Dogmatism and the distinctiveness of opposite vs. different cognitive systems: Release from proactive inhibition for shifts within- and between-dimensions of meaning

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Abstract

In a series of three experiments, encoding distinctiveness in a release from proactive
inhibition paradigm was investigated as a function of dogmatism. Significant differences in
release from proactive inhibition between high and low dogmatic individuals were found for
shifts within meaning dimensions (from one end of a dimension to the other end) but not for
shifts between different dimensions of meaning. The results were discussed in terms of the
emphasis on belief vs. disbelief systems in dogmatism, motivational processes in cognition, and
recent work on individual differences in social cognition.
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1. Introduction

With the rise in interest in social cognition, the last 20 years has seen a rapid increase in research on individual differences in social cognition. This is reflected in the development of concepts such as compartmentalization (Showers, 2002), need for cognition (Cacioppo, Petty, Feinstein, & Jarvis, 1996), need for cognitive closure (Webster & Kruglanski, 1994), need to evaluate (Jarvis & Petty, 1996), self-complexity (Linville, 1987), and uncertainty orientation (Sorrentino, 1996). These concepts are reminiscent of research done in the 1950s and 1960s on cognitive styles (for reviews, see Goldstein & Blackman, 1978; Sternberg & Grigorenko, 1997).

Cognitive styles are "habitual ways or modes of dealing with information about oneself and one's environment which are to a large degree independent of the content of the information being handled… Cognitive styles are assumed to be trans-situational in that they are operative in a variety of tasks and domains… Another associated concept is that of cognitive *ability*. We can say that a measure of cognitive ability is an index of how *well* a person *can* think, whereas a measure of cognitive style is an indication of how a person habitually *does* think." (Warr, 1970, p. 11). Well-known cognitive styles include cognitive complexity (Bieri, 1955), cognitive controls (Gardner, Holzman, Klein, Linton, & Spence, 1959), conceptual differentiation (Gardner & Schoen, 1962), dogmatism (Rokeach, 1954), field dependence (Witkin et al., 1954), integrative complexity (Harvey, Hunt, & Schroder, 1961), intolerance of ambiguity (Frenkel-Brunswik, 1949), and rigidity (Luchins, 1951).

The particular focus of this paper is on dogmatism (Rokeach, 1954, 1960). An important part of Rokeach's analysis of dogmatism and dogmatic thinking focused on the structure of cognitive systems. The organization of elements both within and between cognitive systems can be described in terms of isolation and interdependence. Cognitive systems vary along a continuum from open to closed with dogmatic individuals possessing closed cognitive systems. The closed nature of the cognitive systems of highly dogmatic individuals is evidenced by their tendency to compartmentalize and isolate different elements within their cognitive systems ("black/white" thinking), whereas the more open cognitive systems of low dogmatic individuals are evidenced by their readiness to make connections between the different elements (e.g., Franklin & Carr, 1971; Zagona & Zurcher, 1965). For example, relative to low dogmatic individuals, highly dogmatic individuals strive to avoid inconsistency in their cognitions and they react to inconsistent information by ignoring, minimizing or selectively forgetting it (e.g., Durand & Lambert, 1975; Hunt & Miller, 1968; Kleck & Wheaton, 1967; Leone, 1989; Palmer & Kalin, 1985).

This account of dogmatism is conceptually similar to the structural aspects of the Big-5 Openness-to-Experience factor (McCrae, 1994) and it could well be that Openness- to-Experience subsumes dogmatism. However, there have been no direct empirical tests of the correlation between dogmatism and Openness. What studies there are have shown a negative correlation between dogmatism and Openness-to-Experience, as expected, but using measures of Openness that pre-date the development of the Big-5 (e.g., Tittler, 1974). While on the subject of Openness-to-Experience, it should be noted that data on the relation between intelligence and dogmatism are scant (Goldstein & Blackman, 1978, p. 220).

Although Rokeach's analysis of dogmatism was heavily influenced by work on authoritarianism (Adorno, Frenkel-Brunswik, Levinson, & Sanford, 1950), he was particularly concerned to distinguish between the content-neutral *cognitive style* aspects of dogmatic thinking and the content-specific aspects of the dogmatic personality relating to authoritarianism, intolerance, and ideology (see, for example, Goldstein & Blackman, 1978). However, surprisingly little work has been carried out on the cognitive processes involved in dogmatic thinking and judgment apart from Rokeach himself who used the "Denny Doodlebug" problem to investigate how dogmatic individuals incorporate new information into existing cognitive systems (e.g., Rokeach, McGovney, & Denny, 1955).

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Recently, Davies (1993) investigated cognitive processing differences in dogmatic thinking using the phenomenon of belief persistence after evidential discrediting. Davies predicted that highly dogmatic individuals would show greater belief persistence because they are unable or unwilling to revise their initial belief in the light of discrediting information, whereas low dogmatic individuals would show less belief persistence because their more open belief systems allow them to reconcile their initial belief with the discrediting information. Davies found support for these predictions and moreover provided evidence of differences in cognitive processing: highly dogmatic individuals generated fewer reasons contradicting their belief than did low dogmatic individuals. In a further paper, Davies (1998) replicated these latter findings for predictive judgments and found evidence for greater "output interference" effects in dogmatic individuals; generating one type of reason interfered with the generation of the opposite type of reason more for high than for low dogmatic individuals. These findings were explained in terms of memory mechanisms (cf. Roediger, 1978) but no direct tests of memory were involved.

The present research was also concerned with differences in cognitive processing as a function of dogmatism, but this time memory mechanisms *were* specifically examined. A paradigm that would seem to be particularly well suited for investigating the role of memory processes in dogmatic thinking is *release from proactive inhibition* (RPI). Release from proactive inhibition has been used as a means of identifying those dimensions, categories, or classes of meaning that are important in the encoding of stimulus information (Wickens, 1970, 1972). In the RPI paradigm, participants receive a number of trials (typically four) on each of which a set of stimulus items (typically three) is presented, followed by a short distractor task, after which participants recall the previous items. For the first three trials, the sets of items are drawn from the same conceptual class (e.g., flower names) and it is found that recall declines over these trials due to a build-up of proactive inhibition. However, if the conceptual class is changed or shifted on the last trial (e.g., animal names), recall improves significantly, sometimes recovering to the same level as on the first trial. Wickens argued that this *release* effect indicates the extent to which items on the shift (release) trial are encoded differently or distinctively from items on the previous trials.

2. Study 1: Dogmatism and RPI for shifts between different categories of meaning

Study 1 investigated differences in RPI between high and low dogmatic individuals using the classic RPI paradigm of shifts in conceptual or taxonomic categories (Wickens, 1970, 1972). Two different conceptual categories were used—-fruits and flowers (c.f. Wickens, Dalezman, & Eggemeier, 1976). Fruits and flowers share the common attribute, among other things, that they both grow from the ground, but whereas most fruits can be eaten most flowers cannot. Because highly dogmatic individuals compartmentalize and isolate different elements in their cognitive systems, they should tend to focus on *differences* between fruits and flowers, whereas low dogmatic individuals who do not isolate the different elements in their cognitive systems should tend to focus on *similarities* between them. It was therefore expected that highly dogmatic individuals would encode the meaning of different conceptual categories more distinctively and would therefore show greater RPI than low dogmatic individuals.

2.1. Method

2.1.1. Design

The design was a 2 (High/Low Dogmatism) x 2 (Fruit/Flower names on Trials 1–3) x 2 (Fruit/Flower names on Trial 4) x 4 (Trials) factorial with repeated-measures on the Trials factor.

On Trials 1–3, participants were shown either fruit or flower names. In the shift (experimental) conditions, participants were shown words from one category on Trials 1–3 and then switched to words from the other category on Trial 4. In the no shift (control) conditions, participants were shown words from the same category on Trial 4 as on Trials 1–3. The experimental conditions (with their relevant control conditions shown in parentheses) are defined by the combinations of Trials 1–3 and Trial 4 words as follows: $Fruits_{1-3}$–$Flowers_4$ ($Flowers_{1-3}$–$Flowers_4$); $Flowers_{1-3}$–$Fruits_4$ ($Fruits_{1-3}$–$Fruits_4$).

2.1.2. Materials

The stimulus items were the names of fruits (e.g., pear, grape, and cherry) and flowers (e.g., pansy, lilac, and daisy) used by Wickens et al. (1976) which were drawn from the Battig and Montague (1969) norms. The words were divided into triads so that the triads were matched on average word frequency.

2.1.3. Participants

The Troldahl and Powell (1965) version[1] of the dogmatism scale was administered to 224 college students in mass-testing sessions. From this sample, 64 students (44 females and 20 males) were selected as the high dogmatism group from those scoring in the top third of the distribution of scores and 64 students (46 females and 18 males) were selected as the low dogmatism group from those scoring in the bottom third of the distribution. (Sex of participant did not have any significant effect on the pattern of results and is not mentioned further.) Participants were matched across conditions within the high dogmatism and within the low dogmatism groups so that differences between conditions in average dogmatism level were minimized (*Fs* < 1).

[1]Although the Troldahl and Powell version is an improvement on the original Rokeach Dogmatism scale, it still suffers the problem of being unbalanced and therefore prone to acquiescent responding.

2.1.4. Procedure

Some weeks after the initial test session, participants in the high and low dogmatism groups returned for a second session. The instructions given to participants explained that they would be shown a number of words on a computer screen. After a delay, they would then be asked to recall aloud the words they had just been shown.

A 2-s warning asterisk appeared on each trial after which the three words were presented for 2 s. After presentation of the words, the command "Read out these numbers"! appeared, followed by a series of 20 double-digit numbers, one every second. After this distractor task, the command "Recall"! appeared and participants had 10 s to recall in any order the words that had just been presented. After an inter-trial interval of 6 s, the next trial began. The procedure continued in this manner for four trials.

The order of presentation of the sets of words was counterbalanced across participants in each condition so that each set of words appeared an equal number of times at each trial position.

2.2. Results

Recall was scored as the number of words correctly recalled per trial regardless of original order of presentation. Fig. 1 shows mean correct recall scores as a function of dogmatism, shift/no shift conditions, and trial order.

2.2.1. Trials 1–3: Build-up of PI

A 2 (High/Low Dogmatism) x 2 (Shift/No Shift condition) x 2 (Fruits/Flowers on Trial 4) x 3 (Trials) ANOVA showed a significant main effect due to trials, $F(2,240) = 68.75$, $p < .001$. As can be seen from Fig. 1, there was a typical decrease in recall over the first three trials in all conditions due to a build-up of PI, with performance declining from 88% on trial 1, through 65% on trial 2, to 53% on trial 3. This was the only significant effect.

2.2.2. Trial 4: Release from PI

A 2 (High/Low Dogmatism) x 2 (Shift/No Shift condition) x 2 (Fruits/Flowers on Trial 4) ANOVA of trial 4 performance revealed only a significant effect of shift/no shift condition, $F(1,120) = 29.03$, $p < .001$. As can be seen from Fig. 1, recall was significantly higher in the shift conditions ($M = 1.99$) than in the no shift conditions ($M = 1.02$). Dogmatism was not found to have a significant impact either as a main effect or in interactions. The amount of release from PI can be demonstrated using the Wickens (1972) *release index*, namely:

$$\frac{\text{Trial 4 Shift - Trial 4 No Shift}}{\text{Trial 1 No Shift - Trial 4 No Shift}} \times 100.$$

The amount of release was 62% for high dogmatic individuals and 59% for low dogmatic individuals.

2.3. Discussion

The findings showed significant RPI when words shifted in conceptual category, in line with the findings of Wickens for taxonomic or conceptual categories (e.g., Wickens, 1970), but this effect was not found to be exhibited more by highly dogmatic individuals. It could be that the assumption that highly dogmatic individuals would focus more on differences between conceptual classes and low dogmatic individuals would focus more on similarities may have been incorrect since this assumption was not directly tested.

Another possibility is that the experiment did not compare *opposite* cognitive systems but rather compared *different* cognitive systems. On closer inspection of Rokeach's (1954) analysis, it appears that it is the *opposed* nature of cognitive systems that is the hallmark of dogmatism since Rokeach gives more prominence to interdependence and isolation between belief vs. disbelief systems rather than between different belief systems or between different disbelief systems. Indeed, a number of items in the Dogmatism scale involve explicit belief–disbelief contrasts, e.g., "There are two kings of people in this world: those who are for the truth and those who are against the truth". Moreover, almost all the published research on the structural aspects of dogmatism has investigated belief–disbelief contrasts.

3. Study 2: Dogmatism and RPI for shifts within meaning dimensions

Study 2 investigated the role of dogmatism in RPI for shifts within the same dimension of meaning. Wickens (1970, 1972) has shown that changing the polarity of words on semantic dimensions leads to reliable RPI. For example, Wickens and Clark (1968) found that shifting from one pole (e.g., positive) to the opposite pole (e.g., negative) of Semantic Differential dimensions (Osgood, Suci, & Tannenbaum, 1957) led to significant amounts of RPI. Study 2 set out to replicate this effect but also examined whether highly dogmatic individuals would show greater RPI than low dogmatic individuals. Highly dogmatic individuals should encode differences in the evaluative meaning of words more distinctively because the positive and negative elements of their cognitive systems are more compartmentalized and isolated than those of low dogmatic individuals. As a result, a shift from favorable to unfavorable words (and vice versa) should produce a more distinctive encoding of the shift words and therefore greater RPI in high rather than low dogmatic individuals.

3.1. Method

3.1.1. Design

The design was a 2 (High/Low Dogmatism) x 2 (Favorable/Unfavorable words on Trials 1–3) x 2 (Favorable/Unfavorable words on Trial 4) x 4 (Trials) factorial with repeated-measures on the Trials factor. On Trials 1–3, participants were shown either evaluatively favorable or evaluatively unfavorable words. In the shift (experimental) conditions, participants were shown words from one end of the dimension on Trials 1–3 and then switched to words from the opposite end of the dimension on Trial 4. In the no shift (control) conditions, participants were shown words from the same end of the dimension on Trial 4 as on Trials 1–3. The experimental conditions (with their relevant control conditions shown in parentheses) are defined by the combinations of Trials 1–3 and Trial 4 words as follows: Favorable$_{1-3}$–Unfavorable$_4$ (Unfavorable$_{1-3}$–Unfavorable$_4$); Unfavorable$_{1-3}$–Favorable$_4$ (Favorable$_{1-3}$–Favorable$_4$).

3.1.2. Materials

The stimulus items were words from the unfavorable and favorable ends of the Semantic Differential Evaluative dimension (e.g., success, nice, knowledge; danger, worry, lose). Following Wickens and Clark (1968), words were selected that fell at each of the extreme ends of the Evaluative dimension but which were neutral on the Potency and Activity dimensions according to the profiles produced by Heise (1965). Synonyms and antonyms were excluded. The words were divided into triads such that the triads were matched on average word frequency.

3.1.3. Participants and procedure

Troldahl and Powell's (1965) short form of the dogmatism scale was administered to 231 college students in mass-testing sessions. From this sample, 64 students (48 females and 16 males) were selected as the high dogmatism group from those scoring in the top third of the distribution of scores and 64 students (47 females and 17 males) were selected as the low dogmatism group from those scoring in the bottom third of the distribution. Participants were matched across conditions within the high dogmatism and within the low dogmatism groups so that differences between conditions in average dogmatism level were minimized ($Fs < 1$).

The procedure was the same as Study 1.

3.2. Results

Recall was scored as the number of words correctly recalled per trial regardless of original order of presentation. Fig. 2 shows mean correct recall scores as a function of dogmatism, shift/no shift conditions, and trial order.

3.2.1. Trials 1–3: Build-up of PI

A 2 (High/Low Dogmatism) x 2 (Shift/No Shift condition) x 2 (Favorable–Unfavorable words on Trial 4) x 3 (Trials) ANOVA showed a significant main effect due to trials, $F(2,240) = 58.83$, $p < .001$. As can be seen from Fig. 2, there was a typical decrease in recall over the first three trials in all conditions due to a build-up of PI. This was the only significant effect.

3.2.2. Trial 4: Release from PI

A 2 (High/Low Dogmatism) x 2 (Shift/No Shift condition) x 2 (Favorable–Unfavorable words on Trial 4) ANOVA of trial 4 performance revealed a significant effect of Shift/No Shift condition, $F(1,120) = 31.54$, $p < .001$. As can be seen from Fig. 2, recall was significantly higher in the Shift conditions ($M = 1.92$) than in the No Shift conditions ($M = 1.04$). Dogmatism was found to interact significantly with Shift conditions, $F(1,120) = 6.07$, $p < .02$. As can be seen, the Trial 4 Shift/No Shift difference was much larger for highly dogmatic individuals, *simple effect* $F(1,120) = 39.46$, $p < .001$, than for low dogmatic individuals, *simple effect* $F(1,120) = 4.24$, $p < .05$. The amount of release from PI using the Wickens (1972) index was 82% for highly dogmatic individuals and 31% for low dogmatic individuals.

3.3. Discussion

The results of Study 2 showed significant RPI when words shifted in evaluative meaning, in line with the findings of Wickens and Clark (1968).More important, this effect was much greater for high than for low dogmatic individuals. These findings suggest that highly dogmatic individuals encode differences in the evaluative meaning of words more distinctively because the positive and negative elements of their cognitive systems are more compartmentalized and isolated than those of low dogmatic individuals. The implication of the findings of the first two studies is that when stimulus information switches between different dimensions of meaning (Study 1), differences between high and low dogmatic individuals are not likely to be observed. But when stimulus information switches between opposite ends of the same dimension of meaning (Study 2), differences between high and low dogmatic individuals are likely to observed.

4. Study 3: Dogmatism and RPI for shifts within- vs. between-dimensions of meaning

In Study 3, I compared directly the amount of RPI shown by high and low dogmatic individuals for *within-dimensions* shifts (from one pole to the other pole of a meaning dimension) and for *between-dimensions* shifts (from one meaning dimension to a different, orthogonal meaning dimension). It was expected that highly dogmatic individuals would show greater RPI than low dogmatic individuals for within-dimensions shifts but not for between-dimensions shifts. It could be argued that the findings of Study 2 merely show that dogmatic individuals are more prone to evaluation, i.e., making good–bad judgments rather than making greater distinctions between beliefs vs. disbeliefs. To extend the generalizability of the Study 2 findings therefore, I

used words that shifted on the Potency or Activity dimensions of the Semantic Differential rather than on the Evaluative dimension.

4.1. Method

4.1.1. Design

The design was a 2 (High/Low Dogmatism) x 2 (Within/Between-Dimensions condition) x 2 (Shift/No Shift condition) x 4 (Trials) factorial with repeated-measures on the Trials factor. For the Within-Dimensions condition, experimental words shifted from the positive end to the negative end of the Potency dimension of the Semantic Differential. The Shift (experimental) condition consisted of positive Potency words on Trials 1–3 and negative Potency words on Trial 4. The No Shift (control) condition was negative Potency words on Trials 1–3 and negative Potency words on Trial 4. For the Between-Dimensions condition, experimental words shifted from the positive end of the Potency dimension to the positive end of the Activity dimension. The Shift (experimental) condition consisted of positive Potency words on Trials 1–3 and positive Activity words on Trial 4. The No Shift (control) condition was positive Activity words on Trials 1–3 and positive Activity words on Trial 4. A complete RPI design was not feasible because of the very large number of conditions that would have been required. In this study, therefore, the shifts were only in one direction (e.g., positive to negative) rather than both directions, but, since Studies 1 and 2 (also Wickens, 1972) had shown symmetrical shift effects, this was not regarded as a problem.

4.1.2. Materials

The stimulus items were words drawn from positive, negative, and neutral positions on the Potency dimension, positive and neutral positions on the Activity dimension, and neutral positions on the Evaluation dimension based on the norms of Heise (1965). Examples of Positive Potency and Neutral Activity words are "hard," "oil," "science"; examples of Neutral Potency and Positive Activity words are "fast," "party," "play"; and examples of Negative Potency and Neutral Activity words are "glad," "poet," "wife." The Semantic Differential values of words used in the different conditions are shown schematically in Table 1. Synonyms and antonyms were excluded. The words were divided into triads such that the triads were matched on average word frequency.

4.1.3. Participants and procedure

The Troldahl and Powell (1965) version of the dogmatism scale was administered to 227 college students in mass-testing sessions. From this sample, 64 students (48 females and 16 males) were selected as the high dogmatism group from those scoring in the top third of the distribution of scores and 64 students (46 females and 18 males) were selected as the low dogmatism group from those scoring in the bottom third of the distribution. Participants were matched across conditions within the high dogmatism and within the low dogmatism groups so that differences between conditions in average dogmatism level were minimized (*Fs* < 1).

The procedure was the same as Study 1.

4.2. Results

Recall was scored as the number of words correctly recalled per trial regardless of original order of presentation. Fig. 3 shows mean correct recall scores as a function of dogmatism, within/between-dimensions condition, shift/no shift condition, and trial order.

4.2.1. Trials 1–3: Build-up of PI

A 2 (High/Low Dogmatism) x 2 (Within/Between-Dimensions condition) x 2 (Shift/No Shift condition) x 3 (Trials) ANOVA showed a significant main effect of trials, $F(2,240) = 63.18$, $p < .001$. As can be seen from Fig. 3, there was a typical decline in recall over the first three trials in all conditions due to a build-up of PI. This was the only significant effect.

4.2.2. Trial 4: Release from PI

A 2 (High/Low Dogmatism) x 2 (Within/Between-Dimensions condition) x 2 (Shift/No Shift condition) ANOVA of trial 4 performance showed a significant effect of shift/no shift condition, $F(1,120) = 36.94$, $p < .001$. Recall was significantly higher in the shift conditions ($M = 2.02$) than in the no shift condition ($M = 1.11$). The shift effect was not found to be significantly different between the Within- and Between-Dimensions conditions ($F < 1$). There was a significant three-way interaction between Dogmatism, Within/Between-Dimensions, and Shift conditions, $F(1,120) = 5.31$, $p < .05$. As can be seen from Fig. 3, the Trial 4 Shift/ No Shift difference in the Within-Dimensions condition was larger for high dogmatic individuals than for low dogmatic individuals, *simple interaction* $F(1,120) = 5.70$, $p < .02$, whereas this effect was not significant in the Between-Dimensions condition, *simple interaction* $F < 1$. The amount of release in the Within- Dimensions condition was 85% for high and 25% for low dogmatic individuals, and, in the Between-Dimensions condition, 46% for high and 62% for low dogmatic individuals.

4.3. Discussion

The results of Study 3 confirm the findings of Studies 1 and 2 that highly dogmatic individuals show greater RPI than low dogmatic individuals for opposite shifts within dimensions of meaning but not for shifts between different dimensions of meaning. Thus, highly dogmatic individuals encode stimulus information more distinctively than low dogmatic individuals when the shift in meaning is from one end of a dimension to the opposite end but not when the shift is between different, orthogonal meaning dimensions. Although Rokeach's (1954, 1960) analysis of the structural aspects of dogmatism considered the organization of elements both within and between cognitive systems in terms of isolation and interdependence, the findings of Study 3 suggest that it is the opposed nature of cognitive systems that define dogmatic thinking.

5. General discussion

Although research in cognition has led to a detailed understanding of how people process information, relatively little research has been carried out on individual differences in information processing. Yet the study of individual differences can add much to our understanding of cognitive processes. Such studies can provide a valuable test of normative theories by investigating the effects of natural variations in postulated mediating processes (Snyder & Ickes, 1985; Underwood, 1975). The present series of studies investigated a well-known cognitive phenomenon (release from proactive inhibition) as a function of a well-known individual-difference variable (dogmatism) and found that release from proactive inhibition is significantly affected by dogmatism. The compartmentalized and isolated cognitive systems of highly dogmatic individuals leads them to encode changes in meaning more distinctively than low

dogmatic individuals, such that shifts in meaning produce greater release from proactive inhibition in high than low dogmatic individuals. However, this occurs only if the shift in meaning is from one end of a meaning dimension to the opposite end in line with the opposed nature of dogmatic cognitive systems. If the shift in meaning is from one meaning dimension to a different meaning dimension or from one conceptual category to another, differences in RPI as a function of dogmatism are not observed. This is consistent with an interpretation of Rokeach's analysis of dogmatism in terms of differences between belief vs. disbelief systems rather than differences between different belief systems or between different disbelief systems.

So far, dogmatism has been discussed in terms of purely cognitive processes. However, motivational aspects of dogmatism also need to be considered. Rokeach himself considered that dogmatism is associated with a glorification of positively valued authority and a vilification of negatively valued authority, hence the link with authoritarianism and intolerance. This particular motivational aspect is not relevant to the present research. More relevant is research showing that highly dogmatic individuals strive to avoid inconsistency in their cognitive systems and react to inconsistent information by ignoring, minimizing or selectively forgetting it (e.g., Durand & Lambert, 1975; Hunt & Miller, 1968; Kleck & Wheaton, 1967; Leone, 1989; Palmer & Kalin, 1985). This was the basis of the research by Davies (1993, 1998)—described in the Section 1—on the role of evidence generation in the formation and persistence of beliefs, where it was predicted and found that highly dogmatic individuals would generate fewer reasons contradicting their beliefs than low dogmatic individuals. The original explanation for this finding was in terms of cognitive mechanisms (e.g., Hoch, 1984; Roediger, 1978); people spontaneously generate supporting reasons for their tentatively held beliefs according to a positive test strategy (Klayman & Ha, 1987). This generation of supporting reasons interferes with the generation of contradictory reasons resulting in confirmatory bias and high dogmatic individuals show this processing bias more than low dogmatic individuals. However, a motivational rather than a cognitive explanation could have accounted for some of these findings. For example, highly dogmatic individuals may be more prone to a *justificatory* motive whereby they selectively report evidence that supports their stated belief or they may be more prone to a *consistency* motive whereby they adopt a particular belief so as to be consistent with the evidence they have generated.

It seems unlikely that such motivational explanations could account for the present series of findings. If highly dogmatic individuals are motivated to minimize or selectively forget inconsistent information, then they should have shown *less* RPI than low dogmatic individuals. That is, having been presented with information from one end of a stimulus dimension, they should have been less likely to recall information from the opposite, "inconsistent" end, whereas the reverse was in fact found. One difference between the present studies and most previous research on dogmatism is that the present studies involved relatively neutral stimuli devoid of social- psychological or personally relevant content. It could be that highly dogmatic individuals are in fact more aware of discrepancies between their beliefs and disbeliefs than low dogmatic individuals but they are motivated, like most of us (including those low in dogmatism), to maintain consistency in their cognitive systems. If the stimulus material is neutral, this awareness of discrepancies can be observed relatively uncontaminated by consistency concerns and hence highly dogmatic individuals show greater RPI effects than low dogmatic individuals. But if socially- or personally relevant stimulus material were involved, a consistency motive may dictate their responses so that highly dogmatic individuals are more likely to minimize or selectively forget inconsistent information.

The foregoing analysis is consistent with the idea of motivated reasoning (e.g., Kunda, 1990) where the effects of particular cognitive processes are modified in the presence of particular motives. It is also similar in some ways to Scheier and Carver's (1988) control theory model of self-attentional processes in self-regulation. When people perceive a discrepancy between their actual behavior and their idealized standards of behavior, they attempt to minimize the discrepancy. People who are acutely self-aware (self-focused) or chronically self-aware (self-consciousness) are more likely to perceive a discrepancy between their actual and their ideal

behavior and therefore show greater attempts to match their behavior to desired standards. In this respect (but not in other respects), highly self-conscious individuals are similar to highly dogmatic individuals: they are more aware of discrepancies and this greater awareness coupled with the relevant motivation leads them to match their behavior more closely to the relevant standard (accuracy in the case of self-consciousness, consistency in the case of dogmatism).

As mentioned in the Section 1, a number of individual-difference constructs relating to social cognition have appeared in the last 20 years, such as compartmentalization (Showers, 2002), need for cognition (Cacioppo et al., 1996), need for cognitive closure (Webster & Kruglanski, 1994), need to evaluate (Jarvis & Petty, 1996), self-complexity (Linville, 1987), and uncertainty orientation (Sorrentino, 1996). All of these constructs seem on face value to bear some resemblance to the concept of dogmatism but there have been no studies directly examining the relationships.

Perhaps the most obvious resemblance is between compartmentalization and dogmatism since compartmentalization is a key aspect of dogmatic thinking. Showers (1992, 2002) suggested that individuals differ in the extent to which they organize their self-attributes into evaluatively consistent categories (compartmentalization) as opposed to evaluatively mixed categories (integration). Depending on the importance of the positive and negative self-categories, compartmentalization has been shown to affect self-esteem and depression (Showers, 1992), reactions to stress (Showers & Ryff, 1996) and mood (Showers & Kling, 1996). For example, when positive self-categories are perceived to be highly important, compartmentalization is associated with high self-esteem and low depression. But when negative self-categories are perceived to be highly important, compartmentalization is associated with low self-esteem and high depression (Showers, 1992). Highly dogmatic individuals tend to keep their beliefs and disbeliefs separate and therefore, they should show greater compartmentalization with concomitant effects on self-esteem and depression depending on the importance of positive and negative self-categories. There are three differences between compartmentalization and dogmatism however. First, Showers' concept specifically refers to *evaluative* compartmentalization whereas dogmatism refers to any kind of compartmentalization (although it is recognized that evaluation is one of the most fundamental and important bases of conceptualization). Second, Showers' concept relates to the self-system whereas dogmatism refers to cognitive systems in general. On these two grounds, it could therefore be argued that dogmatism subsumes the concept of compartmentalization. Third, and perhaps most important, Showers suggests that compartmentalization can change under certain circumstances particularly as a result of stress (Showers, Abramson, & Hogan, 1998). By contrast, dogmatism is conceived as an enduring disposition and as yet there is no evidence that people's levels of dogmatism are subject to change.

Complexity is another concept that would seem to be relevant to dogmatism. Since dogmatic individuals show greater compartmentalization and black/white thinking, it would be expected that they would be low on complexity. However, a number of studies using Bieri's (1955) Rep Test measure of cognitive complexity have failed to find the expected relationship (e.g., Nidorf & Argabrite, 1968; Pyron, 1966; Starbird & Miller, 1976). Similarly, a number of studies of integrative complexity have failed to .nd the expected relationship (e.g., Rule & Hewitt, 1970; Schroder, Driver, & Streufert, 1967; Streufert & Driver, 1967). More recently, Linville (1987) developed a measure of self-complexity that is quite different in format from cognitive and integrative complexity. Participants are given a set of personality traits and sort them into groups each of which represents a distinct aspect of the self. The measure of self-complexity comprises the number of such self-aspects and the degree of overlap between the self-aspects such that the greater the number and the lower the overlap, the greater the self-complexity.

Although there is no particular reason why high dogmatic individuals should produce more or fewer groupings than low dogmatic individuals, it would be expected that high dogmatic individuals would show much less overlap between groupings than low dogmatic individuals because of greater compartmentalization. On this basis, it would be predicted somewhat

counterintuitively that high dogmatic individuals would score *higher* on self-complexity than low dogmatic individuals.

Also relevant here is research by Sorrentino (e.g., Sorrentino, 1996; Sorrentino, Short, & Raynor, 1984) on uncertainty orientation. Uncertainty orientation appears closely related (inversely) to dogmatism. Uncertainty-oriented people seek out novel and unpredictable situations, and strive to resolve (rather than avoid) inconsistencies. Certainty-oriented people, however, are less interested in seeking out new information, preferring to maintain consistency and to avoid inconsistencies. In a study of person memory, Driscoll, Hamilton, and Sorrentino (1991) found that the recall advantage for expectancy-incongruent person information over expectancy-congruent information was much more marked for uncertainty-oriented people than for certainty-oriented people. In particular, Driscoll et al. found that certainty-oriented people recalled fewer incongruent items than uncertainty-oriented people. These findings are conceptually similar to the findings mentioned in the Section 1 that highly dogmatic individuals strive to avoid inconsistency in their cognitions and they react to inconsistent information by ignoring, minimizing or selectively forgetting it (e.g., Durand & Lambert, 1975; Hunt & Miller, 1968; Kleck & Wheaton, 1967; Leone, 1989; Palmer & Kalin, 1985).

Further research is needed to examine the relationships between dogmatism and these more recent individual differences in cognition. The present research underscores the value of applying different theoretical approaches—one involving a general process model (release from proactive inhibition), the other an individual-difference variable (dogmatism)—to generate new findings that would not have been produced with either approach alone.

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Fig. 1. Mean correct recall scores as a function of dogmatism, shift/no shift conditions, and trial order in Study 1.
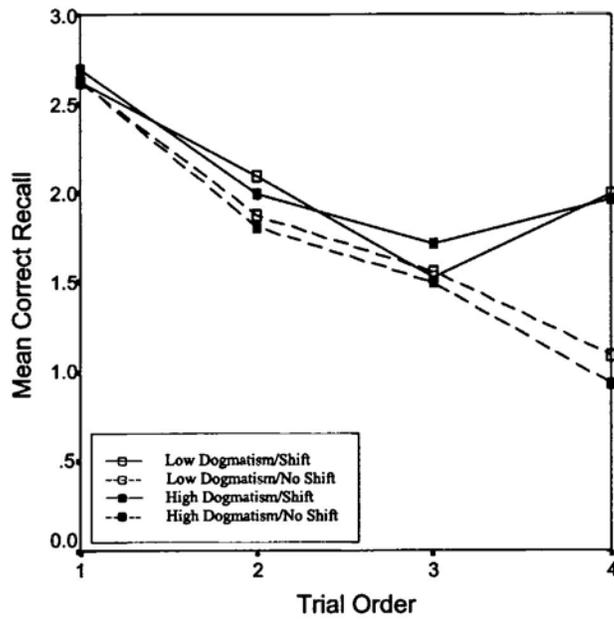

Fig. 2. Mean correct recall scores as a function of dogmatism, shift/no shift conditions, and trial order in Study 2.
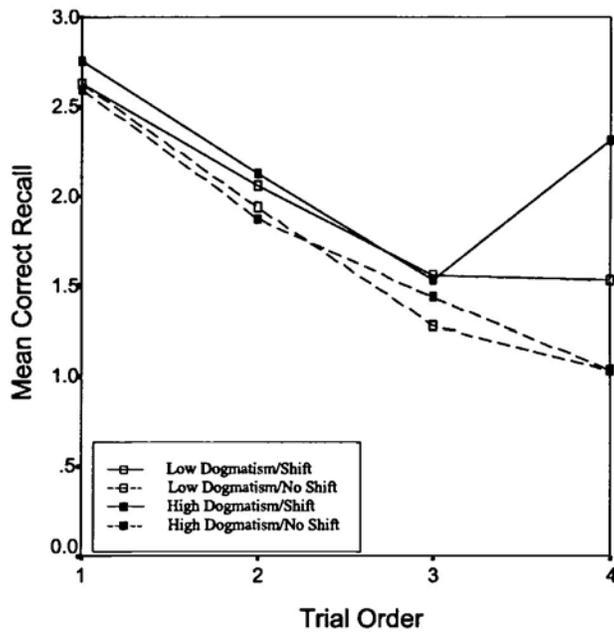
Table 1

Semantic differential values of words used in Study 3 conditions

Condition	Trials 1–3			Trial 4		
	Semantic differential dimension			Semantic differential dimension		
	Potency	Activity	Evaluation	Potency	Activity	Evaluation
Within-dimensions						
Shift	+	0	0	−	0	0
No Shift	−	0	0	−	0	0
Between-dimensions						
Shift	+	0	0	0	+	0
No Shift	0	+	0	0	+	0

Note. +, positive value; 0, neutral value; and −, negative value.

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Fig. 3. Mean correct recall scores as a function of dogmatism, within/between-dimensions condition, shift/no shift condition, and trial order in Study 3.