first allowed to be different in each sample and are then forced to be the same for both samples (Thissen et al, 1993). We have the responses of monolingual students from the two cultures who responded to the items in their own native language. By comparing Chi-square values, we can test for the significance of any differences between English and Turkish students responses to each item. Thus we can detect the differential item functioning (item bias between samples).

8.2.6. Hypothesis

Differences between samples will be due to item malfunctioning (Hambleton et al., 1991) or cultural differences (Hui & Triandis, 1983; Van der Vijver & Poortinga, 1982; Poortinga & Van der Vijver, 1987, Hulin, 1987).

8.3. RESULTS

In this part we are going to present the results for differential item functioning but only for differences between $\chi 2$. The "a" and "b" values will not be presented or interpreted even though most of them were above the criterion values for both samples because the results seemed numerically unstable in most of the subscales. This unreliability was due to the sample size. However, see appendix D for the "a" and "b" values.

8.3.1. Control, Means-Ends and Agency beliefs (CAMI):

The results showed that for CAMI all ten subscales functioned differently in the two cultures. All subscales exceed the critical value of X^2. However, for all the Agency beliefs subscales the chi-square values were negative when the parameters were free or constrained. For Means-Ends beliefs for Luck the chi-square values were negative when the parameters were free (X^2= -93.6, df=32). These negative values make us suspect numerical instability in the data. The square of a number is a positive numerical value, therefore the negative results we have got can only be explained by numerical instability. We think that although we had a fairly big sample to run the program it may not be enough. IRT programs in general require 1000 subjects to run and we had 820. Furthermore, the number of parameters are much higher then demonstration samples given in the manual (Thissen, 1991) and other literature (Thissen & Steinberg, 1984; Thissen, Steinberg and Wainer, 1993). In demonstrations the scales usually have three monotonic ratings and only two items are investigated at one time. Therefore the maximum number of parameters dealt with at once is twelve. In our case, the scales had at least four rating points and at least four items.

Therefore the minimum number of parameters to be estimated is 32. The maximum number of parameters is 320. This is in CNSIE which has forty items and four rating points.

8.3.2. Nowicki-Strickland Internal vs External Locus of Control Scale (CNSIE) :

With this scale we had running problems with the early version so we needed to use a high capacity version of the program (MULTILOG) to enable us to process more then 50 items at once. Although CNSIE has got only 40 items, because of the study's requirements we needed to treat the items in the two languages as being completely different (e.g. 80 items instead of 40).

CNSIE showed substantial differential item functioning. The difference between X^2 for parameters fixed and free was 2110.5; df=180 (see summary table 8.4.1).

8.3.3. Multidimensional Academic Specific Locus of Control Scale (MASLOC):

The results showed that each of MASLOC's subscales functioned differently in the two samples. For the Internal subscale the difference was 406.3; df=30; for Helplessness 189.2, df=30; for Luck 53.1. When the parameters were free X^2 for the Internal subscale was negative, (X^2=-190.0).

8.3.4. Religiosity in Youth Scale:

The results showed that even the most stable scale in the questionnaire showed differential item functioning. The differences between samples was 331.4, df=32. This can only be interpreted as a cultural difference or emic (Berry et al., 1992). The item fidelity study with the bilingual sample showed that there was no bias or different interpretations of the same items in the two languages. Therefore the differences between X^2 are due to cultural differences rather than item bias.

8.3.5. Authoritarianism F-Scale:

The differences between samples was 314.8, df=160, p<0.01. Therefore the Authoritarianism scale shown differential item functioning, which we think is the result of two causes. First, because we did not drop any items after the first part of this research some of them (e.g. 2, 4) may have functioned badly because of translation biases. Second, some other items differences may be because of cultural differences or emic.

8.4. SUMMARY

The results showed that for CAMI all the subscales functioned differently in the two cultures. Additionally, in CAMI Means Ends For Luck and the Agency beliefs subscales (e.g. agency for effort, luck, attribute, powerful others) the chi-square values were negative in both cases when the parameters were free and constrained. These negative X^2 values suggests numerical instability in the data. The results showed that each of MASLOC's subscales functioned differently in the two cultures. When the parameters were free X^2 for the Internal subscale was negative. Both the Religiosity scale and the Authoritarianism scale functioned differently in the two cultures. In these cases X2 was numerically stable. Therefore the results were reliable.

Table 8.4.1: Detecting Item Bias in English and Turkish Samples with the Comparison of the Differences Between Item Characteristics when are the Parameters Free and Constrained.

SCALES	PARAMETERS CONSTRAINED	PARAMETERS FREE	DIFF.	DF	P<.01
CONTROL, MEANS-ENDS, AGENCY BELIEFS					
Control Belief	3033.0	2662.0	371	32	55.3
Means-Ends Beliefs					
Effort	3431.9	3224.7	207.2	32	55.3
Luck	33.7	- 93.6	n/a	32	55.3
Unknown Factors	1843.4	1764.0	79.4	32	55.3
Attribute	2682.6	2441.1	241.5	32	55.3
Powerful Others	2199.5	2034.7	164.8	32	55.3
Agency Beliefs					
Effort	- 4042.7	-4163.6	n/a	16	32.0
Luck	- 3740.8	-3831.6	n/a	16	32.0
Attribute	- 3923.8	-3970.4	n/a	16	32.0
Powerful Others	- 3589.8	-3642.1	n/a	16	32.0
CNSIE Nowicki-Strickland's LOC Scale	65388.4	63277.9	2110.5	160	
MASLOC Palenzuela's LOC Scale	24200/3	23530.5	669.8	90	124.1
Internal	216.3	-190.0	n/a	30	50.9
Helplessness	1305.9	1116.7	189.2	30	50.9
Luck	1511.7	978.6	533.1	30	50.9
RELIGIOSITY SCALE	4745.3	44133.9	611.4	40	63.7
AUTHORITARIANISM SCALE	67724.6	67409.8	314.8	180	226.3

8.5. CONCLUSIONS

There are a few problems related to the results of DIF in this study. Firstly unlike other item analyses the differences between the two samples were far more significant. This could be explained by the sensitivity of item characteristic curves, item information and the nature of the analysis, but also may be caused by the robustness of the X^2 analysis used for DIF detection (Hambleton et al., 1991). Secondly and most importantly, in some of the DIF analyses X^2 was negative, which is impossible. Therefore the reliability of these analyses should be treated with caution. This brings up the issue of the limitation of the programme and most importantly the reliability of Item Response Theory when the sample size is not bigger than 1000.

The results of DIF in this comparison were different from the those of the other methods used. It is not clear if the differences detected were reliable or a false alarm of the analysis. Because χ^2 is so sensitive it is likely that detected differences may be false alarms. These are more likely to occur in cross cultural data because of the number of sources of variance.

8.0. GENERAL CONCLUSIONS FOR PART II

The general finding of this part is that there are differences between the English and Turkish data at the item level. But the are also differences in the size of differences detected by the different methods. Classical item analysis detected some differences but also many similarities at the item level. Factor analysis revealed factor similarities for most of the scales (CAMI, Religiosity and Authoritarianism in particular). But IRT, investigated with Thissen's MULTILOG and Samejima's Graded model for rating scales, came out with many differences in all the scales concerned. Additionally, some of the results contained unexpectedly negative results, which raises the possibility of the unreliability of the results in these cases (Means-End beliefs for Luck of CAMI and for the Internal subscale of MASLOC as well as CNSIE) and suggests that a larger sample size was needed.

The general conclusions drawn for scales from the second part are:

CAMI proved to be a good, cross-culturally reliable scale and all 10 subscales can be used. The factor structures were very similar in both samples of this study and to the original sample in West-Berlin but the order of the factors was different on some occasions. Factor structures have also been found to be valid in recent years for East-Berlin and Russian samples (Little et al., 1995; Statsensko, et al., 1995; Oettingen, Little, Lindenberger & Baltes, 1994).

The CAMI Control beliefs subscale is problematic. The CAMI Means-Ends Scale is acceptable on cross-cultural comparability but was not in terms of item quality (item-total correlations) in one or the other culture. Means-Ends for Luck and Unknown were fine but in the scales for Effort, Attribute and Powerful others, between one and three items out of 8 were low on item-total correlations.

The CAMI agency subscales were fine on cross-cultural comparisons as well as item-total correlations.

The Control belief scale had some problems in the original studies as well. It was not a good predictor of academic performance (Skinner , Schindler & Tschechne, 1990) and was not very informative theoretically because it only represented the direct causal relationship between agency and outcome without any mediation. So it was not about competence or strategies of the individual in fulfilling his or her aims (Skinner, 1995). Second, unlike other domains it was only represented by eight questions which is a small representation of the concept. In the author's view this domain

is like a general aspect of perceived control that does not take into account multidimensionality, as the subscales of Agency and Means-Ends do, each of which is represented by 8 items.

These results so far support the idea that the Means-Ends beliefs are more culture dependent than Agency beliefs. But most importantly, they are applicable to both cultures (Derived etic or etic). Evidence from other studies is that Agency seems more likely to be an etic aspect of perceived control (Little et al., 1995). The CAMI scale will be used in the cross-cultural comparison part of the study because it passes investigation of the derived etic, at least for the Means-Ends and Agency beliefs subscales.

CNSIE: This will be taken out of the study for more than one reason. Although translation fidelity was mainly acceptable, the scale failed to show good reliability and high item-total correlations. This raises the possibility of the multidimensionality of the scale. But although the factor analysis suggested the multidimensionality of the scale it was hard to see any consistent factor structure. This is also found in the literature. Therefore, the multidimensionality of the scale may also be questioned. One other explanation of this inconsistent factor structure may be related to early theories that the concept was unidimensional (Rotter, 1966, 1975; Nowicki & Strickland, 1973). Recent literature indicates that the concept is multidimensional therefore CNSIE was developed on an immature conception of perceived control.

MASLOC: The three factor solution failed at a certain level but the one factor solution was fine after an item had been dropped. The Helplessness and Luck subscales were problematic in all of the analyses carried out. The reliability of the scale and most of the items seemed to be better in the Turkish sample than the English. This can be related to the similarities in experiences between Turkish and Spanish cultures, as the scale was originally in Spanish. The expressions used in the English scale have also been questioned. The differences in English were more to do with nuance differences rather than the meaning but it may be still important enough to effect the results.

RELIGIOSITY. The factor and classical item analysis results have been taken into account. It is retained without any changes and the one factor solution is accepted.

AUTHORITARIANISM: Factor analysis and classical item analysis were used to take some of the items out of the scale to leave the derived etic items for the final comparisons.

PART III
COMPARISON BETWEEN CULTURES

CHAPTER 9: ANTACEDENTS OF
PERCEIVED CONTROL BETWEEN CULTURES

CHAPTER 9: ANTECEDENTS OF PERCEIVED CONTROL BETWEEN CULTURES

9.1. INTRODUCTION

The cross-cultural comparability of the scales was investigated in depth in the first and second parts. Now, finally, in this chapter we will investigate the relationship between perceived control and its social antecedents using the instruments that have been shown to be similar (derived etic) for the two cultures.

We know that perceived control is a very good predictor of performance at all ages, particularly during late childhood and adolescence in secondary schools (Findley & Cooper, 1983), Because of its predictive value for many behaviours we would like to know how perceived control develops during an individual's life. The developmental aspects and the effects of environmental factors on perceived control have been discussed but it seems that the literature is not at all conclusive.

First of all, in the early literature, developmental changes in perceived control were thought to be linear (Findley & Cooper, 1983) but recent research provides evidence that the development may be curvilinear, with changes around the age of 10 related to other features of cognitive development (Skinner & Chapman, 1990). It adjusts with real experiences and becomes more external, but then becomes more internal again. It shows a decline again around late adulthood, though the results at this end of the life span are still not comprehensive or very consistent (Flammer, 1995).

One way in which environmental factors such as available resources can be understood is by comparing developed and developing countries.

Secondly, environmental factors have always been considered important in the development of perceived control but have never been investigated in depth. Cross-cultural studies have tended to show that western cultures are more internal than their Asian and African counterparts but the results vary from country to country (Dyal, 1984; Hui, 1982). Religion seems another inconclusive but influential variable in perceived control. Some studies have found that religiosity was highly positively related with Internal perceived control but others have found the opposite or no significant differences at all. Combining this with other cross-cultural studies, our expectation is that there will be negative relationships between religiosity and internal perceived control, particularly in Islam because of the nature of the religion, which encourages social support and is authoritarian. In terms of SES, it seems that there are fairly consistent results showing low SES

populations are less internal, but the number of studies in this area is very limited. Although some studies found that females are more external than males, many studies have not found any significant differences between genders.

Thirdly, above all, studies on environmental differences create real methodological problems in psychology. These problems were investigated in the previous two parts of this thesis. See chapters 3, 4 and 5 for translation fidelity and chapters 6, 7 and 8 for comparability-derived etic. The questionnaires were analysed in terms of a derived etic and in this part of the study only those items which were reliable and valid have been used. We found that CAMI and the Religiosity scale for Youth functioned similarly in both cultures. So did the third scale of the MASLOC questionnaire after the subscales were combined rather than being used separately. However, the Authoritarianism Scale (F-Scale) needed to be changed by dropping 10 of the questions and CNSIE had to be completely excluded (see Ch 6).

So, this part of the study will investigate the true influence of the social antecedents of perceived control. We will be re-analysing some parts of the data collected for Part 2. Any relationship between perceived control and its predictive variables (e.g. culture, socio-economic status, religiosity, religion) will be due to individuals' experiences within their environment. Adolescents are the age group in which we are particularly interested because they represent the new generation, but also because their perceived control is relatively more stable than that of children (Skinner & Chapman, 1990).

9.2. METHOD
9.2.1. Design
The results of the perceived control scales collected from the English and Turkish samples (dependent variables) were investigated in terms of the antecedents of perceived control (independent variables) such as age, gender, SES, culture, religion, religiosity and authoritarianism.

9.2.2. Analysis
A preliminary descriptive analysis, univariate ANOVA were used to identify significant differences in perceived control in terms of age, gender, SES, culture, and religion. In this preliminary analysis religiosity and authoritarianism were also considered dependent variables, and the differences in scores investigated in terms of age, gender, etc. Religiosity and authoritarianism were not treated in the ANOVA as independent variables because they consist of interval data.

Their effect on perceived control was investigated in the second step. Additionally Pearson product-moment correlations were calculated for religiosity, authoritarianism and all perceived control scales to see the relationships between the main independent and dependent variables.

In the second step a multivariate data analysis was used to investigate the relationships between age, gender, culture, religion, religiosity and authoritarianism and perceived control. Canonical correlations and multiple regressions were used to identify the major effects of the independent variables on the dependent variable after the effect of the covariances had been eliminated (Hair, Anderson, Tatham, Black, 1995).

Canonical correlation analysis is usually used to see the functional relationships between dependent variables and latent functions derived from the independent variables. Canonical correlation analysis can be used when we have several kinds of measurements (some interval, some ordinal) at the same time. So metric and nonmetric measurements are both permissible. If the predictor (independent) variables are only categorical, MANOVA can be used, but if some of them are metric (in our case religiosity and authoritarianism) then canonical correlation analysis can be used. Although it assumes normal distribution of the underlying variable it can be used for a binary distribution as well (Hair et al. 1995). This technique enables researchers to develop independent canonical functions that maximise the correlations between the linear composites of sets of criterion (dependent) and predictor (independent) variables (Hair et al., 1995).

"Interpretation of the canonical variates in a significant function is based on the premise that variables in each set that contribute heavily to shared variances for these functions are considered to be related to each other" (Hair et al., 1995, p. 333).

There are several properties of canonical analysis that have been used to interpret the results. These are canonical cross-loading and canonical weights (Hair et al., 1995). Canonical loading is the between sets variable-variate correlation. It "...reflects the variance that an observed variable in one set of variables shares with the canonical score for that set. Canonical weights are the relative importance of a variable in each set of variables" (Hair et al., 1995). This information is simply constructed from canonical loadings. In our study, after we test the validity of the analysis with one of the subtraction methods to assure the stability of the score, we will be giving canonical weights and loadings to identify latent canonical variables which share common variance with observed variables. Although the results of both the canonical weights and the canonical loadings are given in the table, because of the greater stability of the scores only canonical loadings will be

interpreted. Simultaneously, multiple regression analysis is used with canonical correlation analysis to find out which independent variables are best at explaining the dependent variables.

9.2.3. Instruments

We analysed the original ten subscales of the CAMI, a total score for the three subscales of the MASLOC, the Religiosity for Youth scale and the Authoritarianism scale. Therefore, 13 scores were calculated.

9.2.4. Sample

The participants were the same as in Part 1. They were 362 British and 420 Turkish pupils. The age range was 14 to 18 years old. In the Turkish sample 93.98 % said they were Moslem. In the English sample 54.64 % said they were Christian and 32.78 % non religious. See the Method chapter for details.

9.2.5. Procedure

The procedure is the same as for Part 2. See the Method chapter for details.

9.2.6. Hypothesis

The aim of this research is to see how much social variables affect perceived control within a cross-national setting. This was tested in several ways with the criterion variables we set. In terms of our criterion variables these are the hypotheses we are going to test.

Final result chapter:

The results of part 1 and part 2 have altered the final set of hypotheses slightly. Because CNSIE has been eliminated from this part of the thesis the hypotheses are now more specific to CAMI and MASLOC.

H1: For reasons discussed earlier we expect the English pupils to be more internal than the Turkish pupils

H2: For reasons discussed in the Introduction we expect older pupils, boys and pupils with high SES to be more internal.

H3: As discussed before we expect Christians to be more internal than Muslims. But it should be noted that religion is highly confounded with culture in general. Most of the Turkish sample said

that they were Muslim but in the English sample more variation was observed. Therefore the confounding effect may be greater in the Turkish sample.

H4 & H5: It is expected that high religiosity and high authoritarianism will be highly related to external perceived control. This will be more true for strategy beliefs because they refer to the means used for reaching the ends in a social environment and therefore they are more likely to be learned from social experiences.

H6: There will be different amounts of influence on different types of perceived control as a result of cultural and other kinds of social and individual differences. Control beliefs and strategy beliefs will be more affected by cultural differences, SES and all other related predictors. On the other hand, capacity beliefs, which highly related to a person's individual skills, will be less affected by socio-environmental variables.

9.3. RESULTS

9.3.1. Differences in Perceived Control, Religion and Authoritarianism:

See table 9.3.1 for a summary of F values of the main effects.

9.3.1.1. Cross-cultural/National differences on perceived control, religiosity and authoritarianism:

Culture Main Effect.

The cross-cultural differences between the cultures were tested with a one way ANOVA. The results showed that there were significant differences between cultures for six out of ten CAMI's subscales. These differences were concerned with Control beliefs ($F(1,776)= 40.75$, $p<0.001$), Means and Ends for Effort ($F(1,782)= 89.92$, $p<0.001$), for Powerful Others ($F(1,774)= 6.82$, $p<0.01$), and for Unknown Factors ($F(1,771)= 7.21$, $p<0.01$), Agency beliefs for Powerful Others ($F(1,783)= 75.98$, $p<0.001$), and for Luck ($F(1,783)= 9.66$, $p<0.01$) All these differences, except Agency for Luck, showed that Turkish pupils scored more Internal on CAMI's subscales than their English peers. This result disproves the hypothesis that the English students will have more perceived internal control than the Turkish students (hypothesis (1) and (4) above).

The MASLOC scores did not show any differences between cultures.

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Table 9.3.1.1: Mean Scores for Culture.

SCALES/Subscales	Means (Turkish) N=407	Means (English) N=319	Grand Total Means
CAMI			
Control Beliefs	14.96	17.02	15.87
M-E Effort	17.34	19.61	18.35
M-E Luck	12.41	12.88	12.61
M-E Unknown	14.42	15.38	14.85
M-E Attribute	22.76	22.67	22.72
M-E Powerful Others	15.66	16.43	16.00
Agency Effort	8.84	9.43	9.10
Agency Attribute	9.95	10.34	10.12
Agency Powerful Others	10.63	12.00	11.24
Agency Luck	9.47	8.84	9.19
MASLOC	32.54	33.45	32.94
Religiosity	24.60	18.74	21.98
Authoritarianism	82.34	65.66	75.00

It was also expected that the Turkish sample would score higher on the Religiosity and Authoritarianism scales. This was supported for Religiosity ($F(1,766)= 152.89$, $p<0.001$) and for Authoritarianism ($F(1,692)= 222.87$, $p<0.001$). This results supports hypothesis 3, and part of 1 (above). See table 9.3.1 for F values and table 9.3.1.1 for Means.

9.3.1.2. Gender, Age and SES Differences for Perceived control, Religiosity and Authoritarianism scores:

Gender Main Effect.

Gender differences were observed on six out of ten CAMI subscales: Means-Ends for Attribute ($F(1,781)= 18.92$, $p<0.001$), for Powerful Others ($F(1,774)= 6.84$, $p<0.01$), for Luck ($F(1.774)=8.87$, $p<0.01$) and for Unknown Factors ($F(1,771)= 32.34$, $p<0.001$); Agency for Effort ($F(1,788)= 8.71$, $p<0.01$) and for Powerful Others ($F(1,783)= 8.86$, $p<0.01$). The differences observed were not always in the same direction. Girls scored more external on Means-Ends for

Attribute (p<0.001) and Agency for Powerful others (p<0.01), but boy scores more external on Means-Ends for Unknown (p<0.001), Powerful Others (p<0.01), and Agency for Effort (p<0.01). Therefore hypothesis 2 is partially supported.

Table 9.3.1.2.a: Mean scores for Gender.

SCALES/Subscales	Means (Girls) N=387	Means (Boys) N=339	Grand Total Means
CAMI			
Control Beliefs	15.88	15.86	15.87
M-E Effort	18.30	18.41	18.35
M-E Luck	12.24	13.05	12.61
M-E Unknown	14.20	15.59	14.85
M-E Attribute	23.15	22.23	22.72
M-E Powerful Others	15.86	16.38	16.00
Agency Effort	8.80	9.44	9.10
Agency Attribute	10.28	9.94	10.12
Agency Powerful Others	11.35	11.11	11.24
Agency Luck	9.47	8.84	9.19
MASLOC	32.06	33.45	32.94
Religiosity	22.48	21.43	21.98
Authoritarianism	75.14	74.84	75.00

MASLOC also showed significant gender differences (F(1,726)= 8.53, p<0.001). There were no differences for Religiosity or Authoritarianism. See table 9.3.1 for F values and table 9.3.1.2.a for means.

Age Main Effect.

Age did not produce any significant differences except for CAMI's Agency beliefs for Effort. The older the pupils the less likely they were to believe in their own effort to success, so they became more external. See tables 9.3.1.2.a and 9.3.1.2.b.

Table 9.31.2.b: Mean scores for Age.

SCALES/Subscales	Means (- 15 yrs old) N=91	Means (16 yrs old) N=224	Means (17 yrs old) N=231	Means (18 yrs old -) N=180
CAMI				
Control Beliefs	15.70	16.05	15.79	15.84
M-E Effort	19.94	17.72	17.15	17.35
M-E Luck	12.01	12.85	12.69	12.54
M-E Unknown	15.27	14.73	14.91	14.70
M-E Attribute	22.83	22.68	22.74	22.64
M-E Powerful Others	15.53	16.43	16.10	15.73
Agency Effort	8.13	9.25	9.12	9.40
Agency Attribute	10.39	10.13	10.00	10.13
Agency Powerful Others	11.09	10.96	11.50	11.34
Agency Luck	9.48	9.05	9.19	9.21
MASLOC	32.68	34.06	32.59	32.13

Socio-Economic Status Main Effect.

The socio-economic status of the pupils was measured (or decided) indirectly from the schools' catchment area and reputations. The result of this section should therefore be treated with care (e.g. Sedghill school in London-England and Sidika Rodop in Izmir-Turkey were counted as low SES schools). Five out of the ten CAMI subscales showed differences. These were Control Beliefs $(F(3,776)= 5.9$, $p<0.01)$, with middle SES pupils scoring more external then the rest; Means-Ends beliefs for Luck $(3, 774)= 6.36$, $p<0.001)$ and for Powerful Others $(F(3,774)= 4.41$, $p<0.01)$, with scores increasing (becoming more external) with increasing SES; Agency beliefs for Effort $(F(3,783)= 10.7$, $p<0.001)$, with scores being more external with increasing SES and for Attribute $(F(3,784)= 13.3$, $p<0.001)$, with scores being internal with increasing SES (see hypothesis 2).

Table 9.3.1.2.c: Mean scores for Socio-Economic Status .

SCALES/Subscales	Means (SES 1) N=167	Means (SES 2) N=121	Means (SES 3) N=382	Means (SES 4) N=86
CAMI				
Control Beliefs	15.70	16.94	15.48	14.79
M-E Effort	17.69	18.52	18.63	18.39
M-E Luck	11.70	12.45	13.21	13.22
M-E Unknown	14.53	15.43	14.86	14.32
M-E Attribute	22.85	23.03	22.40	22.55
M-E Powerful Others	15.22	16.04	16.46	16.06
Agency Effort	8.30	8.93	9.57	9.71
Agency Attribute	10.25	10.66	9.97	8.94
Agency Powerful Others	11.30	11.27	11.04	11.66
Agency Luck	9.22	8.97	9.20	9.68
MASLOC	31.34	33.13	34.02	32.74
Religiosity	23.41	21.68	21.36	21.94
Authoritarianism	85.67	73.37	72.31	67.55

SES 1= Low socio-economic statue (Sidika Rodop and Sedghill schools)
SES 2= Middle Socio-Economic statue (Suphi Koyuncuoglu and Pimlico schools)
SES 3= Upper-Middle Socio-Economic statue (Bornova Anodolu, Alleyn and Haydon Schools)
SES 4= Upper Socio-Economic statue (American Koleji and Westminster Schools)

Authoritarianism showed a very significant decrease with increasing (high) SES ($F(3,692)$= 27.79, $p<0.001$). Religiosity did not have and effect (see hypothesis 2). See tables 9.3.1 and 9.3.1.2.c.

9.3.1.3. Interactions For Culture, Gender, Socio-Economic Status.

See table 9.3.1.3 for F values of the interactions. We also tested whether there were any interactions between culture and other independent variables such as gender and SES. There were interactions between SES and Culture on one out ten of CAMI's subscales: Means-Ends for Luck ($F(3,774)$= 3.78, $p<0.01$). The Turkish scores became more external for the upper SES while the English scores become more internal. MASLOC, the other Perceived Control Scale, also showed a significant interaction between Culture and SES ($F(3,726)$= 5.91, $p<0.001$). For MASLOC the Turkish scores became more external with higher SES but the English scores became more Internal. An interaction was also found between Culture and SES for Religiosity ($F(3,766)$= 14.33, $p<0.001$). The Religiosity scores decreased as SES increased in the Turkish sample but increased

in the English sample. Only the religiosity result was highly significant (P<0.001) and this needs to be pursued further. The other differences were relatively small and did not show any trend.

There were interactions between gender and SES on two out of ten CAMI's subscales. The first was Means-Ends for Luck ($F(3,774)=3.62$, $p<0.01$), where girls with low SES scored more internal than boys. Boys with high SES scored more internal than girls with the same SES. The second was Agency for Luck ($F(3,774)= 5.05$, $p<0.01$), where girls with low SES scored more internal but boys with high SES scored more internal. Overall boys were more internal than girls for most levels of SES.

These results give good reason to think that the differences between cultures are mainly linear. It is therefore possible to look at the effects of the independent variables combining the English and Turkish samples rather than looking at them separately. See summary table 9.3.1 for significant differences.

Table 9.3.1: Summary table of the F Values for the main effects of Culture, Gender and SES and Age.

SCALES/Subscales	F-Value of Cultural dif.	F-Value of Gender dif.	F-Value of SES dif.	F-Value of AGE
CAMI				
Control Beliefs	**40.75 ** **	0.02	**5.90 ***	1.01
Means-Ends Beliefs				
For Effort	**89.92 ** **	0.93	1.99	1.45
For Attribute	0.14	**18.92 ** **	1.76	0.11
For Luck	1.39	**8.87 ***	**6.36***	0.82
For Powerful Other	**6.82 ***	**6.84 ***	**4.41 ***	2.24
For Unknown Fact.	**7.21 ***	**368.2 ** **	3.20	1.49
Agency Beliefs				
For Effort	6.33	**8.71 ***	**10.7 ** **	**5.90***
For Attribute	3.90	2.50	**13.3 ** **	1.47
For Luck	**9.66 ***	**5.42**	2.31	0.53
For Powerful Other	**75.98 ** **	**8.86 ***	3.10	2.38
MASLOC	0.89	**8.53 ***	2.42	1.38
Religiosity Scale	**152.90 ** **	0.04	2.27	2.02
F-Scale	**222.87 ** **	4.76	**27.79*** **	

p<0.01 *, p<0.001 **

Table 9.3.1.3: Summary table of the F Values for the two and three way interactions between Culture, Gender and SES.

SCALES/Subscales	Culture X Gender F-Value	Culture X SES F-Value	Gender X SES F-Value	Culture X Gender X SES F-Value
CAMI				
Control Beliefs	0.53	0.14	0.80	2.23
Means-Ends Beliefs				
For Effort	0.77	3.65	0.99	1.51
For Attribute	3.24	2.09	0.60	0.75
For Luck	0.02	3.78 *	3.62 *	1.55
For P. Others	3.24	2.57	1.16	0.80
For Unknown Factors.	0.27	2.14	2.42	2.79
Agency Beliefs				
For Effort	0.18	2.27	2.00	0.93
For Attribute	5.22	2.66	2.67	1.39
For Luck	0.58	2.56	5.05 *	1.19
For P. Others	0.61	3.30	2.31	0.87
MASLOC	2.67	5.91 *	1.498	0.81
Religiosity	2.26	14.30 **	0.252	0.56
F-Scale	1.27	2.76	1.637	0.81

P<0.01 *, p<0.001 **

9.3.1.4. Summary of ANOVA results:

Culture

Six out of the 10 CAMI subscales showed cultural differences. Three out of six were highly significant at 0.001 (Control Beliefs, Means-Ends for Effort and Agency for Powerful Others). Apart from Agency for Luck, in all other subscales the Turkish sample scored more internal than their English peers. The results disproved the hypothesis that the Turkish sample would score more external because of their experiences and religious background.

MASLOC didn't show any differences.

Religiosity and Authoritarianism were significantly different for the two cultures (p < 0.001). The Turkish sample were more religious and more authoritarian than the English.

Gender

Seven out of the 10 CAMI subscales showed gender differences. Two of them were highly significant: Means-Ends for Attribute (boys scored more internal than girls), and Unknown Factors (girls scored more internal then boys) (p<0.001). Others significant at p < 0.01 were: Means-Ends Beliefs for Powerful Others (girls more internal), Agency Beliefs for Effort (girls more internal) and Powerful Others (boys more internal).

MASLOC scores showed a significant gender effect (girls scored more internal then boys) (p<0.01).

No Religiosity or Authoritarianism differences were found between girls and boys.

Socio-Economic Status

Six out of the 10 CAMI subscales showed significant differences in terms of SES. Two out of six were highly significant (p<0.001): Agency for Effort (low SES scored more internal, with scores gradually getting more external with increasing SES) and Agency for Attribute (as SES increased they became more internal). Significant at 0.01 were: Control Beliefs (upper SES scored the most internal while Middle SES scored more external), Means-Ends for Powerful Others (Low SES scored more internal with the most external group being the upper-middle SES group). No significant differences were found for MASLOC.

The Authoritarianism scores were significantly different for different SES groups (Upper SES scored less authoritarian with scores gradually increasing as SES decreased) (p<0.001).

9.3.2. Relatioships Between Religiosity, Authoritarianism and Perceived Control

The relationships between the perceived control scales and religiosity and authoritarianism were tested with the Spearman product-moment correlation coefficient. The relationships were looked at for each culture separately and then together to see whether the pattern was different from one culture to another. The results show that the correlations between the perceived control scales and subscales and religiosity and authoritarianism were generally low (max. -.32 for authoritarianism and Means-Ends for Effort). Nevertheless there were a number of them that were statistically significant (20 out of 66). The relationships between religiosity and authoritarianism were also tested. They were highly significantly for the Turkish sample and for the whole sample (r=.46, and .41, p<0.001, respectively), but not for the

English sample (r=.10). This difference can be attributed to the English sample being more heterogeneous and diverse than the Turkish sample in relation to the types of religious beliefs.

Additionally, possible curvilinear relationships were investigated with regression analyses in which each subscale of perceived control was the dependent variable and religiosity and the square root of religiosity or authoritarianism and the square root of authoritarianism were independent variables. A significant beta value of the first independent variable (religiosity or authoritarianism) would indicate a significant correlation between the perceived control subscale and religiosity or authoritarianism. A significant beta value for the second independent variable (the square root of religiosity or authoritarianism) would indicate a curvilinear relationship between the perceived control subscale and the first independent variable (religiosity or authoritarianism). The results of these analyses were that three subscales of CAMI showed significant (p<0.01) curviliear relationships. These were Control Beliefs and religiosity and Agency for Luck and Powerful Others and authoritarianism. Two subscales which showed curvilinear relationships to a lesser extent were Means-Ends for Luck and Powerful Others and authoritarianism (see appendix E for details).

9.3.2.1. Correlation between religiosity and perceived control.

English sample
One out of 11 scales and subscales was found to be significantly related to religiosity. This was for Agency for Effort (r= -.15, p<0.01). Pupils who scored high on religiosity scored more internal in agency for effort.

Turkish sample
Four out of the 11 scale and subscales were found to be significantly related to religiosity. These were Means-ends for Effort (r= -.20, p<0.001), Agency for Effort (r= -.25, p<0.01), Agency for Powerful Others (r= .18, p<0.001), and MASLOC (r= -.13, p<0.01). Pupils who scored Internal on Means-Ends for Effort, Agency for Effort and MASLOC scored high on religiosity. This wasn't the case for the Agency for Powerful Others subscale of CAMI; pupils who scored External also scored high on religiosity.

Whole sample
Five out of the 11 scales and subscales were found to be significantly related to religiosity. These were Control Beliefs (r= -.10, p<0.01), Means-Ends for Effort (r= -.21, p<0.001), Means-Ends for Powerful

Others (r= -.10, p<0.01), Agency for Effort (r= -.21, p<0.001), and MASLOC (r= -.12, p<0.01). See table 9.3.2.1 for r-values. For all of these pupils who were high on religiosity scored Internal.

9.3.2.2. Correlations between authoritarianism and perceived control.

English sample

There were significant relationships between 5 out of 11 scales and subscales and authoritarianism. These were Means-Ends for Effort (r= -.15, p<0.01), Means-Ends for Luck (r= .16, p<0.01), Means-Ends for Unknown (r= .20, p<0.001), Agency for Effort, and MASLOC (r= .17, p<0.01). Pupils who scored high on authoritarianism scored more Internal on Means-Ends and Agency for Effort but they scored External on Means-Ends for Luck, Unknown, and MASLOC.

Turkish sample

Only 2 out of 11 scales and subscales were found to be significantly related to authoritarianism. These were Means-End for Effort (r= -.25, p<0.001) and Agency for Effort (r= -.23, p<0.001). Pupils who scored Internal on Means-Ends and Agency for Effort scored high on authoritarianism.

Whole sample

Three out of 11 scales and subscales were found to be significantly related to religiosity. These were Control Beliefs (r= -.10, p<0.01), Means-Ends for Effort (r= -.32, p<0.001) and Agency for Effort (r= -.22, p<0.01). See table 9.3.2.1 for r-values. For these significant results pupils who scored Internal scored high on authoritarianism.

Table: 9.3.2. Correlations between perceived control scales, religiosity, and authoritarianism for sub-samples and the whole samples.

	English		Turkish		Total	
	Religiosity	Authoritarianism	Religiosity	Authoritarianism	Religiosity	Authoritarianism
Control Beliefs	-.06	-.04	.07	.12	-.10*	-.10*
M-E Effort	-.00	-.15*	-.20**	-.25**	-.21**	-.32**
M-E Attribute	-.06	-.07	-.00	-.09	-.01	-.04
M-E Luck	-.03	.16*	-.08	-.05	-.07	.02
M-E Pow. Others	-.03	.07	-.09	-.05	-.10*	-.06
M-E Unknown	.05	.20**	-.01	-.01	-.03	-.00
Agency Effort	-.15*	-.18*	-.25**	-.23**	-.21**	-.22**
Agency Attribute	.01	.11	.01	.08	-.02	.04
Agency Luck	.05	.02	.04	-.04	.05	.07
Agency Pow. Others	.11	.05	.18**	.12	.01	-.09
MASLOC	-.09	.17*	-.13*	-.08	-.12*	.01
Authoritarianism	.10		.46**		.41**	

P<0.01*, p<0.001**

9.3.2.3. Summary of correlation results:

English Sample

Only Agency for Effort was related to religiosity. Five out of the 11 subscales and scale were related to authoritarianism. These were Means-Ends for Effort, Luck, and Unknown, Agency for Effort and MASLOC. Only Means-Ends for Unknown factors was significant at 0.001. The others were only significant at 0.01. For those which were significant at 0.01 there were possibly curvilinear relationships between the two variables.

Turkish Sample

Three out of 11 subscales and scale were found to be highly significantly (significant at 0.001) related to religiosity. These were Means-Ends for Effort, Agency for Effort and Agency for Powerful Others. Means-Ends and Agency for Effort and MASLOC were negatively correlated to religiosity but Agency for Powerful Others was positively related. So, in the first three the Internals scored high on religiosity, which is the opposite to what we expected (see Hypothesis 4 and 5). The correlation for Agency for Powerful Others was in the expected direction. Externals scored high on religiosity. Only two Effort subscales, Means-Ends and Agency, were highly significantly related to authoritarianism. The Internals

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scored high on authoritarianism. This was in the opposite direction to what we expected (see hypothesis 4 and 5).

Although they weren't significantly correlated three subscales showed significant (p<0.01) curvilinear relationships. These were control beliefs with religiosity and agency beliefs for luck and powerful others with authoritarianism. Two means-ends scales also showed significant curvilinear relationships (only p<0.05). These were means-ends for luck and powerful others with authoritarianism. The curvilinearities were positively U shaped for Agency for luck and powerful others. Pupils who scored high Internal or External on CAMI's Agency for luck and powerful others subscales scored high on authoritarianism but those who scored average scored low on authoritarianism. For Means-Ends for Luck and Powerful others the curvilinearities were negatively U shaped: pupils who were average Internal/External (neither Internal or External) scored high on authoritarianism, but those who scored high Internal or External scored low in authoritarianism. The same applied to control beliefs and religiosity.

Whole sample

Five out of 11 scales and subscales were significantly related to religiosity. Only two of these were consistent with the subsample analyses and were highly significant at 0.001, namely, Means-Ends and Agency for Effort. Two had not been significant in the separate English and Turkish analyses. Three out of 11 subscales and scales were related to authoritarianism. Two of these were similar to and consistent with the subsample results -Means-Ends and Agency for Effort. These results were again in the opposite direction to what we expected. See hypothesis 4 and 5.

Overall, across the samples, consistent and highly significant correlations were found for the Agency for Effort subdomain of CAMI. Second, consistent significant correlations were found for Means-Ends for Effort but not as much as for Agency for Effort in the English sample. None of those relationships were found to be curvilinear (p<0.01). Two other subscales (Means-Ends for Luck and Powerful Others) were curvilinear to a lesser extent (p<0.05). None of these curvilinear relationships were found to be linearly significant.

9.3.3. Canonical Correlation Data Analysis:
9.3.3.1. Overview.

The data were analysed using canonical correlation analysis to test for relationships between the perceived control variables (e.g. Control beliefs, means-ends for effort etc.) and predictor variables (culture, religion, religiosity level, authoritarianism) and other demographic variables (e.g. gender, age, location of the school (SES)) as a set of criterion variables.

Table 9.3.3.1: Variance explained by Canonical Variables of the Covariances.

Can. Var.	Pct. Var. DE	Cum. Var. DE	Var. CO	Cum. Var. CO
1	12.17	12.17	41.30	41.30
2	2.26	14.42	13.81	55.10
3	.949	15.37	8.91	64.02
4	.598	15.97	9.82	73.84

The canonical correlation analysis showed that it is possible to model the relationship between independent variables (e.g. Culture, Gender, Authoritarianism) and dependent variables (CAMI's Subscales such as Means-Ends and Agency, MASLOC), with reference to four canonical functions. Firstly multiple regression analysis showed that the relationship between independent and dependent variables was very significant. Overall, the standardised variances of the dependent and independent variables explained by the canonical functions were 45.6% and 73.84% respectively. The shared variance for function 1 was 10.30% for dependent and 12.17% for independent variables; function 2 was 14.05% for dependent variables and 2.26% for independent variables; function 3 was 11.75% for dependent and 0.95% for independent variables; function 4 was 9.50% for dependent variable and 0.60% for independent variables. The cumulative percentage of covariance was 7.16% for dependent variables and 73.84% for independent variables. The last two functions' contribution to the total variance was very small therefore we are not going to interpret them any further. See table 9.3.3.1. Because of the small amount of covariance between dependent variables we will also be using regression analysis.

9.3.3.2. Validation and Diagnosis

The validity of the canonical correlation analysis was tested with sensitivity analysis. This analysis was derived from a comparison of the full model (all dependent variables in the model) against removal of an independent variable form the model. Detection of consistency is derived from this result. This procedure was repeated three times, with three different independent variables (authoritarianism, age, and culture) being deleted from the model one at a time. Differences between shared variance are also presented for each detection. The results reveal that omission of an independent variable did not change the variance of the other variables but affected the shared variance. As seen, the canonical loadings of the independent variables, after removal of an independent variable, were still very stable and consistent in each of the three cases where the independent variable (X1, X3, or X5) was deleted. The overall canonical correlation (R^2) also remained stable. See table 9.3.3.2.

Table 9.3.3.2: Sensitivity Analysis of the Canonical Correlation Results to Removal of an Independent Variable.

	Complete Variate	Results After Deletion of X1, X5, X6		
		X1 (F1)	X5 (F1)	X6 (F1)
Sq. Mul. R	.84	.78	.82	.81
Adj R Sq.	.72	.61	.70	.70
Independent Variables				
Canonical Loadings				
X1 Culture	-.96	Omitted	-.97	-.96
X2 Being Christian	-.89	-.89	-.90	-.89
X3 Being Muslim	.94	.95	.95	.94
X4 Religiosity	.41	.43	.39	.40
X5 Authoritarianism	.67	.70	Omitted	.67
X6 Age	.11	.10	.10	Omitted
X7 Gender	-.08	-.09	-.08	-.08
X8 SES	-.30	-.34	-.30	-.30
Dependent Variables				
Canonical Loadings				
X9 Control Beliefs	-.35	-.32	-.34	-.35
X10 M-E Effort	-.64	-.64	-.58	-.64
X11 M-E Attribute	.04	.01	.09	.04
X12 M-E Pow. Others	-.26	-.28	-.27	-.25
X13 M-E Luck	-.17	-.19	-.19	-.17
X14 M-E Unknown Factors	-.28	-.27	-.27	-.27
X15 Agency Effort	-.30	-.34	-.26	-.29
X16 Agency Attribute	-.13	-.10	-.12	-.13
X17 Agency Pow. Others	-.46	-.45	-.51	-.47
X18 Agency Luck	.23	.21	.22	.24
X19 MASLOC	-.23	-.24	-.22	-.23

9.3.3.3. Canonical Analysis

The canonical loadings showed that in the first canonical function the independent variables of Culture (-.96), being Moslem (.94), being Christian (-.89), Authoritarianism (.67), Religiosity (.41) and SES (-.30) shared variance with the dependent variables (Means-Ends for Effort (-.64), Agency for Powerful Others (-.46) and Control beliefs (-.35). In the second canonical function the independent variables of SES (.66), Authoritarianism (-.46), Religiosity (-.37), and Gender (.36) shared variance with the dependent variables of Agency for Effort (.66), Agency for Powerful Others (-.55), MASLOC (.46) and Means-Ends for Luck (.42). See table 9.3.3.3.a for canonical loadings. The canonical weights are presented in table 9.3.3.3.b for information.

In the first function, Culture, being Muslim and being non-Christian were the most explanatory variables for Control beliefs, Means-Ends for Effort and Agency for Powerful others. The negative correlations of Culture, being Christian and each of the three subscales with the canonical function means that Turkish and non-Christian (i.e. Muslim) pupils were most likely to score internal on all these scales. The positive correlation of Authoritarianism, Religiosity and being Muslim with the canonical function and the negative correlation of the three subscales with the canonical function means that authoritarian, religious and Muslim pupils were more internal. Finally, the (low) negative correlation of SES and the three subscales with the canonical function mean that pupils with low SES were more internal.

In the second function, SES, Authoritarianism, Religiosity and Gender were the most explanatory variables for the other three Agency beliefs subscales (Effort, Powerful Others, Attribute), for another two of the Means-Ends beliefs subscales (Luck and Powerful Others) and MASLOC. The results mean that upper SES, less authoritarian and less religious boys were most likely to score external on Means-Ends beliefs for Luck and Powerful Others, Agency beliefs for Effort and MASLOC but they were most likely to score internal on Agency belief for Attribute and Powerful Others.

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Table 9.3.3.3.a: Canonical Loadings for the Four Canonical Functions.

Canonical Loadings				
	F1	F2	F3	F4
Correlations Between the Independent Variables and Their Canonical Variates				
X1 Culture	-.96	-.23	.03	.10
X2 Being Christian	-.89	-.27	.08	-.06
X3 Being Muslim	.94	.25	-.07	.06
X4 Religiosity	.41	-.37	.25	.03
X5 Authoritarianism	.67	-.46	.47	.08
X6 Age	.11	-.07	-.03	-.31
X7 Gender	-.08	.36	.43	.69
X8 SES	-.30	.66	.48	-.43
Correlations between the Dependent Variables and Their Canonical Variates				
X9 Control Beliefs	-.35	-.21	-.27	.11
X10 M-E Effort	-.64	.27	-.52	-.01
X11 M-E Attribute	.04	-.00	-.66	-.27
X12 M-E Pow. Others	-.26	.37	.34	.17
X13 M-E Luck	-.17	.42	.42	.01
X14 M-E Unknown Factors	-.28	.15	.15	.72
X15 Agency Effort	-.30	.66	-.08	-.05
X16 Agency Attribute	-.13	-.36	-.31	.23
X17 Agency Pow. Others	-.46	-.55	.32	-.33
X18 Agency Luck	.23	.08	-.00	-.40
X19 MASLOC	-.23	.46	-.05	.30

Table 9.3.3.3.b: Canonical Weights for the Four Canonical Functions.

Canonical Weights				
	F1	F2	F3	F4
Standardised Canonical Coefficient for the Independent Variables				
X1 Culture	-.56	-.41	.01	.76
X2 Being Christian	-.00	-.16	.10	.06
X3 Being Muslim	.28	.16	-.35	.84
X4 Religiosity	.06	-.38	.22	-.01
X5 Authoritarianism	.20	-.52	.88	-.09
X6 Age	.02	-.15	-.06	-.37
X7 Gender	-.03	.33	.35	-.77
X8 SES	-.11	.47	.72	-.55
Standardised Canonical Coefficient for the Dependent Variables				
X9 Control Beliefs	-.14	-.30	-.11	-.17
X10 M-E Effort	-.55	.23	-.44	.02
X11 M-E Attribute	.91	-.01	-.41	-.23
X12 M-E Pow. Others	-.27	.08	.22	.02
X13 M-E Luck	-.11	.18	.48	-.46
X14 M-E Unknown Factors	-.12	-.05	-.09	.80
X15 Agency Effort	-.37	.48	.03	.36
X16 Agency Attribute	-.06	-.39	.29	.05
X17 Agency Pow. Others	-.75	-.43	.37	-.35
X18 Agency Luck	.18	.05	-.37	-.39
X19 MASLOC	-.03	.15	-.15	.26

9.3.3.4. Summary

The canonical functions revealed that the first function, which shared variance with most of the predictive variables, only explained three of the dependent variables. These were Control beliefs, Means-Ends beliefs for Effort and Agency beliefs for Powerful Others.

The second canonical function mainly explained the variance of the Agency beliefs subscales (Agency for Effort, for Attribute and for Powerful Others), the Means-Ends for Luck and for Powerful Others subscales and MASLOC, which was used in a unidimensional way. The same function shared variance with the predictive variables of SES, Authoritarianism, Religiosity and Gender.

Overall, SES appeared in both functions, which means that it explained many of the dependent variables. Agency for Powerful Others also appeared in both functions which means that it is explained by many of the independent variables.

Age on the other hand was not loaded on either of the canonical functions. Because of the age of children used in this study (14 to 18) no curvilinear relationship was expected. However, the literature for children older than 12 yrs old has found a linear relationship (Findley & Cooper, 1983; Skinner & Chapman, 1990; Flammer, 1995). It is not clear why this was not found in this study.

9.3.4. The Results of Regression analysis

Along with canonical multivariate analysis we investigated simple regression analysis for each perceived control scale and subscale to see whether and how much the social antecedents explained the variances of these scores. According to the literature, the subdomains of CAMI are independent from each other because each of them measures different domains of perceived control (Skinner et al., 1988). This was also true in our analysis (see previous section 9.3.3). Therefore, as well as multivariate analysis it is valid and informative to use univariate statistical analysis to explain the relationships between individual perceived control subscales and the explanatory variables (e.g. Culture, Gender etc.). The results of the regression analyses for each subscale of CAMI and MASLOC are given below and in table 9.3.4.

Control Beliefs. The variance of the Control belief scale was not significantly explained by any of the independent variables. None of the significance levels reached $p < 0.01$.

Means-Ends for Effort. The variance was mostly explained by Authoritarianism (Beta= -.30, t= -6.56, p<0.000). The less authoritarian scored more external and the more authoritarian scored more internal.

Means-Ends for Luck. The variance was mostly explained by SES (Beta= -.09, t= -2.21, p<0.000). Upper SES pupils scored more external.

Means-Ends for Unknown. The variance was mostly explained by Gender (Beta= .18, t= 4.64, p<0.000). Boys scored more external and girls more internal.

Means-Ends for Attribute. The variance was mostly explained by Authoritarianism (Beta= -.18, t= -3.66, p<0.000), SES (Beta= -.14, t= -3.4, p<0.001) and gender (Beta= -.11, t= -2.74, p<0.006). Authoritarian, high SES and boys scored more Internal.

Means-Ends for Powerful Others. The variance was explained by SES (Beta= .14, t= 3.31, p<0.001), Gender (Beta= .12, t= 3.06, p<0.002) and Religiosity (Beta= -.11, t= -2.58, p<0.01). Low SES, girls and high religious pupils scored more internal.

Agency for Effort. The variance was explained by Authoritarianism (Beta= -.18, t= -3.81, p<0.000), Religiosity (Beta= -.15, -3.72, p<0.000) and SES (Beta= .12, 3.01, p<0.003). Authoritarian, more religious, and low SES were scored more internal.

Agency for Attribute. The variance was explained only by SES (Beta= -.16, t= -3.89, p<0.000). The high SES group was more internal than the low SES group.

Agency for Powerful Others. The variance was explained by Authoritarianism (Beta= .16, t= 3.44, p<0.001), Religiosity (Beta= .11, t= 2.69, p<0.007) and being Muslim (Beta= -0.37, t= -2.56, p<0.01). Authoritarian, non Muslim and religious pupils scored more external.

Agency for Luck. This subscale was not explained by any of the independent variables. None of the significance levels reached p<0.01.

MASLOC. The variance was explained by Religiosity (Beta= -.16, t= -3.88, p<0.000) and Age (Beta= -.11, t= -2.77, p<0.006). The older and more religious pupils were more Internal.

Table 9.3.4: Summary of Regression Analysis Results.

		Culture	Christian	Muslim	Religiosity	Authoritarianism	Age	Gender	SES
Control Beliefs	B=								
	t=								
	p<								
M-E Effort	B=					-.30			
	t=					-6.56			
	p<					.001**			
M-E Attribute	B=					-.18		-.11	-.14
	t=					-3.66		-2.74	-3.40
	p<					.001**		.01*	.01*
M-E Pow. Others	B=				-.11			.12	.14
	t=				-2.58			3.06	3.32
	p<				.01*			.01*	.001**
M-E Luck	B=								.20
	t=								4.76
	p<								.001**
M-E Unknown F.	B=							.18	
	t=							4.64	
	p<							.001**	
Agency Effort	B=				-.15	-.18			.12
	t=				-3.72	-3.81			3.01
	p<				.001**	.001**			.01*
Agency Attribute	B=								-.16
	t=								-3.89
	p<								.001**
Agency P. Others	B=			-0.37	.11	.16			
	t=			-2.56	2.69	3.44			
	p<			.01*	.01*	.01*			
Agency Luck	B=								
	t=								
	p<								
MASLOC	B=				-.16		-.11		
	t=				-3.88		-2.77		
	p<				.001**		.01**		

p<0.01 *, p<0.001 **

9.3.4.1. Summary

SES was a significant explanatory variable for five out of eleven perceived control scale and subscales. This was followed by Religiosity which explained four out of eleven subscales, and Gender and Authoritarianism which both explained three out of eleven. SES was an explanatory variable for Means-Ends beliefs for Attribute, for Powerful Others and for Luck, Agency beliefs for Effort and for Attribute. Gender was an explanatory variable for Means-Ends for Luck, for Unknown factors, for Attribute and for Powerful Others. Religiosity was an explanatory variable for Means-Ends for Powerful Others, Agency for Effort and for Powerful Others and MASLOC. Finally Authoritarianism was an explanatory variable for Means-Ends for Effort and for Attribute

and Agency for Powerful Others. Being Muslim was an explanatory variable for Agency for Powerful Others and Age was an explanatory variable for MASLOC.

9.5. CONCLUSIONS

The results of these three analyses seem mainly consistent with each other. Because it is multivariate analysis and particularly appropriate for the variables investigated in this study, canonical correlation analysis was the best in explaining the relationships between the variables tested. All three analyses indicated that culture and religion were important variables, but only for 3/16 subscales of CAMI. The other culture related variables (Religiosity and Authoritarianism) and demographic variables (SES and Gender) explained the other perceived control subdomains.

Control beliefs, Means-Ends for Effort and Agency for Powerful Others in particular showed differences between cultures. According to the ANOVA results, in almost all the scales and subscales the Turkish pupils scored more internal than their English counterparts. This result deserves more explanation. One explanation is that up to now all cross-cultural studies have been affected by measurement bias, therefore the results may not have represented actual differences between western and non-western cultures but different responses to the instrument in the imposed culture (Berry et al., 1992). Another explanation is that multivariate measurements of perceived control have only recently been used in different cultures and therefore we have detected cultural differences in domains which have not been investigated separately before. Most importantly, we did not expect the Turkish sample to be more Internal than the English sample. In fact the opposite had been hypothesised.

The results for each hypothesis are as follows:

H1: For reasons discussed earlier we expect the English pupils to be more internal than the Turkish pupils.

The hypothesis was shown to be wrong. The ANOVA found that significant differences were found for six out of ten CAMI subscales. These were Control beliefs, Means-Ends for Effort, for Powerful Others, for Unknown Factors, Agency for Luck and for Powerful Others. Except for one of these subscales the Turkish sample scored more internal than their English counterparts. The exception was Means-Ends for Luck.

The regression analysis did not show significant relationships for any of the perceived control subdomains.

The canonical correlations showed that culture was highly related to function 1, together with Control beliefs, Means-Ends for Effort and Agency for Powerful Others.

Although the regression analyses did not show any significant relationships between culture and perceived control, both ANOVA and the canonical correlations consistently showed significant relationships between culture and three subscales: Control beliefs, Means-Ends for Effort and Agency for Powerful Others.

These results suggest that the Turkish pupils had greater feelings of control over environmental factors in certain domains. This result may be explained if we remember that high educational motivation in pupils is quite a well known fact in Turkey and that all the items were school related.

H2: For reasons discussed in the Introduction we expect older pupils, boys and pupils with high SES to be more internal.

AGE

The ANOVA results showed that there was only one significant age difference. This was for Agency beliefs for Effort, where pupils became more external with age. The regression analysis also showed significant relationships between MASLOC and age but in this general scale pupils became more internal with age. Overall, age did not have an effect on perceived control. This is consistent with the literature on teenagers and adolescents, for who linear relationships have been reported (Findley & Cooper, 1983).

SES

SES was found to be highly related with many of the perceived control subscales. The ANOVA showed that five out of the eleven subscales scored significantly different in terms of SES. These were: Control Beliefs, Means-Ends for Luck, for Powerful Others, Agency for Effort and for Attribute. On Means-Ends for Luck, for Powerful Others and Agency for Effort low SES scored more Internal. On Control beliefs, Agency for Attribute high SES scored more Internal.

According to the regression analysis five out of eleven subscales showed a significant relationship. These were: Means-Ends beliefs for Attribute, for Powerful Others, for Luck, Agency beliefs for Effort and for Attribute. The directions of the relationships were the same as ANOVA. Additionally in Means Ends for Attribute high SES scored more Internal.

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SES also contributed significantly to all canonical latent functions and explained many of perceived control scales in one or other function. In function 1 SES explained Control beliefs, Means-Ends for Effort and Agency for Powerful Others. Low SES scored more Internal on all domains. In function 2 SES explained Means-Ends for Powerful Others, Agency for Effort, for Attribute and for Powerful Others, and MASLOC. In this function high SES scored Internal on Agency for Attribute and for Powerful Others and External on the others.

Three out of eleven subscales were consistently significant in all three statistical analyses. These were: Means-Ends for Powerful Others and Agency for Effort and for Attribute. The direction of the relationship for each subscale was the same across the three analyses.

GENDER

The ANOVA showed that Gender was related to most of the Means-Ends beliefs subscales. These were Means-Ends for Attribute, for Luck, for Powerful Others and for Unknown Factors. Except for Means-Ends for Attribute the girls scored more Internal.

The regression analysis showed that Gender was related to three out of eleven subscales. These were: Means-Ends for Attribute, for Powerful Others and for Unknown factors. Girls scored more Internal on Means Ends for Powerful Others and for Unknown Factors.

According to the canonical correlations Gender contributed to Means-Ends for Powerful Others, Agency for Effort, for Attribute and for Powerful Others and MASLOC. However the relationships were not always consistent. Boys scored more internal on Agency for Attribute and for Powerful Others, girls scored more internal on Means-Ends for Powerful Others, Agency for Effort and MASLOC.

The only consistent result across all three analyses was for Means-Ends for Powerful Others, which showed that girls scored more Internal.

H3: As discussed before we expect Christians to be more internal than Muslims. But it should be noted that religion is highly confounded with culture in general. Most of the Turkish sample said that they were Muslim but in the English sample more variation was observed. Therefore the confounding effect may be greater in the Turkish sample.

The regression analysis showed that Agency for Powerful Others was significantly related to being Muslim. Muslims scored more Internal. According to the canonical analysis three out of ten CAMI subscales were significantly different between religions. These were Control beliefs, Means-Ends for Effort and Agency for Powerful Others. Being Muslim and not being Christian was highly related with Internal perceived control in the first function.

The common results of regression and canonical analysis showed that Agency for Powerful Others was related to being Muslim. Muslims scored more Internal in this domain. Therefore the hypothesis was not supported. It must be remembered that religion is highly confounded with culture and this is supported by the fact that the same significant relationships were observed for culture. In the literature there is no similar research on the Muslim population so the results are hard to interpret.

H4 & H5: It is expected that high religiosity and high authoritarianism will be highly related to external perceived control. This will be more true for strategy beliefs because they refer to the means used for reaching the ends in a social environment and therefore they are more likely to be learned from social experiences.

Correlational analyses showed that there were consistent significant relationships between the M-E and Agency for Effort subscales and religiosity in both English and Turkish samples and the combined sample. The relationships were stronger for the Turkish sample. Correlational analyses also showed that there were consistent significant relationships between M-E and Agency for Effort subscales and authoritarianism in both English and Turkish samples and the combined sample. The relationships were stronger for the Turkish sample.

The regression analysis showed that there were strong relationships between four out of eleven perceived control sub/scales and the religiosity level. These were: Means-Ends for Powerful Others, Agency beliefs for Effort and for Powerful Others and MASLOC. Religious pupils scored more Internal on these subdomains. Canonical correlations showed that there were strong relationships between three out of eleven perceived control subscales and Religiosity in function one and an additional five out of eleven in function two. In function 1 these were Control Beliefs,

Means-Ends for Effort and Agency beliefs for Powerful Others. In function 2 they were Means-Ends for Powerful Others, for Luck, Agency for Effort, for Attribute and for Powerful Others and MASLOC. In function one, religious people scored more internal. In function two less religious people scored more Internal on Agency for Attribute and for Powerful Others and more External on Means-Ends for Powerful Others, Agency for Effort and the MASLOC.

Both statistical analyses showed consistent relationships between religiosity and perceived control for four out of eleven scale and subscales. These were: Means-Ends for Powerful Others, Agency for Effort, for Powerful Others and MASLOC. These results are consistent with some of the literature. Lesser & Painser (1985) and Gabbard, Howard & Taggeson (1986) found high correlations between internal perceived control and religiosity. Friederberg & Friderberg (1985) suggested that religiosity may be related to internal perceived control in a more complicated way: that religious people may be internal in some areas of perceived control but not others. This was true to some extent in our results too. But Furnham's (1982) finding of religious people being more internal in some subdomains like ability, but external on other subdomains like fate and powerful others, did not always prove to be the case in this study.

The regression analysis showed that there were significant relationships between authoritarianism and four out of the eleven scales and subscales. These were: Means-Ends beliefs for Effort and for Attribute, Agency beliefs for Effort and for Powerful Others. Authoritarians scored more Internal on first three but more external on Agency for Powerful Others. The canonical correlation analysis showed the same results for religiosity. Although both variables were strongly related to perceived control they were not always in the predicted direction.

Both statistical analyses showed consistent relationships between Authoritarianism and perceived control for three out of eleven subscales. These were: Means-Ends for Effort, Agency for Effort and for Powerful Others.

H6: There will be different amounts of influence on different types of perceived control as a result of cultural and other kinds of social and individual differences. Control beliefs and strategy beliefs will be more affected by cultural differences, SES and all other related predictors. On the other hand, capacity beliefs, which highly related to a person's individual skills, will be less affected by socio-environmental variables.

The consistent results (across the three analyses) of the previous four hypotheses have shown that Culture as well as other culture-related social antecedents (e.g. religion, religiosity etc.) were consistently related to some of the perceived control subdomains, but not always in the expected direction. Control beliefs was related to culture. Only Means-Ends for Effort and Powerful Others were consistently related to some of these variables e.g. Effort with Culture and Authoritarianism, Powerful Others with Religiosity, SES and Gender. The same Agency beliefs subscales were related to some of these variables e.g Effort with Religiosity, Authoritarianism and SES; Powerful Others with Culture, Religiosity, Authoritarianism and being Muslim. Also Agency for Attribute was related to SES.

So the hypothesis that social antecedents will be more related to Means-Ends (strategy) beliefs rather than Agency (capacity) has been disproved. The social antecedents were related to both Means-Ends (strategy) for Effort and Powerful Others and Agency (Capacity) beliefs for Effort and Powerful others. This shows the importance of these social antecedents for some of the subdomains of Capacity beliefs as well as Strategy beliefs.

The finding that social antecedents were related to Agency (capacity) and Control beliefs contradicts our hypothesis and needs further investigation. Little et al., (1995) and Schmitz & Skinner (1993) suggested Agency beliefs are more directly related to academic performance. Combining their findings with ours suggests that these results need further investigation.

CHAPTER 10: DISCUSSION

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10.1. OVERVIEW

This study focused on the investigation of the antecedents of perceived control in two cultures. The first two parts of the study investigated the cross-cultural comparability of information. Then several hypotheses were tested with multivariate statistics. The investigation of comparability employed three different psychometric methods to test for cross-cultural equivalence of measurement. One of the outcomes of parts one and two was to show the utility of certain psychometric methods in future studies. The second outcome was a derived etic which enabled us to compare the two cultures. To derive the etic of the two cultures, translation fidelity and then item equivalence were tested across the samples.

In part one, item fidelity was generally shown to exist. Only four out of sixteen scales and subscales showed a translation problem. Investigation at the item level found that two out of sixty four items in CAMI, and one item in MASLOC showed differences. These results were consistent throughout the three different psychometric analyses of the same scales.

In part two, all 16 scales and subscales were tested in monolingual samples of the two cultures. The results showed that the CAMI subscales were generally satisfactory and, although its translation fidelity was acceptable, CNSIE was not a good scale to measure perceived control in either of the samples. CNSIE's poor quality can be attributed to conceptual changes in perceived control, which is now largely considered to be a multidimensional concept. MASLOC needed to be regarded as one scale rather than three subscales and one item needed to be removed from the scale because of poor functioning in the Turkish sample. The Religiosity scale performed satisfactorily. Ten out of thirty items needed to be removed from the Authoritarianism scale, mainly because of poor item quality in both of the samples.

Overall investigation of the translation fidelity and derived etic of the scales at the item level proved to be useful and the psychometric methods used for the purpose were good. But, Item Response theory was not always consistent with the other methods and in some cases the information could not be gathered due to the limitations of the programme. This problem may be overcome with larger samples.

In part three, investigation of the antecedents of perceived control showed that Culture was an important variable in only three out of eleven scales and subscales. These were Control beliefs,

Means-Ends for Effort, and Agency for Powerful Others. Religiosity, Authoritarianism and SES were explanatory variables for all the Agency beliefs subscales (except Luck) and for MASLOC. Gender, SES and Authoritarianism were explanatory variables for most of the Means-Ends subscales but to a lesser extent because they were all correlated with the third canonical function. Means-Ends for Unknown factors and Agency for Luck were not significantly related to any latent variable of the canonical functions but were marginally explained by the fourth function and were related to gender, SES and age.

10.2. FINDINGS

10.2.1. Findings for Translation Fidelity:

According to the Generalizability approach, only Means-Ends for Effort showed a difference between forms. The two Luck subscales in Means-Ends beliefs and Agency beliefs, as well as the Helplessness subscale in MASLOC, showed differences between the first and second occasions of testing. An interaction between forms and occasions was only found for the Helplessness and Luck subscales of MASLOC. Additionally, variances for CAMI's Control beliefs and Agency for Powerful Others were different under different conditions. Therefore the results for these two subscales were not reliable.

Classical item analysis revealed that only two out sixty four items in CAMI, one of forty in CNSIE and one out of fifteen items in MASLOC were significantly different (p<0.01) between samples. These were item 41 in CAMI's Control beliefs subscale, item 12 in Agency beliefs for Powerful Others, item 36 in CNSIE and item 8 in the MASLOC Helplessness subscale. The Religiosity for Youth and Authoritarianism scales were similar in the two language forms. Examination of these items showed that the differences were caused partly by slight changes in the translation procedure e.g. using a different verb to make understanding easier. This explanation was appropriate for item 12 "When you want them to, will your teachers help to see that you do well in school?" and 41 "If you want to can you keep from doing badly in school?". The difference between forms for item 8 in MASLOC was caused by a translation mistake. The English item was "I don't think it is worthwhile studying hard since the grades I will get will be completely manipulated" and this was translated as, "I do think it is worthwhile studying hard since the grades I will get will be completely manipulated". For item 36 in CNSIE, "Do you usually feel that, when someone doesn't like you, there is little you can do about it?", there was no obvious translation problem which would cause the difference in the two language forms. Given that the item made a greater contribution to the total score in the Turkish form (the i-t correlation was 0.41) this difference could be attributed to connotational differences of the item in the two languages. An alternative

explanation is that the English of the bilingual sample was not good enough but this does not seem to be a very plausible explanation on this occasion.

The analysis with Item Response theory showed similarities with other analyses for CAMI, MASLOC, and the Religiosity for Youth scales. But the number of items detected to be different in the two languages was greater compared to classical item analysis in some of the scales. The scales or subscales, which showed significant differences from one sample to another, were CAMI's Means-Ends for Luck, Agency for Powerful Others and MASLOC's Internal and Luck subscales. The Means-Ends for Luck and MASLOC's Internal subscales were, for the first time, found to be different from one language form to another. There were no results for the CNSIE and Authoritarianism scales when the parameters were constrained to be the same because of the large number of items (40 and 30 respectively) and the limited sample size (Hambleton, et al., 1991; Lord, 1980; Thissen, 1991; Holland & Weiner, 1993). Four out of sixty-four items in CAMI, and three out of fifteen in MASLOC were found to be different between language forms. These were, in CAMI, item 13 in Means-Ends for Attribute, items 28 and 29 in Means-Ends for Luck and item 12 in Agency beliefs; items 10 and 11 in the MASLOC Internal subscale; and item 13 in the MASLOC Luck subscale.

Overall, translation fidelity of the scales was good although some items, scales and subscales seemed to differ from one language form to another. These were item 41 "If you want to can you keep from doing badly in school?" in CAMI Control beliefs; item 12 "When you want them to, will your teachers help to see that you do well in school?" in CAMI Agency beliefs for Powerful Others, item 8 "I don't think it is worthwhile studying hard since the grades I will get will be completely manipulated" in the MASLOC Helplessness subscale and all items in the MASLOC Luck subscale. Only item 12 in CAMI Agency Beliefs for Powerful Others was consistently different for both the Classical and Item Response analyses. CNSIE was also found to be functioning poorly in both languages but did not show translation infidelity. There was evidence that the results from the different analyses were complementary to each other. Some of the differences were detected by all the analyses, some others were detected by only two analyses and a few detected only by IRT. Thus we conclude that perhaps Classical Item analysis is not sufficient on its own to identify the differences, but, with one other complementary method, could be more sensitive to possible differences. The method to complement Classical Item analysis should be IRT. However, although in the recent literature on cross-cultural testing it has been strongly recommended (Van de Vijver & Hambleton, 1996), due to technical problems such as sample size, it is not always possible to use it. In our case there was one additional problem, which was

that the rating scales we used had far too many points compared with examples of DIF given in the literature (Thissen, 1991; Thissen, Steinberg and Wainer, 1993). These were usually four (CAMI) but were sometimes five (Religiosity in Youth) and six (MASLOC and Authoritarianism sub/scales points).

Part two was dedicated to detecting emic and etic, and eventually a derived etic for both cultures. The scales were tested at the item level again to detect the similarities and differences between the cultures. Classical item analysis, factor analysis and IRT were used.

10.2.2. Findings for Comparability (Derived Etic) of the samples:

The methods used to test metric equivalence were the classical methods of item and factor analysis and IRT. The results of the classical item analysis factor analysis and Item Characteristic Curves will first be discussed separately then in combination.

The item analysis results revealed that four out of eight items of the Control Beliefs subscale in CAMI were significantly different from one culture to the other. These were item 3 "If you really make up your mind not to get any bad grades, can you do it?", item 7 "If you decide to sit down and learn really hard, can you do it?", item 10 " Can you get good grades when you really want to?" and item 41 "If you want to can you keep from doing badly in school?". Item 41 had already been detected in the translation fidelity analysis but the other three items were possibly different due to cultural differences. However, item 3 (r=0.56 and r=0.29 in the English and Turkish samples respectively) and item 7 (r= 0.48 and r= 0.28 in the English and Turkish samples respectively) made relatively small contributions to the total variance. It was also found that these items had changed in the translation processes. This left item 10 ("Can you really get good grades when you really want to?") being different between cultures. Therefore this item can be considered an emic item. None of the other CAMI items showed any significant differences between samples. However some low item-total correlations, and therefore low scale reliability, was observed in Means-Ends beliefs for Effort, for Attribute, for Powerful Others, and for Unknown factors. The Agency beliefs subscale was fine in terms of all the criteria used in the Classical item analysis. The decision about CAMI's subscales was to keep them all in the study without making any changes and to be aware of strong cultural differences for Control beliefs, Means-Ends for Effort and Agency for Powerful Others.

Six out of 40 items of CNSIE showed significant differences between cultures. The items were 4 "Most of the time do you feel that getting good grades means a great deal to you?", item 10 "Do

you believe that good things can be made to happen simply by wishing them?", item 15 "Do you believe that your parents should allow you to make of your own decision?", item 24 "Have you ever had a good luck charm?", item 30 "Do you think that children can get their own way if they just keep trying?" and item 34 "Do you feel that it is easy to get friends to do what do you want them to?". No specific reason was found for the differences other than emic or culture specific experiences. Most importantly again, most of the items (thirty-three out of forty) showed low item-total correlations. This scale was eventually removed from the final part of the study due to poor reliability. With a large number of items it is possible to obtain a medium reliability level, but this does not mean that all the items contribute strongly to the total variance of the scale. The larger the items pool the higher the reliability, regardless of how small the contribution of the individual items. But there is also a limit to the minimum number of items that will give high reliability to a scale. However, there is not a fixed or advised number of items given in the literature for optimum reliability (Nunnally, 1978, Ferguson & Takane, 1989).

In MASLOC, one item in the Internal scale (Item 5 "I am convinced that the grades I will get depend on how well or badly I do in exam.") and all items in the Helplessness scale showed significant differences between cultures (Item 4 "It is an absolute waste of time for me to make any effort, since there is no relationship between my capability, how hard I work, and the grades I will get", item 8 "I don't think it is worthwhile studying hard since the grades I will get will be completely manipulated.", item 9 "I am convinced that whatever I do my teacher will be always give me the grades they want to.", item 14 "It makes absolutely no difference whether I prepare well for a subject or not since in the long run teachers are "out to catch you", item 15 "Regarding my academic life I just don't know what to do. Anything might happen; may be I will do an exam well and fail or may be I will do it badly and pass."). Additionally, item 3 "Whatever the quality of my work I am always lucky when it comes to examinations" and item 6 "My getting good or bad grades in my exam is related to whether the precise the topics I have studied come up in exam." in the Luck subscale showed low Item-Total correlations in both cultures. Although the difference was significant for Item 5 the items were highly correlated with total scores in both cultures. The same pattern was observed for Helplessness items except that item 8 showed a very low item-total correlation due to translation infidelity. This item is a very good example of where translation may go wrong. The only problem with this item was that the sentence was phrased positively in Turkish while it was negative in the English version. Although the scoring was adjusted accordingly after the problem was detected in part one, it was not possible to rescue the item.

In the Religiosity scale, three out of eight items functioned differently in the two cultures. This scale was fine in terms of item fidelity, therefore the differences can only be attributed to culture differences (emic). The items were item 3, "Which of the following best describe your views on prayer or religious meditation?", item 6, "Which of the following statements comes closest to your belief about God?" and item 8 "During the past year, how often have you experienced a feeling of religious reverence or devotion?". The Turkish sample's item-total correlations were relatively lower than the English. Overall, all of the item-total correlations were much higher then 0.30 so this difference between samples may be because differences between correlations are detected much more easily (sensitively) when correlations are high. The other possible explanation is that, the majority of the sample were Christian (Rohrbaugh & Jessor, 1976; Jessor et al., 1994). This seems to be the first time this scale was used in a Muslim culture. Therefore minor differences can be attributed to differences between Christian and Muslim cultures. Overall the scale was highly reliable in both cultures, so it was decided to keep it without any changes.

In the Authoritarianism scale only two out of thirty questions were different in the two cultures. The items were item 16, "People can be divided into two distinct classes: The weak and the strong", and item 18, "Some day it will probably be shown that astrology can explain a lot of things". They both functioned badly in the Turkish form, particularly item 18. On both occasions it was not the translation but the connotational meanings that were different. In item 18 the difference may have been because astrology is known only from horoscopes in the daily newspapers and weekly magazines and is not much respected in Turkey.

The factor analysis results revealed mostly that CAMI showed a similar factor structure in the English and Turkish samples compared with the original. The English sample's comparability with the original was better than the Turkish sample's in all cases. The order of the factors in the English data was only different for the factor analysis of both Effort subscales, but in the Turkish sample the order of factors was consistently different except for Unknown factors. However, replicability of exploratory factor analysis is not always perfect in cross-cultural comparisons and differences in factor order in the imposed culture are often reported in the literature. Similarities between factor structures are enough to conclude that there are no differences. Also, in this study the explained level of variance was similar in both samples. But on two occasions, when the Attribute and Powerful Others factors were tested in the Turkish sample, some items loaded on different factors from what was expected. Some Control belief items (items 7, 34, 35, 41, 42; e.g. item 42 "Can you get all the problems (e.g. in spelling) right, when you want to?") loaded on the Agency beliefs for Effort and some Means-Ends beliefs for Powerful Others items (14 & 45; e.g. item 45

"When student do really well in school, is it usually because the teacher doesn't like them?"), also loaded on Agency for Powerful Others. There were also some negative factor loadings in both samples. These were the Agency factor in the Attribute analysis in the English sample and the Control beliefs factor in the Luck analysis in the Turkish sample. This can be interpreted as either an emic difference or a slight validity problem of the scales across samples.

The CNSIE scale did not show a one factor solution as has been suggested (Lefcourt, 1991). Although the factor orders were different, a four factor solution for both cultures seems to be plausible. The first factor was related to peers, the second to powerful others, avoidance and fatalism, the third was internal, and the fourth was luck, fatalism and avoidance. Overall, twenty-seven out of forty items loaded on one or other of these factors. Failures of replication of factor structure of CNSIE is also found in the literature (Walters & Klein, 1980; Raine, Derek & Venables, 1981).

For the MASLOC scale, the three factor solution did not succeed. The one factor solution was fine except that items 2, 5 and 6 in the English sample and items 3, 6 and 8 in the Turkish sample had low loadings. In particular, item 6 "My getting good or bad grades in my exams is related to whether the precise the topics I have studied come up in exam" was very low in both of the samples (-0.05 and 0.01 in English and Turkish samples respectively).

The Religiosity scale showed a one factor solution in both cultures.

The Authoritarianism scale also showed a one factor solution, but some of the items did not load highly on the factor and were removed from the scale later. These items were 2-6, 18, 23, 25, and 30.

Using IRT for comparison purposes was not successful for all scales and subscales. The programme was run for all scales and subscales including CNSIE and Authoritarianism but the results showed that the scales functioned significantly differently in the two cultures. More importantly there were many negative values of X^2 which should not have happened. This may be attributed to numerical instability arising from too small a sample. For this reason it was decided not to use these results in the decision-making procedure of the comparisons. A large sample is needed to overcome this problem.

Overall, combined information from the item and factor analyses of cross-cultural data revealed that there were some emic differences between the two cultures and also one or two with poor translation fidelity from the first part. But the main differences were caused by the emic of the cultures. Most importantly, some of the scales failed to show the consistent factor structure that has been suggested. For this reason we decided not to use CNSIE any further in this study. We decided to use MASLOC as a one factor scale after removing one item from the scale because of its low contribution to the total score. The Authoritarianism scale showed a one factor solution and ten items were taken out due to their small contribution. The decision was made on the basis of the item-total correlation analysis as well as the factor analysis. For comparison purposes, although IRT may have been the most sophisticated method to use, it was not reliable due to the sample size and other unknown factors.

10.2.3. Findings for the antecedents of perceived control:
10.2.3.1. Group comparisons:
Culture:

The comparison between cultures showed that six out of ten subscales of CAMI showed differences. These were Control beliefs, Means-Ends for Effort, Powerful Others, Unknown Factors and also Agency for Luck and for Powerful Others. The significant differences were great for Control beliefs, Means-Ends for Effort and Agency beliefs for Powerful Others ($p =< 0.001$). Except for Agency for Luck, in all other scales and subscales the Turkish sample scored more internally. The Religiosity and Authoritarianism scores showed large significant differences as well - the Turkish sample being more religious and authoritarian than the English.

Gender:

Gender differences were observed on six out of ten CAMI subscales and on MASLOC. The CAMI scales were Means-Ends for Attribute, for Luck, for Powerful Others and for Unknown Factors; Agency for Effort and for Powerful Others. The differences between gender were greater for CAMI's Means-Ends for Attribute (boys scored more internal then girls) and for Unknown factors (girls scored more internal then boys).

Socio-Economic Status:

Socio-Economic Status or, rather, the catchment area of the schools, showed significant differences in five out of ten CAMI subscales and for the Authoritarianism scale as well. The CAMI subscales were Control Beliefs, where high SES scored more internal, Means-Ends for Powerful Others and for Luck, where low SES scored more internal, Agency for Effort, where low

SES scored more internal, and Agency for Attribute, where high SES scored more internal. The differences were greater for Agency for Effort and Attribute (p=<0.001). The Authoritarianism scale was also highly significant with those from the upper socio-economic classes being less authoritarian than those from the lower classes.

Age:

Age did not produce any significant differences except for CAMI's Agency beliefs for Effort. The older the pupils the less likely they were to believe in their own effort to succeed. They become more external.

Interactions:

Although, some interaction effects were observed between culture and gender, culture and SES, and gender and SES at 0.01 level no general trend was observed. The only exception was the interaction between culture and SES for the religiosity scale. In the Turkish sample the trend observed was that the low SES students were more religious then their high SES peers, whilst, in England, low SES students were less religious. This is not a surprise from the author's point of view. In Turkey, well-educated middle and upper middle class families are less religious compared with low and middle SES families. This is highly related to internal immigration and the catchment area of low SES schools, which usually contains relatively new city residents compared with the middle and upper SES groups. This does not seem to be the case in England. On the other hand, in England, the upper SES groups, in particular, seem to be the most conservative in terms of social values. This sociological finding may need more explanation and investigation in the future.

10.2.3.2. Relationships between perceived control and its antecedents:

The relationhips between variables were investigated in three different ways. First, simple Pearson Product-moment correlations were calculated between the Perceived Control Scales and two major independent variables, religiosity and authoritarianism, for the sub samples as well as the whole sample. Second, all variables were tested in a causal model of multiple regression analysis and third, canonical correlations were calculated to test the effects of the independent variables (religiosity, religion, authoritarianism, SES and gender) on perceived control.

10.2.3.2.1. Correlations between perceived control and religiosity and authoritarianism:

Highly significant correlations were found only for the Agency for Effort subscales of CAMI. This was consistent for the sub samples and the whole sample. The second consistent result found was for the Means-Ends for Effort, where authoritarian students were found to be more internal, but in this case the significance level was less for the English sample. Overall, the relationships with religiosity and authoritarianism were found to be positive and highly significant for the Turkish sample but not for the English sample. It was also found that, however small, most of the significant correlations in the English sample were between perceived control and authoritarianism (5/11 in the English sample; 1/11 in the Turkish sample) but in Turkish sample they were between perceived control and religiosity (4/11 in Turkish, 2/11 in English).

10.2.3.2.2. Regression analysis results:

Culture

The regression analysis results showed that culture was not a particularly predictive variable for almost any of the perceived control scales and subscales. However, culture was found to affect Control beliefs and Means-Ends for Effort, which were both only significant at the $p < 0.05$ level. On the other hand SES, Authoritarianism, Religiosity and Gender were predictive for most of the CAMI and MASLOC scales and subscales.

SES

SES, in particular, appears to be predictive for three out of five Means-Ends beliefs subscales as well as two out of four Agency beliefs subscales. These were Means-Ends for Attribute, for Luck and for Powerful Others and also Agency for Effort and for Attribute. Students in the high SES groups scored internal on both of the Attribute scales in Means-Ends and Agency beliefs, and scored External on Means-Ends beliefs for Luck and for Powerful Others and Agency beliefs for Effort.

Authoritarianism:

Authoritarianism was predictive for Means-Ends for Effort and Attributes and Agency beliefs for Effort and Powerful Others. Students high on authoritarianism were more internal on Means-Ends beliefs for Effort and Attribute and Agency beliefs for Effort, but those who were less authoritarian were more internal on Agency beliefs for Powerful Others.

Religiosity and Religion:

Religiosity was a predictive variable for Means-Ends for Powerful Others, Agency for Effort and Powerful Others, and for MASLOC as well. Highly religious students scored more Internal on Means-Ends for Powerful Others, Luck, Agency beliefs for Effort and MASLOC. Only on Agency beliefs for Powerful Others did more religious students score more external. Additionally the students who scored more external on the Powerful Others subscale were mainly Muslim.

Gender:

Males were more external on Means-Ends for Luck, for Powerful Others and for Unknown factors, females were more external on Mean-Ends for Attribute and there were no gender differences on Means-Ends for Effort. As Means-Ends beliefs are related to strategies these differences suggest that boys and girls in both cultures may have different experiences about which strategies are successful. Girls were more external on Agency for Powerful Others.

Age:

Age showed differences only for Agency for Effort. Older students were more external. We expected to find no differences This was the case for all of the other sub scales.

Interactions:

An interaction was found between culture and gender for CAMI's Agency for Attribute, where girls scored more internal in Turkey and boys scored more internal in England. There were also interactions between culture and SES for Means-Ends for Luck and MASLOC, where the Turkish scores were more external for the upper SES and the English scores were more internal, and Religiosity, where the religiosity scores decreased in the Turkish sample but increased in the English sample as SES increased. Finally there were interactions between gender and SES for Means-Ends for Luck and Agency for Luck, where girls with low SES scored more internal but boys with high SES scored more internal. Only the religiosity interaction was very significant (p<0.001).

10.2.3.2.2. Findings from the Canonical Correlation Analysis:

Culture and all other culture related variables such as authoritarianism, religiosity, religion and, to a lesser extent SES, loaded on the first function, together with CAMI's Control beliefs, Means-Ends beliefs for Effort and Agency beliefs for Powerful Others. The results showed that authoritarian, religious (mainly) Turkish students and non Christians or Muslims with low SES were more likely to score Internal on Control Beliefs, Means-Ends for Effort and Agency beliefs for Powerful Others. Because one item of Control Beliefs and Agency for Powerful Others of CAMI showed item infidelity some of the differences could be attributed to bias rather than cultural differences. But it was also the case that in the second part of the study more items of Control Beliefs were found to be different (emic). Therefore, the differences between samples are more likely to be due to cultural differences. Also Means-Ends for Effort and Agency for Powerful Others showed relatively low reliability in the English sample (alpha= 0.59 and 0.63 respectively) and the Control beliefs reliability was lower in the Turkish sample (alpha= 0.69). Bearing in mind that some bias was detected in part one and two, particularly for Control Beliefs and Agency for Powerful Others, these results are very significant from this study's point of view. Firstly not all of the perceived control domains seem affected by cultural differences. Secondly the ones which were affected by cultural differences were the ones that may be considered to affect individual development. It seems that Turkish students believe more that their actions directly affect outcomes. This is because they scored significantly more internal on the Control Beliefs subscale of CAMI which refers to the direct relationships between actions and outcomes. Also it seems that Turkish students believe more that a person's efforts can change the outcome. This is because they scored more internal then their English counterparts on Means-Ends for effort subscale. Finally, it seems that Turkish students believe more in their capacity to attract the attention of powerful others (i.e. teachers) is much higher then their English counterparts. This is because, they scored more internal on the Agency for Powerful Others subscale of CAMI. This could be explained by their higher motivation and belief in their ability to change their circumstances and performance in school. The results seem to apply to Muslim students in England as well. The relevance of authoritarianism, religiosity and SES to these results is not very clear. One would like to think that the religiosity and SES are just another type of cultural difference that we have hypothesised in this thesis.

SES, together with Authoritarianism and Religiosity and Gender loaded on the second canonical function, together with most of the Agency beliefs subscales (Agency for Effort, for Attribute and Powerful others). Also two Means-Ends beliefs scales loaded on the same function. These were Means-Ends for Luck and for Powerful Others. The relationships between this function and the

independent and dependent variables were that non-authoritarian and less religious, high SES boys scored more External on Means-Ends for Luck, for Powerful Others, Agency for Effort and MASLOC, and scored more Internal on Agency for Attribute and Powerful Others. Basically high SES boys who were not authoritarian or religious showed very external beliefs in strategies (Luck and Powerful Others) but most importantly they carried these external beliefs to the Capacity for Effort domain as well. The only aspects of their capacity in which they were internal was Attribute and Powerful Others who in this particular scale were teachers.

The last two functions in the canonical analysis explained less then one percentage of total variance, therefore there were trivial from this study's point of view. We mention them because the third function was where all the Means-Ends beliefs subscales and gender and SES were loaded. The last function only explained the Means-Ends for Unknown factor, which did not load on any other function.

Going back to the first two functions, it is very important to have found that culture is only important for three out of ten subscales of CAMI. But on the other hand the importance of culture on an individual's life needs further investigation. For example, do the effects of strategies on effort and capacity on influencing powerful others have any big influences on outcomes such as performance in school.

Explanations:
Overall, how much do Control beliefs, without the involvement of any strategy and capacity beliefs, directly predict an individual's behaviour? In the short term perhaps an individual believes that there is a direct relationship between actions and outcomes. This is the one way deterministic model of perceived control in which control beliefs play a big role. In the long term the relationship between actions and outcomes will be mediated by strategies and capacities. In this case Bandura's and Skinner's triadic reciprocal models apply. Capacity beliefs will develop through experiences of one's own ability to affect outcomes and strategy beliefs will develop from observations of the relationships between actions and outcomes in life.

The finding that Turkish, Muslim and low SES students were more religious and authoritarian, and also more internal on CAMI's Control beliefs and Strategy beliefs for Effort and Powerful Others, is meaningful and unexpected at a certain level. This can be explained by the overall cultural nature of this specific group who are highly motivated towards education and told by parents that success depends on being well educated. It is also interesting to see that regardless of culture,

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religiosity and authoritarianism had an influence on the capacity beliefs of individuals. The latter model seems to work well for the girls but not for the boys. Boys who are not particularly religious or authoritarian and from high socio-economic groups believe in the effects of their internal capacity on external causes such as Powerful Others and Attributes (cognitive styles) but they also believe in the effects of external strategies on external causes such as Luck and Powerful Others. Also, they have no belief that their own efforts will make any difference to the outcomes.

Summary of Findings:

The aim of this study was to compare Turkish and English samples in terms of the effects of some social antecedents on development of perceived control. The study firstly aimed to assure cross-cultural comparability of the two cultures by detecting translation infidelity and metric equivalency. After this was done the results for the two cultures were compared to find out the importance of some of the social antecedents of perceived control. The results revealed that culture and other culture based variables such as religiosity and authoritarianism were only related to some domains of perceived control. These were Control beliefs, Strategy beliefs for Effort and Capacity beliefs for Powerful Others. Unexpectedly, the Turkish students scored more internal. Although this result may have been affected by the translation infidelity of one item in the Agency for Powerful Others subscale (on item 12, see detail in part 1) the final results were too marked to be explained only by this. The second important result was that many other domains of perceived control were explained by demographic variables which may be considered as the micro level of environmental factors. This seems to be the case beyond cross-cultural differences. In particular, Capacity beliefs (agency beliefs) and some Strategy beliefs (Means-Ends) were affected by an individual's gender and the immediate social (SES) environment. It seems that the direction of the relationships is consistent from one culture to another.

10.3. CONCLUSIONS

Although the three analyses used (e.g. classical item analysis etc.) are usually used to detect scalar equivalency, in this study (part I) they were used to detect conceptual equivalence as well. This was done by the application of scalar equivalence techniques in the bilingual experimental design which enable us to look at item fidelity. Although there were some discrepancies, the methods used to test item fidelity were consistent with each other. This is consistent with studies which find strong correlations between different statistical techniques of item bias detection e.g. Rogers & Swaminathan, 1993; Raju, Drasgow, & Slinde, 1993). During the scalar investigation in the second part of this study the same scales or items were found to be different in the two cultures. There two findings indicate that scalar and conceptual equivalence have been distinguished. Returning to item fidelity, some of the scales, or in some cases items, were different only in one analysis and this was highly related to the sophistication or sensitivity of the methods used. Thus, IRT usually detected more bias than the other methods. The only problem with IRT is that the significance test of Differential Item Functioning is not yet well established in the programmes available (Thissen, 1991; Thissen et al, 1993; Holland & Weiner, 1993). This also seems to be consistent with the literature showing low and moderate correlations between different methods of item bias detection (Devine, Raju, 1982; Ironson & Subkoviak, 1979; Reise, Wideman, & Pugh, 1993, Rutner, Getson, & Knith, 1980). The implication of our results is that it is important to test item fidelity using psychometric methods. This allows us to be more flexible in the translation procedure, unlike decentralisation and other back-translation methods, and take into account connotational meanings. But which statistical or psychometric methods will be most beneficial is open to debate. This study's results draw attention to the use of psychometric methods to test item fidelity but cannot make any clear recommendation as to which method should be used. In terms of costs and availability, it is easier to use the most available psychometric techniques of Classical item analysis and perhaps Generalizability theory. On the other hand the superiority of IRT to other methods is unquestionable if the researcher has a large sample and the necessary knowledge of the method.

It is worthwhile to emphasise the importance of a separate investigation of item fidelity using a bilingual sample. This obviously enables us to separate two different sources of bias or variance from each other. One of these is translation or connotational bias, also called non-uniform bias, where, due to connotational differences, an item acts in completely different ways in different cultures. This was tested in bilingual sample (Part I). The other type is cultural or uniform bias (in some cases differences) where one culture consistently outperforms another culture (van de Vijver & Leung, 1997). This was tested in the monolingual samples (Part II).

Generalizability theory detects translation infidelity by allowing the researcher to detect major differences across time and language forms. However, it should be noted that this study adjusted the analysis so that it could be used for total scores.

When Classical theory is used for translation fidelity it allows us to compare different language forms but will ignore time differences (which are detected by the generalizability analysis). The advantage of using classical analyses is that they are widely available in common statistical packages (e.g. SPSS). Also, they do not require very large samples.

Item response theory allows us to get the best fit of two given language forms. It is possible to fix the parameters and force different versions of the same item (e.g. English and Turkish), answered by the same participants, to be tested mathematically. To a large extent it is possible to get the best information from the available data. However, it requires a lot of data to fix the parameters and this requirement becomes important if the scale has a large number of questions. Furthermore, the reliability index becomes artificially increased because the number of questions doubles when we combine English and Turkish versions of the answers. And finally, because χ^2 is so sensitive it is possible that the detected differences are false alarms rather than genuine (e.g. on MALOSC's internal subscale differences were found only in the IRT analysis).

In conclusion the results suggest that while IRT is the best method to detect translation infidelity, its sensitivity may cause false alarms, which are more likely to occur in cross-cultural data because of the number of sources of variance. This over sensitivity can be compensated for by using one of the other two method together with IRT. For practical purposes it seems that classical theory and generalizability theory are still effective when the researcher has no access to the specialist programs needed for IRT (e.g. MULTILOG, BILOG etc.).

The derived etic between cultures was tested with metric equivalence. Again two psychometric methods were used. Metric equivalency was investigated using classical item analysis and factor analysis as well as IRT but due to some numerical instability in IRT analysis only the Classical theory results were used in the interpretation. According to these, the CAMI and Religiosity scales were kept in the final analysis without any change, the MASLOC and Authoritarianism scales were altered and CNSIE was completely removed. CNSIE did not show good item-total correlations therefore the reliability was low in both cultures. It also failed to show any consistent factor structure in both cultures, which was attributed to the multidimensionality of perceived control.

This was not seriously considered in the early studies of perceived control (Rotter, 1975; Novicki, Stricklands, 1973).

The psychometric information gathered about perceived control scales has reinforced the multidimensionality of the concept (Weigel, Wertlieb, & Feldstein, 1989). In particular the validity of multidimensional measurement of CAMI has been shown to be the case for both samples. On the other hand MASLOC proved to be unidimensional, rather than multidimensional as it is meant to be. This finding conflicts with the literature (Palenzuela, 1988) that MASLOC measures the Internal, helplessness and Luck domains separately.

Classical analysis was very informative. The IRT results seemed to be unreliable due to negative Chi-square values. This may have been caused by sample size. There is only one demonstration of the use of IRT in the literature to test for Differential Item Functioning with similar data but the number of parameters tested were much smaller (Thissen et al., 1993). The need for a large sample seems to be a drawback of this method. On the other hand, the benefits of this technique should not be overlooked, even though it was found to be unreliable in this study. IRT is a valuable statistical test for cross-cultural studies because of the independence hypothesis of the analysis. Unlike classical analysis the parameters estimated do not depend on the groups being investigated but on the nature of the latent trait being studied. In classical analysis, the item difficulty is dependent on the average responses of the group. Van de Vijver & Leung (1997) state that "...the estimation of person's standing on a latent trait in IRT is independent of the item used. An interesting implication of this property of the IRT model is that using identical stimuli are no longer required when comparing different cultural groups" p. 78. As a result of this, in ideal circumstances the method's flexibility when tailoring items (making new scales from combinations of items tested on different occasions) is very attractive for cross-cultural studies. Therefore, the utility of IRT can not be denied and should certainly be encouraged in future studies (de Gruijter & Van der Kamp, 1984; Lord, 1980; Hulin, 1987; Van de Vijver & Hambleton, 1996; Hambleton et al., 1991).

The third part of the study also showed that perceived control is a multidimensional concept. In some cases the participants scored internal in one domain of CAMI but external in another. This kind of result is consistent with the literature and shows the multidimensional nature of perceived control (Levenson, 1982; Lefcourt, 1984; Skinner et al., 1988; Palenzuela, 1989). What we are not able to say from these results is the nature of the relationship between general and specific domains of perceived control because of the omission of CNSIE, which is a general scale, from

the later stages of our analysis. On the other hand, in the last stage we used MASLOC as a one dimensional scale. Therefore, perhaps because MASLOC, and CAMI's Agency belief subscales were loaded on function two, it is possible to say that Agency (capacity/self-efficacy) subdomains are related to the general domain of perceived control. So, it possible to suggest that there is a link between general and specific domains. These results also show the value of conceptualisations in this area. Palenzuela (1988) has argued that perhaps it is time to refine our understanding of perceived control. In his view perceived control is closer to Seligman's (1975; 1995) concept of Learned Helplessness than Bandura's (1986) concept of self-efficacy. According to Skinner and her colleagues (1988; 1987) old perceived control scales such as CNSIE are more correlated to Means-Ends (strategies) beliefs rather than Agency beliefs. This is contradicted by what we found, but it supports the point made by Palenzuela that the reshaping of the concept is in place.

One of our hypotheses, that cultural differences will influence some dimensions of perceived control, was shown to be true for only three subscales, Control beliefs, Means-Ends for Effort and Agency for Powerful Others. What was not expected, but was found, was that the Turkish sample was more Internal than their English counterparts on all of these dimensions. These results are not the only ones in the cross-cultural literature to show that non-western cultures are more internal than, or at least equally internal to, their Western counterparts. Particularly in personal (self) control, some cultures are known to be equally, or sometimes even more internal than their western counterparts (Rafaei & Rahman, 1976; Carment, 1974 Cited in Hui; La & Loftus, 1998).

There is some evidence in the literature that Agency beliefs (also called self-efficacy; Oettingen, 1995) are all highly and consistently related to academic performance (Chapman & Skinner, 1989; Chapman, Skinner & Baltes, 1990). It seems that this is a domain where consistent relationships between macro-environmental variables (culture, religion, religiosity and authoritarianism) and perceived control have been found.

In a time series analysis of classroom data by Schmitz & Skinner (1993), Means-ends for Effort was found to be significantly related to the academic performance of individuals, but in a more complicated and indirect way, where the perceived control domains act as mediators of academic success. One explanation for the results is that classroom structure may be playing a role in the development of perceived control. Perhaps in the whole class teaching system, as in Turkey, children get more immediate feedback about their capacity compared with their peers, whilst in England, where skill-based teaching is in place, children get less immediate feedback about their capacity. Little and his colleagues (1995) favoured this explanation when they found that an

American sample were more Internal than German and Russian samples. But their second finding was that while this high Internality was not related to high achievement for the American sample, it was for the German and Russian sample, where whole-class teaching more common and therefore led to children developing very realistic perceptions of their capacity (Agency) beliefs.

Little's explanation may not be a good one for our results for two reasons. First, we did not test academic achievement therefore we cannot make the same inferences that they made. Second, where their East German and Russian samples were more external as a result of a whole class teaching experience our Turkish sample was more internal. Therefore we favour the explanation that children in Turkey are more intrinsically motivated for school achievement and their achievement motivation is encouraged by their social environment (Weisz & Stipek, 1982; Harter & Connell, 1984).

Whatever the reason might be, it is important to highlight this internally oriented locus of control (it may be called optimism) of the Turkish pupils' control beliefs. High achievement motivation may come from the need to improve living circumstances and social position through education and employment in highly paid professions. This is consistent with the family structure in Turkey where education is encouraged because this enables the whole family to move up in social status (Kagitcibasi, 1996). However, the motivation to succeed is highly dependent on an optimistic evaluation of the circumstances. One needs a positive view of the future to pursue long term goals such as good educational qualifications and highly paid employment (Oettingen, 1996). When Oettingen (1995) looked at the explanatory styles of East and West Berlin residents she found that for both negative as well as positive life events East Berliners' tended to use more internal, stable and global explanatory styles. This is like people with depressive tendencies, whereas people without depressive tendencies use internal, stable and global explanatory styles only for positive life events.

Optimistic and pessimistic thinking in relation to culture is an interesting idea which is able to explain some of our findings better than some of the other literature on perceived control introduced in this thesis. However, the results of research in this area are not conclusive. Some studies have found that Western and individualistic cultures are more optimistic than Eastern cultures (Lee & Seligman, 1998). Others have found that fundamentalism is highly positively related to optimism in North America subcultures (Sethi & Seligman, 1993).

The second important finding of the final study was that almost all Agency beliefs (except Agency for Luck, where the Turkish sample scored more external) were explained by demographic variables (gender and SES) and micro-social variables (religiosity and authoritarianism). Cultural (macro environment) differences were not significant. The results showed that girls with low SES were more internal on Agency for Effort but they also scored more external on Agency for Attribute and for Powerful Others. It is evident that these CAMI's sub domains are independent from each other. But it is still believed that their combined and multivariate effect on final performance is important. From our point of view, it is very difficult to make any predictions about the girls performance apart from speculating that their Agency belief about Effort will help them try even after they have made an unsuccessful attempt (Schmitz & Skinner, 1993). Boys with high SES on the other hand, who are less religious and authoritarian, seem more External on Agency for Effort and more Internal on Attribute and Powerful Others. This may well be simply a result of their experiences of being praised and rewarded disproportionately when they are successful. From our results, it is not clear how these pupils perform in school. But, in the recent literature, studies of the effects of coping on perceived control have shown that coping and motivation may have a crucial effect on engagement in a task and therefore on performance and the development of perceived control (Skinner, 1995; Smiths, 1989; Schmitz & Skinner, 1993). In the literature the importance of perceived control on performance has been shown, from both Means-Ends (strategy) and Agency (Capacity) beliefs. What has not been said before clearly and what has been found in our research is that Religiosity and authoritarianism are important predictors of Internal Agency (capacity) beliefs. Although some preliminary results (Lesser & Painser, 1985; Furnham, 1982; Jackson & Courtsey, 1988) suggest that perhaps religious people are more internal than their counterparts, particularly in certain domains such as luck (chance), these studies were done with highly religious groups. Therefore the findings are not generalizable to normal samples. They also used adult samples. Apart from these exceptions in the literature it seems that most of the relationships found are in the other direction, where high religiosity is related to external locus of control (Davies & Stephan, 1995; Ramussen & Charman, 1995). Additionally, investigations of the causes of life events in religious and non-religious groups have shown that causal explanations do not differ between them, except that religious people tend to use God as a causal agent in health related and death related life events (Loewenthal & Cornwall, 1995). To our knowledge the effect of religiosity has not been investigated in a large Muslim sample, except in a study where Hindus and Muslims (125 in each group) were compared in terms of their dependence proneness and internal locus of control. Although Muslims were found to be more dependence prone the differences on LOC were not significant (Saeeduzzafar & Sharma, 1992). These results are perhaps worth pursuing until the links between specific perceived control

domains and performance have been established and until our understanding of the effects of Religiosity on perceived control is clear. One explanation is that Religiosity creates a subculture where intrinsic motivation is praised a lot. Another explanation is that during development a person's understanding of the world is expanded and developed by all these values and belief systems together. Therefore the effect of Religiosity on perceived control is more than just as a social or individual motivating factor. If this is the case, perhaps the relationships is more between two cognitive category systems which are, by their nature, connected to each other. The connectedness could be mediated by their general or domain specific nature. Then again, it will again be very interesting to study the relationships between domain specific and domain general development (Gelman et al., 1994; Medin & Ortony, 1986; Vosniadou & Ortony, 1986; Semin & Fiedley, 1996). Although religiosity and authoritarianism were found to explain most of the agency beliefs subdomains using canonical analysis, they were also found to be related to mean-ends and agency beliefs for effort using Pearson product-moment correlations. Their explanatory value, even though higly significant, is limited by the small variances explained.

Sethi and Seligman (1993) investigated nine major religions in North America (sample of 623). They ordered these religions from fundamental (this group includes Muslims, Orthodox Jews and Calvanists) to liberal. When they content analyzed the ceremonial materials used in each religion for explanatory style they found that the fundamentalist religious services expressed much more optimism (internal, stable, global explanatory style) than the moderates and liberals. This was consistent with the followers self-reports on an attribution style questionnaire. Other studies on optimism also showed that there were differences between cultures which were related to their experiences. People from different cultures tend to use different explanatory styles (Oettingen & Seligman, 1990; Oettingen, 1995; Lee & Seligman, 1998). Oettingen found that because of political differences people from East-Berlin were more pessimistic than West-Berliners in common domains of experiences such as the Olympic games. Even though they won more medals than West Berliners they tended to be more pessimistic and used a negative explanatory style (internal, stable, global). Lee & Seligman (1998) also found that Americans were more optimistic than Chinese living on Mainland China. Chinese living in America scored in between these two groups.

In relation to authoritarianism, there is no clear conclusion from the literature about the direction of the relationship between locus of control and authoritarianism. Where some studies have found negative relationships between authoritarianism and Internal Locus of control (Ray & Subick, 1998; Ojha, 1997; Morrison, de-Man & Drumheller, 1993) others, like our study, have found

positive relationshisp between authoritarianism and Internal locus of control (Na & Loftus, 1998; Diakonova & Gilgen, 1998; McCollaum & Lester, 1995). In all of these studies the samples used were either adults or university students and the samples were not always big. Diakonova et al. (1995) particularly draw attention to the small amount of variance explained by the variable. What is interesting is that similar results to those reported in this thesis are being found in other cross-cultural research. Na and Loftus (1998) compared American, Korean and Japanese samples and found the direction of the relationship to be similar in the non-western cultures. The American and Korean samples were found to be similar on LOC, and Internal LOC and Authoritarianism were found to be related to each other and to provide an explanation for the people's attitude towards the law and prisoners in both cultures. The partial correlations were relatively small (.27) but still very significant.

The significant relationships between religiosity, authoritarianism and Internal LOC for the Agency subscales were found mainly in the Turkish sample, where the majority of the population is Muslim, because the positive correlation between religiosity and authoritarianism was found to be high for the Turkish sample but low for the English. So the unexpected results between religion, authoritarianism and Internal LOC may be unique to socio-cultural variables, which have not been tested in this particular way before. The opposite relationship between religiosity and Locus of control found in the literature (e.g. Rasmussen & Charmann, 1995) may be specific to these investigations, which were of Christians.

Overall it is important to show the predictive value of social variables such as nationality, religion, religiosity and authoritarianism and SES, as well as gender, on perceived control (Lefcourt, 1991; Little et al, 1995) Statsenko et al, 1995). What is most important is that the relationships between these variables were not in the direction one would have predicted. However small in magnitude, this was particularly the case of the relationships between perceived control and religiosity and authoritarianism.

This can be explained in two ways. One is that this study took into consideration comparability of measurement in different cultures, therefore most of the variance may have been caused by cultural as well as measurement differences. Therefore, the study is based on more reliable information than previous studies. The second explanation is that the results are specific to the Turkish culture. If this is true they may have been caused either by sample bias or by specific experiences in the culture, one of which may be the Turkish pupils' schooling experience.

What also seems important is that the Agency beliefs subscales did not show cultural differences at the macro level, but did show differences at the micro level of social variables (Religiosity and Authoritarianism, SES and gender). These results can be taken as evidence of the validity of the comparability aspect of this research and for the cross-cultural validity of the CAMI scale and the theory behind it.

10.4. IMPLICATIONS

The comparability of the cross-cultural data needs to be regulated by the existing framework, such as the derived etic or decentralisation approaches (Berry et al., 1992). Additionally psychometric methods should be used to assure the reliability of the information gathered in the cultures investigated (Van de Vijver & Hambleton, 1996; Van de Vijver & Leung, 1997).

It seems that existing methods are useful but they need to be amended for the specific needs of cross-cultural data. For example, most of the cross-cultural research in psychology uses self-report rating scales but existing methods in contemporary psychometric comparisons, such as the Mantel-Haenszel procedure, are mainly about skill based binary scores (Holland & Wainer, 1993). Perhaps Generalizability theory is the most promising for dealing with rating scales, but usually it is difficult to use at the item level because of the large number of items to be investigated. Van de Vijver & Leung (1997) suggest using an analysis of variance conditional to deal with the problem. In this analysis the scores are the dependent variable and culture and score levels (e.g. high, medium, low) are independent variables. But, the programme still doesn't overcome the number of comparisons that need to be done (a 20 item scale with 5 point rating scale for each would require 100 comparisons). The Classical approach was not challenged by this problem in the past and therefore was not designed for it. Nevertheless, it is still informative and practical.

There are at least two more alternatives to using psychometric methods to detect differences between cultures. These are the SINCLAR and Structural Equation models, which both apply to multivariate scales. In future the use of these methods should also be considered (Hui & Triandis, 1983; Little et al., 1995). Also, Van de Vijver & Leung (1997) suggest that Level oriented statistical techniques would be useful for Cross-cultural bias detection. They suggest hierarchical regression analysis and multi-level models to be examples of this.

The implication here of the comparison between cultures is that macro environmental variables such as culture are important but not on all domains of perceived control. Micro environmental variables such as SES and gender had the greatest effect on capacity beliefs. The importance of

Religiosity on Control beliefs, Means-Ends for Effort, as well as almost all Capacity beliefs, suggests that general and domain specific learning work together. However small the magnitude of the relationship it would be worthwhile to investigate in detail to find out the causal links between them. It is also possible that there are other explanatory variables which not included in this study, equally explain perceived control. The other antecedents such as teaching methods are worth further investigation. Knowing that Turkish students are more Internal on most of the perceived control domains can be taken at face value to suggest the success of the new Turkish generation. But this inference can only be made safely when the antecedents of perceived control have been linked with actual performance, something, which has not been done in this study.

One conclusion of this research is that optimism and pessimism, as an extended theory of learned helplessness, may be a valuable area in the investigation of the relationship between LOC and religion and authoritarianism. This is one area which seems to have been overlooked in the past. Without making any judgements, it would be worthwhile investigating in depth the relationships between fundamentalist discourse, which has been adopted by some religions or sectors and optimism. Also, it would be interesting to compare not only the differences in discourse between different religions but also the differences of meaning and the practice of the religion between nations.

10.5. LIMITATIONS OF THE STUDY

The results of this study were limited by the selective nature of the samples and the materials used. In Turkey in particular the sample represented only children and adolescents who were in secondary education. Given that education is not compulsory after 14 to 15 years of age, and the sample tested were between 14 and 18 years of age, the representativeness of the sample of all Turkish adolescent of this age can be questioned.

There is also some evidence that the school ethos sometimes causes a certain type of attitude in pupils. In the Turkish sample and some parts of the English sample some of the schools were very selective. This may have encouraged certain types of self-perception. The problems of differences between schools have been investigated and taken into account by some educational studies and the analysis of these variables is called Multi Level Structural Analysis (Goldstein & Wood, 1989). However, care was taken to ensure that the schools in our two samples were matched as far as possible, and some of the schools in both samples were representative of ordinary schools. It is also the case that the schools were chosen from big inner cities in both countries, but even though

they were therefore matched they did not represent rural schools. We do not know whether this is an important variable.

We would like to have tested the same variables with more measurements of perceived control, such as other multidimensional and unidimensional as well as domain general and domain specific scales (Lefcourt, 1982; Levenson, 1981; Paulhus, 1983). This may have allowed us to make better predictions about the dimensions and domains measured and the relationships involved. It would also have allowed scales or items to be dropped from the study without affecting the amount of information collected. But, even with the battery we used we found that the students' attention span and the time the schools allowed for the project was limited.

10.6. FUTURE RESEARCH

The finding that the Turkish sample was more Internal in some domains of perceived control should be investigated in more detail and the reasons should be identified. The consequences of this for performance should also be tested before any conclusions are drawn about the link between perceived control and achievement. At the moment there are many conflicting results about the relationships between perceived control and academic performance and knowing a person's perceived control does not necessarily predict their performance.

The link between micro level social and environmental variables and perceived control needs to be explained more. So the investigation should be repeated in one culture to clarify the role of micro level environmental variables.

It is worthwhile trying to identify classroom and school dynamic variables, which may have an influence on the development of perceived control. There is already some evidence for the effect of these variables in Schmitz & Skinner's (1993) time series study of classroom tasks and in Little et al.'s (1995) study of teaching style in different cultures.

It would be interesting to investigate the relationships between religion, religiosity and authoritarianism in relation to optimism because in these factors may make life events (e.g. school engagement and performance) more predictable.

In terms of methodology, further investigation of the use of IRT with a larger sample seems warranted. Its use in detecting DIF is promising. Alternative methods of bias detection need to be

emphasised for all future cross-cultural research. Multi Level analysis would also be another promising test to use in this area (Van de Vijver & Leung, 1997).

THE APPENDICES:

Appendix A: Scales in two language forms

Appendix B: ANOVA tables of generalizability analysis

Appendix C: Example of Item Characteristics Curves (ICC)

Appendix D: Item Discrimination (A) and Difficulties (Bs) for the English and Turkish Forms of the Scales and Subscales

Appendix E: Regression analyses and a sample of scattergrams of the significant and curvilinear relationships between Religiosity, Authoritarianism and Perceived Control

APPENDIX A: Scales in two language forms

Scale 1:

Control beliefs, Means-Ends beliefs and Agency beliefs (CAMI)

In These questions, you use the following possible answers;

1=Almost Never 2= Sometimes 3=Often 4=Almost Always

1.   Do you try as hard as you can in school?

2.   Can you learn things you need to for school pretty fast, without really working on them?

3.   If you decide not to get any bad marks, can you really do it?

4.   Do you really pay attention in class?

5.   Can you do anything to keep from getting bad marks?

6.   Are you sort of person who is lucky with their homework?

7.   If you decide to sit down and learn really hard, can you learn it?

8.   When the teacher calls on you, are you usually lucky in knowing the right answer?

9.   Are you clever in school even without studying a lot?

10.   Can you get good marks when you really want to?

11.   Do your teachers, on the whole, like you?

12.   When you want them to, will your teachers help to see that you do well in school?

13.   When students give the right answer to questions in class, is it usually only because they're just good students?

14.   Do students do well at school because their teachers don't like them?

15.   If a student gets bad marks, is it usually because the teacher doesn't like them?

16.   When students give the wrong answers on a test, is it usually because they don't work carefully?

17.   When students get bad marks, is it usually because they are no good at school?

18.   When a student does well at school, is it usually because he or she is just clever?

19.   When a student doesn't understand something at school, is it because he or she doesn't pay enough attention?

20.   When a student knows a lot about something, is it because he or she works hard at learning it?

21. When a student does badly in school, is it usually because the teacher doesn't really like him or her very much?

22. When a student does badly in school, is the main reason usually that he or she is just not clever?

23. Is trying hard the usual reason that students do well in school?

24. If a student gets good marks, is it usually because he or she gets along well with the teacher?

25. Some students learn things more easily than other students do. Is it because they are luckier?

26. If the teacher asks a student a hard question and he or she answers correctly, is it usually difficult to work out why the student gave the right answer?

27. When a student gets a lot of problems wrong (for example, in a spelling test), is it usually difficult to work out why the student gave the right answer?

28. Is doing well at school usually a matter of luck?

29. When students get bad marks, is it because they have bad luck?

30. When students do better than usual in a subject, is it hard to tell why?

31. When students do badly in school, is it hard to work out why that happens?

32. If a teacher asks a student a question and the student doesn't know the answer, is it simply because the student's unlucky?

33. Do you listen very carefully to what your teacher says?

34. If you decide that you're not going to get any problems wrong (for example, in maths or spelling) can you do it?

35. If you want to well in school, can you?

36. When it comes to schoolwork, are you usually luck?

37. When it comes down to it, do you really work hard on your homework?

38. When it comes to learning something hard, do you usually have luck on your side?

39. Do you get problems right (for example, in math), even you don't try hard?

40. Do you have teachers who will help when you want them to?

41. If you want to, can you keep from doing badly in school?

42. Can you get all the problems (for example, in spelling) right, when want to?

43. When you think about it, would you say that your teachers are pretty satisfied with you?

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44. Can you understand the teachers' lessons easily?

45. When students do really well in school, is it hard to know the reason why?

46. When students get good marks in school, is it hard to know the reason why?

47. When a teacher asks a student a question and the student gives the wrong answer, is this usually because the student isn't trying hard enough?

48. If a teacher calls on a student and the student knows the right answer, would you say it's because the student is lucky?

49. When students don't understand something, is it because they are just no good at school?

50. When a student manages to learn something hard, is it because the student's clever?

51. When students have problems in school, is it usually because of the teacher?

52. If students have problems in school, is it usually because of the teacher?

53. If students understand things quickly, is it because they are very good at school?

54. When students give the wrong answer to a teacher's questions, do you find it hard to know why that happens?

55. Just imagine that a student does really well on a test. Is it hard to know why?

56. When students don't learn very much in class, is it usually because they don't work very hard?

57. Is getting good marks just a matter of luck?

58. When a student has a hard time learning something, is it usually because the student's unlucky?

59. When a student does worse in a subject than usual, is it hard to now why?

60. When a student does well in school, is it usually because the student gets along well with the teachers?

61. When a student does well in schoolwork, is it usually because the student works very carefully?

62. When a student has a hard time learning something, is it usually because the student is unlucky?

63. When students do badly in a subject, is it usually because the teachers just don't help them very much?

64. Is the usual reason that students understand what the teachers say, that they pay attention and listen carefully?

Scale 2:

Novicki-Strickland's Internal and External Locus of Control Scale for Children (CNSIE)

In these questions, use the following possible answers:

1=Almost Never 2= Sometimes   3= Often   4= Almost Always

1.   Do you believe that most problems will usually sort themselves out in time?

2.   Do you believe that you can stop yourself from catching a cold?

3.   Are some children just born lucky?

4.   Most of the time do you feel that getting good marks means a great deal to you?

5.   Are you often blamed for things that just aren't your fault?

6.   Do you believe that if somebody studies hard enough he or she can pass any subject?

7.   Do you feel that most of the time it doesn't pay to try hard because things never turn out right anyway?

8.   Do you feel that if things start out well in the morning it's going to be a good day no matter what you do?

9.   Do you feel that, most of the time; parents listen to what their children have to say?

10.   Do you feel that wishing can make good things happen?

11.   When you get punished does it usually seem to be for no reason at all?

12.   Most of the time, do you find it hard to change a friend's opinion?

13.   Do you think that cheering more than luck helps a team to win?

14.   Do you feel that it's nearly impossible to change your parent's mind of your own decisions?

15.   Do you believe that your parents should allow you to make more of your own decisions?

16.   Do you feel that, when you do something wrong, there's very little you can do to make it right?

17.   Do you believe that some children are just born good at sports?

18.   Are most of the other children your age stronger than you are?

19.   Do you feel that one of the best ways to handle most problems is just not to think about them?

20.   Do you feel that you have a lot of choice in deciding who your friends are?

21.   If you find a four-leaf clover do you believe that it might bring you good luck?

22. Do you feel that whether you do your homework has much to do with what kinds of marks you get?

23. Dou you feel that when another teenager your age decides to hit you, there's little you can do to stop him or her?

24. Have you ever had a good luck charm?

25. Do you believe that whether or not people like you depend on how you act?

26. Will your parents usually help you if you ask them to?

27. Have you felt that, when people were mean to you, it was usually for no reason at all?

28. Most of the time, do you feel that you can change what might happen tomorrow by what you do today?

29. Do you believe that when bad things happen, they are just going to happen, no matter what you do try to stop them?

30. Do you think that children can get their own way at home?

31. Most of the time, do you find it useless to try to get your way at home?

32. Do you feel that, when good things happen, they happen because of hard work?

33. Do you feel that, when somebody your age wants to be your enemy, there's little you can do to change matters?

34. Do you feel that it's easy to get friends to do what you want them to?

35. Do you usually feel that you have little to say about what you get to eat at home?

36. Do you feel that, when someone doesn't like you, there's little you can do about it?

37. Do you usually feel that it's almost useless to try in school because most other children are just cleverer than you are?

38. Are you the kind of person who believes that planning ahead makes things turn out better?

39. Most of the time, do you feel that you have little to say what your family decides to do?

40. Do you think it is better to be clever than to be lucky?

Scale 3:

Multidimensional Academic Specific Locus of Control Scale (MASLOC)

In these questions, the possible answers are:

1=Strongly Disagree   2=Somewhat Disagree   3=Slightly Disagree

4=Slightly Agree   5=Somewaht Agree   6=Strongly Agree

1.   If I want to obtain a good exam record, it is essential that I should have good luck.

2.   The marks I get at the end of the year will always be closely related to what I do during the year.

3.   Whatever the quality of my work, I am always lucky when it comes to exams.

4.   It is an absolute waste of time for me to make any effort, since there is no relationship between my ability, how hard I work, and the marks I get.

5.   I am convinced that the marks I'll get depend on how well or badly I do in my exams.

6.   My getting good or bad mark in my exams is related to whether precisely the topics I have studied came up in the exams.

7.   The kind of marks I will get in my studies depends on how capable I am in preparing myself for the subjects.

8.   I don't think it is worthwhile studying hard, since the marks I will get will be completely manipulated.

9.   I am convinced that whatever I do, my teacher will always give me the marks they want to.

10.   If I want to get a good academic record, I have to be competent and I must work hard.

11.   In general, I believe that, if one is competent and works hard, one will get good results in one's studies.

12.   Luck is decisive in the kind of marks I get in my studies.

13.   The marks I get in my subjects are always determined by a series of random circumstances.

14.   It makes absolutely no difference whether I prepare well for a subject or not, since, in the long run, teachers are "out to catch you".

15.   Regarding my academic life, I just don't know what to do. Anything might happen: may be I'll do an exam well and fail, or may be I'll do it badly and pass.

Scale 4:

Religiosity in Youth

Please answer the following questions:

1. What religious group do you belong to?

   1) Christian (please specify what sort)   2) Muslim

   3) Jewish   4) Hindu   5) Others (please specify)

2. How often you attend religious services during the past year? (tick only one)

   1) Not at all   2) A few times   3) About once a mount

   4) About once a week   5) More often

3. Which of the following best describes your practice of prayer or religious meditation?

   1) Prayer is a regular part of my daily life.
   2) I usually pray in times of stress or need, but rarely at any other time.
   3) I pray only during ceremonies.
   4) Prayer has little importance in my life.
   5) I never pray.

4. When you have a serious personal problem how often do you take religious advice or teaching into consideration?

   1) Almost always 2) Usually 3) Sometimes 4) Rarely 5) Never

5. How much of an influence would you say that religion has on the way that you choose to act or the way that you choose to spend your time each day?

   1) No influence   2) A small influence   3) Some influence
   4) A fair amount of influence   5) A large influence

6. Which one of following statements comes closest to your belief about God?

   1) I am sure that God really exists and that He is active in my life.
   2) Although I sometimes question His existence, I do believe in God and believe he knows of me as a person.
   3) I don't know if there is a personal God or higher power of some kind.
   4) I don't know if there is a personal God or higher power of some kind, and I don't know if I will ever know.
   5) I don't believe in a personal God or in a higher power.

7.	Which of the following statements comes closest to your belief about life after death (immortality)?

1) I believe in life after death and a soul existing as a specific individual.
2) I believe in soul existing after death as part of a universal spirit.
3) I believe in a life after death of some kind, but I really don't know what it would be like.
4) I don't know whether there is any kind of life after death, and I don't know if I will ever know.
5) I don't believe in any kind of life after death.

8.	During the past year, how often have you experienced a feeling of religious reverence or devotion?

1) Almost daily 2) Frequently   3) Sometimes   4) Rarely   5) Never

9.	Do you agree with the following statement?
"Religion gives me a great deal of comfort and security in life."

1) Strongly disagree   2) Disagree   3) Uncertain
4) Agree   5) Strongly agree

Scale 5:

Authoritarianism Scale

In these questions, use following possible answers:

1=Strongly Disagree   2=Somewhat Disagree   3=Slightly Disagree

3=Strongly Agree   5=Somewhat Agree   6=Slightly Agree

1.   Obedience and respect for authority are the most important virtues children should learn.

2.   No weakness or difficulty can hold us back if we have enough will power.

3.   Science has its place but there are many important things that can never be understood by the human mind.

4.   Human nature being what it is, there will always be war and conflict.

5.   Every person has a problem or worry, it is best for him or her not to think about it, but to keep busy with more careful things.

6.   When a person has a problem or worry, it is best for him or her not to think about it, but to keep busy with more cheerful things.

7.   A person who ahs no manners, bad habits, and poor breeding can hardly expected to get along with decent people.

8.   What youth needs most is strictly discipline, rugged determination, and the will to work and fight for family and country.

9.   Some people are born with an urge from high places.

10.   Nowadays when so many different kinds of people move around and mix together, a person has to protect him or herself especially against catching an infection or disease from them.

11.   An insult to our honour should always be punished.

12.   Young people sometimes get rebellious ideas, but, as they grow up, they ought to get over them.

13.   It is essential for learning or effective work that our teacher or bosses outline in detail what is to be done and exactly how to do it.

14.   What this country needs most, more than laws and political programmes, is a few courageous, tireless leaders in whom the people can put their faith.

15.   Sex crimes, such as rape, and attacks on children, deserve more than mere imprisonment; such criminals ought to be whipped, or worse.

16.   People can be divided into two distinct classes: the weak and strong.

17. There is hardly anything lower than a person who does not feel a great love, gratitude, and respect for his parents.

18. Some day it will probably be shown that astrology can explain a lot of things.

19. Some leisure is necessary, but it is good hard work that makes life interesting and worthwhile.

20. Nowadays more and more people are prying into matters that should remain personal and private.

21. Wars and social troubles may someday be ended by an earthquake or flood that will destroy the whole world.

23. The wild sex life of the old Greeks and Romans was tame compared to some of the goings-on in this country, even in places where people might least expect it.

24. If people would talk less and work more, everybody would be better off.

25. Most people don't realise how much our lives are controlled by plots hatched in secret places.

26. Homosexuals are hardly better than criminals and ought to be severely punished.

27. Books and movies ought not to deal so much with the unpleasant and seamy side of life; they ought to concentrate on themes that are entertaining or uplifting.

28. No sane, normal, decent person could ever think of hurting a close friend or relative.

29. Familiarity breeds contempt.

30. When you come right down to it, it's human nature never to do anything without an eye to one's profit.

1. Olcek

Bu sorular icin asagidaki mumkun cevap formlarini kullaniniz;

1=Hemen Hicbir Zaman   2=Bazen

3=Cogunlukla   4=Heman Her Zaman

1.   Dusununuz: Okulda basarmak icin tum cabanizi sarfediyor musunuz?

2.   Okulda ihtiyaciniz olan seyleri ogrenirken, cok fazla calismadan, kolayca ogrenebiliyor musunuz?

3.   Dusununki ogretmen size bir soru sordu ve siz cevabi bilemediniz. Bunun basiniza gelmemesi icin yapabileceginiz bir sey var midir?

4.   Derste gercekten dikkatli olabiliyor musunuz?

5.   Muhakkak ki kotu not almak istemezsiniz. Kotu not almamak icin yapabileceginiz bir sey var midir?

6.   Odevlerinizi hazirlarken kendinizi sansli bir insan olarak goruyor musunuz?

7.   Eger gercekten zor olan bir konuyu kendi kendinize ogrenmeye karar verirseniz, bunu gerceklestirebilir misiniz?

8.   Ogretmen size soru sordugunda, dogru cevabi bilme konusunda genellikle sansli misiniz?

9.   Cok calismamsaniz bile sinifta iyi misiniz?

10.   Istediginiz zaman iyi not alabilir misiniz?

11.   Ogretmenlerinizin hepsi sizden hoslaniyor mu?

12.   Istediginizde ogretmenleriniz sizin basarili olmaniz icin yardimci oluyorlar mi?

13.   Ogrenciler sinifta bir sorunun cevabini dogru verdiklerinde genel olarak bunun nedeni onlarin gercekten iyi ogrenci olmalari midir?

14.   Ogretmenleri onlara yardim ettigi icin mi, ogrenciler okulda basarilidirlar?

15.   Eger bir ogrenci kotu notlar aliyorsa, genel olarak bunun nedeni ogretmenin ondan hoslanmasi midir?

16.   Ogrenciler testte yanlis cevap verdiklerinde, genel olarak bunun nedeni onlarin dikkatlice calismamis olmalari midir?

17.   Ogrenciler kotu not aldiklarinda, genel olarak bunun nedeni onlarin derslere devamsizligi midir?

18. Bir ogrenci okulda basarili oldugunda, genel olarak bunun nedeni onun yeterince dikkat sarfetmemis olmasi midir?

19. Bir ogrenci bir konuyu tam anlamadiginda, genel olarak bunun nedeni onun bu konuyu ogrenmek icin cok calismamis olmasi midir?

20. Bir ogrenci bir konuyu tam anlamadiginda, genel olarak bunun nedeni onun bu konuyu ogrenmek icin cok calismamis olmasi midir?

21. Bir ogrenci okulda basarisiz oldugunda, genel olarak bunun nedeni ogretmenin ondan hoslamiyor olmasi midir?

22. Bir ogrenci okulda basarisiz oldugunda genel olarak bunun nedeni onun zeki olmamasi midir?

23. Ogrencilerin okulda basarili olmalarinda genel olarak bunun nedeni cok calismalari midir?

24. Eger bir ogrenci iyi notlar almissa, genel olarak bunun nedeni ogretmeniyle arasinin iyi olmasi midir?

25. Bazi ogrenciler, digerlerinden daha kolay ogrenirler. Bu onlarin daha sansli olmasindan midir?

26. Eger ogretmen bir ogrenciye zor bir soru sorarsa ve o da dogru cevap verirse, geenllikle ogrencinin nasil dogru cevap verdigini anlamak zor mudur?

27. Bir ogrenci bir cok problemi yanlis cozerse (ornegin imla ve gramerde, matematikte), bunun nedenini anlamak zor mudur?

28. Okulda basarili olmak genel olarak sansa mi baglidir?

29. Ogrenciler kotu notlar aldiklarinda, bu onlarin sanslarinin kotu olmasindan midir?

30. Ogrenciler bir konuda her zamankinden daha iyi olduklarinda, bunun nedenini bilmek zor mudur?

31. Ogrenciler okulda basarisizi olduklarinda, neden boyle oldugunu anlamak zor mudur?

32. Eger ogretmen bir ogrenciye soru sorar ve o da bilmezse, bunun nedeni basitce ogrencinin sansiz olmasi midir?

33. Derslerde ogretmeninizin ne soyleyecegini dikkatle dinler misiniz?

34. Eger herhangi bir soruyu (ornegin Matematik veya imla ve gramerde) yanlis cevaplandirmamamya azmederseniz, bunu gercekten yapabilir misiniz?

35. Eger okulda basarili olmaya kara verirseniz, bunu gercekten yapabilir misiniz?

36. Okulla ilgili calismalarinizda genel olarak sansli misinizdir?

37. Okulda basariniz dustugunde; evde ders ve odevleriniz uzerinde gercekten siki calisir misiniz?

38. Ogrenilmesi guc bir konuya denk geldiginizde; sonuca ulasmada genellikle sansli misiniz?

39. Ornegin matematikte cok caba sarfetmeseniz bile, problemleri dogru cozebilr misiniz?

40. Ogretmenleriniz istediginiz zaman size yardimci olan kisiler mi?

41. Eger okulda derslerinizde basarisiz olmamaya karar verirseniz bunu yapabilir misiniz?

42. Istediginiz zaman (ornegin imla ve gramer konusunda) butun sorulari dogru yapabilen birisi misiniz?

43. Dusundugunuzde, ogretmenlerinizin sizden yeterince hosnut oldukalarini soyleyebilir misiniz?

44. Ogretmenlerin verdigi dersleri kolayca anlayabiliyor musunuz?

45. Ogrenciler okulda iyi notlar aldigiklarinda, bunun nedenini anlamak zor mudur?

46. Ogrenciler okulda gercekten basarili olduklarinda, bunun nedeni ogretmenleri midir?

47. Bir ogretmen, bir ogrenciye soru sordugunda ve ogrenci yanlis cevap verdiginde, genel olarak bunun nedeni ogrencinin yeterince caba sarfetmemis olmasi midir?

48. Eger ogretmen bir ogrenciye soru soruyor ve ogrenci de dogru cevap veriyorsa, bunun ogrencinin sansli olmasindan dolayi boyle oldugunu soyleyebilir misiniz?

49. Ogrenciler bazi seyleri anlamadiklarinda, bunun nedeni onlarin okulda pekte iyi ogrenci olmamalari midir?

50. Bir ogrenci bazi zor seyleri ogrenmeyi basardiginda, bunun nedeni ogrencinin cok zeki olmasi midir?

51. Ogrencilerin okulda bir problemleri oldugunda, genel olarak bunun nedeni ogretmenleri midir?

52. Eger bir ogrenci, ogretmenin sorusuna yanlis cevap verirse, bu onun yeterince zeki olmamasindan midir?

53. Eger ogrenciler konulari cabuk anliyorsa, bunun nedeni onlarin okulda basarili olmamalari midir?

54. Ogrenciler ogretmenlerinin sorularina yanlis cevap verdiklerinde, bunun nedenini anlamak zor mudur?

55. Bir ogrencinin girdigi testte cok basarili oldugunu dusunun. Bunun nedenini anlamak zor mudur?

56. Ogrenciler sinifta cok iyi ogrenemediklerinde, genel olarak bunun nedeni onlarin yeterince calismiyor olmalari midir?

57. Iyi not alma sansa mi baglidir?

58. Bir ogrenci bir konuyu ogrenmekte gucluk cekiyorsa, bunun nedeni bu ogrencinin sansiz olmasi midir?

59. Bir ogrenci bir konuda normalde diger konularda oldugundan daha kotuyse, bunun nedenini anlamak zor mudur?

60. Bir ogrenci okulda basarili oldugunda, bunun nedeni bu ogrencinin ogretmeniyle arasinin iyi olmasi midir?

61. Bir ogrenci okulda basarili oldugunda, genel olarak bunun nedeni bu ogrencinin cok dikkatli calisiyor olmasi midir?

62. Bir ogrenci okulda basarili oldugunda, genel olarak bunun nedeni ogrencinin sansiz olmasi midir?

63. Ogrenciler bir konuda cak basarisiz olduklarinda, genel olarak bunun nedeni ogretmenlerin onlara yeterince yardim etmememis olmasi midir?

64. Ogrencilerin ogretmenlerinin onlara ne dedigini anlamalarinin nedeni, onlari dikkat sarfederek dinlemeleri midir?

2. Olcek

Bu sorulara asagidaki mumkun cevap formlarini kullaniniz:

1=Hemen Hicbir Zaman   2=Bazen

3=Cogunlukla   4=Hemen Her Zaman

1.   Cogu problemin genellikle zaman icinde hallolacagina inanir misiniz?

2.   Soguk almaktan kacininabilacaginize inanir misiniz?

3.   Bazi cocuklar hakikaten sansli dogar?

4.   Cogu zaman iyi not almanin sizin icin onemli oldugunu dusunur musunuz?

5.   Cogu zaman sizin hataniz olmayan seylerden dolayi suclanir misiniz?

6.   Eger herhangi bir insan yeterince calisirsa, herhangi bir konuyu basaracagina inaniyor musunuz?

7.   Ne yaparsaniz yapin sonuc degismeyecegi icin cogu kere yeterince caba sarfetmediginizi dusunuyor musunuz?

8.   Eger sabah gune iyi baslarsaniz, o gunun devaminin da ne olursa olsun iyi gelecegini hisseder misiniz?

9.   Cogu zaman anne-babalarin cocuklarinin soylediklerini dinlemedegini dusunuyor musunuz?

10.   Dilerseniz iyi seyler olacagina inanir misiniz?

11.   Cezalandirilidiginiz zaman, genellikle size, cezalandirilmak icin aslinda hakli bir neden yokmus gibi gelir mi?

12.   Cogu zaman arkadaslarinizin fikirlerini degistermenin guc oldugunu dusunuyor musunuz?

13.   Alkislamanin, bir takimin kazanmasina sanstan daha fazla yardimci olacagini dusunur musunuz?

14.   Anne-babanizin herhangi bir konuda fikrini degistirmenin hemen hemen imkansiz oldugunu dusunuyor musunuz?

15.   Kendi kararlarinizin cogunu uygulamaniza ailenizin izin verecegine inaniyor musunuz?

16.   Bir seyler ters gittiginde bunu duzeltmek icin yapabileceginiz pek bir sey olmadigini dusunuyor musunuz?

17.   Bazi cocuklarin daha dogustan spora yetenekli olduklarina inaiyor musunuz?

18.   Yasitiniz bircok genc sizden daha gucludur?

19. problemlerle basetmenin en iyi yolunun onlar hakkinda dusunmemek oldugu gorusunde misiniz?

20. Kiminle arkadas olacaginiz konusunda karar vermede pek cok seceneginiz oldugunu dusunuyor musunuz?

21. Dort yaprakli yonca bulursaniz bunun sans getirecegini dusunur musunuz?

22. Evde ders ve odevlerinizi yapip yapmamanin alacaginiz notu etkileyecegini dusunuyor mususnuz?

23. Sizin yasinizdaki bir baska genc size vurmaya kalkisirsa, onu durdurmak icin yapabileceginiz cok az sey oldugunu mu dusunuyorsunuz?

24. Hic sansli oldunuz mu?

25. Insanlarin sizden hoslanim hoslanmamasinin sizin eylemlerinize bagli olduguna mi inanirsiniz?

26. Eger yardimlarini isteyecek olursaniz anne-babaniz genellikle size yardimci olurlar mi?

27. Genellikle bir neden olmadigi halde insanlarin size karsi mesafeli ve soguk olduklarini hisseder misiniz?

28. Cogu kere bugun yaptiklarinizla yarin olacaklari degistirebileceginize inanir misiniz?

29. Kotu bir seyin olacagi varsa, durdurmak icin ne yaparsaniz yapin yine de olacagina inanir misiniz?

30. Eger denerlerse genclerin kendi yollarinda ilerleyebileceklerini dusunur musunuz?

31. Cogu kere evde kendi bildiginizi yapmaya calismayi faydasiz mi buluyorsunuz?

32. Iyi bir sey oldugunda, bunun siki calismanizdan dolayi oldugunu dusunur musunuz?

33. Sizin yasitiniz birisi size dusman oldugunda, bunu degistirmek icin yapacaginiz pek bir sey olmadigini mi dusunursunuz?

34. Istediginiz zaman kolayca arkadas edinebileceginiz gorusunuzde misiniz?

35. Evde yiyeceginizi secme konusunda genellikle cok az bir soz hakkiniz oldugu gorusunde misiniz?

36. Birisi sizden hoslanmadigi zaman bu durumu degistirmek icin yapabileceginiz pek bir sey olmadigini dusunur musunuz?

37. Okuldaki diger cocuklarin sizden daha zeki olmalari nedeniyle okuldaki cabanizin yarasiz oldugunu hisseder misiniz?

38. Gelecege yonelik plan yaparak onu iyi yonde degistirebileceginize inanir misiniz?

39. Cogu zaman, ailenizde verilen kararlar hakkinda cok az bir soz hakkiniz oldugu gorusunde misiniz?

40. Sansli olmaktansa, zeki olmanin daha iyi oldugunu mu dusunur sunuz?

3. Olcek

Bundan sonraki sorular icin asagidaki cevap formatini kullaniniz:

1=Tamamen Karsi   2=Cogunlukla Karsi

3=Biraz Karsi   4=Biraz Taraftar

5=Cogunlukla Taraftar   6=Tamamen Taraftar

1. Eger iyi bir okul derecesine sahip olmak istiyorsam bunun icin en onemli sey iyi bir sansa sahip olabilmemdir.

2. Sene sonunda elde ettigim not her zaman icin sene icinde ne yaptigimla cok iliskili olacaktir.

3. Calismanin niteligi ne olursa olsun, sinav zamaninda sansim bana hep yardim eder.

4. Calismamin miktari ve alacagim not ile benim yeteneklerim arasinda bir iliski olmadigi icin calismaya sarfettigim caba tamamen zaman kaybidir.

5. Inaniyorum ki sinavlarda aldigim notlar tamamen benim o sinavlarda ne kadar iyi ya da kotu yaptigima bagli olacaktir.

6. Sinavlarimdan iyi ya da kotu not almanin, tamamen sinavda calismis oldugum konularin gelip gelmemesiyle iliskilidir.

7. Calismalarim sonucu, alacagim not benim bu konulari hazirlama kapasiteme baglidir.

8. Cok calisarak alacagim notlari tamamen belirleyebilecegime inaniyorum.

9. Inaniyorum ki, ogretmenim icin ne yaparsam yapayim, o her zaman bana kendi istedigi notu verir.

10. Eger iyi bir derece elde etmek istersem, yeterli olmaliyim ve siki calismaliyim.

11. Genelde inaniyorum ki, eger birisi yetenekliyse ve siki calisiyorsa bu kisi calismalarindan iyi sonuc alacaktir.

12. Calismalrimdan nasil bir not alacagim sansa baglidir.

13. Kendi dalimda aldigim notlar her zaman tesadufi kosullar serisiyle belirlenmektedir.

14. Benim bir ders icin iyi hazirlik yapmis olup olmamam hic bir anlam tasimaz, zira uzun vadede ogretmenlerin isi ogrencilerin bosluklarini yakalamaktir.

15. Okul hayatimda ne yapacagimi gercekten bilmiyorum. Hersey olabilir; belki sinavi iyi yapip basarisiz olacagim, belki kotu yapip gececegim.

4. Olcek

Bu olcek icin her sorunun altinda ayri ayri belirtilmis olan cevap formatini kullaniniz;

1. Asagidaki din gruplarindan hangisi sizin dininizi kapsiyor?

   a. Hristiyanlik (hangisi belirtiniz)   b. Muslumanlik

   c. Yahudilik   d. Diger (belirtiniz)

2. Gecen yil dininizin gereklerini yerine getirdiniz mi?

   a. Hic   b. Birkac Kere   c. Ayda Bir Kere
   d. Haftada Bir Kere   e. Surekli olarak

3. Asagidakilerden hangisi sizin dua etme sikliginizi daha iyi tanimliyor?

   a. Dua etmek gunluk yasamimin surekli bir parcasidir.
   b. Cogunlukla sikisik oldugum ve ihtiyacim oldugu zamanlarda dua ederim, fakat bunun disinda nadiren dua ederim.
   c. Sadece dini torenlerde dua ederim.
   d. Dua etmek yasamimda cok az bir oneme sahiptir.
   e. Hic dua etmem.

4. Cok ciddi bir kisisel probleminiz oldugunda ne siklikla dini oneri veya ders almayi dusunursunuz?

   a. Hemen her zaman   b. Genellikle   c. Bazen

   d. Nadiren   e. Hic

5. Hareketlerinizin veya gunluk yasaminizi nasil gecireceginizin seciminde dininizin ne kadar etkili oldugunu soyleyebilr misiniz?

   a. Hic etkilemez   b. Ufak bir etkisi vardir   c. Biraz etkiler

   d. Yeterli oranda etkiler   e. Oldukca fazla etkiler

6. Asagidaki tanimalamalardan hangisi sizin Tanri hakkindaki inanciniza yakin dusuyor?

   a. Eminim ki Tanri hakikaten var ve O benim yasamim da surekli etkilidir.
   b. Her ne kadar zihnimde bazen O'nun varligi ile ilgili soru olussa da Tanri'nin varligina inaniyorum ve inaniyorum ki o beni kisi olarak biliyor.
   c. Tanri'nin var olup olmadigini bilmiyorum ve bundan sonra bunu bilip bilemeyecegimi kestiremiyorum.
   d. Tanri'nin veya bir yuksek gucun var olup olamadigini bilmiyorum ve bundan sonra bunu bilip bilemeyecegimi kestiremiyorum.
   e. Tanri'nin veya bir yuksek gucun varligina inanmiyorum.

7. Asagidaki goruslerden hangisi sizin olumden sonraki hayatla ilgili dusuncenize yakin dusuyor?

a. Olumden sonraki hayata, her bireyin kendine ozgu bir ruhunun var olduguna inaniyorum.
b. Evrensel ruhun bir parcasi olarak olumden sonra ruhun var olduguna inaniyorum.
c. Olumden sonraki bir tur hayata inaniyorum, fakat onun nasil olabilecegini gercekten bilmiyorum.
d. Olumden sonraki herhangi bir tur hayatin olup olmadigini bilmiyorum, bundan sonra bilip bilemeyecegimi de kestiremiyorum.
e. Olumden sonraki herhangi bir tur yasama inanmiyorum.

8. Gecen yil boyunca, dini gereklerinizi hangi siklikla yerine getirdiniz?

a. Hemen Her Gun   b. Siklikla   c. Bazen   d. Nadir Olarak   e. Hic

9. Asagidaki cumleye katiliyor musunuz?

" Din benim yasamima buyuk oranda guven ve rahatlik veriyor".

a. Tamamen Karsiyim   b. Karsiyim   c. Karasizim
d. Katiliyorum   e. Tamamen Katiliyorum

5. Olcek

Bundan sonraki sorular icin asagida belirtilmis olan cevap formatini kullaniniz;

1=Tamamen Karsi   2=Cogunlukla Karsi

3=Biraz Karsi   4=Biraz Taraftar

5=Cogunlukla Taraftar   6=Tamamen Taraftar

1. Cocuklarin ogrenmesi gereken en onemli erdem otoriteye saygi ve itiattir.

2. Eger yeterli guce sahip olursak hic bir zaaflik bizi geriletemez.

3. Bilimin yeri vardir, fakat insan zihni tarafindan hic bir zaman anlasilamayacak cok onemli seyler de vardir.

4. Insanin dogasi geregi, her zaman savas ve catismalar olacaktir.

5. Bazi doga ustu guclerin kararlarina soru sormaksizin itaat etmek herkesin kaderidir.

6. Birinin problemi veya sikintisi oldugunda, yapacagi en iyi sey o konu hakkinda dusunmemek, eglendirici seylerle mesgul olmaktir.

7. Kotu aliskanliklari, tarzlari ve egitimi olan kisilarin iyi insanlarla gorusmesi beklenemez.

8. Gecligin en cok ihtiyaci olan seyler siki bir disiplin, kararlilik ve gerek ulkesi gerek ailesi icin savasmak, calismaktir.

9. Bazi insanlar, yuksek mevkilere ulasma arzusu ile dogarlar.

10. Gunumuzde etrafta cok cesitli turden insanlar dolastigi ve birbirlerine karistigi icin, kisi kendini korumalidir, ozellikle onlardan gelecek hastalik veya enfeksiyonlara karsi dikkatli olmalidir.

11. Serefimize yapilan hakaretler mutlaka cezalandirilmalidir.

12. Genclerin bazen isyankar fikirleri vardir, ancak buyuduklerinde o fikirlerden vazgecmelidirler.

13. Etkili calisma ve ogrenme icin, is verenlerimizin veya ogretmenlerimizin tasarilarinin ayrintilarini ve bunlari nasil uyguladiklarini bilmek onemlidir.

14. Bu ullkenin, kanunlardan, politik programlardan ziyade, bir kac cesur, fedakar, yorulmak bilmez ve halkin arkalarindan gitmek isteyecegi yorulmak bilmez liderlere ihtiyaci vardir.

15. Cinsel suclar-tipki tecavuz, cocuklara saldiri gibi- hapsedilmekten daha fazlasini hak eder: Bu tur suclar halkin gozu onunde veya daha agir sekillerde cezalandirilmalidir.

16. Insanlar iki sinifa ayrilabilirler; gucluler ve gucsuzler.

17. Anne-babaya sevgi, saygi ve minnettarlik duymayan bir insandan daha kotu bir sey yoktur.
18. Bir gun astrolojinin (yildiz falinin) pek cok seyi aciklayabilecegi gorulecektir.

19. Bazen bos zaman gereklidir, fakat yasami degerli ve ilginc kilan siki calisma, daha iyidir.

20. Gunumuzde her gecen gun daha fazla kisi mahrem ve kisisel konulara burnunu sokmaktadir.

21. Savaslar ve sosyal karisikliklar bir gun butun dunyayi yok edecek bir tufan veya depremle son bulabilir.

22. Savaslar ve sosyal karisikliklar bir gun butun dunyayi yok edecek bir tufan veya depremle son bulabilir.

23. Ahlaksizlik, hilekarlik ve budallaliktan kurtulabilirsek toplumumuzun pek cok problemini cozebiliriz.

23. Eski Yunanli ve Romalilarin ahlak disi hayati, bu gun ulkemizde olan bazi seylerle karsilastirildiginda, daha hafif kalmistir.

24. Eger insanlar az konusup cok calisirsaydi, herkes daha iyi olurdu.

25. Cogu kisi dusunmez ama, hayatimiz gizli yerlerdeki bir takim suikastlar ve entrikalar tarafindan kontrol edilmektedir.

26. Homoseksueller suclulardan daha iyi degildirler ve onlarda siddetli bicimde cezalandirilmalidirlar.

27. Kitaplar ve filmler hayatin sikintili ve hos olmayan yanlariyla cok fazla ilgili olmamalidir. Eglendirici olmali ve hayatin yuce yanlarini islemelidirler.

28. Akli basinda, normal, iyi bir kisi asla yakin bir arkadasi veya akrabasini incitmeyi dusunemez.

29. Asiri samimiyet saygisizlik dogurur.

30. Haklarini kaybettiginde; insan dogasi geregi baskasinin malina goz dikmeden edemez.

APPENDIX B: ANOVA tables of Generalizability analysis

Table Ba : Multivariate Variance of Analysis Between Subjects Effects of the Control Beliefs Subscale in CAMI.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	4471.82	196	22.82		
Constant	84443.83	1	84443.83	9.81	0.002
Form	235.74	3	78.58	3.08	0.029

Table Baa: Multivariate Analysis of Variance Within Subjects Effects for Control Beliefs Subscale in CAMI.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	971.99	196	4.96		
Time	48.65	1	48.65	9.81	0.002
Form by Time	45.76	3	15.25	3.08	0.029

Table Bb: Multivariate Analysis of Variance Between Subjects Effects for Means-Ends Beliefs for Effort Subscale in CAMI.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	2675.97	196	13.65		
Constant	125096.00	1	12509.09	9160.63	0.000
Form	170.97	3	56.99	4.17	0.007

Table Bbb: Multivariate Analysis of Variance of Analysis Within Subjects Effects for Means-Ends Beliefs for Effort Subscale in CAMI.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	869.06	196	13.65		
Time	44.86	1	44.86	10.12	0.002
Form by Time	38.74	3	12.91	2.91	0.036

Table Bc:Multivariate Analysis of Variance Between Subjects Effects for the Means-Ends Beliefs for Luck Subscale in CAMI.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	3202.15	194	16.51		
Constant	65260.61	1	65260.61	3953.77	0.000
Form	95.84	3	31.95	1.94	0.125

Table Bcc: Multivariate Analysis of Variance Within Subjects Effects of the Means-Ends Beliefs for Luck Subscale in CAMI.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	1165.49	194	6.01		
Time	152.50	1	152.50	25.38	0.000
Form by Time	46.42	3	15.47	2.58	0.055

Table Bd: Multivariate Analysis of Variance Between Subjects Effects for the Means-Ends Unknown Factors Subscale in CAMI.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	3099.56	193	16.06		
Constant	77272.56	1	77272.56	4811.53	0.000
Form	157.29	3	52.43	3.26	0.023

Table Bdd: Multivariate Analysis of Variance Within Subjects Effects for the Means-Ends Beliefs Unknown Factors Subscale in CAMI.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	1298.62	193	6.73		
Time	14.16	1	14.16	2.10	0.149
Form by Time	16.31	3	5.44	0.81	0.491

Table Be: Multivariate Analysis of Variance Between Subjects Effects for the Means-Ends Beliefs Attribute Subscale in CAMI.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	2031.32	197	10.31		
Constant	202122.79	1	202122.79	19602.14	0.000
Form	90.06	3	30.02	2.91	0.036

Table Bee: Multivariate Analysis of Variance Within Subjects Effects for the Means-Ends Beliefs Attribute Subscale in CAMI.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	580.64	197	2.95		
Time	17.24	1	17.24	5.85	0.017
Form by Time	27.10	3	9.03	3.06	0.029

Table Bf: Multivariate Analysis of Variance Between Subjects Effects for the Means-Ends Beliefs Powerful Others Subscale in CAMI.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	3259.66	197	16.55		
Constant	98500.38	1	98500.38	5952.94	0.000
Form	31.42	3	10.47	0.63	0.595

Table Bff: Multivariate Variance of Analysis Within Subjects Effects for the Means-Ends Beliefs Powerful Others Subscale in CAMI.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	721.10	197	3.66		
Time	0.10	1	0.10	0.03	0.866
Form by Time	5.65	3	1.88	0.51	0.672

Table Bg: Multivariate Variance of Analysis Between Subjects Effects for the Agency Beliefs Effort Subscale in CAMI.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	2332.15	197	11.84		
Constant	35324.75	1	35324.75	2983.93	0.000
Form	35.42	3	11.81	1.00	0.395

Table Bgg: Multivariate Analysis of Variance Within Subjects Effects for the Agency Beliefs Effort Subscale in CAMI.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	244.47	197	1.24		
Time	0.10	1	0.10	0.08	0.778
Form by Time	6.73	3	2.24	1.81	0.147

Table Bh: Multivariate Analysis of Variance Between Subjects Effects for the Agency Beliefs Attribute Subscale in CAMI.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	480.14	198	2.42		
Constant	37184.65	1	37184.65	15334.14	0.000
Form	15.57	3	5.19	2.14	0.096

Table Bhh: Multivariate Analysis of Variance Within Subjects Effects for the Agency Beliefs Attribute Subscale in CAMI.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	206.80	198	1.04		
Time	3.92	1	3.92	3.75	0.054
Form by Time	5.31	3	1.77	1.69	0.170

Table Bj: Multivariate Analysis of Variance Between Subjects Effects for the Agency Beliefs Powerful Others Subscale in CAMI.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	1939.28	199	9.75		
Constant	48801.20	1	48801.20	5007.76	0.000
Form	15.56	3	5.19	0.53	0.661

Table Bjj: Multivariate Analysis of Variance Within Subjects Effects for the Agency Beliefs Powerful Others Subscale in CAMI.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	350.56	199	1.76		
Time	0.75	1	0.75	0.43	0.514
Form by Time	13.65	3	4.55	2.58	0.055

Table Bk: Multivariate Analysis of Variance Between Subjects Effects for the Agency Beliefs Luck Subscale in CAMI.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	1304.41	197	6.62		
Constant	36900.78	1	36900.78	5572.96	0.000
Form	26.20	3	8.73	1.32	0.269

Table Bkk: Multivariate Analysis of Variance Within Subjects Effects for the Agency Beliefs Luck Subscale in CAMI.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	319.79	197	1.62		
Time	11.85	1	11.85	7.30	0.008
Form by Time	1.87	3	0.62	0.38	0.765

Table Bl: Multivariate Analysis of Variance Between Subjects Effects for the CNSIE Nowicki-Strickland's Internal and External Control Scale for Children.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	21299.09	183	116.39		
Constant	2612430.07	1	2612430.10	22445.78	0.000
Form	14.47	3	4.82	0.04	0.989

Table Bll: Multivariate Analysis of Variance Within Subjects Effects for the CANSIE Nowicki-Strickland's Internal and External Control Scale for Children.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	5980.08	183	32.68		
Time	48.07	1	48.07	1.47	0.227
Form by Time	228.00	3	76.00	2.33	0.076

Table Bm: Multivariate Analysis of Variance Between Subjects Effects for the Internal Subscale in MASLOC.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	3671.86	195	18.83		
Constant	42831.95	1	42831.95	22.74.66	0.000
Form	29.13	3	9.71	0.52	0.672

Table Bmm: Multivariate Analysis of Variance Within Subjects Effects for the Internal Subscale in MASLOC.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	1462.84	195	7.50		
Time	3.08	1	3.08	0.41	0.522
Form by Time	18.55	3	6.18	0.82	0.482

Table Bn: Multivariate Analysis of Variance Between Subject Effects for the Luck Subscale in MASLOC.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	3693.50	194	19.04		
Constant	95937.24	1	95937.24	5039.07	0.000
Form	56.88	3	18.96	1.00	0.396

Table Bo: Multivariate Analysis of Variance Within Subjects Effects for the Luck Subscale in MASLOC.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	1438.75	194	7.42		
Time	8.03	1	8.03	1.08	0.299
Form by Time	361.64	3	120.55	16.25	0.000

Table Boo: Multivariate Analysis of Variance Between Subjects Effects for the Helplessness Subscale in MASLOC.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	3734.28	190	19.65		
Constant	78694.17	1	78693.17	4003.91	0.000
Form	34.28	3	11.43	0.58	0.628

Table Bp: Multivariate Analysis of Variance Within Subjects Effects for the Helplessness Subscale in MASLOC.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	1834.04	190	9.65		
Time	138.48	1	138.48	14.35	0.000
Form by Time	250.88	3	83.63	8.66	0.000

Table Bq: Multivariate Analysis of Variance Between Subjects Effects for the Religious Scale.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	12362.61	190	65.07		
Constant	198970.18	1	198970.18	3057.96	0.000
Form	125.90	3	41.97	0.64	0.587

Table Bqq: Multivariate Analysis of Variance Within Subjects Effects for the Religious Scale.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	1075.25	190	5.66		
Time	0.14	1	0.14	0.03	0.874
Form by Time	9.81	3	3.27	0.58	0.630

Table Br: Multivariate Analysis of Variance Between Subjects Effects for the California F (Authoritarianism) Scale.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	72866.98	158	461.18		
Constant	4207473.60	1	4207473.60	9123.21	0.000
Form	1558.48	3	519.49	1.13	0.340

Table Brr: Multivariate Analysis of Variance Within Subjects Effects for the California F (Authoritarianism) Scale.

Source of Variation	SS	DF	MS	F	Sig of F
Within Cells	17857.90	158	113.02		
Time	528.41	1	528.41	4.68	0.032
Form by Time	187.04	3	62.35	0.55	0.648

Figure 1: Item Characteristic Curves for Item 1 in English and Turkish Languages, as an Example of One Unsuccessfully Translated Item.

Control Beliefs Subscale
Item 1 in English form
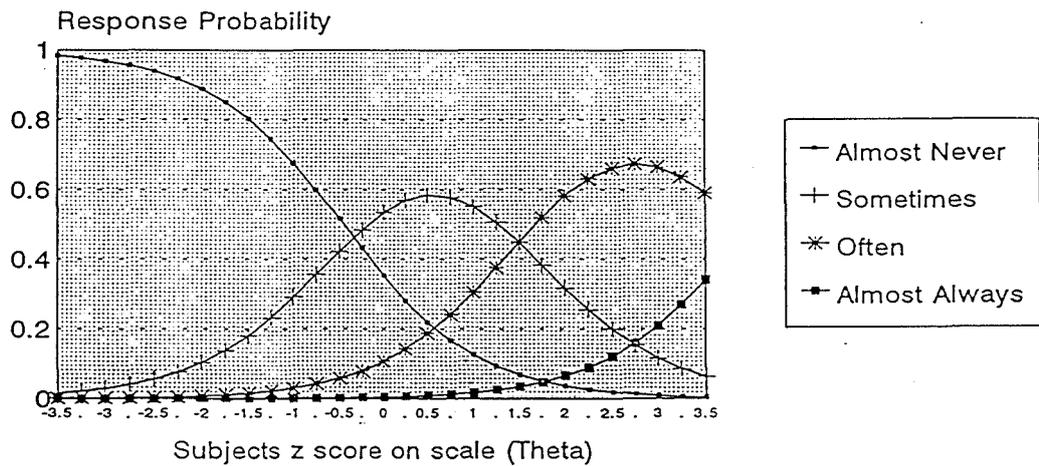
Q. 7: If you decide to sit down and learn really hard, can you do it?

Control Beliefs Subscale
Item 1 in Turkish Form
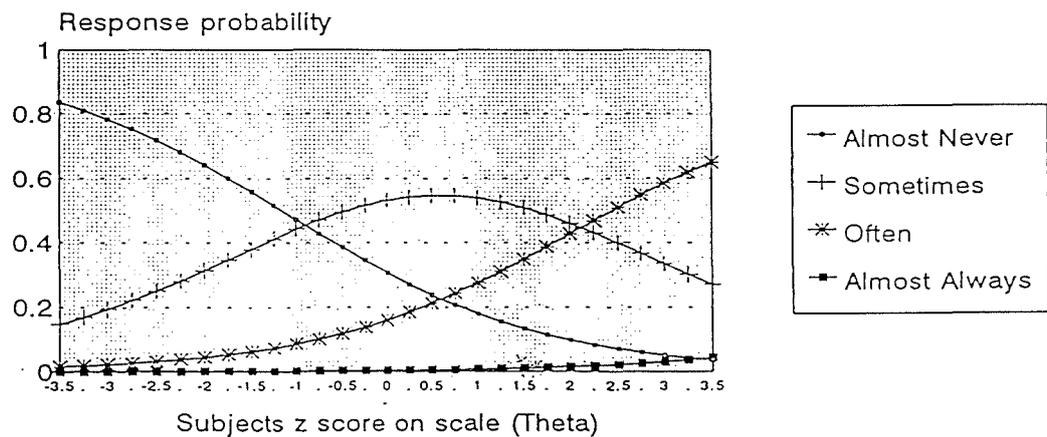
Q. 7: Eger gercekten zor olan bir konuyu kendi kendinize ogrenmeye karar verirseniz, bunu gerceklestirebilir misiniz?

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Figure 2: Item Characteristic Curves for Item 8 in English and Turkish Languages, as an Example of One Successfully Translated Item.

Control Beliefs Subscale
Item 8 in English Form
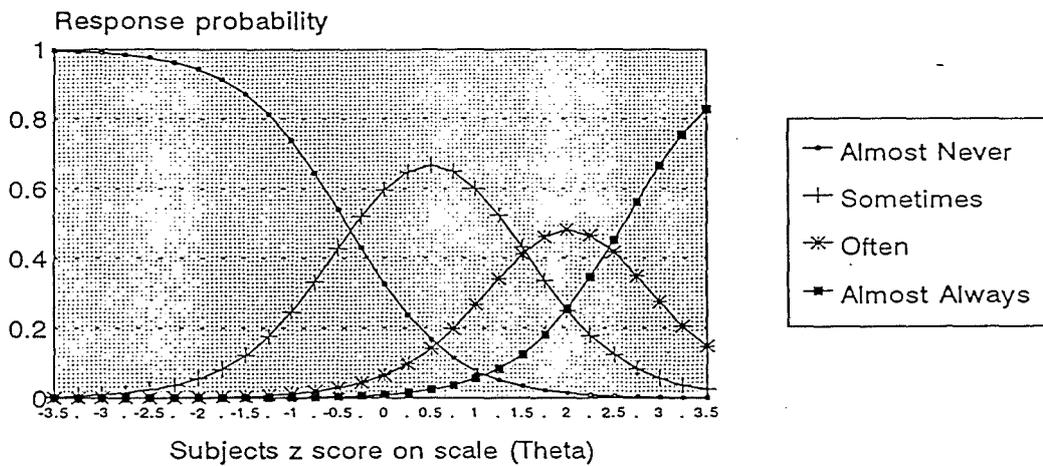
Q.41: If you want to can you keep from doing badly in school?

Control Beliefs Subscale
Item 8 in Turkish Form
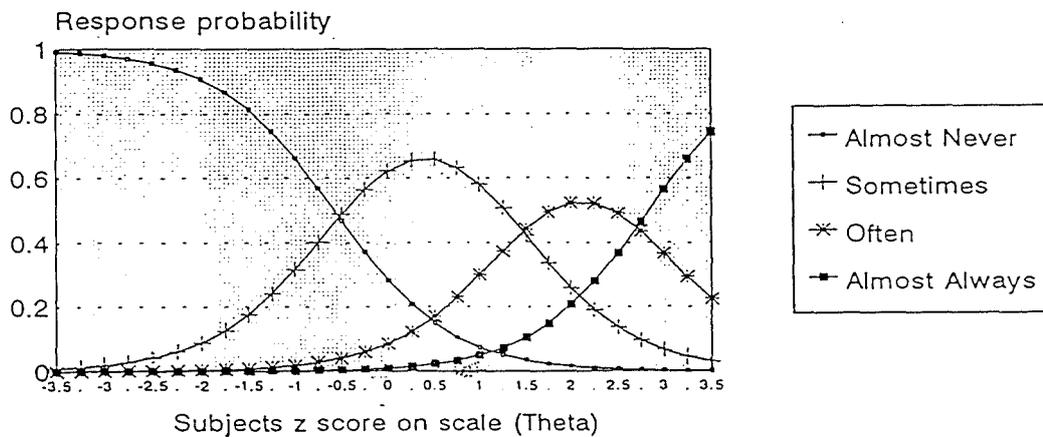
Q.41: Eger okulda derslerinizde basarisiz olmamaya karar verirseniz bunu yapabilir misiniz?

MASLOC Helplessness Subscale
Item 4 in English form
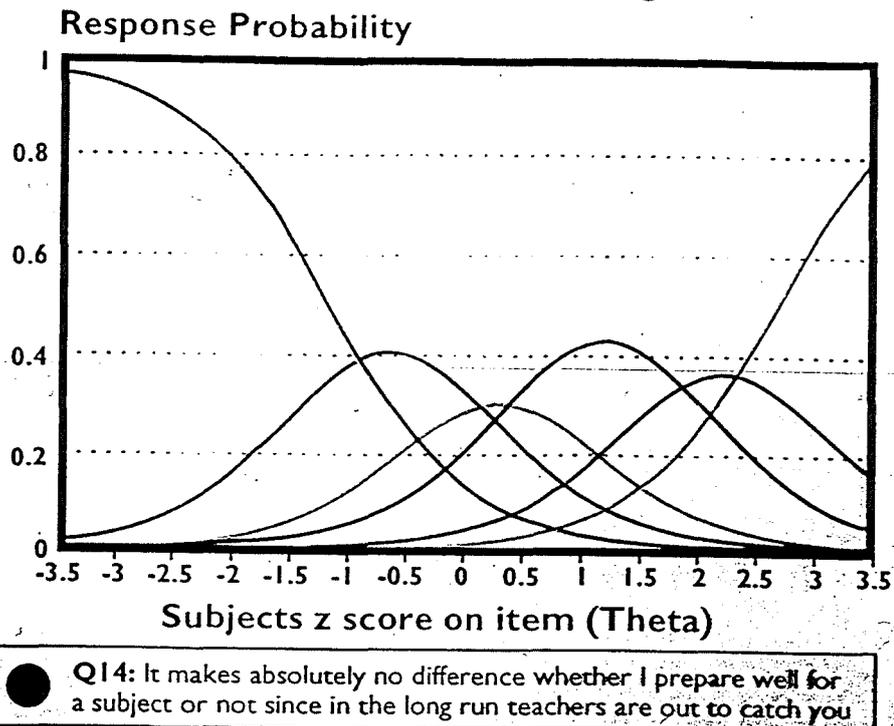
Response Probability

Subjects z score on item (Theta)

- Strongly disagree
- Somewhat disagree
- Slightly disagree
- Slightly agree
- Somewhat agree
- Strongly agree

● Q14: It makes absolutely no difference whether I prepare well for a subject or not since in the long run teachers are out to catch you

FIGURE 2

MASLOC Helplessness Subscale
Item 4 in Turkish form
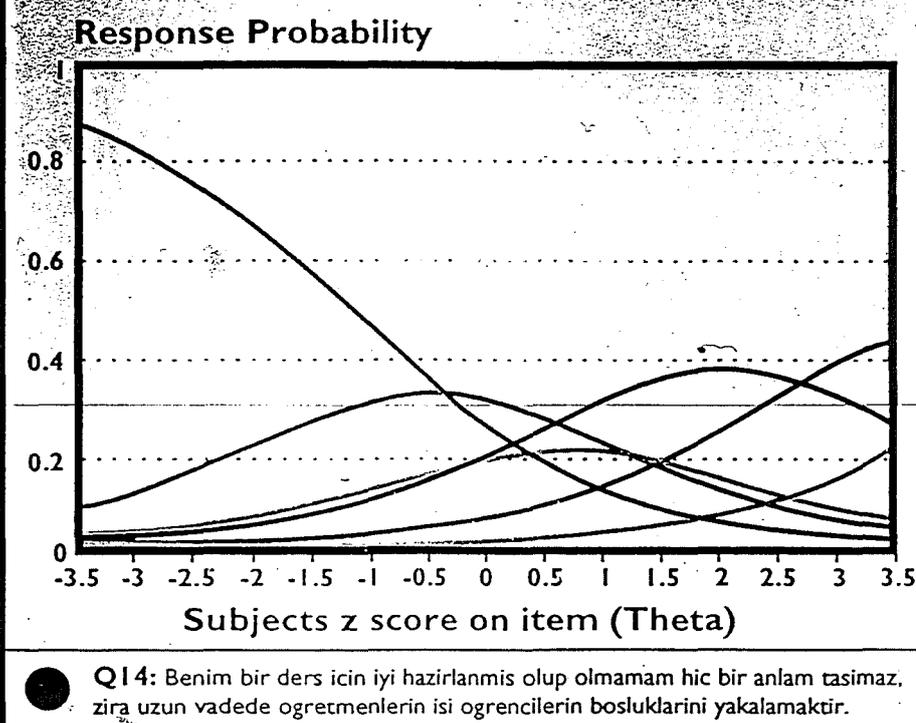
Response Probability

Subjects z score on item (Theta)

- Strongly disagree
- Somewhat disagree
- Slightly disagree
- Slightly agree
- Somewhat agree
- Strongly agree

● Q14: Benim bir ders icin iyi hazirlanmis olup olmamam hic bir anlam tasimaz, zira uzun vadede ogretmenlerin isi ogrencilerin bosluklarini yakalamaktir.

FIGURE 3

Appendix D: Item discrimination (A) and difficulties (Bs) for English and Turkish Forms of the Scale and Subscale.

Table Da: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Samples of the CAMI's Control Beliefs Subscale with Samejima's Model of IRT (N=820).

ITEMS	ENGLISH SAMPLE				TURKISH SAMPLE			
	A	B1	B2	B3	A	B1	B2	B3
CAMI7	1.08	.03	1.51	4.00	0.70	-2.11	0.56	5.18
CAMI10	2.09	-.30	1.08	5.73	1.09	-.94	1.45	3.61
CAMI42	1.56	-1.34	0.12	1.75	1.40	-2.40	-.16	1.90
CAMI35	1.59	-.76	0.90	2.81	3.06	-.96	0.65	1.83
CAMI3	1.62	-1.09	0.33	2.50	0.64	-2.63	0.50	3.84
CAMI5	1.14	-1.42	0.67	3.33	0.82	-.73	2.30	6.14
CAMI34	1.26	-2.20	-.26	1.56	1.40	-1.55	0.50	2.72
CAMI41	1.84	-.73	0.64	2.33	1.29	-1.21	0.63	1.70

Table Db: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Samples of the CAMI's Means-Ends for Effort Subscale with Samejima's Model of IRT (N=820).

ITEMS	ENGLISH SAMPLE				TURKISH SAMPLE			
	A	B1	B2	B3	A	B1	B2	B3
CAMI23	0.91	-1.01	1.23	4.34	0.94	-2.09	1.58	4.30
CAMI20	0.72	-2.49	1.05	4.91	0.88	-1.94	1.20	3.98
CAMI61	1.31	-1.84	0.48		1.19	-1.57	1.25	2.75
CAMI64	1.48	-0.99	0.69	2.60	0.83	-1.52	1.56	3.89
CAMI19	0.59	-5.85	-1.77	4.05	0.92	-2.20	0.23	2.72
CAMI16	0.69	-3.31	-0.60	3.80	1.24	-2.51	-0.31	2.28
CAMI56	0.64	-4.74	-2.08	2.29	1.26	-2.48	-0.31	1.90
CAMI47	1.16	-2.78	-0.10	2.79	0.92	-3.02	-0.27	3.39

Table Dc: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Samples of the CAMI's Means-Ends for Attribution Subscale with Samejima's Model of IRT (N=820).

	ENGLISH SAMPLE				TURKISH SAMPLE			
ITEMS	A	B1	B2	B3	A	B1	B2	B3
CAMI18	0.71	-3.97	-0.19	4.56	1.56	-1.69	0.31	2.09
CAMI13	0.47	-4.90	-1.01	4.64	0.80	-3.18	0.03	2.97
CAMI50	1.50	-2.59	-0.82	1.48	1.81	-2.09	-0.04	1.67
CAMI53	0.96	-2.60	-0.08	3.02	0.67	-3.43	0.90	4.14
CAMI17	0.79	-5.19	-1.92	1.89	0.56	-5.19	-0.99	4.47
CAMI22	1.17	-3.25	-1.54	1.75	1.16	-3.30	-1.63	0.73
CAMI49	1.49	-3.36	-1.99	0.23	0.74	-6.75	-2.19	1.31
CAMI52	1.79	-2.75	-1.77	0.55	1.21	-4.64	-2.16	0.42

Table Dd: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Samples of the CAMI's Means-Ends for Powerful Others Subscale with Samejima's Model of IRT (N=820).

	ENGLISH SAMPLE				TURKISH SAMPLE			
ITEMS	A	B1	B2	B3	A	B1	B2	B3
CAMI24	1.04	-1.34	1.30	3.78	1.72	-1.41	0.68	2.22
CAMI14	0.11	-20.8	3.93	23.4	0.34	-3.55	2.69	8.58
CAMI60	1.04	-1.88	1.07	3.19	1.73	-1.43	0.36	2.27
CAMI45	0.24	-9.17	2.17	11.0	0.37	-5.00	1.20	6.42
CAMI15	1.53	-0.06	1.91	2.82	2.04	-0.87	1.17	2.38
CAMI21	1.63	-0.26	1.89	2.94	1.80	-1.05	1.28	2.18
CAMI63	1.50	-1.14	1.15	2.44	1.56	-2.41	0.37	1.92
CAMI51	1.41	-1.59	1.18	2.49	1.41	-2.25	0.61	2.07

Table De: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Samples of the CAMI's Means-Ends for Luck Subscale with Samejima's Model of IRT (N=820).

	ENGLISH SAMPLE				TURKISH SAMPLE			
ITEMS	A	B1	B2	B3	A	B1	B2	B3
CAMI28	1.67	0.63	1.98	2.94	1.75	-1.35	0.40	1.38
CAMI25	1.03	-0.24	1.66	3.47	0.87	-1.10	0.69	2.28
CAMI57	1.93	0.31	1.76	2.65	2.16	-1.56	0.37	1.39
CAMI48	1.38	-0.35	2.05	3.37	1.73	-2.14	0.29	1.45
CAMI29	1.61	0.27	2.22	3.06	1.99	-1.39	0.44	1.43
CAMI32	1.31	0.14	1.99	3.03	1.52	-1.53	0.49	1.47
CAMI58	1.70	0.04	1.76	2.83	2.64	-1.14	0.35	1.03
CAMI62	2.15	-0.01	1.59	2.37	2.32	-1.43	0.37	1.31

Table Df: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Samples of the CAMI's Means-Ends for Unknown Factors Subscale with Samejima's Model of IRT (N=820).

	ENGLISH SAMPLE				TURKISH SAMPLE			
ITEMS	A	B1	B2	B3	A	B1	B2	B3
CAMI30	1.88	-0.99	1.26	2.46	1.32	-1.29	0.56	2.04
CAMI26	0.79	-1.21	2.37	3.95	1.00	-2.00	1.09	2.71
CAMI46	1.38	-0.65	1.70	3.12	1.84	-0.91	0.85	1.44
CAMI55	1.43	-0.41	1.71	3.10	2.11	-0.86	0.65	1.40
CAMI31	0.94	-1.60	2.02	4.19	1.04	-1.85	0.93	2.51
CAMI27	1.06	-1.02	1.43	3.00	1.18	-1.58	0.89	2.75
CAMI54	1.55	-0.94	1.56	2.86	1.82	-1.54	0.79	1.77
CAMI59	1.04	-1.91	1.48	3.56	1.00	-2.04	0.87	2.85

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Table Dg: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Samples of the CAMI's Agency Beliefs for Effort Subscale with Samejima's Model of IRT (N=820).

ITEMS	ENGLISH SAMPLE				TURKISH SAMPLE			
	A	B1	B2	B3	A	B1	B2	B3
CAMI1	2.03	-1.15	0.26	1.94	1.93	-1.57	0.18	2.14
CAMI4	2.27	-1.19	0.47	2.24	2.01	-1.78	0.04	2.17
CAMI37	1.56	-1.71	-0.31	1.33	1.72	-1.31	0.35	2.07
CAMI33	2.19	-1.31	0.30	1.75	2.57	-1.34	0.49	2.28

Table Dh: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Samples of the CAMI's Agency Beliefs for Attribution Subscale with Samejima's Model of IRT (N=820).

ITEMS	ENGLISH SAMPLE				TURKISH SAMPLE			
	A	B1	B2	B3	A	B1	B2	B3
CAMI2	2.11	-1.57	-0.43	1.82	1.61	-2.00	-0.15	2.60
CAMI9	2.38	-1.54	-0.40	1.17	1.52	-2.10	-0.15	2.12
CAMI39	1.14	-2.68	-0.96	1.40	1.16	-2.75	-0.69	1.68
CAMI44	0.87	-1.92	0.78	4.01	1.47	-1.60	0.18	3.40

Table Dj: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Samples of the CAMI's Agency Beliefs for Powerful Others Subscale with Samejima's Model of IRT (N=820).

ITEMS	ENGLISH SAMPLE				TURKISH SAMPLE			
	A	B1	B2	B3	A	B1	B2	B3
CAMI12	1.98	-2.37	-0.77	0.43	1.10	-2.35	0.10	1.85
CAMI11	1.85	-2.73	-0.99	0.47	2.20	-1.93	-0.49	1.39
CAMI40	1.23	-2.88	-1.14	0.34	1.09	-2.27	-0.11	1.64
CAMI43	1.10	-2.59	-0.59	1.86	2.05	-1.84	-0.11	1.76

Table Dk: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Samples of the CAMI's Agency Beliefs for Luck Subscale with Samejima's Model of IRT (N=820).

	ENGLISH SAMPLE				TURKISH SAMPLE			
ITEMS	A	B1	B2	B3	A	B1	B2	B3
CAMI6	1.24	-1.56	0.62	2.11	0.99	-1.93	0.66	2.36
CAMI8	0.89	-2.52	0.11	2.85	1.11	-3.54	-0.13	2.61
CAMI38	1.29	-0.77	1.29	2.76	1.27	-2.14	0.53	3.26
CAMI36	1.92	-1.09	0.72	2.07	1.92	-1.97	0.18	2.15

Table D1: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Samples of the Nowicki-Strickland Internal vs External Scale for Children with Samejima's Model of IRT (N=820).

	ENGLISH SAMPLE				TURKISH SAMPLE			
ITEMS	A	B1	B2	B3	A	B1	B2	B3
NOV1	0.27	-8.31	0.31	6.58	0.08	-38.65	-7.03	18.71
NOV2	0.10	-31.1	-14.96	-0.69	0.27	-7.68	0.47	7.17
NOV3	0.69	-0.73	2.07	4.00	0.45	-5.36	0.10	3.15
NOV4	0.24	-2.74	4.84	11.48	0.01	-49.8	128.0	340.6
NOV5	0.84	-2.64	0.49	2.04	0.81	-2.91	1.22	2.99
NOV6	0.09	-7.10	9.66	31.20	0.39	-0.11	7.19	11.78
NOV7	1.77	-0.04	1.30	2.54	0.50	-4.10	1.20	4.60
NOV8	0.68	-1.43	1.50	3.99	0.25	-9.26	-0.05	8.12
NOV9	0.43	-5.20	-0.55	4.57	0.40	-6.31	-0.16	5.13
NOV10	1.04	0.64	2.04	3.29	0.04	-51.97	1.02	43.78
NOV11	0.68	-1.34	2.21	3.95	0.72	-3.96	0.68	3.20
NOV12	0.20	-9.77	2.37	11.89	0.58	-4.31	0.88	4.61
NOV13	0.12	-12.3	-0.79	13.72	0.19	-9.24	1.28	12.06
NOV14	0.59	-3.15	0.85	3.39	0.84	-2.59	0.35	2.48
NOV15	0.02	-43.2	11.60	90.91	0.63	-3.12	-0.05	2.79
NOV16	1.24	-1.71	0.77	2.19	0.88	-2.40	1.40	4.07
NOV17	0.13	-15.9	-2.56	8.51	0.28	-6.58	-0.76	4.95
NOV18	0.57	-2.83	2.34	5.71	0.46	-3.36	2.69	7.10
NOV19	1.10	-0.56	1.48	2.57	0.42	-0.52	3.01	6.02
NOV20	0.12	-6.47	5.70	22.48	0.65	-2.45	0.46	3.82
NOV21	0.56	-0.25	1.74	3.72	0.08	-4.67	12.60	29.99
NOV22	0.26	-2.98	2.15	9.21	0.04	-22.60	32.11	79.46
NOV23	0.65	-1.17	1.47	3.47	0.47	-0.56	3.06	6.04

ITEMS	ENGLISH SAMPLE				TURKISH SAMPLE			
	A	B1	B2	B3	A	B1	B2	B3
NOV1	0.27	-8.31	0.31	6.58	0.08	-38.65	-7.03	18.71
NOV2	0.10	-31.1	-14.96	-0.69	0.27	-7.68	0.47	7.17
NOV24	0.61	-0.22	1.74	3.23	0.03	-75.93	19.84	85.14
NOV25	0.18	-1.60	5.92	17.77	0.27	-3.10	5.03	13.28
NOV26	0.75	-0.07	1.77	4.14	0.95	-0.52	1.43	3.87
NOV27	0.54	-4.25	1.13	3.92	1.06	-2.09	1.27	2.46
NOV28	0.14	-14.9	-2.34	12.42	0.29	-7.30	-0.17	6.31
NOV29	1.01	-1.70	0.97	2.52	0.72	-2.72	1.12	3.68
NOV30	0.07	-32.6	-8.23	30.03	0.60	-1.55	2.42	5.93
NOV31	0.46	-2.44	3.09	6.36	0.38	-3.14	3.77	7.76
NOV32	0.20	-8.53	0.67	12.61	0.09	-17.73	12.96	42.73
NOV33	0.68	-3.11	0.54	2.69	1.05	-1.24	1.56	3.39
NOV34	0.04	-56.4	-22.3	44.86	0.59	-1.95	1.45	5.38
NOV35	0.66	-0.53	2.22	4.03	0.76	-0.05	2.07	3.26
NOV36	0.80	-2.67	1.10	3.44	1.30	-1.38	1.33	2.76
NOV37	1.52	0.13	1.55	2.50	0.83	-0.27	2.70	4.28
NOV38	0.12	-14.0	-2.80	15.82	0.51	-2.62	2.31	6.65
NOV39	1.00	-1.17	1.51	2.81	1.06	-1.16	1.08	2.30
NOV40	0.43	-1.31	1.41	5.34	0.16	-3.19	5.03	16.67

Table Dm: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Samples of the MASLOC's Internal Subscale with Samejima's Model of IRT (N=820).

ITEMS	ENGLISH SAMPLE						TURKISH SAMPLE					
	A	B1	B2	B3	B4	B5	A	B1	B2	B3	B4	B5
MASLOC 2	0.81	-1.57	0.44	1.45	2.91	4.77	1.17	-1.76	0.05	1.00	1.50	2.30
MASLOC 5	3.74	-0.72	0.05	0.50	1.24	2.01	1.41	-1.82	-0.11	0.60	1.17	1.84
MASLOC 7	0.67	-1.66	-0.01	1.66	3.26	5.34	1.31	-2.45	-0.44	0.79	1.70	3.02
MASLOC 10	0.24	-14.9	-8.20	-5.23	0.18	6.91	1.95	-0.85	0.56	1.32	1.65	2.06
MASLOC 11	0.17	-8.03	1.98	9.54	17.58	25.34	1.95	-0.70	0.78	1.22	1.61	2.45

Table Dn: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Samples of the MASLOC's Helplessness Subscale with Samejima's Model of IRT (N=820).

ITEMS	ENGLISH SAMPLE						TURKISH SAMPLE					
	A	B1	B2	B3	B4	B5	A	B1	B2	B3	B4	B5
MASLOC 4	1.94	-0.08	0.55	1.03	1.66	2.24	0.59	-0.40	1.33	2.54	4.04	6.44
MASLOC 8	2.24	-0.07	0.72	1.26	1.69	2.28	0.17	-6.10	4.38	8.63	11.17	17.37
MASLOC 9	1.55	-0.36	0.64	1.29	2.02	2.54	0.82	-1.48	-0.06	0.65	2.00	3.14
MASLOC 14	2.48	-0.25	0.58	1.10	1.62	2.26	11.57	-0.59	-0.30	0.47	0.84	1.56
MASLOC 15	0.92	-1.51	-0.41	0.53	1.43	2.88	0.70	-2.44	-0.98	-0.17	1.67	2.96

Table Do: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Samples of the MASLOC's Luck Subscale with Samejima's Model of IRT (N=820).

ITEMS	ENGLISH SAMPLE						TURKISH SAMPLE					
	A	B1	B2	B3	B4	B5	A	B1	B2	B3	B4	B5
MASLOC 1	0.83	-1.41	0.08	1.04	2.59	3.84	1.00	-1.83	-0.50	0.50	2.55	4.49
MASLOC 3	0.34	-3.23	0.22	2.18	5.60	9.81	0.70	-2.04	-0.18	1.11	3.99	6.50
MASLOC 6	1.02	-0.07	0.86	1.57	2.48	3.34	0.25	-15.08	-9.47	-6.06	-0.69	5.32
MASLOC 12	3.67	-0.33	0.79	1.45	1.88	2.15	11.89	-0.61	-0.17	0.53	1.55	1.73
MASLOC 13	1.86	-0.45	0.83	1.69	2.24	2.85	1.39	-0.51	0.85	1.53	2.48	3.65

Table Dp: Items Discrimination (A) and Difficulties (Bs) for English and Turkish Samples of the Religiousity Scale with Samejima's Model of IRT (N=820).

ITEMS	ENGLISH SAMPLE					TURKISH SAMPLE				
	A	B1	B2	B3	B4	A	B1	B2	B3	B4
RELIGIOSITY 1	1.65	-0.21	1.14	1.47	2.40	1.77	-0.91	1.27	1.65	2.12
RELIGIOSITY 2	1.99	-0.62	0.01	0.52	1.66	1.56	-2.45	-1.49	-1.16	0.45
RELIGIOSITY 3	2.48	0.06	0.86	1.52	2.04	1.70	-0.55	0.33	1.41	2.44
RELIGIOSITY 4	1.91	-0.03	0.83	1.46	2.31	1.74	-1.02	-0.10	1.11	2.36
RELIGIOSITY 5	2.63	-1.32	-0.38	0.38	1.25	1.55	-2.74	-2.07	-1.33	0.37
RELIGIOSITY 6	1.40	-1.61	-0.28	1.18	1.67	1.22	-2.70	-1.81	0.74	1.06
RELIGIOSITY 7	2.56	-0.10	0.79	1.57	2.38	2.35	-1.13	0.18	1.64	2.42
RELIGIOSITY 8	1.69	-0.95	-0.13	0.98	1.88	2.11	-2.03	-1.40	-0.21	1.29

Table Dq: Item Discrimination (A) and Difficulties (Bs) for English and Turkish Samples of the Authoritarianism Scale with Samejima's Model of IRT (N=820).

ITEMS	ENGLISH SAMPLE						TURKISH SAMPLE					
	A	B1	B2	B3	B4	B5	A	B1	B2	B3	B4	B5
AUTO 1	1.12	-1.76	-0.83	-0.10	0.97	2.57	1.11	-1.50	-0.61	0.07	1.21	2.23
AUTO 2	0.44	-6.74	-4.33	-2.41	-0.07	3.40	0.33	-11.5	-7.25	-4.10	-1.15	4.28
AUTO 3	0.31	-9.53	-5.34	-2.58	1.11	4.65	0.65	-5.41	-3.25	-2.06	-0.17	2.46
AUTO 4	0.20	-18.26	-12.03	-6.77	-1.42	5.46	0.16	-15.27	-9.28	-5.91	-0.54	7.72
AUTO 5	0.77	-0.56	0.73	1.93	2.98	4.42	0.31	-4.48	-1.69	0.70	4.50	8.93
AUTO 6	0.66	-3.30	-1.31	0.21	1.95	4.29	0.42	-3.30	-1.01	0.11	2.60	5.50
AUTO 7	0.99	-2.07	-1.05	0.09	1.10	2.21	0.76	-2.39	-0.96	0.42	2.02	4.15
AUTO 8	1.27	-1.30	-0.30	0.62	1.65	2.82	1.40	-1.44	-0.63	-0.04	0.81	1.92
AUTO 9	0.63	-2.06	-0.62	0.81	2.45	3.90	0.67	-3.90	-2.47	-1.35	0.84	3.19
AUTO 10	1.06	-1.89	-0.73	0.01	1.01	2.11	0.90	-4.79	-2.97	-1.79	-0.31	1.39
AUTO 11	1.03	-1.67	-0.23	0.97	2.22	3.21	1.02	-3.57	-2.32	-1.14	-0.02	1.59
AUTO 12	0.97	-3.11	-1.45	-0.11	1.31	3.35	1.50	-1.64	-0.68	-0.08	0.79	1.99
AUTO 13	0.55	-5.66	-3.07	-0.93	1.30	4.02	1.03	-4.28	-2.69	-1.47	0.25	2.33
AUTO 14	0.73	-2.82	-1.19	0.03	1.87	3.72	0.81	-3.99	-2.76	-1.59	-0.12	1.76
AUTO 15	0.79	-2.73	-1.61	-0.80	0.25	1.12	1.03	-1.99	-1.11	-0.39	0.49	1.61
AUTO 16	0.81	-1.53	0.04	1.19	2.56	4.06	0.19	-3.92	-0.65	2.12	7.29	12.76
AUTO 17	1.23	-1.39	-0.45	0.41	1.87	2.90	1.64	-1.56	-0.86	-0.35	0.34	1.32

AUTO 18	0.73	-1.97	-0.58	0.86	2.64	4.23	0.15	-6.67	-1.97	1.73	11.37	18.66
AUTO 19	1.00	-2.76	-1.02	0.44	1.81	3.16	0.95	-3.20	-1.91	-0.75	0.62	2.58
AUTO 20	0.58	-5.15	-3.03	-1.41	0.73	3.03	0.71	-4.62	-3.38	-1.72	0.46	3.02
AUTO 21	0.82	-1.41	-0.12	0.80	1.93	3.22	0.67	-3.28	-1.98	-0.80	0.98	3.27
AUTO 22	1.30	-1.87	-0.72	0.34	1.53	2.46	1.04	-3.58	-2.49	-1.79	-0.59	1.17
AUTO 23	0.42	-5.83	-3.46	-0.40	2.51	5.07	0.57	-4.04	-2.34	-0.50	2.24	5.03
AUTO 24	1.10	-1.69	-0.42	0.70	2.14	3.17	0.89	-2.96	-1.63	-0.80	0.61	2.41
AUTO 25	0.66	-2.64	-0.72	1.18	3.09	4.37	0.48	-4.16	-1.99	-0.29	2.49	5.34
AUTO 26	0.82	-0.34	0.67	1.39	2.09	2.79	0.89	-0.90	0.15	0.91	1.86	3.17
AUTO 27	0.65	-2.07	-0.47	1.18	2.93	4.66	1.02	-1.96	-0.91	-0.13	0.96	2.31
AUTO 28	0.57	-3.98	-2.30	-0.47	0.98	2.94	1.08	-3.22	-2.26	-1.25	-0.41	1.32
AUTO 29	0.77	-2.54	-1.01	0.79	2.80	4.16	0.61	-2.85	-1.50	-0.48	1.59	4.70
AUTO 30	0.58	-4.40	-2.18	-0.43	1.88	4.00	0.38	-5.77	-3.44	-1.64	1.81	6.55

APPENDIX E: Regression Analysis for English Sample.

Table Ea1: Testing for a curvilinear relationship between control beliefs and religiosity with regression analysis in the English sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	17.568	1.601		10.976	.000
	Religiosity	-2.1E-02	.163	-.034	-.127	.899
	RTSQUARE	-3.5E-04	.004	-.025	-.093	.926

a. Dependent Variable: Control Belief

Table Eb1: Testing for a curvilinear relationship between Means-Ends for Effort and religiosity with regression analysis in the English sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	19.594	1.115		17.580	.000
	Religiosity	-5.3E-03	.113	-.012	-.047	.963
	RTSQUARE	1.8E-04	.003	.018	.068	.946

a. Dependent Variable: Means-Ends for Effort

Table Ec1: Testing for a curvilinear relationship between Means-Ends for Attribution and religiosity with regression analysis in the English sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	22.799	.987		23.100	.000
	Religiosity	-9.7E-03	.100	-.026	-.097	.923
	RTSQUARE	-6.9E-05	.002	-.008	-.030	.976

a. Dependent Variable: Means-Ends for Attribute

Table Ed1: Testing for a curvilinear relationship between Means-Ends for Luck and religiosity with regression analysis in the English sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	11.489	1.401		8.203	.000
	Religiosity	.181	.142	.345	1.275	.203
	RTSQUARE	-4.8E-03	.003	-.399	-1.475	.141

a. Dependent Variable: Means-Ends for Luck

Table Ee1: Testing for a curvilinear relationship between Means-Ends for Powerful Others and religiosity with regression analysis in the English sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	15.964	1.136		14.048	.000
	Religiosity	5.6E-02	.115	.132	.487	.627
	RTSQUARE	-1.3E-03	.003	-.133	-.493	.623

a. Dependent Variable: Means-Ends for Powerful Others

Table Ef1: Testing for a curvilinear relationship between Means-Ends for Unknown Factors and religiosity with regression analysis in the English sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	13.440	1.222		10.999	.000
	Religiosity	.208	.124	.451	1.679	.094
	RTSQUARE	-4.6E-03	.003	-.436	-1.626	.105

a. Dependent Variable: Means-Ends for Unknown

Table Eg1: Testing for a curvilinear relationship between Agency for Effort and religiosity with regression analysis in the English sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.206	.931		10.964	.000
	Religiosity	-4.5E-02	.095	-.125	-.471	.638
	RTSQUARE	1.1E-04	.002	.013	.048	.962

a. Dependent Variable: Agency for Effort

Table Eh1: Testing for a curvilinear relationship between Agency for Attribute and religiosity with regression analysis in the English sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.029	.843		11.897	.000
	Religiosity	3.1E-02	.086	.096	.356	.722
	RTSQUARE	-6.2E-04	.002	-.085	-.316	.753

a. Dependent Variable: Agency for Attribute

Table Ej1: Testing for a curvilinear relationship between Agency for Luck and religiosity with regression analysis in the English sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.959	.811		11.041	.000
	Religiosity	1.6E-02	.083	.052	.193	.847
	RTSQUARE	-9.9E-04	.002	-.139	-.519	.604

a. Dependent Variable: Agency for Luck

Table Ek1: Testing for a curvilinear relationship between Agency for Powerful Others and religiosity with regression analysis in the English sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.224	.877		13.938	.000
	Religiosity	-4.6E-02	.089	-.138	-.519	.604
	RTSQUARE	1.6E-03	.002	.200	.752	.452

a. Dependent Variable: Agency for Powerful Others

Table El1: Testing for a curvilinear relationship between MASLOC and religiosity with regression analysis in the English sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	31.902	3.640		8.764	.000
	Religiosity	.337	.372	.251	.905	.366
	RTSQUARE	-1.1E-02	.009	-.350	-1.259	.209

a. Dependent Variable: Multidimensional Academic Specific LOC

Table Em1: Testing for a curvilinear relationship between control beliefs and authoritarianism with regression analysis in the English sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	17.018	4.548		3.742	.000
	Autoritarianism	1.1E-02	.090	.048	.124	.902
	ATSQUARE	-1.2E-04	.000	-.100	-.259	.796

a. Dependent Variable: Control Belief

Table En1: Testing for a curvilinear relationship between Means-Ends for Effort and authoritarianism with regression analysis in the English sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	21.933	3.220		6.810	.000
	Autoritarianism	-2.2E-02	.064	-.129	-.338	.736
	ATSQUARE	-2.2E-05	.000	-.027	-.071	.944

a. Dependent Variable: Means-Ends for Effort

Table Eo1: Testing for a curvilinear relationship between Means-Ends for Attribution and authoritarianism with regression analysis in the English sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	22.735	2.959		7.684	.000
	Autoritarianism	7.6E-03	.059	.050	.129	.897
	ATSQUARE	-9.2E-05	.000	-.123	-.318	.751

a. Dependent Variable: Means-Ends for Attribute

Table Ep1: Testing for a curvilinear relationship between Means-Ends for Luck and authoritarianism with regression analysis in the English sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	14.290	4.154		3.440	.001
	Autoritarianism	-5.5E-02	.082	-.257	-.665	.507
	ATSQUARE	3.9E-04	.000	.375	.969	.333

a. Dependent Variable: Means-Ends for Luck

Table Eq1: Testing for a curvilinear relationship between Means-Ends for Powerful Others and authoritarianism with regression analysis in the English sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	20.582	3.203		6.426	.000
	Autoritarianism	-9.6E-02	.064	-.586	-1.513	.131
	ATSQUARE	5.4E-04	.000	.662	1.709	.088

a. Dependent Variable: Means-Ends for Powerful Others

Table Er1: Testing for a curvilinear relationship between Means-Ends for Unknown Factors and authoritarianism with regression analysis in the English sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	14.128	3.519		4.015	.000
	Autoritarianism	-8.7E-03	.070	-.048	-.124	.901
	ATSQUARE	2.0E-04	.000	.228	.595	.552

a. Dependent Variable: Means-Ends for Unknown

Table Es1: Testing for a curvilinear relationship between Agency for Effort and authoritarianism with regression analysis in the English sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.027	2.715		3.693	.000
	Autoritarianism	9.8E-03	.054	.069	.182	.856
	ATSQUARE	-1.6E-04	.000	-.230	-.602	.547

a. Dependent Variable: Agency for Effort

Table Et1: Testing for a curvilinear relationship between Agency for Attribute and authoritarianism with regression analysis in the English sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.238	2.373		2.207	.028
	Autoritarianism	9.3E-02	.047	.762	1.983	.048
	ATSQUARE	-4.1E-04	.000	-.680	-1.771	.078

a. Dependent Variable: Agency for Attribute

Table Eu1: Testing for a curvilinear relationship between Agency for Luck and authoritarianism with regression analysis in the English sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.179	2.411		4.222	.000
	Autoritarianism	-3.0E-02	.048	-.244	-.631	.529
	ATSQUARE	1.6E-04	.000	.269	.698	.486

a. Dependent Variable: Agency for Luck

Table Ev1: Testing for a curvilinear relationship between Agency for Powerful Others and authoritarianism with regression analysis in the English sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.112	2.510		4.028	.000
	Autoritarianism	3.5E-02	.050	.269	.697	.486
	ATSQUARE	-1.4E-04	.000	-.225	-.585	.559

a. Dependent Variable: Agency for Powerful Others

Table Ew1: Testing for a curvilinear relationship between MASLOC and authoritarianism with regression analysis in the English sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	23.835	11.298		2.110	.036
	Autoritarianism	.125	.229	.228	.545	.586
	ATSQUARE	-2.8E-04	.001	-.103	-.246	.806

a. Dependent Variable: Multidimensional Academic Specific LOC

330

Appendix E: Regression Analysis for Turkish Sample.

Table Ea2: Testing for a curvilinear relationship between control beliefs and religiosity with regression analysis in the Turkish sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.992	1.782		5.609	.000
	Religiosity	.430	.155	.721	2.767	.006
	RTSQUARE	-8.7E-03	.003	-.682	-2.618	.009

a. Dependent Variable: Control Belief

Table Eb2: Testing for a curvilinear relationship between Means-Ends for Effort and religiosity with regression analysis in the Turkish sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	21.046	1.668		12.618	.000
	Religiosity	-.202	.146	-.357	-1.386	.167
	RTSQUARE	1.9E-03	.003	.160	.620	.536

a. Dependent Variable: Means-Ends for Effort

Table Ec2: Testing for a curvilinear relationship between Means-Ends for Attribution and religiosity with regression analysis in the Turkish sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	23.049	1.422		16.211	.000
	Religiosity	-5.8E-03	.124	-.012	-.047	.963
	RTSQUARE	-2.3E-04	.003	-.023	-.088	.930

a. Dependent Variable: Means-Ends for Attribute

Table Ed2: Testing for a curvilinear relationship between Means-Ends for Luck and religiosity with regression analysis in the Turkish sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	11.360	1.808		6.282	.000
	Religiosity	.126	.158	.208	.795	.427
	RTSQUARE	-3.2E-03	.003	-.247	-.941	.347

a. Dependent Variable: Means-Ends for Luck

Table Ee2: Testing for a curvilinear relationship between Means-Ends for Powerful Others and religiosity with regression analysis in the Turkish sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	15.671	1.704		9.195	.000
	Religiosity	4.4E-02	.149	.078	.299	.765
	RTSQUARE	-1.8E-03	.003	-.144	-.550	.582

a. Dependent Variable: Means-Ends for Powerful Others

Table Ef2: Testing for a curvilinear relationship between Means-Ends for Unknown Factors and religiosity with regression analysis in the Turkish sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.718	1.837		6.925	.000
	Religiosity	.126	.160	.206	.787	.432
	RTSQUARE	-2.2E-03	.003	-.169	-.645	.519

a. Dependent Variable: Means-Ends for Unknown

332

Table Eg2: Testing for a curvilinear relationship between Agency for Effort and religiosity with regression analysis in the Turkish sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	11.897	1.177		10.109	.000
	Religiosity	-.148	.102	-.364	-1.444	.150
	RTSQUARE	9.4E-04	.002	.108	.429	.668

a. Dependent Variable: Agency for Effort

Table Eh2: Testing for a curvilinear relationship between Agency for Attribute and religiosity with regression analysis in the Turkish sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.444	1.062		7.949	.000
	Religiosity	.133	.092	.375	1.441	.150
	RTSQUARE	-2.7E-03	.002	-.361	-1.387	.166

a. Dependent Variable: Agency for Attribute

Table Ej2: Testing for a curvilinear relationship between Agency for Luck and religiosity with regression analysis in the Turkish sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.511	1.034		9.200	.000
	Religiosity	-2.3E-02	.090	-.068	-.260	.795
	RTSQUARE	8.2E-04	.002	.112	.429	.668

a. Dependent Variable: Agency for Luck

333

Table Ek2: Testing for a curvilinear relationship between Agency for Powerful Others and religiosity with regression analysis in the Turkish sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.536	1.228		6.138	.000
	Religiosity	.202	.107	.487	1.890	.059
	RTSQUARE	-2.9E-03	.002	-.330	-1.278	.202

a. Dependent Variable: Agency for Powerful Others

Table El2: Testing for a curvilinear relationship between MASLOC and religiosity with regression analysis in the Turkish sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	32.183	4.355		7.390	.000
	Religiosity	.185	.380	.130	.487	.627
	RTSQUARE	-6.7E-03	.008	-.220	-.823	.411

a. Dependent Variable: Multidimensional Academic Specific LOC

Table Em2: Testing for a curvilinear relationship between control beliefs and authoritarianism with regression analysis in the Turkish sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.022	5.329		.379	.705
	Autoritarianism	.217	.094	1.063	2.325	.021
	ATSQUARE	-9.0E-04	.000	-1.010	-2.208	.028

a. Dependent Variable: Control Belief

Table En2: Testing for a curvilinear relationship between Means-Ends for Effort and authoritarianism with regression analysis in the Turkish sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	14.181	5.122		2.769	.006
	Autoritarianism	.118	.090	.584	1.312	.190
	ATSQUARE	-7.6E-04	.000	-.861	-1.933	.054

a. Dependent Variable: Means-Ends for Effort

Table Eo2: Testing for a curvilinear relationship between Means-Ends for Attribute and authoritarianism with regression analysis in the Turkish sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	23.308	4.245		5.491	.000
	Autoritarianism	1.6E-02	.074	.099	.218	.828
	ATSQUARE	-1.7E-04	.000	-.240	-.527	.599

a. Dependent Variable: Means-Ends for Attribute

335

Table Ep2: Testing for a curvilinear relationship between Means-Ends for Luck and authoritarianism with regression analysis in the Turkish sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.552	5.308		.292	.770
	Autoritarianism	.203	.093	.998	2.180	.030
	ATSQUARE	-9.2E-04	.000	-1.039	-2.270	.024

a. Dependent Variable: Means-Ends for Luck

Table Eq3: Testing for a curvilinear relationship between Means-Ends for Powerful Others and authoritarianism with regression analysis in the Turkish sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.981	5.414		.920	.358
	Autoritarianism	.198	.094	.990	2.094	.037
	ATSQUARE	-8.9E-04	.000	-1.033	-2.185	.029

a. Dependent Variable: Means-Ends for Powerful Others

Table Er2: Testing for a curvilinear relationship between Means-Ends for Unknown and authoritarianism with regression analysis in the Turkish sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.988	5.659		1.411	.159
	Autoritarianism	.115	.099	.535	1.162	.246
	ATSQUARE	-5.1E-04	.000	-.541	-1.174	.241

a. Dependent Variable: Means-Ends for Unknown

Table Es2: Testing for a curvilinear relationship between Agency for Effort and authoritarianism with regression analysis in the Turkish sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.821	3.784		1.803	.072
	Autoritarianism	6.5E-02	.066	.442	.981	.327
	ATSQUARE	-4.0E-04	.000	-.618	-1.372	.171

a. Dependent Variable: Agency for Effort

Table Et2: Testing for a curvilinear relationship between Agency for Attribute and authoritarianism with regression analysis in the Turkish sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.478	3.290		1.665	.097
	Autoritarianism	6.8E-02	.058	.535	1.172	.242
	ATSQUARE	-2.5E-04	.000	-.460	-1.007	.315

a. Dependent Variable: Agency for Attribute

Table Eu2: Testing for a curvilinear relationship between Agency for Luck and authoritarianism with regression analysis in the Turkish sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	18.560	3.045		6.096	.000
	Autoritarianism	-.157	.053	-1.334	-2.934	.004
	ATSQUARE	6.7E-04	.000	1.309	2.879	.004

a. Dependent Variable: Agency for Luck

Table Ev2: Testing for a curvilinear relationship between Agency for Powerful Others and authoritarianism with regression analysis in the Turkish sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	22.886	3.746		6.110	.000
	Autoritarianism	-.239	.066	-1.627	-3.643	.000
	ATSQUARE	1.1E-03	.000	1.757	3.934	.000

a. Dependent Variable: Agency for Powerful Others

Table Ew2: Testing for a curvilinear relationship between MASLOC and authoritarianism with regression analysis in the Turkish sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	32.720	13.653		2.397	.017
	Autoritarianism	1.4E-02	.239	.028	.059	.953
	ATSQUARE	-1.4E-04	.001	-.064	-.133	.895

a. Dependent Variable: Multidimensional Academic Specific LOC

Appendix E: Regression Analysis for whole sample.

Table Ea3: Testing for a curvilinear relationship between control beliefs and religiosity with regression analysis in the whole sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	17.258	1.131		15.260	.000
	Religiosity	-5.7E-02	.109	-.102	-.527	.599
	RTSQUARE	-1.5E-04	.002	-.012	-.060	.952

a. Dependent Variable: Control Belief

Table Eb3: Testing for a curvilinear relationship between Means-Ends for Effort and religiosity with regression analysis in the whole sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	21.593	.922		23.430	.000
	Religiosity	-.207	.089	-.437	-2.325	.020
	RTSQUARE	2.4E-03	.002	.224	1.190	.234

a. Dependent Variable: Means-Ends for Effort

Table Ec3: Testing for a curvilinear relationship between Means-Ends for Attribution and religiosity with regression analysis in the whole sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	22.616	.765		29.574	.000
	Religiosity	1.6E-02	.074	.042	.218	.828
	RTSQUARE	-5.4E-04	.002	-.062	-.320	.749

a. Dependent Variable: Means-Ends for Attribute

Table Ed3: Testing for a curvilinear relationship between Means-Ends for Luck and religiosity with regression analysis in the whole sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.017	1.030		11.670	.000
	Religiosity	.108	.099	.209	1.082	.279
	RTSQUARE	-3.3E-03	.002	-.279	-1.443	.149

a. Dependent Variable: Means-Ends for Luck

Table Ee3: Testing for a curvilinear relationship between Means-Ends for Powerful Others and religiosity with regression analysis in the whole sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	16.535	.910		18.176	.000
	Religiosity	-6.5E-03	.088	-.014	-.074	.941
	RTSQUARE	-7.0E-04	.002	-.068	-.351	.725

a. Dependent Variable: Means-Ends for Powerful Others

Table Ef3: Testing for a curvilinear relationship between Means-Ends for Unknown Factors and religiosity with regression analysis in the whole sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	14.578	.986		14.790	.000
	Religiosity	5.2E-02	.095	.105	.544	.587
	RTSQUARE	-1.6E-03	.002	-.141	-.726	.468

a. Dependent Variable: Means-Ends for Unknown Factors

Table Eg3: Testing for a curvilinear relationship between Agency for Effort and religiosity with regression analysis in the whole sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.681	.677		15.771	.000
	Religiosity	-7.0E-02	.065	-.203	-1.079	.281
	RTSQUARE	-4.9E-05	.001	-.006	-.033	.973

a. Dependent Variable: Agency for Effort

Table Eh3: Testing for a curvilinear relationship between Agency for Attribute and religiosity with regression analysis in the whole sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.941	.613		16.224	.000
	Religiosity	2.9E-02	.059	.093	.484	.628
	RTSQUARE	-8.1E-04	.001	-.116	-.601	.548

a. Dependent Variable: Agency for Attribute

Table Ej3: Testing for a curvilinear relationship between Agency for Luck and religiosity with regression analysis in the whole sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.676	.594		14.595	.000
	Religiosity	4.1E-02	.057	.136	.707	.480
	RTSQUARE	-7.0E-04	.001	-.103	-.538	.590

a. Dependent Variable: Agency for Luck

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Table Ek3: Testing for a curvilinear relationship between Agency for Powerful Others and religiosity with regression analysis in the whole sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.367	.699		17.694	.000
	Religiosity	-.111	.068	-.315	-1.639	.102
	RTSQUARE	2.5E-03	.002	.307	1.596	.111

a. Dependent Variable: Agency for Powerful Others

Table El3: Testing for a curvilinear relationship between MASLOC and religiosity with regression analysis in the whole sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	33.069	2.571		12.861	.000
	Religiosity	.180	.249	.143	.724	.469
	RTSQUARE	-7.5E-03	.006	-.260	-1.312	.190

a. Dependent Variable: Multidimensional Academic Specific LOC

Table Em3: Testing for a curvilinear relationship between control beliefs and authoritarianism with regression analysis in the whole sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	16.026	3.197		5.013	.000
	Autoritarianism	2.3E-02	.060	.114	.381	.703
	ATSQUARE	-2.2E-04	.000	-.234	-.783	.434

a. Dependent Variable: Control Belief

Table En3: Testing for a curvilinear relationship between Means-Ends for Effort and authoritarianism with regression analysis in the whole sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	19.242	2.625		7.330	.000
	Autoritarianism	4.8E-02	.049	.277	.972	.332
	ATSQUARE	-5.0E-04	.000	-.619	-2.174	.030

a. Dependent Variable: Means-Ends for Effort

Table Eo3: Testing for a curvilinear relationship between Means-Ends for Attribution and authoritarianism with regression analysis in the whole sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	21.821	2.230		9.786	.000
	Autoritarianism	2.8E-02	.042	.202	.672	.502
	ATSQUARE	-1.8E-04	.000	-.279	-.927	.354

a. Dependent Variable: Means-Ends for Attribute

Table Ep3: Testing for a curvilinear relationship between Means-Ends for Luck and authoritarianism with regression analysis in the whole sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.485	2.971		2.856	.004
	Autoritarianism	7.8E-02	.056	.427	1.408	.160
	ATSQUARE	-3.6E-04	.000	-.423	-1.396	.163

a. Dependent Variable: Means-Ends for Luck

Table Eq3: Testing for a curvilinear relationship between Means-Ends for Powerful Others and authoritarianism with regression analysis in the whole sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	14.977	2.625		5.705	.000
	Autoritarianism	3.0E-02	.049	.184	.607	.544
	ATSQUARE	-1.8E-04	.000	-.240	-.794	.428

a. Dependent Variable: Means-Ends for Powerful Others

Table Er3: Testing for a curvilinear relationship between Means-Ends for Unknown Factors and authoritarianism with regression analysis in the whole sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	11.074	2.863		3.867	.000
	Autoritarianism	7.2E-02	.054	.405	1.338	.181
	ATSQUARE	-3.3E-04	.000	-.405	-1.338	.181

a. Dependent Variable: Means-Ends for Unknown Factors

Table Es3: Testing for a curvilinear relationship between Agency for Effort and authoritarianism with regression analysis in the whole sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	9.200	2.008		4.581	.000
	Autoritarianism	2.5E-02	.038	.197	.669	.503
	ATSQUARE	-2.3E-04	.000	-.392	-1.330	.184

a. Dependent Variable: Agency for Effort

Table Et3: Testing for a curvilinear relationship between Agency for Attribute and authoritarianism with regression analysis in the whole sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	6.545	1.766		3.706	.000
	Autoritarianism	6.5E-02	.033	.593	1.975	.049
	ATSQUARE	-2.9E-04	.000	-.575	-1.916	.056

a. Dependent Variable: Agency for Attribute

Table Eu3: Testing for a curvilinear relationship between Agency for Luck and authoritarianism with regression analysis in the whole sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	11.338	1.726		6.569	.000
	Autoritarianism	-4.9E-02	.032	-.457	-1.524	.128
	ATSQUARE	2.7E-04	.000	.536	1.788	.074

a. Dependent Variable: Agency for Luck

Table Ev3: Testing for a curvilinear relationship between Agency for Powerful Others and authoritarianism with regression analysis in the whole sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	16.356	2.031		8.055	.000
	Autoritarianism	-8.8E-02	.038	-.693	-2.312	.021
	ATSQUARE	3.7E-04	.000	.632	2.109	.035

a. Dependent Variable: Agency for Powerful Others

Table Ew3: Testing for a curvilinear relationship between MASLOC and authoritarianism with regression analysis in the whole sample.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	21.854	7.583		2.882	.004
	Autoritarianism	.204	.143	.447	1.434	.152
	ATSQUARE	-9.2E-04	.001	-.435	-1.394	.164

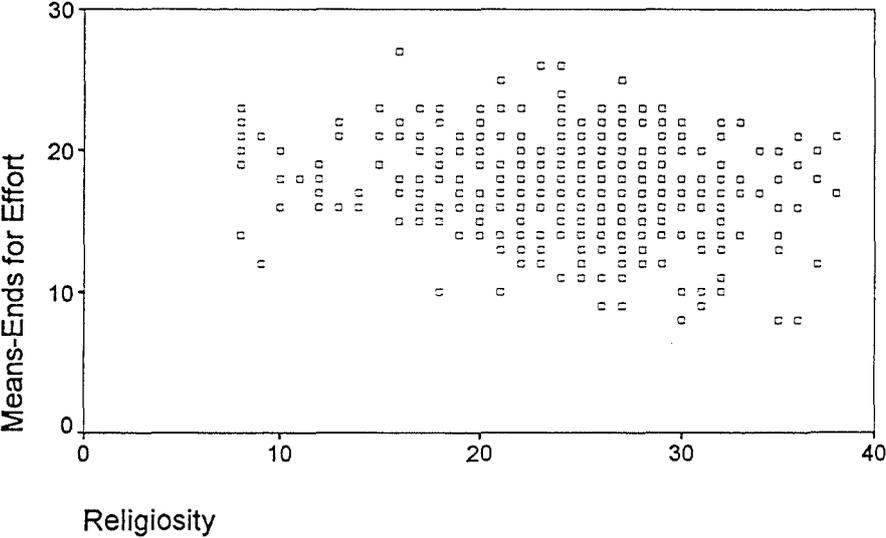a. Dependent Variable: Multidimensional Academic Specific LOC

Graph

Scattergram of the relationship between
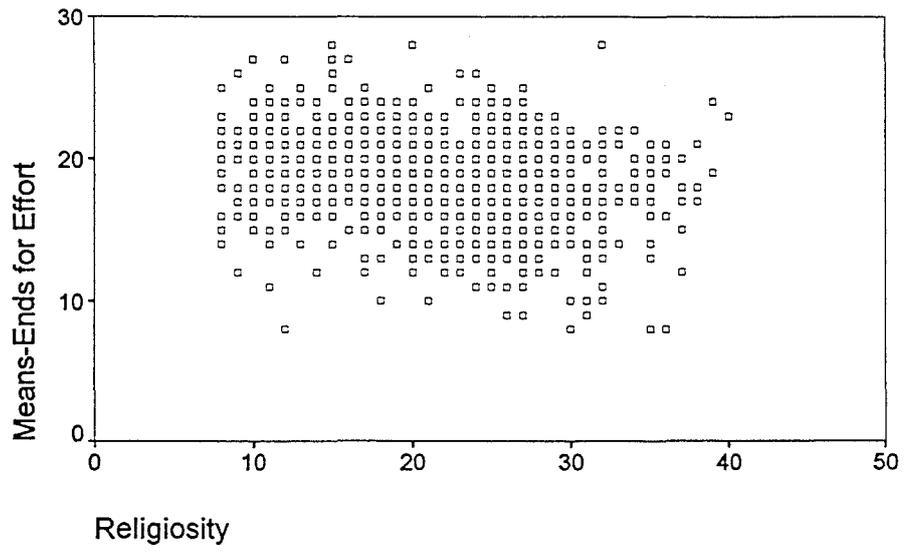Means-Ends for Effort and religiosity
in the English sample
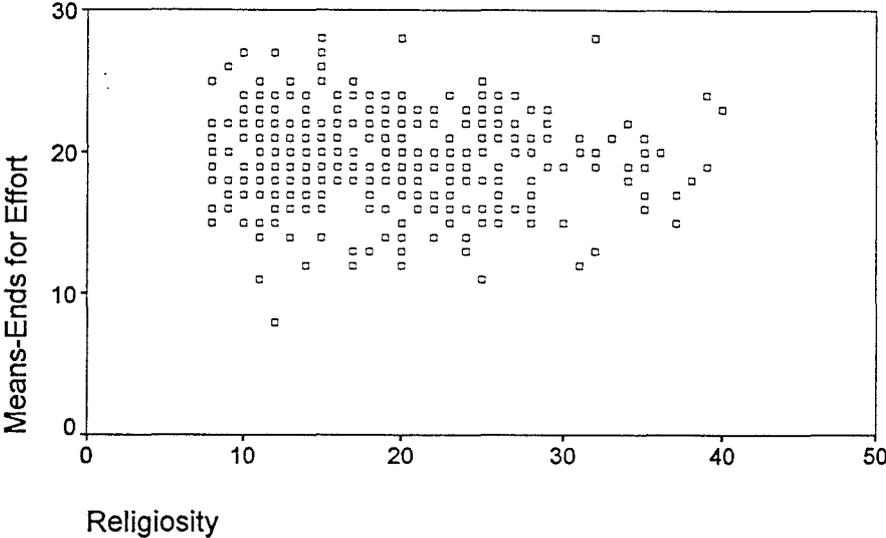
Graph
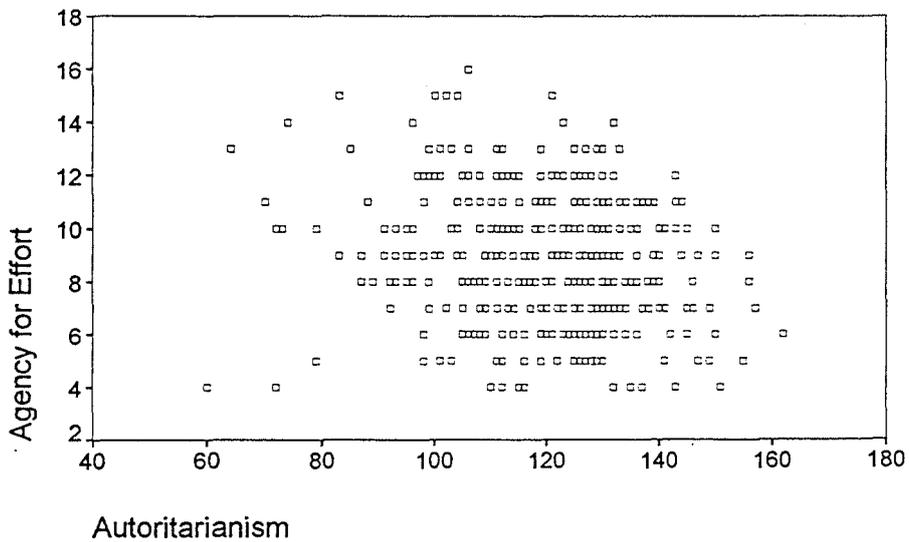
Scattergram of the relationship between
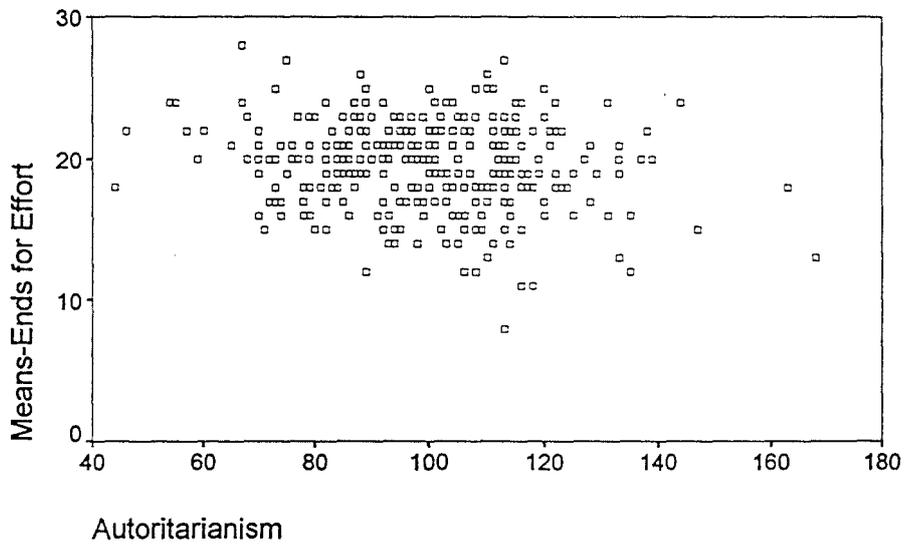Means-Ends for Effort and religiosity
in the Turkish sample

Graph

Scattergram of the relationship between
Means-Ends for Effort and religiosity

in the whole sample

Religiosity

Graph

Scattergram of the relationship between Means-Ends for Effort and Authoritarianism in the English sample

Autoritarianism

Graph

Scattergram of the relationship between Means-Ends for Effort and Authoritarianism in the Turkish sample
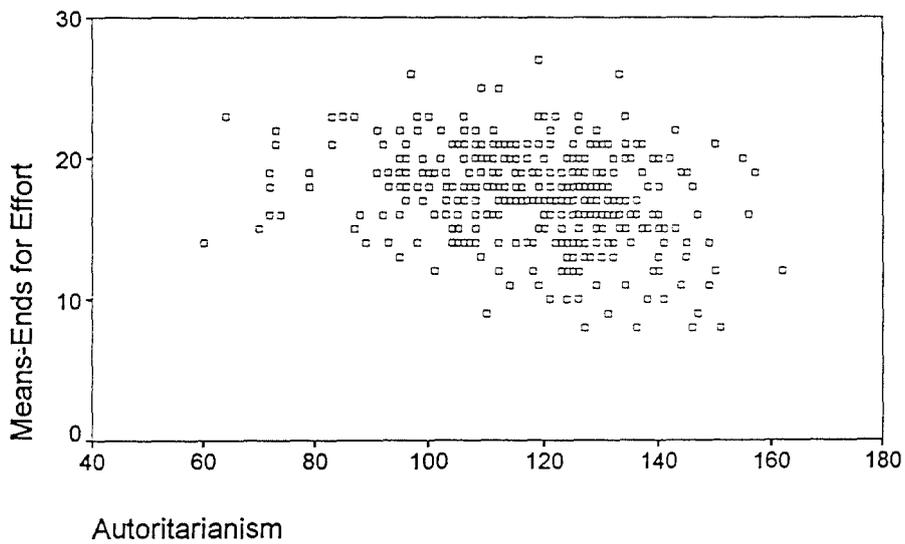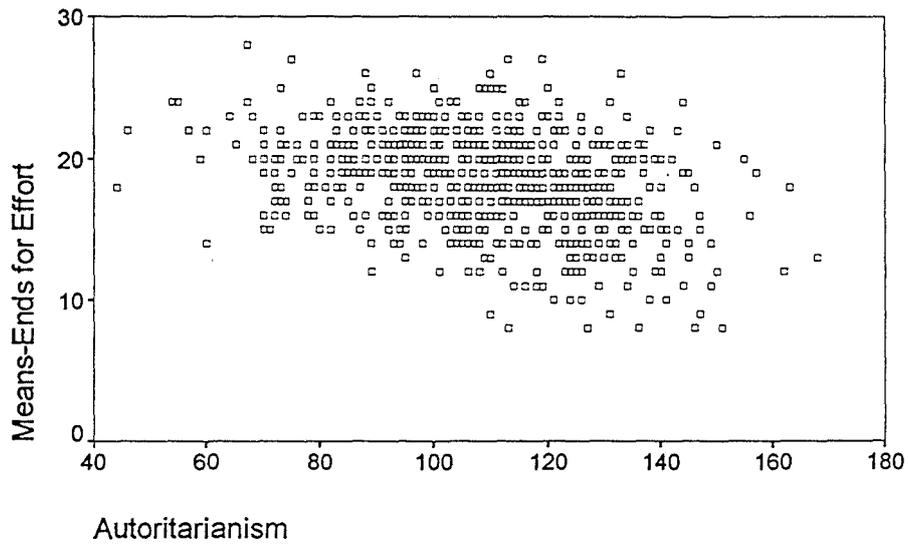

Autoritarianism

Graph

Scattergram of the relationship between Means-Ends for Effort and Authoritarianism in the whole sample

Graph

Scattergram of the relationship between
Agency for Effort and religiosity
in the English sample

Religiosity

Graph

Scattergram of the relationship between
Agency for Effort and religiosity
in the Turkish sample

Religiosity

Graph

Scattergram of the relationship between Agency for Effort and religiosity

in the whole sample

Graph

Scattergram of the relationship between Agency for Effort and Authoritarianism in the English sample

Autoritarianism

Graph

Scattergram of the relationship between Agency for Effort and Authoritarianism in the Turkish sample

Autoritarianism
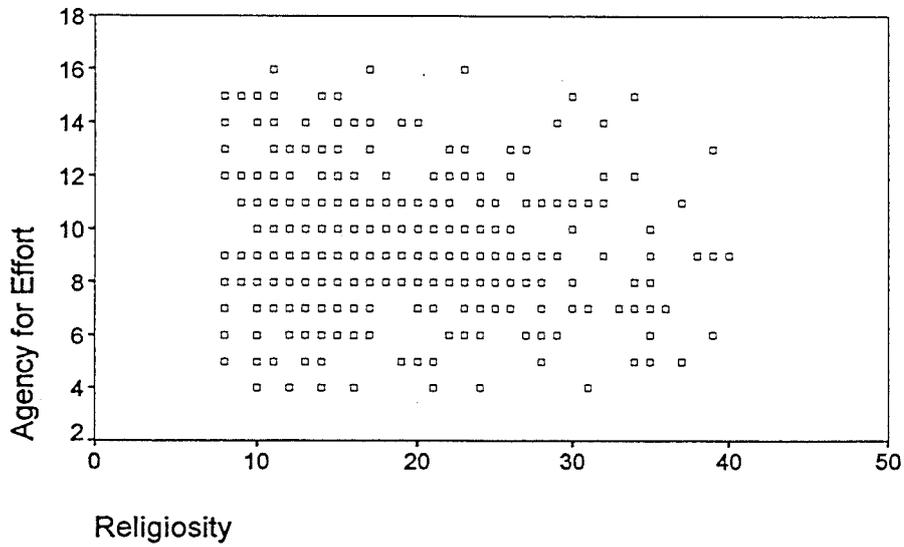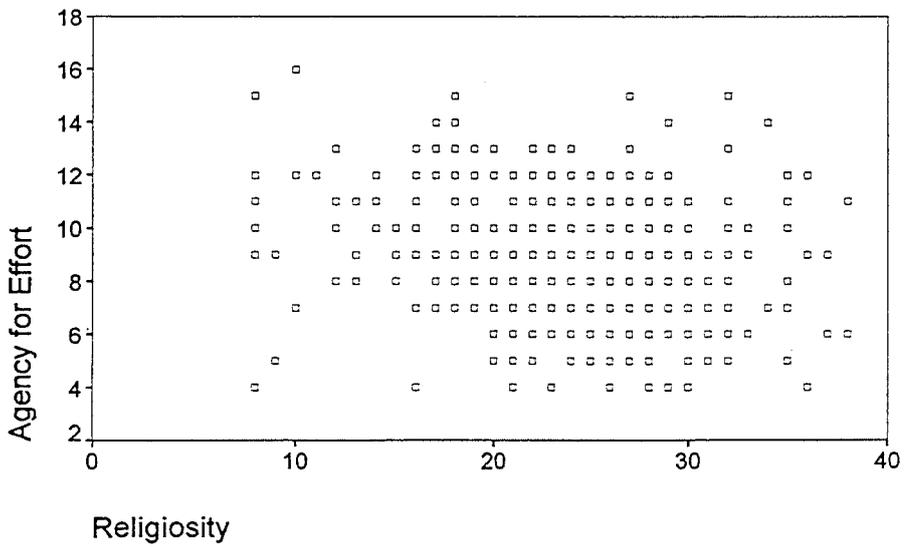
Graph

Scattergram of the relationship between Agency for Effort and Authoritarianism in the whole sample

Autoritarianism

Graph

Scattergram of the relationship between
Agency for Luck and Authoritarianism
in the Turkish sample

Autoritarianism

Graph

Scattergram of the relationship between
Agency for Powerful Others & Authoritarianis
in the Turkish sample
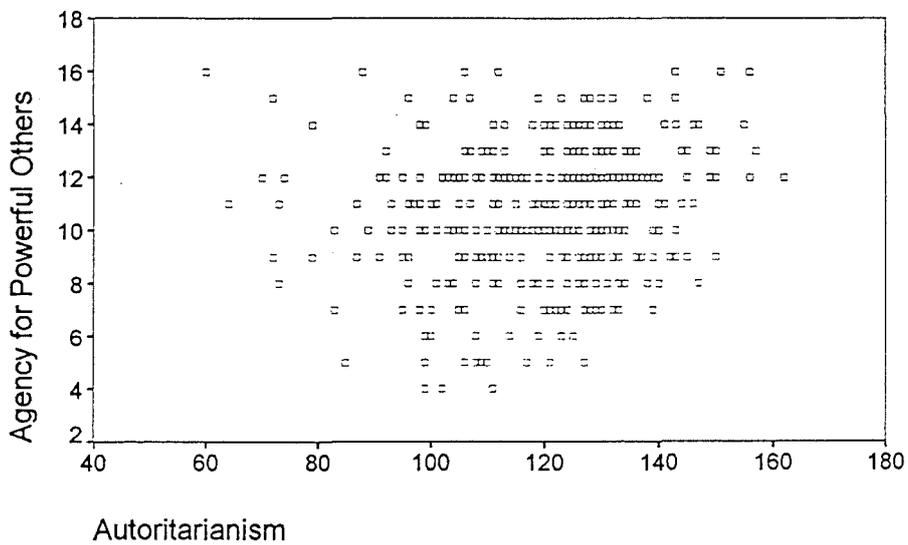
Autoritarianism

Graph

Scattergram of the relationship between
Control Beliefs and religiosity
in the Turkish sample

Religiosity

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