Effectiveness of a Classroom Mindfulness Coloring Activity for Test Anxiety in Children

Abstract

To evaluate the effectiveness of mindfulness-based structured versus unstructured coloring on test anxiety, 52 participants (53.8% female; M_{age} = 10.92 years, *SD* =.82) were randomly assigned to either a structured mandala (*n* = 26) or free coloring condition (*n* = 26), and completed a standardized anxiety measure to assess anxiety before and after coloring, immediately before a spelling test. Results revealed an overall decrease in anxiety for both groups. However, a significant gender by group interaction demonstrated that while both genders experienced anxiety reduction in the mandala condition, males reported a greater anxiety reduction in the free coloring condition while females only benefited from the mandala condition. Possible explanations for these gender effects are explored and future directions discussed.

Experiences of test anxiety affect approximately one third of elementary school students (Lowe & Lee, 2008). Test anxiety represents a combination of state anxiety, the perceived threat before the test, and trait anxiety; the constant, general worry of performance evaluation (Lowe et al., 2008). In addition to low self-esteem, lower grades, and depressive symptoms, test anxiety is also associated with other types of anxiety disorders (Beidel & Turner, 1988; Ogundokun, 2011). If left untreated, children who suffer from test anxiety may experience future challenges impacting their academic performance (Beidel & Turner, 1988; Bodas & Ollendick, 2005; McDonald, 2001; Wren & Benson, 2004). Yet, despite the high prevalence of test anxiety in elementary school students (Lowe & Lee, 2008) and the serious implications of the condition, research on effective test anxiety interventions at the elementary school level is largely lacking.

According to Ergene (2003), the majority of test anxiety reduction programs created are intended for students in higher education. However, recently the use of mindfulness has been suggested as a feasible and potentially beneficial approach to address anxiety and stress in children (e.g., Britton et al., 2014; Mendelson et al., 2010; Semple, Reid, & Miller, 2005). Kabat-Zinn (2003) has described mindfulness as a deep and focused attention and engagement that is typically experienced through the practice of meditative techniques. Mindfulness is conceptually parallel with awareness (Semple & Lee, 2011); as such, mindfulness-based practices are concerned with developing this nonjudgmental present-moment awareness. Semple and Lee (2011) maintained that children may be more open than adults to focusing their attention on "living in the moment"—a core component of mindfulness-based activities, and thus these approaches may be particularly beneficial for children. However, there is limited research examining the effectiveness of mindfulness for test anxiety reduction in children specifically, although studies have demonstrated that mindfulness-based activities for children are beneficial for reducing general or trait anxiety which is a predictor of test anxiety (McDonald, 2001). Due to the stress and anxiety that students may experience, researchers have suggested that children would benefit from consistent mindfulness-based activities within schools (Napoli, Krech, & Holley, 2005). For instance, Mendelson and colleagues (2010) examined the effectiveness of a 12-week school-based mindfulness and yoga intervention on stress, mental health, and social adjustments in 97 fourth- and fifth-grade students (60.7% female) from four urban public schools. Students were randomly assigned to an intervention or control group and completed the Involuntary Engagement Coping Scale from the Response to Stress Questionnaire, the Short Mood

and Feelings Questionnaire—Child Version, the Emotion Profile Inventory, and the People in My Life measure pre-post intervention. Compared with the control group, students in the mindfulness intervention group demonstrated significant improvements on their response to stress. These findings suggest that mindfulness-based activities can be effective in reducing children's worrying thoughts—a key component of anxiety (Mendelson et al., 2010). Given these results, it is important to determine the specific benefits of mindfulness on anxiety within the classroom context.

In a related, broad review of studies evaluating the effectiveness of mindfulness-based approaches for children and adolescents, Burke (2010) concluded that current research demonstrated significant associations between increased mindfulness and reductions in anxiety. For instance, Napoli and colleagues (2005) assessed the impact of a 24-week mindfulness-based training program on measures of attention in 194 first, second, and third grade students and their teachers. Students were randomly assigned to a mindfulness intervention group or control group and completed the Test Anxiety Scale and the Test of Everyday Attention for Children pre-post-intervention. Students practiced a variety of mindfulness-based techniques that included awareness of breath, physical activities and sensory activities (e.g., yoga, body scan, attending to senses). Results revealed a significant decrease in anxiety and an increase in attention for students in the intervention group compared with students who did not participate in the mindfulness training. Furthermore, Semple et al. (2005) conducted a clinical open-trial examining the feasibility of a 6-week mindfulness training program in 5 anxious children. The mindfulness programs included adapted Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT) for children. Due to the small

sample size and lack of control group, the findings from the anxiety measures were not reported. However, clinical observations of this intervention suggest that a mindfulness program is an acceptable and feasible approach to addressing anxiety in youth.

More recently, research preformed by Britton and colleagues (2014) further confirmed the findings of both Napoli and colleagues (2005) and Semple and colleagues (2005) by examining the effectiveness of a classroom-based mindfulness intervention in 101 sixth-grade students (45.54% female). Participants were randomly assigned to an intervention group, which consisted of daily mindfulness meditation activities, or an active control group. Students in the intervention group participated in a 6-week meditation module that incorporated 3- to 12-minute mindfulness-based activities (e.g., body sweeps, breath awareness, etc.). All participants completed a modified version of the Stait-Trait Anxiety Inventory for Children state form and the Cognitive and Affective Mindfulness Scale before and after the 6-week intervention. Although the intervention and control group did not demonstrate significant differences on the measure of mindfulness, results revealed that increases in mindfulness in the intervention group were associated with decreases in anxiety. The findings from this pilot study suggest that gains in mindfulness are associated with reductions in anxiety

Although the above reviewed research suggests preliminary evidence for the feasibility of weekly classroom mindfulness interventions, in a recent special issue on mindfulness interventions in schools, Frank, Jennings, and Greenberg (2013) noted that there is a need for more empirical studies of mindfulness interventions in educational settings. Furthermore, it has been suggested that these specific mindfulness meditation-type exercises may not always be suitable for all children due to their limited attention

span or skills in metacognition (Greenberg & Harris, 2012). Therefore, it is important to consider developmentally appropriate mindfulness-based tasks in which children can effectively participate.

According to Greenberg and Harris (2012), in order for a task to be considered 'mindful,' it is necessary for it to include a structured component in which individuals can focus their attention and control their physical and mental activity. A specific type of mindfulness activity that has recently been explored is mindful art making (e.g., Curry & Kasser, 2005; Sandmire, Gorham, Rankin, & Grimm, 2012). The process of 'mindful art making' incorporates the physical and creative manipulation of materials of art making (Abbott, Shanahan, & Neufeld, 2013) with the benefits of mindfulness meditation, such as a deep relaxation and concentration (Curry & Kasser, 2005). For instance, in Semple and Lee's (2011) description of their 12-week mindfulness-based cognitive therapy program for children with anxiety, the authors detail the implementation of a structured drawing activity in which children are able to practice mindful awareness while drawing pictures. As a result, although research suggests that mindfulness meditation is a beneficial tool for reducing anxiety—particularly because it involves engaging in the moment—the opportunity to become absorbed in a challenging but attainable activity can also take place through the art making process (Brown & Ryan, 2003; Curry & Kasser, 2005).

A common example of mindfulness-based art that facilitates in-depth attentiveness and engagement involves structured mandalas. Structured mandalas are circular designs composed of symmetrical shapes that are regularly used for meditative purposes (Henderson, Rosen, & Mascaro, 2007). Coloring in the intricacies of the

symmetrical shapes within a structured circular mandala blends art therapy with the calming effects of meditation (Curry & Kasser, 2005) and helps create a state of mindfulness.

Research has begun to provide evidence for the effectiveness of mandalas in reducing stress and anxiety, and supporting positive functioning. In one study, Sandmire and colleagues (2012) assessed the effect of art making on anxiety in a sample of 57 undergraduate students (79% female) one week prior to final examinations. Participants in the intervention condition selected to engage in one of five art making activities, with coloring of structured mandalas as one option. Results from the State-Trait Anxiety Inventory revealed that state and trait anxiety scores of participants in the intervention condition decreased significantly between pre- and post-art making activity compared with the control group. Similarly, Walsh, Chang, Schmidt, and Yoepp (2005) found that four creative art intervention techniques, which included the use of mandalas, were successful in reducing stress and anxiety and increasing positive emotions in a sample of 36 female undergraduate nursing students. In addition, although the authors claimed that students suffering from test anxiety would benefit from these types of artistic tasks before a test is administered, this investigation did not occur in the context of test-taking (Walsh et al., 2005). Although these studies provide preliminary support for the effectiveness of mandalas in anxiety reduction, their methodology employed a combination of art making activities rather than focusing on mandalas alone, which makes it difficult to evaluate the specific effect of mandalas as a mindfulness coloring activity on anxiety.

Curry and Kasser's research (2005) was one of the first studies to specifically examine the effectiveness of structured mandalas on students' pre-post-anxiety levels following an anxiety

induction. Participants were 84 college students (65% female) who engaged in one of three coloring conditions; structured mandalas, structured plaid forms, or free unstructured coloring. Anxiety was assessed at three time points: at baseline, pre-coloring activity, and post-coloring activity, using the State Anxiety Inventory. An anxiety induction procedure consisting of having the participants recall a time when they felt most “fearful” took place following the baseline anxiety assessment. The results revealed that students who colored in either the structured mandalas or the structured plaid forms for 20 minutes demonstrated a significant reduction in anxiety, while participants who engaged in free unstructured coloring did not. The results of this study provided one of the first clear demonstrations for the benefit of structured coloring in anxiety reduction, albeit not within a classroom test-taking context. In contrast, in a subsequent replication of Curry and Kasser's (2005) study, using the exact same procedure, Van der Vennet and Serice (2012) found that free unstructured coloring was also associated with benefits for anxiety reduction. Participants were 50 undergraduate and graduate students (82% female) who engaged in either structured coloring of mandalas, structured coloring of plaid forms, or free unstructured coloring. Consistent with Curry and Kasser's (2005) findings, it was found that the participants who colored in structured mandalas demonstrated greater anxiety reductions relative to free coloring. Yet, contrary to Curry and Kasser's (2005) study, the participants in the free coloring condition also exhibited a reduction in anxiety. Thus, currently results remain mixed regarding the benefits of structured versus unstructured coloring on anxiety reduction and further research is needed to elucidate the relative benefits of these approaches. In addition, both Curry and Kasser's (2005) and Van der Vennet and Serice's (2012) studies used a predominantly female sample and neither evaluated possible gender effects. Therefore the benefits of structured versus unstructured art making for anxiety in males and females remains to be examined.

In practice, art therapy interventions frequently incorporate mandalas as treatment for psychological disorders and symptoms in individuals of all ages, including children (Kim, Kang, & Kim, 2009). According to Semple and Lee (2011), structured drawing activities are suggested to bring about the awareness that is inherent to mindfulness. Indeed, structured mandalas are currently being used with children in elementary schools by teachers and practitioners who provide anecdotal support for its use (Fitzell, 2009; Sullivan, 2012); however, there has been no empirical evaluation of its efficacy in this population. Although research has begun to examine the effectiveness of structured coloring on anxiety, the potential benefits of coloring mandalas on reducing test anxiety specifically has also not been explored. Therefore, in order to determine that there are real potential benefits to incorporating this easily adapted mindfulness technique into the elementary classroom, an empirical evaluation is required. Thus, the present study was designed to test the effect of coloring mandalas on reducing test anxiety in elementary school children prior to a spelling test. Participants' state anxiety was assessed before the intervention (mandala coloring or free draw/color) and immediately following the coloring activities. In line with Curry and Kasser's (2005) and Van der Vennet and Serice's (2012) finding that in college students coloring structured mandalas is associated with greater anxiety reduction than unstructured coloring, it is hypothesized that the children who engage in coloring mandalas will show greater reduction in their state anxiety from pre- to post-intervention compared with the free draw/color condition. Due to the exploratory nature of the investigation of possible gender effects in response to the mandala intervention, no specific hypotheses are proposed.

METHOD

Participants

Participants were students in grades four to six from a private co-ed elementary school (44% female) in Montreal, Canada. Students' from this school were predominantly Caucasian, upper middle class, with English (78%) as their primary language. Following approval from the school, parents of the students were required to provide consent for their children to participate in the study. In order to ensure that all students received the same information, an oral script that described the present study was read to the students. Following this description, the teachers distributed the consent forms to 120 students in grades 4 to 6 to take home to their parents. Only those agreeing to participate were to return the forms. Due to school administrative constraints, there was a short timeline (3 days) for consent forms to be returned. Within 3 days, 57 approved consent forms were received (47.5% consent). Of this sample, 4 students were not able to participate due to absence. However, actual consent would have been higher with a longer return time as further consents were returned over the following week; thus the 47.5% consent rate is not indicative of a lack of consent but a lack of sufficient time to collect consent.

A total of 53 participants completed the study. One participant from the mandala group was an outlier on the spelling test; therefore, the participant was removed from analyses as there was reason to believe from interactions that the student might not have understood the measure of anxiety. As a result, the final sample comprised 52 participants (53.8% female; M_{age} = 10.92 years, *SD* =.82); 26 in the mandala coloring group (mandala condition) and 26 in the free draw/color group (free condition).

In order to assess the effectiveness of mindfulness-based coloring on test anxiety, participants were randomly assigned to a mandala condition or free color condition.

Participants completed the State-Trait Anxiety Inventory for Children State form (STAIC-S; Spielberger, 1973) pre- and post-coloring intervention, followed by a spelling test. Difference scores between pre- and post-test measures were analyzed.

MATERIALS

Measures/Instruments

State-trait anxiety inventory for children state form

Anxiety was assessed using the State-Trait Anxiety Inventory for Children State form (STAIC-S), which is a widely used self-report measure that assesses children's current state of anxiety (Nilsson, Buchholz, & Thunberg, 2012). This measure has 20 items that ask children how they feel in this particular moment of time, designed to measure transitory anxiety states and takes approximately 5 to 10 minutes to complete, either individually or in groups. All items begin with the statement ‘I feel…’ and participants indicate their current state by circling one of the three given options: e.g., “I feel…very nervous/nervous/not nervous”; “I feel…very jittery/jittery/not jittery.” The STAIC-State form, developed from Spielberger's State-Trait Anxiety Inventory for Children (STAI-C), was the only subscale used in this study, and it has been associated with high reliability (Myers & Winters, 2002; Nilson, et al., 2012; Spielberger, 1973). Internal consistency was found to be good with a Cronbach alpha of.82 and.87 for a large sample of fourth-, fifth-, and sixth-grade male and female students, respectively. Further evidence of reliability was shown with a median item-remainder correlation of.38 for males and.48 for females. Predictive validity was assessed by comparing participants' scores in a TEST condition with participants' scores in a NORM condition (Spielberger,

1973). In the TEST condition, participants were asked to respond to the items according to how they would feel before a final examination, while participants in the NORM condition followed the standard instructions. Scores in the TEST condition were significantly higher for all items compared with scores in the NORM condition in both males and females.

PROCEDURE

The researcher and her assistants arrived at the school on three separate days for each of the three grades to participate in the 50-minute study. In groups of 16 to 21, participants arrived to a central classroom location to complete the study. Upon entering the room, participants were randomly assigned to either a mandala or free condition. Each participant was provided with an envelope, a box of crayons, a pencil, and an eraser. Each envelope contained (a) a measure of anxiety, (b) a mandala (see Figure 1), or a sheet of paper to free draw/color on (c) a second measure of anxiety, and (d) the spelling test section of the WRAT-3. To induce test anxiety in the participants, they were told that they would be given a spelling test as the final task, and that the results of the spelling test would be shared with their parents. The procedure was reviewed by the university's Research Ethics Board, which conforms to the requirements of the Canadian Research Tri-Council policy statement on Ethical Conduct for Research Involving Humans (TCPS-2, 2014). Specifically, students and parents were informed of all aspects of the study; there was no deception involved. The oral script and parent consent form detailed that students would complete a measure of anxiety before and after participating in an art activity, prior to a spelling test, and that their test anxiety would be assessed at two time points. In order to ensure the protection of students, they were told that they

would be able to withdraw from the study at any time without consequences. A description of the debriefing and resources provided to the students and their parents is described within the following section.

First, the researcher read through each item on the STAIC-S with the students following on their own measure to ensure that the students understood all of the items. Second, the participants completed the anxiety measure and were reminded to respond to the questionnaire as honestly as possible, and that each student's specific responses would remain confidential. Third, the mandala group (n = 26) colored structured mandalas for 15 minutes with crayons, while the free group (n = 26) was asked to free draw/color on a blank sheet of 8.5×11 paper. The specific mandala design used in the present study (Freeman, n.d.) has been associated with decreased anxiety in several studies (e.g., Curry & Kasser, 2005; Van der Vennet, & Serice, 2012). All participants received the same individual box of crayons (same colors), and they were informed that they did not need to worry about finishing the coloring activity in the 15-minute time frame; however, the participants were asked to focus on their own coloring quietly within the allotted time. Immediately following the 15 minutes of the coloring activities, all participants completed the STAIC-S to assess their post-anxiety levels. After completion of the post-STAIC-S measurement, the students were given the spelling section of the WRAT-3. At the end of the study, the researcher provided the participants with a handout containing a short description of test anxiety and the purpose of the study to take home to their parents, as well as a verbal debriefing. The verbal debriefing included a summary of the purpose of the study, the expected findings, and a question-and-answer period in which the students were able to discuss their experience with the activity. Each child's specific

score on the spelling and anxiety measures was summarized (e.g., average/high average/above average relative to students their age) and given to their parents, while the director of the school received summarized group scores of the students' spelling scores and anxiety scores. All participants also received a list of resources for literacy and writing development, and resources and suggestions for managing anxiety.

RESULTS

The mandala and free groups were comparable for age, gender, and grade (see Table 1); therefore. all subsequent analyses did not further consider these variables.

In order to test the hypothesis that the mandala group would show a significant decrease in pre-post anxiety, whereas the free group would not show this decrease, a paired-samples t test was conducted on the pre-coloring and post-coloring activity scores on the STAIC-S for both groups. A significant decrease between anxiety scores at pre-coloring (Mandala M = 31.769, SD = 6.257; Free M = 28.308, SD = 4.416) and post-coloring (Mandala M = 28.923, SD = 6.330; Free M = 25.846, SD = 4.144) was found, $t(25) = 2.925$, p =.007 and $t(25) = 3.032$, p =.006, respectively. Thus, this result indicates that participants experienced a reduction in their anxiety levels following the coloring activity for both groups (see Table 2).

In order to investigate the possible gender differences in response to coloring conditions, a 2 (Condition: mandala vs. free) × 2 (Gender: male vs. female) ANCOVA, controlling for pre-anxiety scores, was conducted on the post-coloring STAIC-S scores. Because this was exploratory in nature a more lenient alpha of.10 was employed. Consistent with the paired samples t-test, no main effect for condition was found, F(1,

47) =.483, p =.490, η_p^2 =.010, and no main effect for gender was found, $F(1, 47) = 2.265$, p =.139, η_p^2 =.046. However, a significant interaction between gender and condition was uncovered, $F(1, 47) = 2.90$, p =.095, η_p^2 =.058, such that males and females responded differently to the two conditions. Specifically, in the mandala condition, both males and females reported lower levels of anxiety from pre-to post-coloring (see Figure 2). In the free coloring condition, however, males demonstrated decreased anxiety from pre- to post-coloring, while females did not show this change (see Figure 3).

Discussion

The purpose of this study was to determine whether coloring mandalas, a mindfulness-based activity, prior to a spelling test would lead to a significant reduction in children's test anxiety. Participants in both the mandala condition and in the free condition showed a significant decrease in their anxiety following the coloring activities. This finding is similar to the results in previous studies that demonstrated a relationship between art making and reduced anxiety in college students (e.g., Sandmire et al., 2012; Walsh et al., 2005). However, contrary to our prediction, participants engaged in the mandala activity as a group did not show a significantly greater reduction in their anxiety levels compared with the participants in the free condition, although this result can only be interpreted with reference to the gender by condition interaction effect. Specifically, the effect of the coloring condition on anxiety was found to differ depending on the gender of the child. Interestingly, boys showed greater decreases in anxiety in the control condition of free coloring than in the mandala coloring activity, whereas girls benefited exclusively from the mandala condition.

In this first exploratory study of mindfulness-based art activities in elementary school children, the hypothesis that the mindful activity of coloring the mandalas would be associated with greater anxiety reduction compared with free coloring was supported for girls but not for boys. Female participants who engaged in 15 minutes of coloring mandalas demonstrated a greater decrease between pre-coloring anxiety and post-coloring anxiety than female participants who were asked to free draw/color. The free condition did not result in a benefit for anxiety reduction for the female participants. In contrast, although the male participants also showed a decrease in their anxiety in the mandala condition similar to females, they reported greater reduction in pre- to post-coloring anxiety in the free draw/color condition. These results are partially inconsistent with previous research that has found that coloring structured mandalas is associated with greater decreases in anxiety compared with a free coloring activity (Curry & Kasser, 2005; Van der Vennet & Serice, 2012). Unlike free coloring, coloring in the complex shapes of structured mandalas has been suggested as an art making activity that brings on an attentive and meditative-like state, which can also be associated with reduced anxiety (Curry & Kasser, 2005). However, the present results imply that this mandala-specific benefit is limited to girls, while the free coloring is more effective than mandala coloring for boys. A number of possible explanations might account for these findings.

First, previous research revealed this effect in an older sample, specifically college students (Curry & Kasser, 2005; Van der Vennet & Serice, 2012), while the present study looked at elementary school students. Developmental differences between the two populations may have been responsible for the present divergent results. The finding that males in this study benefitted more from free coloring than females may be

due to the boys' slower development of fine motor skills (Ateah, Kail, & Kavanaugh, 2015/2009; Eisenberg, Damon, & Lerner, 2006; Hanlon, Thatcher, & Cline, 2000), which would make the coloring of the small shapes in the mandala more challenging than free coloring. Consistent with this supposition, qualitative examination of the data revealed that 45% of the boys in the mandala group colored over the shapes, indicating that the intricate coloring demands of the mandala may have been frustrating to some of them, whereas 100% of the girls in the mandala condition colored within the shapes.

Alternatively, it is possible that boys in general will benefit more from a less mindful structured coloring activity than girls. Due to the disproportionately female samples of previous studies (e.g., Curry & Kasser, 2005; Van der Vennet & Serice, 2012), previous research is unable to clarify if males in the samples perhaps responded differently to structured compared with unstructured coloring. Further research is necessary to determine whether the gender effects demonstrating greater anxiety reduction in unstructured coloring tasks for male participants hold across different ages.

A limitation of the present study is the small number of participants in each grade. This limitation may be a result of the short timeline for consent forms to be returned. In light of the interesting pattern of gender differences found in the present study, it would have been beneficial to have larger numbers of participants across grade levels in order to examine age, gender, and coloring condition interactions on anxiety reduction. If students were given more time to return the consent forms, the larger sample size could have made such analyses possible. Since the results of this study differ from those of the university studies (e.g., Curry & Kasser, 2005; Van der Vennet & Serice, 2012), future research should undertake a more in-depth examination of the developmental patterns of boys and

girls in response to mindfulness-based coloring activities such as mandalas. Furthermore, the participants were predominantly Caucasian students from upper middle class families. Future research would benefit from a more diverse SES and cultural sample in order to determine whether students from various backgrounds respond differently to the intervention. Another limitation is the definition of a structured versus unstructured coloring activity. The results of the present study, as well as the results of Van der Vennet and Serice's (2012) study demonstrated that free coloring can be beneficial for reducing anxiety. A possible explanation for this result is that the definition of a mindful art activity may lie within the individual. Therefore, an activity that the researcher labels as unstructured or free coloring may actually be perceived as mindfulness-based by the participant. Future research needs to examine the participants' own experience of the art making activity when assessing these benefits.

Despite these limitations, this is the first study to empirically assess the effectiveness of mindfulness-based art on test anxiety reduction in elementary school children and it holds important implications for future research and the implementation of mindfulness-based art activities in schools. First, the findings indicate that overall both males and females benefit from art making activities prior to a test. Although it appears that females prefer coloring within the shapes of a mandala, this study suggests that students should be given an option as to which art making activity they prefer. Thus, art making activities could be a worthwhile anxiety-management technique for elementary school teachers and school psychologists; if school personnel incorporate these types of art making activities in the classroom for 15 minutes prior to a test, then students can benefit from a reduction in their state of test anxiety.

Second, the results demonstrate that coloring activities have different effects on test anxiety in elementary aged boys and girls, with boys experiencing additional benefits from free coloring. When teachers and school psychologists incorporate mindfulness activities within their schools, it is critical for them to remain aware of the gender and possible individual differences that have yet to be examined. For instance, trait mindfulness is described as an individual characteristic that can be enhanced through mindfulness practice (Brown & Ryan, 2003). Increasingly, researchers have found that trait mindfulness may predispose individuals to respond to a mindfulness-based activity and experience mindfulness states (Shapiro, Brown, Thoresen, & Plante, 2011). As a result, children may differ in their general tendency to be mindful, which can impact their reaction to a mindfulness-based activity. Teachers must be aware that certain children may not respond as well or easily to a mindfulness-based activity given that they do not experience mindfulness as an individual disposition. As such, teachers and school psychologists should remain sensitive to students' differences and dispositions, and incorporate various mindfulness activities that might suit diverse traits and learning styles. For example, an art making activity such as coloring a mandala may be beneficial for children with strong fine motor skills, whereas a classroom mindfulness yoga-based activity might be more appropriate for boys or children with attention difficulties.

The findings from this study hold important implications for teachers and school psychologists as schools are increasingly using mindfulness art making activities, based on the results of previously conducted university studies. School personnel must be able to adapt the mindfulness activity to children's individual differences and remain sensitive to the students' own experience of mindfulness.

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Tables and Figures

Figure 1 Structured mandala.

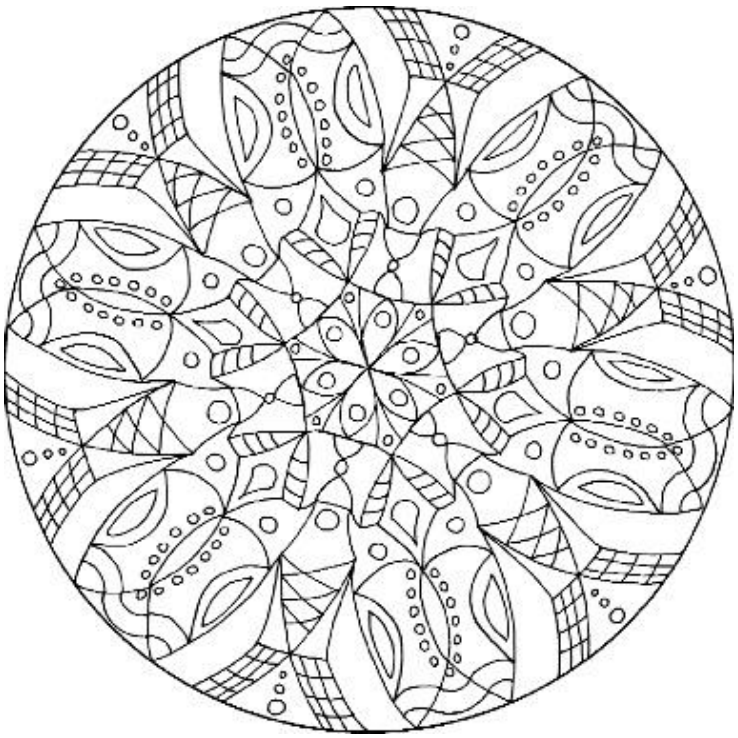

Table 1 Demographic Information and Self-Report Measure Scores Across Participant Groups

Variable	Mandala Group	Free Group	Significance test
Age, M (SD)	10.84 (.80)	11.00 (.84)	$t(50) = -.74$, $p = .466$
Gender, % female	58%	50%	$\chi2(1) = .31$, $p = .578$
Grade %			$\chi2(2) = .10$, $p = .950$
4	46%	42%	
5	31%	35%	
6	23%	23%	

Figure 2 Pre- and post-intervention anxiety scores for the participants in the mandala group.

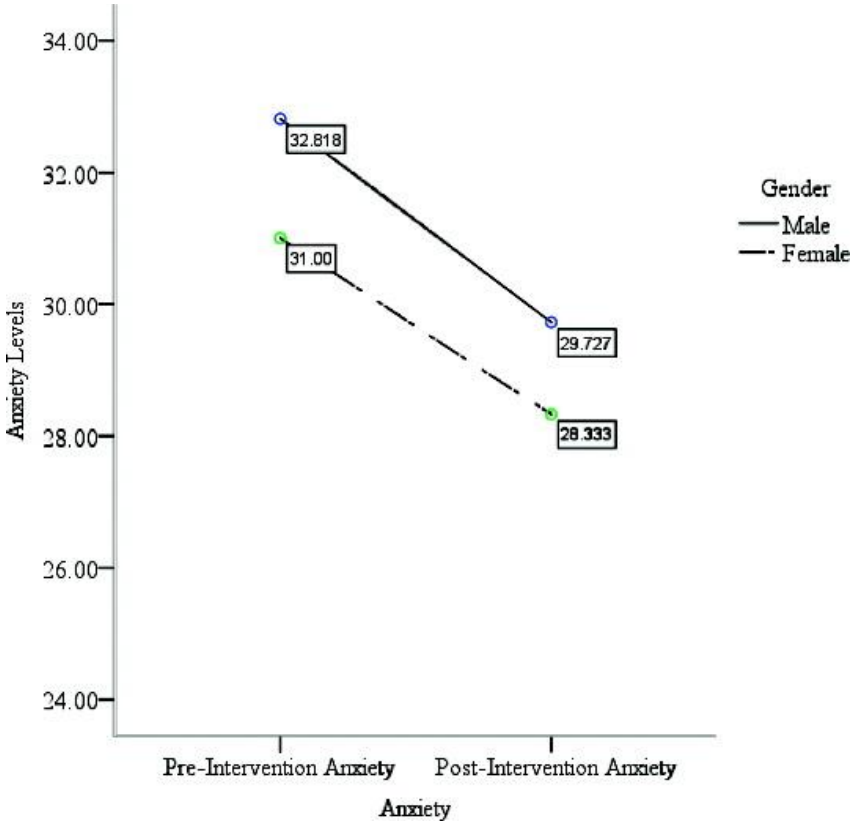

Table 2 Means (and Standard Deviations) for Anxiety Levels in the Mandala and Free Coloring Groups

		Pre-coloring anxiety	**Post-coloring anxiety**	**Significance test**
Group	**n**	**M (SD)**	**M (SD)**	
Mandala	26	31.769 (6.257)	28.923 (6.330)	t(25) = 2.925, p =.007
Free	26	28.308 (4.416)	25.846 (4.144)	t(25) = 3.032, p =.006

Figure 3 Pre- and post-intervention anxiety scores for the participants in the free draw/color group.