Supporting the psychological health of our first-year students: An arts-based community magic workshop for adapting to university

Abstract:

The arts have long been intertwined with wellbeing and empirical attention is shifting back toward the wellbeing value of the arts. One art that has been applied in educational contexts but received limited empirical attention is that of achieving the impossible, namely, the art of performing magic. While research is young, reviews on the wellbeing-value of magic have revealed theoretical frameworks suggesting its potential to enhance self-processes and social aspects. These aspects are especially important for university students to have a psychologically healthy transition to university life because it involves integrating one's adult identity with the self, which can challenge one's self-esteem. Thus, the present study investigated how community magic workshops affect self-esteem, wellbeing, closeness, and sense of belonging for first-year university students in London. Students were allocated to either magic workshops where they learned magic tricks or mindfulness workshops during their first university term. Measures were taken at baseline, post-intervention, and a one-month follow-up. Both groups improved on all measures but students in magic workshops perceived greater benefits than the mindfulness group. Results provide preliminary evidence for using magic-based workshops as an appealing, preventative intervention that enhances the college experience for first-year students.

Keywords: emerging adulthood; community belonging; magic tricks; self-esteem; student wellbeing

Introduction

Throughout history, the arts have been a powerful, precious, and prevalent part of society. Not only do we see this in music, museums, and movies, but also in the artistic design of cities, landscapes, and everyday offices. Furthermore, the value of the arts is evident from their impact on scientific success (Root-Bernstein et al., 2008) as well as their impact on the economy, health, society, and education (Mowlah et al., 2014). The arts and wellbeing have long been intertwined, with scientific interest in their link growing during the 18th and 19th centuries, but as scientific advances accelerated emphasis on biomedical models began to outpace other aspects of care, especially the wellbeing value of the arts (Fancourt & Finn, 2019, Chapter 1)

However, with the advent of the biopsychosocial model of health in the past century (Engel, 1977), attention shifted back toward the wellbeing-value of arts, with scientific interest following. This wellbeing-value of the arts has been shown across all three levels of the model: biological, psychological, and social. For example, psychological benefits include reducing stress (Backos & Pagon, 1999; Dokter, 1998, p. 460; Webb, 1991), regulating emotions (Hillman, 1960, p. 340; Juslin & Sloboda, 2011, p. 1389), and enhancing self-esteem (Franklin, 1992; Hartz & Thick, 2005). Additionally, social benefits of the arts encompass increased social support (Cohen et al., 2006; Crawford et al., 2013; Murrock & Madigan, 2008) and fostering intergroup social cohesion (Lee, 2013).

This arts in health movement also includes the performance arts. The more common performance arts that have been researched include music, dance, film, singing, and theatre, which have all been used successfully in wellbeing interventions (Fancourt & Finn, 2019). Theatrical arts interventions, for instance, have been used to foster better emotional control (McDonald et al., 2020), empathy and prosocial behavior

(Kou et al., 2019), and a positive self-concept in children (DeBettignies & Goldstein, 2019).

One performing art, however, that has been scientifically neglected regarding wellbeing is the art of creating the impossible: the performance art of magic. In fact, this oversight extends to whether magic qualifies as an art, which spurred Congress to pass a bill stating that magic is a rare and valuable art form (H.Res.642, 2016). Meanwhile, the scientific study of magic has increased greatly over the past decade (Kuhn et al., 2008; Kuhn, 2019; Rensink & Kuhn, 2015a, 2015b) and our current understanding is that the core of magic involves a cognitive conflict between what one perceives and what one knows to be possible (Leddington, 2016). Only recently has this empirical interest been applied to areas such as wellbeing and education (Bagienski & Kuhn, 2019, 2020; Lam et al., 2017; Wiseman & Watt, 2018).

In education, this increase of interest includes using the art of magic in primary schools to enhance social skills (Godfrey & Wiseman, 2008), increase creativity (Wiseman et al., 2021) and assist children with learning challenges (Ezell & Klein-Ezell, 2003; Spencer, 2012) . For adolescent students, it has been used to teach English as a second language (Ikhsanudin, 2017; In, 2009; Spencer & Balmer, 2020) and promote interest in STEM careers (Papalaskari et al., 2007) with the latter combining magic with theatrical arts. Within higher education, it has also been used to teach computer science (Hilas & Politis, 2014), psychology (Kuhn, 2019; Moss et al., 2016; Solomon, 1980), flexible thinking (Li, 2020; Wiseman et al., 2021) and critical thinking (Österblom et al., 2015).

Examples of the expansion to wellbeing include curiosity and its use as a distraction therapy (Labrocca & Piacentini, 2015; Peretz & Gluck, 2005; Pravder et al.,

2019; Vagnoli et al., 2005), an engagement tool for physical therapy (Green et al., 2013; Harte & Spencer, 2014), and a means of enhancing self-esteem and positive self-emotions, such as pride (Danek et al., 2014; Ezell & Klein-Ezell, 2003). However, much of the theoretical basis is still speculative and these few empirical studies that do exist often lack empirical rigour. For example, studies that involve learning magic often fail to clarify whether benefits emerge from the actual performing or from factors embedded within the learning of magic (e.g., watching magic, discovering secrets, sharing secrets). Many study designs also preclude the possibility of determining whether benefits arise from magic or from simply learning a new skill (Bagienski & Kuhn, 2019, 2020). Nevertheless, the preliminary findings appear promising, most notably in suggesting that learning to perform magic may improve social skills and self-esteem (Bagienski & Kuhn, 2019).

Regarding self-esteem, prior experiments have typically involved younger participants learning and performing magic, especially in populations with low self-esteem. The majority of studies examining self-related constructs from learning magic found a positive impact (Ezell & Klein-Ezell, 2003; Fancourt & Poon, 2015; Lustig, 1994; Napora, 2021; Spencer, 2012). Two studies had inadequate statistical power, only revealing numerical increases in self-esteem scores (Kwong & Cullen, 2007; Levin, 2006) while one study had nonsignificant results (Sui & Sui, 2007). Only one experiment compared self-esteem from learning magic directly against another art, namely a drawing activity (Wiseman et al., 2021). Researchers found post-intervention scores to be lower for magic than for drawing, which is difficult to explain without baseline measures but may simply be confounded by the beneficial aspects of the drawing activity. The relationship to self-esteem exists amongst professional magicians, with self-esteem being correlated with self-efficacy, ego-resiliency, and optimism

(Napora, 2021).Taken altogether, magic tricks show promise, yet some results are mixed, thus requiring high quality experiments to clarify their impact on self-esteem.

Part of the theoretical rationale for magic enhancing self-esteem is that magic increases engagement in interventions (Bagienski & Kuhn, 2019) via the intense curiosity it evokes (Leddington, 2016). Attempts to enhance self-esteem through magic also typically involve the notion of developing an impressive skill that others cannot perform (Frith & Walker, 1983), which speaks to two common theoretical models for the development of self-esteem. First is the model put forth by James (1892) which suggests that self-esteem arises when one's perceived success in valued domains meets the expectation of one's self in that domain. Learning magic may fit these criteria, firstly, because magical content is valued by both children and adults, as evidenced by experiments showing that tricks presented with a magical causation are more interesting to explore (Subbotsky, 2010). Furthermore, many are driven to figure out how a trick works, which may suggest that learning the secret is valued, and this aligns with research on how people place greater value on things (e.g. secret knowledge) that are scarce (Cialdini, 2007). Secondly, the perceived success could be ensured by 1) choosing simple, effective magic tricks, and 2) performing them for naïve spectators to gain social proof of the success. People also tend to set aspirations and expectations of themselves in the realm of possibility, and hence their expectations of achieving the 'impossible' would be low for magic. Thus, at a certain imaginary level, learning to perform the impossible would necessarily *exceed* one's expectations. At a more realistic level, this sense of performing the impossible becomes somewhat 'real' because the social reactions to magic tricks often imply that the impossible did indeed become possible. Furthermore, since magic evokes curiosity (Bagienski & Kuhn, 2019; Leddington, 2016), these successes may create an especially salient autobiographical

memory that enters one's personal narrative. Since autobiographical memory is pivotal for developing self-continuity (Robyn & Haden, 2003), this salient experience of learning magic could be particularly memorable and useful in forming one's identify via favourable self-evaluations.

The social reactions to magic would also enhance self-esteem within Cooley's (1902, p. 122) 'looking-glass' model of self-esteem, since Cooley suggests that the self is created from opinions of significant others who act as a social mirror. This idea of a social mirror is also useful in explaining why better social skills emerge in magic studies only when learning to perform magic, rather than watching magic or discovering its secrets (Bagienski & Kuhn, 2019). One rationale is that reactions to magic mimic the interested, enthusiastic, active-constructive responses that act as social validation and form the basis of positive relationships (Bagienski & Kuhn, 2019; Gable et al., 2004, 2006). Another theory is based on magic being the only art that deliberately uses speech and social cues for misdirection (Scott et al., 2018) and is thus a natural fit for improving social skills. Cooley's model has been further expanded to suggest that 'significant others' can vary throughout life, such as the more judgemental 'imaginary audience' during adolescence (Elkind, 1967) and the 'generalized other' for older ages (Harter, 2006; Mead, 1934), which may suggest that learning magic to enhance self-esteem is better suited for adults. This more general approval from the public peer domain is also more critical to self-esteem (Harter, 1990, 2006) than approval from close friends and loved ones who offer more stable, unconditional approval of one's self worth, whereas approval in the public domain is more fragile and must be earned. For this same reason, self-esteem interventions may be most fruitful in contexts where people do not know each other well.

One such context where increasing (and maintaining) self-esteem would be

desirable is the period of emerging adulthood. Emerging adulthood is characterized by a period of exploration in domains relevant to adulthood such as one's career, relationships, and political, moral, or religious beliefs due to uncertainty, doubt and instability in these areas (Erikson, 1968; Nelson & Barry, 2005). As such, it is also one of highest risk periods for the onset of depression (Arnett, 2000; Nelson & Barry, 2005), especially for those making the transition to college, since it can be exacerbated by moving away from home to a more challenging academic environment and by factors like the scattering of friends, separation from family, doubts about competence, and a heightened awareness of the increasing urgency to make adult decisions (Nelson & Barry, 2005; Shulman et al., 2005).

The main developmental task at this stage, according to theorists, is identity achievement. This is achieved after adequately exploring temporary roles and making commitments in adult domains, particularly in regards to one's vocation (Erikson, 1968; Schwartz, 2001), that integrate into a coherent and meaningful identity. Thus, Erikson (1968) suggested an exploration and commitment model that was later expanded by Marcia (1980) clarifying four identity statuses based on combinations of high or low levels of exploration and commitment. At the end of adolescence nearly 50% of teenagers are estimated to be in a period of low exploration (Cote, 1996) and thus interventions for first-year college students should encourage exploratory behaviour. Drawing upon broaden-and-build theory (Fredrickson, 2004), such exploratory behaviours could be encouraged through interventions that include positive emotions like curiosity, such as playful workshops that include magic performances. Playful magic lessons may also help facilitate the exploration and integration of identities by giving students a new, previously undefined role of 'magician' where they can comfortably explore and integrate conflicts in their possible future selves; another key

task for identity achievement (Markus & Nurius, 1986).

A previous study has looked at self-esteem during the first college term. Researchers found that the participants whose self-esteem increased (or maintained a high level) were those who gained social support at college, while those who had failed to gain social support and make new social connections decreased in self-esteem (Harter, 1990, p. 166). Thus, social support is very important and as noted earlier, prior research highlights that learning to perform magic may have social benefits (Bagienski & Kuhn, 2019). Another benefit of utilizing magic is that it implies a form of entertainment instead of a therapy or mental health service, which means magic can be an appealing preventative measure for all students, regardless of whether they need psychological help.

In the current study, we set out to examine whether a novel magic-themed community workshop would enhance the wellbeing of first-year students during their first term at the university. Specifically, we focused on self-esteem and social aspects of wellbeing since prior work with magic has shown some promise in these areas. To improve and build upon prior work, we utilized a comparable control group that also practiced an activity (i.e. mindfulness). The social aspects we were interested in were how close students felt to each other and their sense of community within the psychology department. We hypothesized both to be greater for the magic group due to the more interactive performance nature, especially when social components of mindfulness training are minimized (i.e. no loving-kindness meditations). Since mindfulness can heighten an awareness of both positive and negative emotions through emotional regulation (Hill & Updegraff, 2012), we also hypothesized any self-esteem increases to be smaller in magnitude compared to the magic group. For this reason, we also expected magic to perform better on wellbeing measures of depression, anxiety and

stress, especially when minimizing social components of the mindfulness, due to the strong links between social relationships and wellbeing (Lyubomirsky et al., 2005). Finally, we hypothesized that self-reported perceived measures of closeness, community belonging, self-esteem and wellbeing would follow identical patterns of magic outperforming the mindfulness workshops.

Materials and methods

All measures, conditions, and data exclusions are reported below and in the results section. Study protocols were approved by Goldsmiths University ethics committee.

Participants

Participants were first-year undergraduate psychology students at a university in United Kingdom. We aimed for the largest sample size feasible for the first-year psychology cohort, anticipating that attrition would restrict our sample size. This first-year cohort consisted of 243 students. Of these, 133 students completed the baseline questionnaires during the first workshop and 85 completed all three measures. As expected from our university's typical demographic (Goldsmiths University of London, 2018), the sample was heavily skewed toward females (69 female vs 16 male). However, as argued by Fivush and Buckner (2003), gender differences for self-processes are less relevant during this period because college students are surrounded by similar others, of similar ages, with similar goals. Thus, the salient focus on things like academic achievement, concerns over career choice, or professional aspirations tend to overshadow gender differences, since these domains are relevant to both males and females. Chi-square tests confirmed that proportions of males and females were equally distributed across treatment groups, $\chi 2$ (2, N = 85) = .72, p = .422. In testing whether ages of participants

who completed the workshops were equal, the homogeneity of variance assumption was not met, so independent sample t-tests assumed unequal variances and confirmed that ages did not differ significantly between groups, $t(69.2) = 1.16$, $p = .242$.

The students' perceived effects of workshops were also measured after the intervention and during the follow-up. For this sample, participants were included in the analysis, even if no baseline data was available that matched up with the participant ID (or lack of ID), provided they completed at least one workshop. Thus, the sample for the perceived effects was larger with a total of 100 students in the first post questionnaire (16 male, 67 female, and 17 other or unknown due to not providing participant ID in the survey) and 87 students in the final follow-up questionnaire (17 male, 70 female).

Procedure

Students were randomly allocated by the university's timetabling team into one of six timetabling streams. Of these six streams, three were for the magic condition, and three were for a mindfulness control condition. All magic streams were given the same series of three workshops, and likewise for mindfulness streams. Workshops took place during the 9th, 11th and 13th weeks of the autumn term and lasted 1.5 to two hours each. For each week, the same mindfulness or magic workshop was delivered twice on the Tuesday of the week and once more on Friday for different groups of students. Each magic workshop ran simultaneously to a mindfulness workshop scheduled in parallel sessions, in different classrooms (See Figure 1).

[Figure 1 near here]

To disseminate information about the workshops, all students had a module entitled 'Wellbeing Workshops' placed in their online timetable and were made aware

of it during their freshman welcome week, via emails from the first-year coordinator, and reminders at tutorial sessions. By completing measurements at all three timepoints, students could receive 15 research credits that would contribute to their grade for their research methods module. All surveys were delivered in Qualtrics software that students completed on their personal phones, tablets, or laptops. Participation was optional since students could alternatively decide to participate in other studies.

The overall structure of both workshops typically began with a 'check-in' to discuss workshop content or their experience of applying it, followed by exercises to help deliver content, discussions of the experience, and ended with a recap of the main take-aways. amplify the effectiveness, 'homework' challenges were also given in both workshops that students could do outside of workshops. More specific details of the content and exercises for each workshop are outlined below.

Mindfulness workshops

Mindfulness workshops were chosen as an active control group to account for potential confounds from learning a new skill as well as ethical considerations. Since we were interested in social and communal aspects of magic, these were minimized for mindfulness workshops by intentionally avoiding mindfulness activities, such as loving-kindness meditations.

The first of the three workshops focused on giving students a definition of mindfulness, explaining awareness, presence and nonjudgement, and encouraged students to pay attention to bodily sensations. Exercises included squeezing one's fist with and without paying attention to one's breath, and a 10-minute guided body scan meditation. As home practice, students were encouraged to pay mindful attention to an everyday task and use the free Insight Timer app for guided meditations.

The second workshop focused on the link between bodily sensations and emotions, as well as how this is relevant in everyday life. A personal story was given by the facilitator on how noticing one's emotion helped him to react appropriately to a stressful situation and exercises included a 15-minute body scan meditation, a 10-minute mindfulness of breath meditation, and a mindful movement exercise.

The third workshop focused on equanimity, the negative impact that lacking mindful awareness can have when responding to unpleasant events, and the positive impact it can have on enjoying life more. Exercises included a mindful movement exercise, a 15-minute body scan meditation, and a mindful eating exercise with cake or chocolates.

Magic workshops

Magic workshops were delivered by Abracademy, a company that blends learning design and facilitation techniques with the teaching of magic tricks (*Abracademy*, n.d.). All magic tricks that were taught were chosen to be a beginner's difficulty to ensure students could successfully learn the trick in a short period of time.

The first magic workshop focused on the concept of belief in one's self, in others, and in making the 'impossible' become possible. After a short magic performance, there was a brief check-in for introductions, followed by asking students about the values they would like to have during the workshops. To target self-esteem, a second magic performance about the magician believing in himself was then performed, which transitioned into a third performance where a student volunteer used 'magical powers' to create a glowing orb of light that the magician could vanish, re-appear, and toss around. This glowing orb magic trick (Mayfarth, 2017) was taught to all students, who practiced handling the light with both the whole group and in pairs. After

mastering this trick, students were taught how belief can be conveyed through body language and a magic pen trick was taught to practice these body language skills. The pen trick involved piercing a piece of paper currency and magically restoring the hole in the currency (Premium Magic, n.d.). This body language skills were intended to foster community and closeness through developing communication skills The homework challenge given to students was to watch themselves perform the trick in a mirror, video, or method of their choosing and post a video of their solo performance in a WhatsApp group. They were also given a customized website with resources to review what they learned.

To further target community belonging and closeness, the second workshop focused on connecting with one's audience and other people through story and relatable content. It started with a magic performance, which was used as a springboard for discussion on ways the magician may have made his performance more believable. The discussion was facilitated to include body language as well as the use of relatable stories to connect with the audience. The importance of improvisation was also introduced, and students engaged in an improv exercise in small groups. Next, half of the class learned one trick where two ropes turned into one long rope (variation of *Professor's Nightmare*, n.d.)and the remaining half learned a a trick where a pen vanishes in the performers hand (Cornelius, n.d.). After practicing, each student then performed for a student who did not learn the same trick. To conclude, the students formed groups based on an emotion they wanted to convey through their magic. After deciding and practicing their presentation in groups, each group then performed in front of the entire class. The homework challenge was to perform for three people, optionally record it, and request feedback on what went well and how to improve the performance.

The final magic workshop focused on helping students discover their 'magical'

self by exploring their strengths in order to target overall wellbeing and self-esteem. The first magic performance was used as an example of how performing magic was a strength of the performer. Other exercises included sharing a time at their best in pairs before discussing strengths they saw in their partner's story, and an interactive magic trick where students wrote these strengths on cards. After writing them down, students tore them in half, shuffled them, and during the climax of the trick they alternated chants of 'I love myself!' with 'Not so much' (for comedic effect) as they tossed away cards in the air until two torn halves remained, which "coincidentally" matched perfectly (Aragon, n.d.). All students then learned one final magic trick where a matchbox mysteriously moved on its own (Ginn & Bergeron, 1977) and the workshop culminated in an activity where students wrote strengths they saw in others on sticky notes, which were stuck on the back of the corresponding person as music played.

Measures

The variables of interest were students' self-esteem, psychological closeness, belongingness, and general wellbeing. The scales used for pre- and post-measures were administered immediately before the first workshop began, immediately after the final workshop, and at the 1-month follow up. The perceived effects were asked immediately after the final workshop and once more at a 1-month follow up. All items were within the same questionnaire, created with Qualtrics web software.

Self-esteem

Self-esteem was measured using the Self-Perception Profile for College Students (Neeman & Harter, 1986). Seven of the 13 domains were chosen based on a hypothesized relevance to magic. The chosen domains and reliabilities as assessed by Cronbach's alpha during baseline were as follows: Creativity = 0.84, Intellectual Ability

= 0.74, Scholastic Competence = 0.70, Social Acceptance = 0.79, Close Friendships = 0.75, Finding Humor in One's Life = 0.82, and Global Self-worth = 0.88. Each item presents descriptions of two types of students on opposite ends of a spectrum and respondents are asked to to select "which student is most like *you*" and rate how true it is for the respondent. Each item score ranges from one to four, with higher scores indicating higher self-esteem within that domain. All domains contain four items each except for Global Self-worth, which contains six.

The perceived effect on Self-esteem was measured quantitatively by asking participants "How do you think the workshops affected the way you feel about yourself (i.e. self-esteem)?" on a 7 point scale from "Much worse about myself" to "Much better about myself". This was followed with the qualitative, open ended question: "If you feel the workshops affected the way you feel about yourself (i.e. self-esteem), please describe how and why?"

Closeness

Closeness was measured via the Inclusion of Other in Self (IOS) scale (Aron et al., 1992), which contains a single item with 7 paired circles depicting different degrees of overlap between two overlapping circles labelled 'Self' and 'Other'. The item instructed participants to 'Please select the picture that best describes your current relationship with other [University name] psychology students.' The original development demonstrated good reliability (alternate form reliability, $\alpha = .87$ to .95; and test-retest reliability of .85 [Aron et al., 1992]).

The perceived effect of closeness was measured quantitatively by asking participants 'To what extent do you feel the workshops have affected how close you feel to other [University name] psychology students?' on a 7-point scale from 'Much

less close' to 'Much closer'. This was followed by the qualitative, open ended question: 'If you feel the workshops affected the closeness of your friendships and relationships with other students, please describe how and why?'

Community Belonging

Community belonging was measured via the perceived cohesion scale (Bollen & Hoyle, 1990, p. 485), with the term "[University name]'s psychology" as the referent community. Reliability as assessed by Cronbach alpha during baseline was .93.

The perceived effect of belonging was measured by asking participants 'How do you feel the workshops affected your sense of belonging in [University name] psychology?' on a 7-point scale from 'Belong much less' to 'Belong much more'. This was followed with the qualitative, open ended question: 'If you feel the workshops affected your sense of belonging, please describe how and why?'

Wellbeing

Other aspects of wellbeing were measured by first using a general life happiness measure via the question 'Overall, how happy are you with your life as a whole these days?' on a 7-point scale. The second measure of wellbeing was Henry and Crawford's (2005) short form of the Depression, Anxiety, and Stress Scale (DASS-21). Reliability as assessed by Cronbach alpha during baseline for subscales was as follows: Depression = .86, Anxiety = .81, Stress = .85.

The perceived effect of wellbeing was measured by asking participants 'How do you feel the workshops affected your general sense of wellbeing at [University name]?' on a 7-point scale from 'Much lower' to 'Much higher'. This was followed by the qualitative, open ended question: 'If you feel the workshops affected your general sense of wellbeing, please describe how and why?'

Data Analysis

To determine the effectiveness of the intervention for self-esteem, closeness, belonging and general wellbeing, thirteen 2 x 3 mixed ANOVAs with condition (magic, control) as the between subjects variable and time (baseline, post, and one month follow-up) as the within subjects variable were conducted for each scale or subscale. Last observation carried forward Intention to Treat (ITT) analysis was also used (Ranganathan et al., 2016) to ensure conservative results and take into account attrition rates.

To determine differences between groups on perceived effectiveness of the workshops on self-esteem, closeness, belonging, and wellbeing, a series of t-tests were conducted on scores at both the post measure and the one-month follow-up.

Results

A summary of the mean scores and standard deviations for the scales is presented in Table 1 and the perceived measures are presented in Table 2. The analysis for perceived effects tested the differences between the groups on self-reported, perceived effectiveness of the workshops in four domains: self-esteem, closeness with other students, belongingness at the university, and general wellbeing. The ANOVA analyses tested whether these four domains improved over the course of the workshops and whether it sustained at a one-month follow-up (See Tables 3-5).

A total of 133 students completed the baseline measures. Of these, 89 completed the post measure, and 85 completed the follow-up measure (mean age = 19.16, SD = 1.74). Of those who completed the follow-up measures, two did not complete the post measure. Thus, as per last observation carried forward ITT analysis,

the most recent score was carried forward and treated as 'no change'.

Some students participated in the workshops but were missing baseline data. For these students, they were included in analyses only for perceived measures, provided they attended at least one workshop. This resulted in a total sample size of N = 100 for the perceived post measures, and N = 87 for the one-month follow-up measure.

[Table 1 near here] [Table 2 near here]

Self-Esteem

Self-Perception Profile for College Students

There was a main effect of time, $^{*}F(1.56, 203.65) = 5.79$, $p < .01$, $\eta^2 = 0.04$, showing increased global self-esteem over the course of the interventions. There were also main effects of time showing increased self-esteem in the subscales of scholastic competence, $F(2, 262) = 13.45$, $p < .001$, $\eta^2 = 0.09$; social acceptance, $^{*}F(1.83, 239.78) = 8.20$, $p < .001$, $\eta^2 = 0.06$; close friendship, $F(2, 262) = 12.19$, $p < .001$, $\eta^2 = 0.09$; intellectual ability, $^{*}F(1.91, 249.54) = 15.58$, $p < .001$, $\eta^2 = 0.11$; finding humour in one's life, $^{*}F(1.85, 241.72) = 3.70$, $p < .05$, $\eta^2 = 0.03$; and creativity, $F(2, 262) = 10.68$, $p < .001$, $\eta^2 = .08$. There were no significant main effects of condition nor any significant interaction effects for all pre and post measures of self-esteem (See Tables 3-5).

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[*] Greenhouse Geisner correction applied to analysis in cases where Mauchly's test of sphericity was significant for uncorrected model and are indicated by asterisks (*).

Perceived Self-esteem

For the perceived effects on self-esteem during the post measure, results indicated that the magic group perceived significantly higher improvements in how they felt about themselves (due to the workshops) than the mindfulness group did, with a large effect size, $t(98) = 3.88$, $p < .001$, $d = 0.78$. For the final follow-up survey, the same trend was found with a smaller, yet still significant, medium effect size, $t(85) = 2.37$, $p < .05$, $d = 0.51$. Means for both groups were above the midpoint (i.e. value of 4) at all timepoints, which suggests that both interventions were perceived as beneficial for self-esteem (See Tables 3-5).

Closeness

Inclusion of Other in the Self

There was a main effect of time, $*F(1.85, 224.47) = 15.85$, $p < .001$, $\eta^2 = 0.11$ showing an increased sense of closeness with other psychology students over the course of the interventions. There were no significant main effects of condition nor any significant interactions (See Tables 3-5).

Perceived Closeness

For the perceived effects of closeness during the post measure, results indicated that the magic group perceived significantly higher improvements in how close they felt with other students (due to the workshops) than the mindfulness group did, with a large effect size, $t(98) = 5.14$, $p < .001$, $d = 1.0$. For the follow-up measure, the same trend was found with a smaller, yet still significant, medium effect size, $t(85) = 2.37$, $p < .01$, $d = 0.59$. Means for both groups were above the midpoint (i.e. value of 4) at all timepoints, which suggests that both interventions were perceived as beneficial for

closeness.

Belonging

Perceived Cohesion Scale

There was a significant main effect of time, *$F(1.74, 227.48) = 18.66$, $p < .001$, $\eta^2 = 0.13$, showing an increased sense of belonging to the psychology community, over the course of the intervention. There were no significant main effects of condition nor any significant interactions (See Tables 3-5).

Perceived Belonging

For the perceived effects of belonging during the post measure, results indicated that the magic group perceived significantly better improvements in their sense of belonging to psychology (due to the workshops) than the mindfulness group did, with a large effect size, $t(98) = 3.90$, $p < .001$, $d = 0.78$. For the final follow-up survey, the same trend was found with a smaller, yet still significant, medium effect size, $t(85) = 2.436$, $p < .05$, $d = 0.54$. Means for both groups were above the midpoint (i.e. value of 4) at all timepoints, which suggests that both interventions were perceived as beneficial for community belonging.

General Wellbeing

WellbeingDASS-21 and life happiness

There were no significant main nor interaction effects for the life happiness measure (See Tables 3-5). There were, however, significant main effects of time in the DASS-21 indicating a decrease in depression, *$F(1.86, 244.03) = 5.53$, $p < .005$, $\eta^2 = 0.04$; anxiety, $F(2, 262) = 11.70$, $p < .001$, $\eta^2 = 0.08$; and stress, *$F(1.87, 244.62) = 7.48$, $p <$

.001, $\eta^2 = 0.05$. There were no significant main effects of condition nor interactions for any subscales of the DASS-21 ().

Perceived Wellbeing

For the perceived effects of wellbeing during the post measure, results indicated that the magic group perceived significantly higher improvements in their general sense of wellbeing (due to the workshops) than the mindfulness group did, with a medium effect size, $t(98) = 2.88$, $p < .005$, $d = 0.58$. For the final follow-up survey, the same trend was found with a smaller, yet still significant, medium effect size, $t(85) = 2.10$, $p < .05$, $d = 0.45$. Means for both groups were above the midpoint (i.e. value of 4) at all timepoints, which suggests that both interventions were perceived as beneficial for general wellbeing.

[Tables 3-5 near here]

Discussion

Undergraduate students during their first term of college took part in either magic or mindfulness workshops. To examine the impact of the workshops on the students' self-esteem, closeness, community belonging, and general wellbeing, measures were taken before the workshops, immediately afterwards, and at a one-month follow-up. Overall, improvements were found for both workshops in all measures across time and thus appear to be beneficial. Contrary to our hypothesis, however, the pre- and post-measures showed no significant between group differences. On the other hand, students reported larger perceived benefits for the magic workshops, compared to mindfulness workshops. This was true for perceived effects on self-esteem, closeness, belonging, and wellbeing at both the post measure and the one-month follow up. While not measured directly, the engagement in the WhatsApp chat for the magic group was low

with no shared videos, and only contained a few thank you messages from students. However, discussions during both magic and mindfulness workshops revealed that at least some students engaged with the homework challenges.

Consistent with prior research on magic and wellbeing (Bagienski & Kuhn, 2019), our results show that participants perceive learning magic as useful in enhancing self-esteem and social relationships. Prior research on undergraduate students during their first term of college suggests that self-esteem tends to either 1) remain stable overall due to an equal amount of students feeling better about themselves as there are for students who feel worse (Harter, 2012, p. 166), or 2) decrease by the end of the first term (Chung et al., 2014). Thus, the self-esteem improvements we found are unlikely an artefact of normative adjustment, and instead suggest that the interventions were indeed effective. Practical limitations include a lack of an inactive control that practiced nothing, and attrition rates may have resulted in a somewhat self-selected sample.

At first glance, the discrepancy between standardized measures at the three timepoints and the perceived effects is rather perplexing. Indeed, if both groups had improved, one might expect the mindfulness group to be more aware of the positive impact and report higher perceived effects. However, it is important to consider that by design the content of the mindfulness workshops did not focus specifically on any social or self-components, whereas these topics were much more salient in the magic workshops. For example, the final magic performance included students chanting alternating statements of “I love myself” and “Not so much” (for entertainment value), which could have affected self-esteem scores through a desire to please the facilitators. Likewise, the body language lessons and tips on connecting with the audience may have made students pay more attention to how the workshops affected their sense of

belonging and closeness to other students. Thus, while both workshops improved self-esteem, community belonging, and closeness, these benefits may have been more implicit in the mindfulness group (i.e. beyond participants' awareness) and much more explicit in the magic group, to the point that the salient content overshadowed any mindful awareness of the benefits. However, this does not explain why the magic group's perceived effects on "wellbeing" was larger than the mindfulness group. An alternative explanation is that watching magic created strong curiosity and interest (see Bagienski & Kuhn, 2019; Leddington, 2016), which may have generalized to noticing a broad number of positive changes. Lending support to this idea of a more general, introspective awareness is that salient content does not account for the decreases in depression, anxiety and stress since these were not even mentioned during the magic workshops. Whether and how curiosity from magic tricks can be 'attached' to learning material is beyond the scope of this study but a worthwhile line of future research as current studies have mixed results (e.g. Lustig, 1994; Moss et al., 2016; Wiseman et al., 2020).

One speculative explanation for the positive impact would be that magic catalyses an initial willingness to engage, which makes it easier to engage participants in subsequent activities that lead to more lasting change. This initial interest may stem from how most people have very limited experience with magic, compared to other entertainment mediums like music, movies, or television. Thus, participants would have more uncertainty on what to expect and ultimately become more curious to learn about the workshops, especially since magic is stereotypically shrouded in secrets. Once participants arrive and begin learning to perform magic, Cooley's (1902) model of self-esteem arising from a "social mirror" may then play a role in enhancing self-esteem. This was anecdotally observed in workshops when students performed their

tricks to an unwitting peer who was unaware of the trick's secret method. Many students expressed surprise by both the magic their partner performed and also by the fact that they successfully "fooled" their partner with their own magic performance. Thus, the social reaction to the magic trick acted as a "social mirror", which challenged their initial self-evaluation of being someone who cannot perform magic well.

In terms of self-esteem scales, the main effects of both workshops had medium to large effect sizes. The largest effects were in intellectual self-esteem followed by scholastic, close friendships, creativity, and social-acceptance self-esteem (in order of decreasing effect size). Influences on close friendships and social-acceptance are in line with findings of social support's critical role in maintaining self-esteem during the college adjustment (Friedlander et al., 2007; Harter, 2012). The smallest effects were for global self-esteem and finding humour in one's life. The humour subscale relates to not taking oneself too seriously and since humility was not salient in either workshop, it's reasonable to have a smaller effect size. As for global self-esteem, the smaller effect size might be indicative of workshops not targeting every single area of importance to one's worth in college, such as romantic relationships or uncertainties about vocation. We attempted to minimize the confounds of practicing a skill and social benefits of the comparison group by utilizing mindfulness sessions without any loving-kindness practices. Nevertheless, mindfulness has psychological benefits as well (Chiesa & Serretti, 2009), which may have still been present in our measures and explain why no between groups effects were found. Since different elements of wellbeing also tend to be correlated, (Goodman et al., 2018; Seligman, 2018) mindfulness benefits may have very well carried over into self-esteem. Furthermore, positive interventions with healthy individuals (as is the case here) tend to have small effect sizes (White et al., 2019), albeit more sustainable, than clinical effects. As a

consequence, the results from the pre- and post-scales may have been underpowered whereas our perceived measures better detected the unique impact from the magic workshop. Thus, one extension of the current study for future research would be to have a control group that practices no activity at all.

Contrary to results from established scales, the perceived effectiveness of workshops on self-esteem suggests that the magic workshops were more effective than the mindfulness workshops. As noted earlier, the discrepancy could be partly explained due to the salient content in the magic workshop or perhaps an enhanced curiosity and interest that was inspired by the magic. Furthermore, effect sizes were large on the perceived measures, which suggests that perceived measures were more sensitive to the benefits of the workshops than the pre-post comparisons for standardized scales. We suggest that the standardized measures could not detect a between-groups difference because the additional contribution from magic was small and confounded by psychological benefits of mindfulness. Thus, future studies should focus on larger samples to increase statistical power.

For social benefits, results were similar to self-esteem. The main effects from ANOVAs showed community belonging and closeness to have large effect sizes. Our attempts to minimize the social impact from mindfulness may have been thwarted by correlations in elements of wellbeing (Goodman et al., 2018; Seligman, 2018), such as an indirect effect of mindfulness on closeness and community belonging. The lack of social aspects in mindfulness was deliberate in this experiment, which may suggest that while both workshops yielded similar results, the mechanisms between the two could be very different. For the more sensitive perceived measures, closeness with other students had the largest between-group difference, supporting our hypothesis that the magic workshops would have greater social benefits.

For the wellbeing measures, the effect sizes of the ANOVAs were medium. For perceived effects, the wellbeing question had the smallest effect size, which is not surprising as the magic workshops did not specifically focus on eliminating depression, anxiety or stress. It is interesting, however, that the magic groups still perceived the wellbeing benefit, which suggests that participants were not simply giving a positive response bias due to salient content, as might be argued for the self-esteem and social benefits. This adds greater weight on the aforementioned explanation of magic generating curiosity that generalizes to a more general, introspective awareness.

Limitations of the current experiment include the fact that both groups learned something, making it difficult to discern how much change from pre- to post- to follow-up can be explained by practicing a skill. Furthermore, the content of the workshops may have unmeasured confounds that play a role. Arguably, this may be particularly the case for the magic workshops, which included music, light physical movement, storytelling exercises, and discussions on believing in yourself and in the 'impossible'. At a real-world, practical level, these confounds may not matter if they are all present in the workshop. To determine the unique contribution of magic, however, it is crucial for future experiments to examine individual components of the workshops (e.g. simply learning a magic trick, performing magic to a naïve spectator, testing different tricks, etc.). Other limitations include the largely female sample, attrition that may have created a self-selected sample, and due to the length of the surveys, survey fatigue may have resulted in careless responding. These could be addressed by incorporating attention checks in the survey design and utilizing a control that learns no new skills. The lack of an inactive control, such as a waitlist, may also be seen as a limitation, although we consider this a strength of the study, since the active control is a conservative test of workshop effectiveness.

Emerging adulthood can be a period of heightened risk for depression and engaging in risky behaviours (Harter, 2012). As such, exploring ways to enhance the college transition experience is critical. Of particular importance is building a means of social support through the college community and maintaining healthy levels of self-esteem. Our preliminary study is the first to suggest that magic workshops may have potential in this context. One of the benefits of such interventions is that they are less prone to stigma because magic tricks are not typically associated with therapy or treatment of low self-esteem. Additionally, they can be useful preventative measures for attracting students with healthy levels self-esteem since one of the unique attributes of magic is the curiosity it inspires by creating impossible moments (Leddington, 2016). Furthermore, by learning to achieve these 'impossible' moments and performing them for others, magic would have positive implications for self-evaluations. Magic is also one of the few performance arts that can be easily applied in intimate, one-on-one social interactions, and thus provide the building blocks of a close-knit community. This sense of community may very well provide the social support needed for healthy college adjustment (Friedlander et al., 2007; Harter, 2012) and ultimately ease the transition. While mindfulness-based interventions could also be helpful for certain students, magic workshops nevertheless provide a more interactive alternative for those students who struggle to engage with passive mindfulness activities like meditation.

In conclusion, the workshops had a positive effect and considering that most studies have shown decreases or stagnant changes in self-esteem when students first adjust to college life, it is unlikely to be a mere case of normative adjustment. The perceived effects may have been more sensitive and thus able to detect between group differences, which suggest that the magic workshops were more useful for self-esteem, closeness, community belonging, and wellbeing. Although further research is needed,

this preliminary study suggests there may be some advantages of magic-based interventions over other types of interventions. Additionally, experiments that separate out the magic from other confounds would be useful for furthering a theoretical understanding.

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