

INVESTIGATING THE PSYCHOLOGICAL BENEFITS OF ADULT COLOURING USING A  
MIXED METHOD APPROACH

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Certificate of Examination

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Investigating the Psychological Benefits of Adult Colouring Using a Mixed Method Approach

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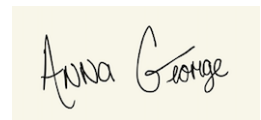
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A handwritten signature in black ink on a light yellow rectangular background. The signature reads "Anna George" in a cursive script.

Anna George  
April 20, 2023

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## **Abstract**

Adult colouring has become one of the newest trends over the last decade with an increase in well-being attached to its effects, yet it is unclear how a colouring book can provide such benefits. Colouring is an activity that promotes concentration and engagement but does not require excessive skills or focus. With that being said, adult colouring provides enough structure so that users are not overwhelmed by too many decisions but is intricate enough to promote engagement and possibly a state of mindfulness. The current study explores the potential effects adult colouring can have on psychological measures including anxiety, burnout, satisfaction with life, desire for control, and mindfulness. Using a mixed-method approach, 105 participants who identified themselves as 'adult colourers' completed an online survey that assessed their colouring experience and how colouring has influenced their lives in regard to psychological measures. Additionally, 4 participants completed colouring sessions which altered the degree of structure throughout the colourings while mindful breathing techniques were also implemented. Semi-structured interviews were conducted after the colouring sessions to gain insight into the benefits the 'adult colourers' experienced. Results showed several significant correlations between the psychological measures with the strongest correlation existing negatively between mindfulness and anxiety. Additionally, all participants who completed the colouring sessions reported a decrease in anxiety and an increase in mindfulness. These results demonstrate that individuals who practice mindfulness or partake in mindful activities are likely to have low levels of anxiety. Qualitative results showed that participants colouring structure preferences aligned with their everyday life control preferences. For instance, the participant who considered themselves to be a leader preferred the unstructured colourings while the participants who considered themselves to be followers preferred the structured colouring designs. There were no



significant differences found between participants' experience or frequency with colouring.

While most adult colourers do not colour to improve on the skill, but merely for enjoyment purposes, the benefits of colouring could become effective immediately and not increase over time which could be why there were no differences found, however, further research is needed to support this claim. Furthermore, additional research is needed to determine the appropriate amount of mindful techniques to include while colouring as one participant mentioned they found the breathing bubble used in the current study to be distracting at times and stated that it took away from their colouring mindset. The results from the current study are consistent with previous literature supporting evidence that adult colouring has the potential to decrease anxiety, increase mindfulness, and essentially benefit one's well-being.

## **Investigating the Psychological Benefits of Adult Colouring Using a Mixed Method**

### **Approach**

Adult colouring has become a popular pastime, there were over twelve million books sold on the U.S. market in 2015 and there is no sign of sales slowing down. Colouring is an activity that promotes concentration and engagement but does not require excessive skills or focus (Curry & Kasser, 2005). One possible reason for its popularity is that adult colouring has been proposed as beneficial to well-being. It provides enough structure so that users are not overwhelmed by too many decisions but is intricate enough to promote engagement and possibly a state of mindfulness (Carsley et al., 2015). Adult colouring books are sometimes advertised as a form of art therapy suggesting that colouring could lead to a reduction in stress and anxiety allowing users to externalize their focus and redirect unhealthy internal dialogue (Flett et al., 2017). However, the American Art Therapy Association argues that, although colouring provides a safe ground for using art for self-soothing purposes, it is not a form of art therapy *per se*. To be considered art therapy, individuals must be under the guidance of an art therapist in which they may come to realize that certain images can tap into the internal experience of the artist in ways that evoke emotions or understanding. The trained art therapist might then guide individuals in focusing on those areas as a therapeutic intervention (Carolan & Betts, 2015). Art therapists might offer adult coloring books to clients outside of treatment to support focusing and stress reduction, or to begin a way of getting back in touch with the creative self (Carolan & Betts, 2015). Adult colouring can be used as a component of a therapeutic intervention because it aims to distract negative thinking and encourage artistic creativity and personal experience (Eaton & Tieber, 2017). The present study will explore the potential outcomes of adult colouring on both positive and negative psychological measures, including anxiety, burnout, desire for control, mindfulness, and life satisfaction. In addition to examining the correlations among these possible

outcomes, a qualitative component of the study will report participant interviews on the processes that occur during structured and unstructured colouring.

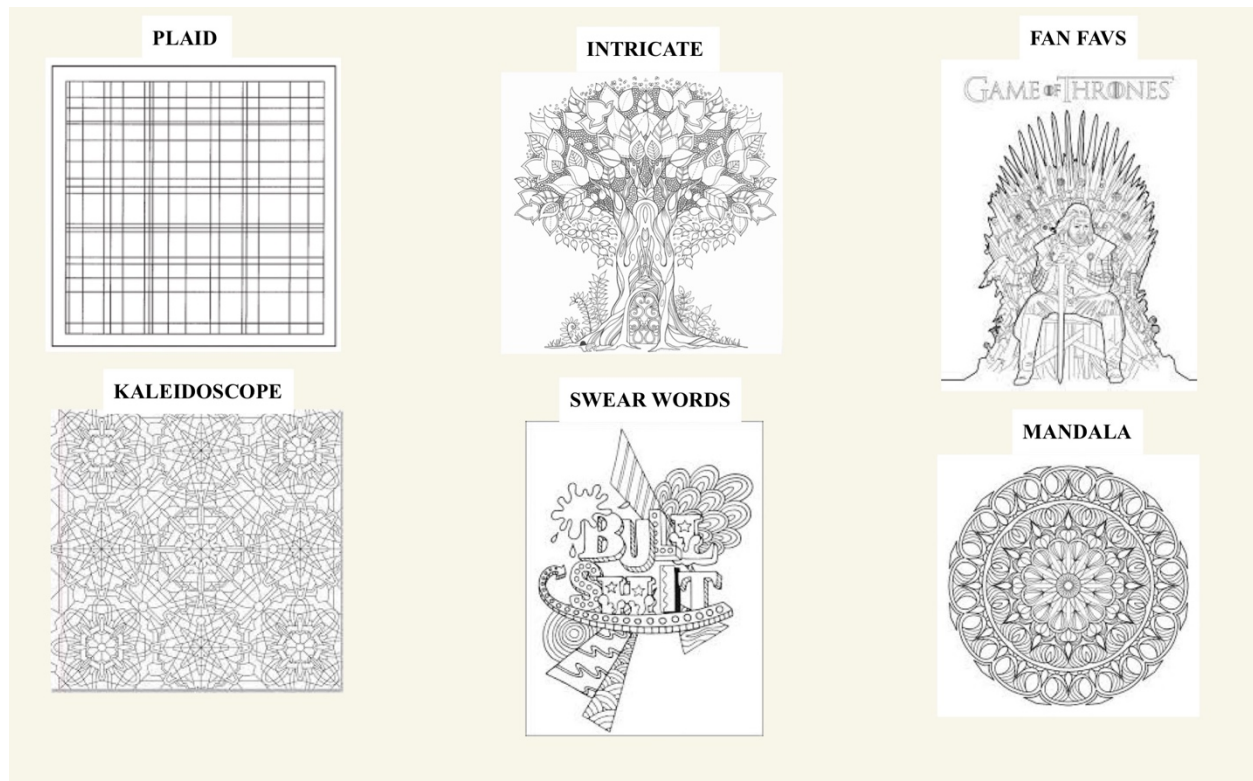
## **Adult Colouring**

As children grew up, coloring books eventually grew up with them. In 1970, Dover's Antique Automobiles published the first colouring book specifically designed for adults but it was not until forty-five years later that the trend took off (Edwards, 2016). According to Publishers Weekly, in 2015, the top ten bestselling colouring books sold at least 1.5 million copies. The adult colouring phenomenon has credited Scottish Illustrator Johanna Basford for her intricate drawings and her most known book titled "*Enchanted Forest*" which sold almost a quarter of a million copies in its first month and sold out within weeks after of being released in February 2015. Basford's success inspired additional publishers (Mumford, 2016).

The most popular coloring books on the market can be considered works of art in their own right, with Basford's titles as prime examples. However, adult colouring books can also include plaid patterns (e.g. checkers board), franchise favourites (e.g. *Game of Thrones*), kaleidoscope patterns, and even swear words (See Figure 1). Another popular theme among adult colouring books is mandalas which are complex abstract designs that are usually circular forms and that are said to symbolize a state of mind that one would like to achieve. In the early 1900s, Carl Jung, the prominent psychoanalyst, explored the psychological effects of mandalas and incorporated them into therapy by prescribing patients to draw and colour them (ColourItSupport, 2018). The largest number of adult colouring book buyers comes from the 18-29 age group with 71 percent of adult colouring book consumers being female (Nielsen, 2016).

**Figure 1**

*Types of Adult Colourings*



Researchers have attempted to discover what adult colouring offers users beyond an enjoyable experience. Many studies have discussed the value of coloring books for adults as a self-care hobby for stress management (Carolan & Batts, 2015), while others looked at the importance of incorporating mindfulness (Mantzios & Giannou, 2018b) and altering the degree of structure involved in the colouring task (Eaton & Tieber, 2017). Still, there exists speculation about if the psychological outcomes produced by adult colouring live up to its expectations.

Previous studies have found that adult colouring decreases anxiety, depression, and negative affect (Flett et al., 2017; Mantzios & Giannou, 2018b; Muthard et al., 2016), as well as increases psychological well-being (Hajra & Saleem, 2021). However, there is currently very little research exploring the effects adult colouring has on additional, positive psychological factors. This study aims to further investigate the psychological benefits of adult colouring

including potential correlations with anxiety, mindfulness, satisfaction with life, and burnout, and desire for control. In addition, the study will implement mindful breathing and compare different degrees of structure in completing the task to determine which types of colourings are most effective.

## **Anxiety**

The American Psychology Association (2008) defines anxiety as an emotion characterized by feelings of tension, worried thoughts, and physical changes such as increased blood pressure. Previous findings indicate that the use of adult colouring books assists in reducing anxiety (Curry & Kasser, 2005; Babouchkina & Robbins, 2015), but other results suggest such findings to be unclear (Van der Venet & Serice, 2012; Carsley et al., 2015). Curry and Kasser (2005) found adult colouring to be effective for reducing anxiety. In their study, participants were asked to write about a fearful experience as a method of inducing anxiety and were allocated to one of three conditions: a plaid design (i.e., a checkers design), free drawing, or colouring a mandala. Anxiety levels were measured before and after the colouring task. The results indicated a significantly greater reduction in anxiety among participants assigned to the mandala colouring and plaid design in comparison to the free-drawing participants. Van der Venet and Serice (2012) replicated Curry and Kasser's (2005) research and found that the mandala design produced a significant anxiety reduction, but not in the plaid or free drawing condition. Inconsistent findings continued to appear in the academic literature, where plaid designs displayed higher effectiveness in reducing anxiety over mandala colourings (Drake et al., 2014).

Although various studies have found that colouring can reduce anxiety, it is still unknown whether there is a difference in the effectiveness of different types of colouring. In a study, Eaton

and Tieber (2017) found that colouring with an intermediate level of difficulty was the most effective in lowering anxiety levels compared to colouring with easy or hard levels of difficulty. Additionally, Eaton and Tieber (2017) found that participants who were in the unstructured colourings group reported a marginally greater decrease in anxiety than those in the structured colouring group which indicates that the degree of structure in the task is influential to the colourings effectiveness. Although there is no clear answer for why this is, it is possible that participants' desire for control might influence preference for the degree of structure in a colouring task. A preference for unstructured colourings seems to be consistent with a higher desire for control because it allows participants to make their own decisions and to have control over the final result.

The correlates of adult colouring likely extend beyond those reviewed in previous literature which is why the current study will include variables that have not yet been measured in adult colouring studies. For instance, previous studies findings suggest mindfulness may be a critical resource in helping decrease negative aspects of burnout (Calderon, 2021). With this being said, it is predicted that people who experience high levels of mindfulness may be less likely to experience burnout, and a correlation may exist between mindfulness and burnout. Therefore, if adult colouring provides a mindful experience for participants, it is expected that it may influence participants burnout as well.

## **Mindfulness**

Mindfulness has been defined as a nonjudgmental present-centred awareness in which each thought, feeling, and sensation that arises is acknowledged and accepted as it is (Bishop, 2004). Mindfulness transforms how we relate to events by bringing a certain quality of attention to moment-by-moment experiences (Kabat-Zinn, 1990). Given that colouring is commonly

referred to as a mindfulness or meditative-like activity (Drake et al., 2014), one would expect there to be a vast amount of research focusing on mindfulness when colouring. Surprisingly, measures of mindfulness had not been incorporated into previous studies' designs until Flett et al. (2017) investigated colouring and the potential change in mindfulness levels. In their research, colouring significantly lowered anxiety symptoms when compared to logic puzzles (as a control condition), but mindfulness increased in both colouring and control conditions. With this, the interpretation of mindfulness having a mediating effect on the relationship between colouring and psychological benefits was weak because even though improvements were found in mindfulness in the colouring group, the same was true of the logic puzzle group. This suggests that mindfulness is not the driving factor behind the improvements in anxiety in the colouring group (Flett et al., 2017).

A study conducted by Mantzios and Giannou (2018a) obtained similar results, where mandala colouring did not increase mindfulness over the free drawing. However, a second experiment by Mantzios and Giannou (2018b) compared unguided and mindfulness-guided colouring against changes in state mindfulness and anxiety. Mindfulness meditation entails guidance and is one of the vital elements that enable novice meditators to enhance their practice (Kabat-Zinn, 1990). Results indicated that the mindfulness-guided mandala colouring group performed better in decreasing anxiety, but no change was observed in mindfulness Mantzios and Giannou (2018b). Additionally, some participants in the study stated that they did not like the voice guiding them while colouring. Their findings directed future researchers to develop instructions on how to colour mindfully, and ongoing guidance during colouring to assimilate the instructions that are usually given during mindfulness meditation as a method of increasing mindfulness through the use of colouring books (Mantzios & Giannou, 2018b).

## **Satisfaction with Life**

The benefits of engaging in art activities have become vastly evident through both clinical and arts-based research, and have shown significant improvements in the condition of individuals' life satisfaction (Braus & Morton, 2020). Life satisfaction can be defined as the degree to which a person positively evaluates the overall quality of their life as a whole. In other words, how much the person likes the life they lead (Veenhoven, 1996). The four main contributing factors to life satisfaction are life chances, course of events, flow of experience, and evaluation of life (Veenhoven, 1996). Art has been known to aid in the facilitation of a positive effect and life satisfaction (Meyer DeMott et al., 2017), however, no previous literature has been found in regards to satisfaction with life being included in an adult colouring study.

## **Burnout**

Burnout is physical, emotional, or mental exhaustion accompanied by decreased motivation, lowered performance, and negative attitudes toward oneself and others (American Psychological Association, 2008). Burnout results from performing at a high level until stress and tension, especially from extremely prolonged physical or mental exertion or an overburdening workload, take their toll (American Psychological Association, 2008). There are limited suggestions for effective interventions to support and enable people to avoid reaching burnout. However, several art therapists have documented how their work has prevented and reduced burnout by managing stress, fostering collegial connections, emphasizing self-care, and enabling the expression of grief (Brooks et al., 2010; Salzano et al., 2015). Additionally, burnout has not been measured in any existing studies regarding adult colouring.

With previous research supporting the efficacy of art therapy in reducing work-related stress and enhancing emotional health (Ho et al., 2019), the purpose of measuring burnout in the



current study is to determine if there is a relationship between the psychological benefits of adult colouring and a decrease in burnout symptoms or occurrences in participants. In addition, integrating mindfulness meditation with art activities has immense potential for self-care and collegial support (Ho et al., 2019) which may lead to a decrease in burnout.

### **Structure and the Desire for Control**

Previous studies have primarily investigated the effects of colouring compared to free drawing (Curry & Kasser, 2005; Van Der Venet & Serice, 2012). However, colouring and drawing differ in structure and are also different in other ways such as the degree of creativity involved, and the need for a certain skill level or sense of efficacy, and therefore are not directly comparable.

Eaton and Tieber (2017) were the first to compare unstructured versus structured colourings. In their study, participants in the unstructured group were allowed to colour an image using any colours they wanted, whereas participants in the structured group were instructed to copy the colours of a pre-coloured image. Results showed positive effects of colouring with greater anxiety reduction in the unstructured group compared to the structured group. Eaton and Tieber (2017) suggest that this may be because higher levels of structure require greater cognitive engagement and are therefore less conducive to facilitating positive outcomes.

The unstructured colourings intend to provide enough flexibility to promote engagement and enough structure to promote completion, they also allow for participants to be in control of the outcomes. However, the preference towards the level of structure involved in the colouring task will differ based on the individuals' desirability of control. Burger and Cooper (1979) defined desire for control as a personality trait in which individuals generally are motivated to feel as if they are in control of the events in their lives. A previous study's findings propose that

individuals with a greater need to exert control over events in their lives (i.e., higher desire of control) combined with a low level of control within a situation have a greater tendency to experience anxiety and are more likely to act to regain control and reduce their anxiety (Moulding & Kyrios, 2006). If this holds true, we can predict participants with a high desire of control to be more anxious during the structured colourings compared to the unstructured colourings. To date, much of the research on adult colouring has limited external validity. The current study will also be using structured and unstructured colourings but instead will be using a repeated measures method rather than comparing between groups. In addition, participants' desire for control will be measured before completing the tasks to determine if one's preference has any influence on the effect of both the unstructured and structured colourings.

### **A Process-Oriented**

Adult colouring has been proposed to improve some negative psychological outcomes yet the specific outcomes are not well documented. Previous studies' results have been inconsistent in various ways. Whether it be the level of structure involved in the colouring task (Eaton & Tieber, 2017), or whether the study included mindfulness techniques (Mantzios and Giannou, 2018b), the conflicting results have not provided solid evidence to support the effects of adult colouring on psychological outcomes. Since engaging in any form of art can have stress-reducing value, it is no wonder that these sophisticated templates for adult coloring have taken on such great popularity. Preprinted designs allow for structure that facilitates safety and minimizes the emotional risk which may explain their appeal to broader audiences (Carolan & Betts, 2015). The current study will include qualitative methods to gain insight into colourers experiences to better understand the outcomes of their psychological measures. A qualitative interview will take place for participants to report their experience with adult colouring and if the effects extend

beyond previous literature findings. In addition, the current study will also employ a quantitative aspect which consists of an online survey using established scales (Appendix A).

With several claims being made concerning the positive effects of colouring on well-being, it is still unclear whether its effects are supported by research. Furthermore, the current study will further our knowledge of various positive aspects of psychological measures that might be affected by adult colouring, in particular, the positive attributes of life satisfaction, mindfulness, and desire for control. Previous research is more focused on negative aspects of psychological measures (e.g. anxiety and depression) than positive aspects, and here we will add the idea of burnout.

### **The Present Study**

The purpose of the present study is to help understand the psychological effects of adult colouring. This mixed method study will examine the effects of adult colouring on psychological measures with both an online survey as well as in-person colouring sessions followed by qualitative interviews. Participants in the interview portion of the study will be able to provide detailed information on the combination of mindful breathing and colouring. More specifically, this study will focus on potential psychological outcomes of colouring, such as a reduction in anxiety, an ability to clear the mind, an improvement of one's judgement of self, a decrease in burnout, and a sense of control.

The current study implemented mindful breathing techniques at times in an attempt to increase the levels of mindfulness during colouring tasks without distracting participants throughout the entire session. With previous studies' participants disliking the guided voice meditation throughout their colouring (Mantzios and Giannou, 2018b), the current study will not

include a guided voice, but rather a pause in the colouring task for participants to focus on a breathing bubble for two minutes, and then return to their colouring. The premise of focused breathing is to have people become aware of the sensations of breathing while paying attention to experiences in the present moment (Arch & Craske, 2006). Thus, the goal of implementing mindful breathing is to increase participants level of mindfulness without causing too much of a distraction throughout the session.

Despite statements about the therapeutic value of colouring, there is limited empirical evidence that colouring pre-drawn images decreases stress and anxiety or elevates mood (Flett et al., 2017). Due to the findings of Eaton and Tieber's (2017) study, we hypothesize that anxiety levels will be lower during the unstructured colourings compared to the structured colouring. However, we predict that this may differ depending on one's desire for control level. For instance, we believe that participants with high levels of desire for control will benefit the most from the unstructured colourings, and participants with low levels of desire for control will benefit the most from the structured colourings. It is also predicted that the sessions including mindful breathing techniques will increase one's level of mindfulness more than the sessions without.

The current study will explore if the effects of colouring will extend beyond the simplistic art activity to potentially create greater satisfaction with life. By measuring the "flow of experience" aspect of life satisfaction, questions will focus on how participants feel about their lives while colouring to get a better understanding of their judgement on their overall life and if their judgement alters during a colouring task. The present study aims to explore if the effects of adult colouring align with other forms of art activities in the improvement of life satisfaction.

Specifically, the study will address the following research questions:

RQ1: Is either having greater experience with adult colouring, measuring in (a) years of forming the activity or (b) more hours spent per week associated with lower anxiety, lower burnout, higher mindfulness, or increased life satisfaction?

RQ2: How do anxiety, burnout, mindfulness, and life satisfaction correlate with each other and with desire for control among adult colourers?

RQ3: How do adult colourers' levels of anxiety, burnout, mindfulness, life satisfaction, and desire for control compare with introductory psychology students?

RQ4: Does qualitative interview data show any differences in participant reactions based on degree of structure in the colouring or use of mindful breathing while colouring?

### **Data Analysis Plan**

The goal of the current study was to investigate the effects of adult coloring on psychological measures including anxiety, desire for control, burnout, satisfaction with life, and mindfulness. The qualitative in-person colouring sessions altered from structured to unstructured colourings to determine if participants control preferences influence the type of design favoured. Mindful breathing techniques were implemented into the colouring sessions to explore if the aspect of mindfulness was being achieved while colouring. Participants time spent at work or school was measured as well as burnout to determine if adult colouring could act as a coping mechanism to decrease burnout. One-way Analysis of Variance (ANOVA) and correlations were conducted to determine results for the quantitative sample while a grounded theory methodology (GTM) was used to analyze the qualitative results.

GTM is the process of developing a theory 'grounded' in the words and thoughts of the participants (Rennie, 2000). The first step of GTM is 'coding' or gathering significant ideas or quotes from the data. Secondly, the researcher goes through a 'categorizing' phase, where they

examine their notes and pull quotes for common themes. For the current study, data analysis started while the interviews were being conducted, at this stage, the researcher started by transcribing the interviews. Once all the interviews had been transcribed, the researcher completed a 'coding' phase which included going through each interview and highlighting rich quotes that stood out. Next, the researcher completed the 'categorizing' phase which identified key themes from the quotes. Lastly, the researcher connected similar themes and grouped various themes into a larger overall category.

## **Method**

### **Participants**

Participants (N = 105) for the quantitative portion of the study (online survey) were members of adult colouring Facebook groups who have taken part in adult colouring within the past year. Of 105 participants, 94 (90%) identified as female, 7 (6%) identified as male, and 4 (4%) identified as non-binary. Ages of participants ranged from 19 years to 76 years with the overall mean age of participants being 34 years. 50 (48%) participants were Canadian, 40 (38%) were American, and 15 (14%) were of other nationality. Majority of participants (N = 90, 86%) ethnicity was Caucasian, while the other 14% (N = 15) were of other mixed ethnicities. As for experience with colouring, 29 (28%) participants stated they have been colouring for less than 1 year, 49 (46%) participants have been colouring for 1 to 5 years, and 27 (26%) participants have been involved with adult colouring for more than 5 years. Lastly, for participants frequency with colouring, 52 (50%) participants stated they colour 1 to 2 times per week, 38 (36%) participants colour 2 to 5 times per week, and 15 (14%) participants colour more than 6 times a week.

Participants (N = 4) for the qualitative portion of the study (colouring sessions) were undergraduate psychology students enrolled at Cape Breton University. Of 4 participants, 3 (75%) identified as female, and 1 (25%) identified as male. Ages of participants ranged from 22 years to 33 years with the overall mean age of participants being 25 years. 3 (75%) participants were domestic students while 1 (25%) participant was an international student. Majority of participants (N = 3, 75%) ethnicity was Caucasian, while the other 25% (N = 1) were of other ethnicity.

## Measures

### Demographic and Grouping Variables

Questions regarding the following demographic variables were included in the online survey: age, gender, ethnicity, and place of living. Grouping variables included questions surrounding participants' school enrollment, occupation status, time spent at school and work, and time perceived as "free time". Additionally, participants were asked how frequently they colour and for how long they have been colouring.

### Outcome Variables

**Anxiety.** A 6-item short form of the state scale of the Spielberger State-Trait Anxiety Inventory (Marteau & Bekker, 1992) was used to measure state anxiety. Participants were asked to rate the extent to which they currently feel calm, tense, upset, relaxed, content, and worried on a 7-point Likert scale. The positive-valenced items were reverse-scored. Internal reliability (Cronbach's alpha) was .89.

**Control.** A 6-item short form of the Desirability of Control Scale (Burger & Cooper, 1979) was used to measure desire of control. Participants were asked to rate the extent to which they currently feel about their overall desire for control on a 4-point Likert scale. Internal reliability (Cronbach's alpha) was .69.

**Mindfulness.** An 8-point short form of the Relaxation-Mindfulness Scale (López-González et al., 2017) was used to measure mindfulness. Participants were asked to rate the extent to which they currently feel relaxed, attentive, clear-minded, concentrated, focused, unoccupied, energetic, and pressured on a 4-point Likert scale. The positive-valenced items were reverse-scored. Internal reliability (Cronbach's alpha) was .79.

**Life Satisfaction.** A 5-item short form of the Satisfaction with Life Scale (Diener et al., 1985) was used to measure life satisfaction. Participants were asked to rate the extent to which



they currently feel about their overall satisfaction with life on a 7-point Likert scale. Internal reliability (Cronbach's alpha) was .87

***Burnout.*** A 5-item short form of the Maslach Burnout Inventory (Maslach et al., 1997) was used to measure burnout. Participants were asked to rate the extent to which they currently feel emotionally drained, used up, tired, strained, and burned out on a 7-point Likert scale. Internal reliability (Cronbach's alpha) was .93.

## **Procedure**

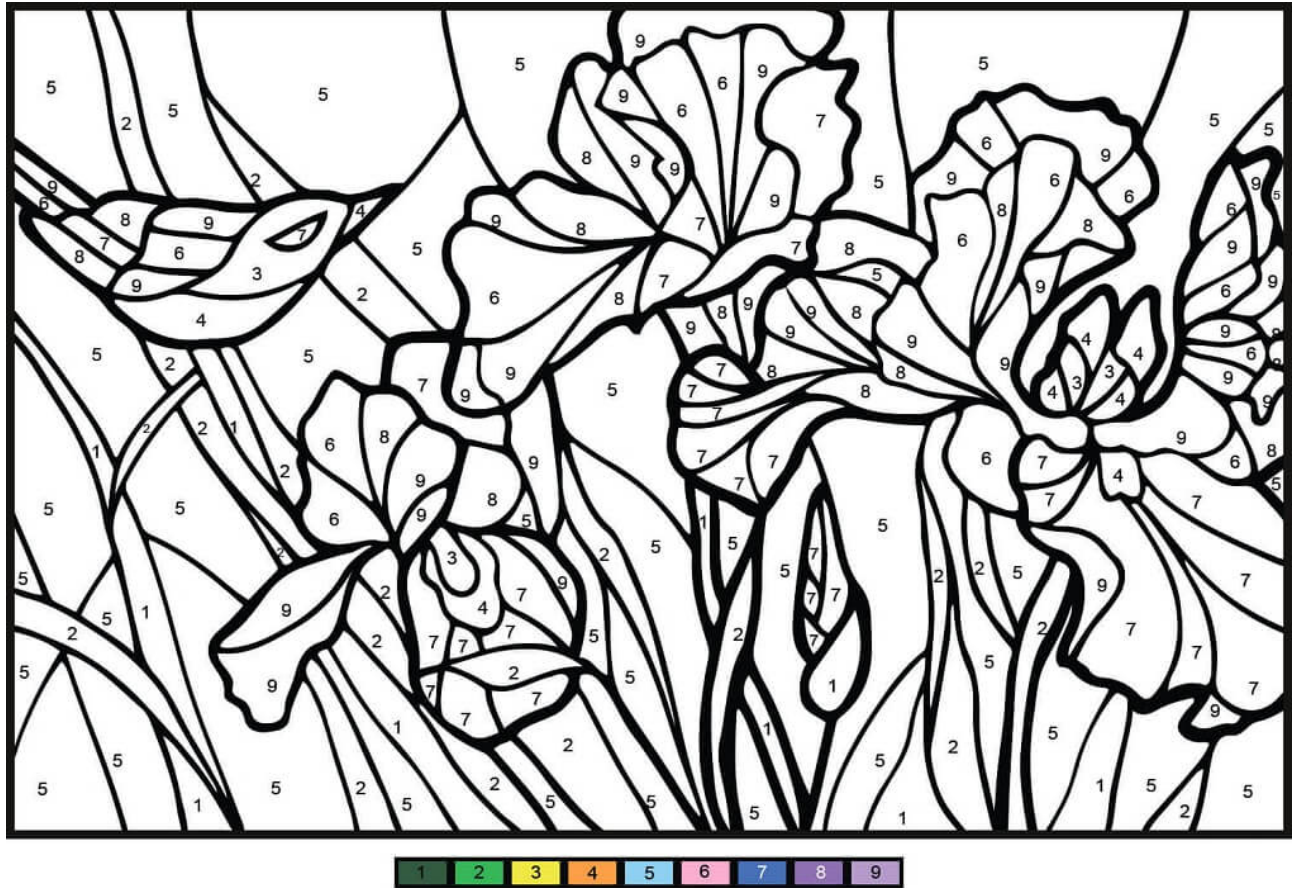
***Quantitative.*** An online survey containing 40 items from the above scales and demographic questions was posted to adult colouring Facebook groups. The 20-minute survey was conducted through the online platform SurveyMonkey. Before accessing the survey, participants were provided with informed consent (Appendix C) in which they would confirm or deny agreement to participate. Participants could complete the survey at a time and location of their choosing.

***Qualitative.*** Participants completed four in-person colouring sessions at Cape Breton University with each session taking approximately one hour. Before participating in the colouring sessions, participants were provided with informed consent (Appendix D) in which they would confirm or deny agreement to participate. The study took place in four sessions with all colourings being an intermediate level. In the first session, participants were instructed to colour an unstructured image with markers, crayons, and colour pencils provided in whichever way they desire (Figure 2). In the second session, participants were instructed to colour a structured image by following a colour guide and copying the colours of a preexisting image with the colouring equipment provided (Figure 3). The third session replicated the first session (unstructured), except this time at the beginning of the session, twenty minutes into the session,

and again at forty minutes into the session, participants stopped colouring and completed a two-minute mindful breathing task. The mindful breathing task included a guided breathing bubble to regulate one's breathing and to increase mindfulness while focusing on the breath. The fourth and final session replicated the second session (structured) while also completing the same mindful breathing task at the same times as session three.



**Figure 2:** *Unstructured Colouring Used in Session 1*



**Figure 3:** *Structured Colouring Used in Session 2*

Once all four colouring sessions were completed, participants had the opportunity to take part in a semi-structured qualitative interview to provide detailed information regarding the colouring sessions. The interview included questions about demographic information, school/work load, satisfaction with life, anxiety, burnout, desire for control, and mindfulness (Appendix B). Participants received the interview protocol a week before their interview took place to help them make an informed decision about whether they feel comfortable participating in the interview portion of the study. The interview gave participants the ability to voice their opinions and provide detailed information regarding the colouring sessions, the mindful breathing tasks, and their preference for the degree of structure involved in the colouring tasks.

Additionally, participants completed the online survey after the colouring sessions to compare their means of scores to the quantitative group.

## Results

### Quantitative Analysis

RQ1 tests whether prior colouring experience and frequency of colouring affect the measures included in the online survey. A one-way MANOVA was conducted with the independent variable being participants weekly time spent colouring and the dependent variables were the four psychological measures (anxiety, satisfaction with life, burnout, mindfulness). No significant differences were found among the groups based on experience ( $F(2, 102) = .812, p = .702, \eta_p^2 = .992$ ), or hours of engagement with colouring ( $F(2, 102) = .749, p = .777, \eta_p^2 = .991$ ); For completeness, the means are presented in Tables 1 and 2 respectively.

**Table 1**

*Descriptive Statistics for Colouring Experience*

Measures	< 1 year			1-5 years			5+ years		
	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>
Anxiety	2.55	.60	27	2.43	.78	47	2.70	.60	31
Mindfulness	2.11	.45	27	2.18	.47	47	2.12	.43	31
Burnout	4.93	1.62	27	4.73	1.73	47	5.08	1.54	31
Life Satisfaction	4.20	1.46	27	4.14	1.27	47	3.61	1.51	31

**Table 2***Descriptive Statistics for Hours of Engagement with Colouring Weekly*

Measures	1-2 times			2-5 times			6+ times		
	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>
Anxiety	2.55	.73	49	2.64	.58	39	2.30	.76	17
Mindfulness	2.16	.47	49	2.06	.39	39	2.29	.47	17
Burnout	5.03	1.50	49	5.11	1.48	39	3.94	2.11	17
Life Satisfaction	2.25	1.42	49	3.88	1.31	39	3.58	1.50	17

**Correlations**

The second research question of the study asks what are the correlations among the 5 scales for adult colourers. Correlations were conducted to determine the relationship between the psychological factors measured in the online survey throughout the group of adult colourers.

**Table 3***Descriptive Statistics and Correlations for Study Variables*

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Life Satisfaction	105	4.00	1.40	-				
2. Burnout	105	4.88	1.64	-.34**	-			
3. Anxiety	105	2.54	.69	-.53**	.47**	-		
4. Desire for Control	105	2.93	.55	.11	-.07	.02	-	
5. Mindfulness	105	2.15	.45	.41**	-.47**	-.57**	.10	-

\*\* $p < .01$

As shown in the table above, desire of control was the one variable that did not significantly correlate with the others. Significant positive correlations were found between life satisfaction and mindfulness, as well as between burnout and anxiety. On the other hand, significant negative correlations exist between life satisfaction and burnout, life satisfaction and anxiety, burnout and mindfulness, and lastly the strongest negative correlation exists between anxiety and mindfulness.

### **Comparison Group**

RQ3 proposed using a comparison group to examine the mean scores of adult colourers. A total of 55 introductory psychology students were recruited to build a comparison or control group. The control group completed the same online questionnaire but rather than answering the questions in regards to adult colouring, they were asked to complete the questionnaire based on how their favourite recreational activity or hobby influences their lives. Independent t-tests were conducted on each of the five psychological measures; no significant differences were found between groups (Table 4)

**Table 4***Mean Comparisons Between Colouring Group and Control Group*

Measures	Adult Colourers		Psychology Students		<i>t</i>	<i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Life Satisfaction	4.00	1.40	3.95	1.45	.195	.884	1.42
Burnout	4.88	1.64	4.99	1.62	-.370	.788	1.63
Anxiety	2.54	.69	2.59	.67	-.423	.926	.68
Desire for Control	2.92	.55	2.89	.49	.426	.465	.53
Mindfulness	2.14	.45	2.04	.56	1.25	.090	.49
Age	34.67	13.69	19.91	2.44	7.85	< .001	11.23

The quantitative data analysis showed that greater levels of experience and engagement with adult colouring did not significantly affect levels of anxiety, burnout, mindfulness, life satisfaction, or desire for control. For comparison, the adult colourers were significantly older than the university students but otherwise similar levels of the five variables in Table 4. Non-significant results can be difficult to interpret. To examine the effects of adult colouring, a quasi-experimental approach to qualitative analysis will be used.

### **Qualitative Analysis**

The qualitative analyses addressed issues related to preference for structured versus unstructured colouring and the addition of mindful breathing. In addition, questions related to anxiety, burnout, and life satisfaction were examined. After completing a GTM, four common themes emerged from the four transcriptions. These themes were: (1) decreased anxiety, (2) alignment of control preferences, (3) increased mindfulness, and (4) decreased burnout.



Although the themes emerged independently, they are interconnected in a sense that if one theme did not exist, the others may not have arose. Each theme stands on its own, however, themes one, three, and four have been noted to lead to the development of one another throughout the results of the present study.

### **Decreased Anxiety**

Previous literature indicates adult colouring can reduce anxiety (Curry & Kasser, 2005; Babouchkina & Robbins, 2015). Although there were no significant differences found in the present quantitative data, decreased anxiety was one of the common themes found throughout the qualitative interviews. Throughout the qualitative interviews, participants were able to voice their experience with colouring and how they felt both during and after the sessions. All (N = 4) participants who completed the qualitative portion of the study reported that the colouring sessions decreased their anxiety. Participants one and three commented on the colouring sessions playing a role in decreasing their anxiety as follows:

“The colouring sessions 100 percent decreased my anxiety. It’s a stressful time in the semester so during the hour that we coloured, my anxiety was definitely lower.” – *Participant 1*

“Colouring is so good when it comes to decreasing anxiety. I can get really anxious and I feel like it's a distraction in the most calming way.” – *Participant 3*

With all the unknowns of what adult colouring has to offer, results of the current study supports previous studies in regard to decreasing anxiety.

### **Alignment of Control Preferences**

After completing two structured and two unstructured colourings, participants were interviewed and asked which degree of structure they enjoyed most and why. Even though desire

of control did not significantly correlate with any of the other variables above, control did emerge as a theme in the qualitative interviews. All four interviewee participants preferred colouring design aligned with their everyday life control preferences. For instance, the three participants who enjoyed the structured sessions the most had a lower mean on desire for control ( $M = 2.74$ ) and reported that they considered themselves to be followers rather than leaders. The following quote from participant two provides insight to why one with a lower desire for control may prefer the unstructured colouring designs.

“I liked the structured colourings better because I found it so hard to tell with the unstructured ones what colours I wanted to use and where I wanted to use them. In my everyday life, I like having a little bit of guidance, but I don't like to be fully independent. The colour key included in the structured colourings decreased the pressure and added a lot of relaxation for me.” - *Participant 2*

In contrast, the one participant who enjoyed the unstructured sessions the most scored 3.83 on the desire for control scale and reported themselves to be a leader rather than a follower. The following quote from this participant explains why someone with a high desire for control may prefer the structured colourings designs.

“I enjoyed the unstructured coloring's the most because I liked having control over what colours I got to put up where. I hate being told what to do and I usually naturally take the lead on things so that's why I wasn't a fan of the structured colourings.” – *Participant 3*

Despite not correlating with any of the other variables in the survey data, desire for control appeared to differentiate interview participants and aligned with their everyday control preferences. Therefore, by measuring one's desire for control and altering the degree of structure throughout the colouring sessions, it made a notable impact on the results of the current study.

### **Increased Mindfulness**

After completing four colouring sessions, two of which included mindful breathing techniques, participants were interviewed and asked if the mindful breathing increased the

positive effects of colouring. The third common theme to arise from the qualitative interviews was increased mindfulness. The three participants who reported an increase of mindfulness had higher mindfulness scores ( $M = 2.67$ ) while they also reported an increase of positive effects due to the addition of the mindful breathing techniques. Participants two and three offered their explanations to how the mindful breathing techniques influenced them in the following quotes:

“In the sessions that included the breathing techniques, I felt way more relaxed through the whole day.” – *Participant 3*

“Sometimes it's hard to just take a step back and focus on inhaling and exhaling, but the mindful breathing techniques were definitely helpful in doing so, and then adding the colouring to it, which is already relaxing, definitely increased my relaxation and mindfulness.” – *Participant 2*

On the other hand, one participant reported a disliking of the mindful breathing techniques and scored lower on the mindfulness scale ( $M = 2.0$ ). The following quote from participant four describes why they were unable to achieve a sense of mindfulness:

“I’ve never practiced mindfulness before, so that might be why I didn’t enjoy the breathing techniques. I felt more pressure to focus on my breathing and for some reason that stressed me out. I also found it distracted me and took away from focusing on the colouring.” – *Participant 4*

Participant 4 lacked experience with mindful breathing which might provide distraction rather than relaxation, defeating the purpose of introducing the breathing exercise into a colouring activity.

### **Decreased Burnout**

To provide further evidence that adult colouring could act as a coping mechanism for decreasing burnout, qualitative participants were asked if the colouring sessions assisted in decreasing their burnout in any way. Three participants reported a decrease in burnout during

their time spent colouring. Participants three and four express in the quotes below how they considered the colouring sessions a ‘break’ which essentially played a role in decreasing their burnout.

“Allowing myself to take the time to colour even if its for ten minutes is such a nice break. It gives me a chance to breath and collect myself so it I would say it helps decreasing burnout.” – *Participant 3*

“Participating in the colouring sessions allowed me to take a break from school work, which I should really do more often. I feel like everyone's just at that point where we just want to finish the semester so, for the hour we coloured and even afterwards, I definitely felt a decrease in burnout.” – *Participant 4*

Though adult colouring has not yet been proven to be an effective intervention for decreasing burnout, it allows participants to take a break from their stress and enjoy the present moment rather than worrying about work or school.

## **Discussion**

The purpose of the present study was to determine the effects of adult coloring activities, using unstructured and structured coloring designs and mindful breathing, on psychological factors including satisfaction with life, burnout, desire for control, anxiety, and mindfulness. With the majority of adult colouring research being conducted quantitatively, the present study was able to dive deeper into the minds of adult colourers by adding qualitative research. With the quantitative results providing limited evidence to the effects of adult colouring, the qualitative portion drew upon the experience of adult colouring while providing valuable insight on the overall effects adult colouring has to offer.

### **Overall Effects**

Contrary to the initial prediction, the effects of adult colouring did not significantly differ with greater experience or frequency with colouring. As statistical analyses were conducted, there were no significant differences found throughout the colouring group on any demographic variable or psychological measure. In attempt to compare adult colourers mean scores to a control group, 55 first year psychology students at Cape Breton University completed the online survey but instead of considering how colouring makes them feel, they were asked to complete the survey based on how their favourite recreational activity or hobby makes them feel. Surprisingly, there were no significant differences found between the colouring group and control group which leads to additional research being needed to compare the effects of colouring to other recreational activities.

In the quasi-experimental situation used in the present study, where naturally occurring groups are tested, it is challenging to construct an appropriate comparison or control group. A control group might have 'non-adult colourers' who partake in an activity similar to colouring.

As mentioned previously, colouring is an activity that promotes engagement and concentration but does not require excessive skills or focus, it is not an activity that one necessarily practices to become better at but is done merely for enjoyment purposes. Having said that, numerous activities similar to colouring may be done for relaxation, self-care, or even mind-expansion purposes (i.e., jigsaw puzzles, sudoku, photography), rather than activities that have a competitive edge to them (i.e., sports, CrossFit, video games). Any of these activities might affect the quantitative variables included in this study (e.g., anxiety, mindfulness). Ideally, an experimental approach would include people who are interested in adult colouring but who have no experience with it. Participants then could be randomly assigned to participate in colouring or not, and then be tested over time as they engage in the activity (or not). Given the ease of use and ubiquity of an activity such as adult colouring, creating an experimental control group is challenging.

Despite there being research on the effects of adult colouring, a gap in the literature exists between the potential of adult colouring being a coping mechanism for dealing with burnout, specifically academic burnout. Schultz et al. (2017) brings attention to the power that exists behind allowing individuals the time and space to “not worry” where they are able to sit in a quiet space, with similar others, and engage in an activity that has minimal negative consequences or further ramifications. By participating in the current study’s colouring sessions, participants were able to take a break from school work and let their mind focus on a distressing activity in a comfortable group setting. Three participants reported a decrease in burnout after completing the colouring sessions and one stated they consider colouring to be the best way to take a break from school work. Although further research is needed, by increasing mindfulness and decreasing anxiety, adult colouring has the potential to work as a coping strategy for dealing with burnout.

## **Control Preferences**

In the light of previous literature, various studies have found the effects of colouring to differ based on the degree of structure provided in the colouring task (e.g., Curry & Kasser, 2005; Eaton & Tieber, 2017). In the current study, the unstructured colourings were intended to provide enough flexibility to promote engagement and enough structure so as not to evoke anxiety, while the structured colourings were intended to provide guidance and lessen the amount of choice participants had over their colouring. In a study by Eaton and Tieber (2017), results showed that participants who completed unstructured colourings reported a marginally greater decrease in anxiety than those in the structured colouring group. Alternatively, the current study's results showed that participants' preference to the colouring design was based on their everyday control preferences indicating that the degree of structure in the colouring task is important and has the potential to influence the effects of colouring. The participants who favoured the unstructured colourings identified themselves as followers who like guidance and direction in their everyday lives, while the participant who favoured the structured colouring identified themselves as a leader who likes to be independent and to be in control of things.

In a study by Curry and Kasser (2005), findings predict that structured colourings induce a meditative state that essentially benefits individuals suffering from anxiety. The results from the current study align with Curry and Kasser's (2005) findings as majority of participants from the current study enjoyed the structured colourings the most while also stating that the unstructured colourings induced stress as participants were undecided of what colours to use and where. These findings lead to the claim that the degree of structure involved in a colouring task matter. If someone were to consider themselves a leader, they may prefer an unstructured colouring design where they are in charge of the outcome. On the other hand, if someone were to consider themselves a follower, that person may prefer a structured colouring design that

provides guidance and instruction. Either way, selecting the appropriate colouring design based on one's control preference could increase the beneficial effects of one's colouring experience.

### **Mindfulness Contributions**

Prior work by Curry and Kasser (2005) and Van Der Venet and Serice (2012) support the claim that adult coloring books provide a quality of structure and direction that specifically works to induce attention and awareness leading to a reduction in anxiety and a possible increase in mindfulness. Results of the present study support these findings as three participants who completed the colouring sessions reported an increase of mindfulness while colouring. Additionally, those three participants reported their favourite colouring session to be the ones that included the mindful breathing techniques. The one participant who did not enjoy the mindful breathing techniques stated that they have never practiced mindfulness before, and they found it distracting. This aligns with previous results as a study conducted by Mantzios and Giannou (2018b) found that participants who were unfamiliar with the practice of mindfulness found the guided voice meditation distracting while they coloured. It is possible that adding meditative effects when colouring may only increase mindfulness for those who are familiar and comfortable with the practice itself, yet further research is needed to support this. Additional research concerning the 'perfect' amount of meditation to add to colouring sessions is also needed as the ideal amount will not distract participants but increase their levels of mindfulness without taking away from the colouring task.

Belchamber (1997) defines "colouring therapy" as a combination of art therapy elements and meditation. The third and fourth colouring sessions in the present study included the mindful breathing bubble in which participants took 2 minutes away from colouring to bring awareness to their breath. The basic idea of colouring therapy is that when individuals colour, they are



provided an opportunity to suspend their “inner dialogue” and to deeply engage in an activity that removes them from the flow of negative thoughts and emotions that can sometimes dominate their lives (Belchamber, 1997). Although, to our knowledge, colouring therapy has not been empirically tested or widely discussed in previous literature, other research suggests that it may indeed hold true as an effective tool for alleviating anxiety, as it combines elements of art therapy (i.e., colouring) and meditation (i.e., deeply focusing on an experience that is calming).

With over 40 studies having been conducted to examine the use of meditation on the reduction of general anxiety (Taylor, 2002), there is speculation surrounding the effects of adult colouring in concern to reducing anxiety and increasing mindfulness. Despite some studies showing no reduction in anxiety through meditation, the strongest correlation found in the current study was with mindfulness and anxiety ( $r = -.57$ ). In a study by Brown and Ryan (2003), results show that people who cultivate “mindfulness,” or awareness and attentiveness to the present moment, also experience lower levels of anxiety. In accordance, participants in the current study who have high levels of mindfulness are also experiencing low levels of anxiety, supporting the claim that practicing mindfulness can be beneficial for anxiety.

## **Limitations**

The study findings were limited by several factors. Firstly, due to limited time, the recruitment process was cut short which resulted in a smaller number of participants than expected. A second limitation that occurred due to insufficient time was forming an appropriate control group. The control group consisted of introductory psychology students who were rewarded a bonus point for completing the study, yet this group is not comparable to the colourers recruited through Facebook, if more time was available, a second round of recruitment could have been done to involve people who participate in activities similar to adult colouring.

Further limitations exist throughout the study as the online survey relied on self-reporting measures which are subject to various flaws and response biases. Additionally, with the majority of adult colouring book consumers being female, the sample consisted of mostly Caucasian females; hence, the results are not necessarily generalizable to other genders or ethnicities. Lastly, by using the mindful breathing bubble during the colouring sessions, it is not possible to conclude whether it was the colouring, the mindful breathing, or a combination of both that led to the self-reported anxiety reduction.

### **Suggestions for Future Studies**

As the current study was unable to provide statistical evidence that adult colouring is beneficial to psychological measures, further research into adult colouring is needed to better understand the effects and the benefits that come along with it. As the results in the current study showed the effects of colouring to be effective immediately, future studies could involve participants who have never completed an adult colouring to assess their psychological measures pre-colouring and post-colouring to determine if the effects are truly immediate. Secondly, as previously mentioned, it is recommended that future studies recruit a more fitting control group to compare the effects of adult colouring to activities with similar purposes. Lastly, with the current study relying mainly on self-reporting measures, it would be interesting for future research to assess psychophysiological indices (e.g., heart-rate variability, electrodermal activity) before, during, and after colouring to determine whether participants undergo calming or arousing sensations throughout the colouring process.

## **Conclusion**

In conclusion, present findings attempted to demonstrate the effects of adult colouring on psychological measures while providing evidence that colouring can be more than just a childish pastime. By alternating from unstructured to structured colouring designs, and by implementing mindful breathing techniques, participants were able to experience and determine preference towards different degrees of structure and the practice of mindfulness. Although the quantitative results were non-significant, the qualitative findings shed light onto the potential benefits adult colouring has to offer throughout the four common themes which included decreased anxiety, alignment of control preferences, increased mindfulness, and decreased burnout. Adult colouring has much more to offer beyond an enjoyable experience, it has the potential to decrease anxiety, practice a mindful state, and overall improve psychological health and well-being.

## Appendix A: Online Questionnaire

NOTE: The scales below will be formatted using the *SurveyMonkey* platform which provides a professional-looking online survey. The sections will be named using a short form of the scale name (shown in the parentheses below)

### Demographics

1. Age: \_\_\_\_\_
2. Gender: \_\_\_\_\_
3. Ethnicity: White – Black – Asian – Hispanic – Other
4. In which country do you currently reside: \_\_\_\_\_

### School/Workload

1. Are you currently enrolled in university or college?
  - Yes/No
2. Do you currently have a job outside the home?
  - Yes/No
3. In a typical week, how many hours do you spend at or doing university/college/work combined?
  - Less than 5
  - 5-10
  - 10-20
  - 20-30
  - 30-40
  - 50+
4. How many hours do you perceive you have as “free time” per week?
  - Less than 5
  - 5-10
  - 10-20
  - 20-30
  - 30-40
  - 50+
5. How many times do you color per week?
  - 1-2
  - 3-5
  - 6-8
  - 8+
6. How long have you been coloring?
  - Less than one month
  - 1-6 months
  - 6 months – 1 year
  - 1-2 years
  - 3-5 years
  - 5-10 years
  - More than 10 years

### Section 1: Satisfaction with Life Scale (Life Satisfaction)

Below are five statements that you may agree or disagree with. Using the 1 - 7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your response.

1	2	3	4	5	6	7
Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree

1. In most ways my life is close to my ideal.
2. The conditions of my life are excellent.
3. I am satisfied with my life.
4. So far I have gotten the important things I want in life.
5. If I could live my life over, I would change almost nothing.

### Section 2: State-Trait Anxiety Inventory (Typical Emotions)

A number of statements which people have used to describe themselves are given below. Read each statement and select the most appropriate number to indicate how you feel right now, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answers which most seems to describe your present feelings best.

1 - Not at all; 2 – Somewhat; 3 - Moderately so; 4 - Very much so

1. I feel calm
2. I am tense
3. I feel upset
4. I am relaxed
5. I feel content
6. I am worried

### Section 3: Maslach Burnout Inventory-Short Form (Burnout)

A number of statements which people have used to describe themselves are given below. Read each statement and select the most appropriate number to indicate how often you feel this way. There are no right or wrong answers. Do not spend too much time on any one statement but give the answers which most seems to describe your present feelings best.

1	2	3	4	5	6	7
Never	A few times per year	Once a month	A few times per month	Once a week	A few times per week	Everyday

1. I feel emotionally drained by my studies/work.
2. I feel used up at the end of a day at university/work.
3. I feel tired when I get up in the morning and I have to face another day at the university/work.
4. Studying or attending a class/working is really strain for me.
5. I feel burned out from my studies/work.

#### **Section 4: Desirability of Control Scale-Short Form (Control)**

A number of statements which people have used to describe themselves are given below. Read each statement and select the most appropriate number to indicate how you feel right now, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answers which most seems to describe your present feelings best.

1 - Not at all; 2 – Somewhat; 3 - Moderately so; 4 - Very much so

1. I prefer a job where I have a lot of control over what I do and when I do it.
2. I enjoy being able to influence the actions of others.
3. I enjoy making my own decisions.
4. I enjoy having control over my own destiny.
5. I consider myself to be generally more capable of handling situations than others are.
6. I'd rather run my own business and make my own mistakes than listen to someone else's orders.

#### **Section 5: Relaxation-Mindfulness Scale-Short Form (Relaxation)**

A number of statements which people have used to describe themselves are given below. Read each statement and select the most appropriate number to indicate how often you feel this way. There are no right or wrong answers. Do not spend too much time on any one statement but give the answers which most seems to describe your present feelings best.

1 – Never; 2 – Occasionally; 3 – Often; 4 - Always

1. I think that learning how to relax is difficult and takes a lot of time.
2. I find it difficult to pay attention to one thing at a time
3. My mind is fresh clear
4. I sense everything I do and I concentrate on it
5. I know how to enjoy what I have to do at every moment
6. In the classroom or at work my mind is unoccupied

7. I feel like I have a lot of energy
8. Usually I do things without pressure and without getting nervous

**Section 6: Additional Comments**

The researchers involved are very much interested in your observations about how doing adult coloring affects you, including your mindfulness and emotional state (e.g., anxiety, relaxation, burnout, satisfaction, and so on). There are no right or wrong answers, your thoughts on doing coloring as an activity. We would appreciate your comments on this specific question: How would you say coloring affects you and why does it affect you in that way?

## Appendix B: Interview Protocol

1. **Intro Question:** Please start by introducing yourself and telling me a little bit about you. Some things you might mention include: your preferred name, pronouns, age, ethnicity, and what country are you from.
2. **School/Work:** Are you a full time student at Cape Breton University? What year are you in at CBU? How much time do you spend on school work outside of the classroom on average per week? Do you have a current job? If so, how many hours do you work per week?
3. **Free Time:** How many hours on average per week do you consider “free time”? What are some activities you like to do during your free time? During your free time, how much time per week do you spend coloring?
4. **Favorite Session:** Out of the four coloring sessions you completed, which one did you enjoy the most? Can you elaborate why you enjoyed this session the most? How did you feel during this session? How did you feel after this session?
5. **Least Favorite Session:** Out of the four coloring sessions you completed, which one did you enjoy the least? Can you elaborate why you enjoyed this session the least? How did you feel during this session? How did you feel after this session?
6. **Structured:** Tell me about what you were thinking and feeling as you completed the structured colorings. How did you feel about not having control over the coloring?
7. **Unstructured:** Tell me about what you were thinking and feeling as you completed the unstructured colorings. How did you feel about having control over the coloring?
8. **Mindfulness:** Did the breathing techniques change the experience of coloring? If so, explain how.
9. **Take Away:** Do you feel that any of the coloring sessions benefitted yourself in any of the following ways, if so please provide reason:
  - A decrease in anxiety
  - An increase of satisfaction of your life
  - A decrease in burnout
  - A sense of control
  - An increase of mindfulness or relaxation
10. **Suggestions:** Is there anything we did not cover in this interview that you would like to add?



## **Appendix C: Online Consent Form**

### **Project Title: Investigating the Psychological Effects of Adult Coloring using a Mixed Methods Approach**

#### **Researcher**

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#### **What is the purpose of this study?**

The purpose of the present study may help understand the effects of adult coloring on psychological measures. Several claims have been made concerning the positive effects of coloring on well-being yet it is still unclear whether its effects are supported by research. The current study will further our knowledge on various positive aspects of psychological measures effected by adult coloring such as satisfaction with life, mindfulness. This study is for the completion of my honours thesis project for my Bachelor of Science (Honours) degree at Cape Breton University.

#### **What will happen during this study?**

For this study, you will be asked to complete a brief 15-20 minute online survey that can be completed at a time and location of your choosing. This survey includes questions about demographic information, school/work load, satisfaction with life, anxiety, burnout, desire of control, and mindfulness.

#### **Confidentiality**

All information collected for this study is confidential. All data collected will be stored on a personal, password protected computer and password-protected USB drive. Data recovered through Survey Monkey is stored on Canadian soil through Cape Breton University servers. Access to this information will only be granted to the researchers listed above. Data, when reported, will be in aggregate form. No personally identifiable information will be collected, and no information will be given out at any time. We recommend completing this survey in a private and safe place where you do not have to worry about other people observing your responses.

#### **Right to Withdraw**

Participation is voluntary. You can choose to end your participation in this study at any time without having to provide a reason and without penalty. If you decide to end the survey early, your data will be automatically discarded and not accessed by researchers.

### **What are the risks/discomforts of participating in this study?**

The only potential cause for discomfort in this study are questions surrounding anxiety and burnout. You may find questions difficult if you are currently struggling with your ability to cope with anxiety and burnout. Please refer to the bottom of the consent form for a list of mental health resources. If there is a specific question that you have difficulty answering, you may skip this question and continue the survey with no consequence. If you have difficulty answering these questions, you may stop at any time and discard your answers.

### **What are the benefits of participating in this study?**

The purpose of the present study is to further understand the effects of adult coloring on individual's psychological measures. It is beneficial to explore how adult coloring may impact psychological measures in a positive way.

### **Study Follow-up**

If participants would like to learn about the results of the study, they can contact the researcher in April through phone or email. Further, a summary of the results will be posted on the CBU Psychology Department website in April 2023. The Psychology Department website can be accessed by following this link: <https://cbucommons.ca/psychology/>

### **Informed Consent**

(Check or X)

☐ **YES**, I have been informed of the purpose of this research and agree to participate in this study.

☐ **NO**, I have not been adequately informed of the purpose of this research and refuse to participate in this study.

If you have any questions that have not been answered satisfactorily by the researcher(s) or supervisor(s) named above, please contact:

- Co-chairs of the Research Ethics Board at CBU, Tracey Harris ([tracey\\_harris@cbu.ca](mailto:tracey_harris@cbu.ca)), or Bishakha Mazumdar ([bishakha\\_mazumdar@cbu.ca](mailto:bishakha_mazumdar@cbu.ca))
- REB Administrator, Jared Walters at (902) 563-3196, email: [ethics@cbu.ca](mailto:ethics@cbu.ca)

*Note: Participants are to be informed of the researcher(s) "Duty to disclose" suspected abuse or neglect of a child or an adult in need of protection. Under section 23(1), Nova Scotia Children and their Family, The Protection of Children and Adoption (1990) states that "Every person who has information, whether it is confidential or privileged, indicating that a child is in need of protective services shall forthwith report that information to an agency." Agency is defined as "an agency continued by or established and incorporated pursuant to the act..." that is, Nova Scotia Department of Community Service Child Welfare. This may vary across provinces within Canada and different regions outside of Canada.*

Mental Health Services available to Participants:

**Good2Talk:** 1-833-292-3698 24 hours a day, 7 days a week service for students

**7 Cups:** [www.7cups.com](http://www.7cups.com) - Free online peer support service for students

**Kognito:** <https://healthymindsns.kognito.com> – free health simulation to assist with identifying students in psychological distress, how to approach to discuss concerns, and make referrals

**TAO (Therapy Assistance Online)** <https://www.taoconnect.org/mindfulness-exercise/> – An online mental health library with interactive modules to help you understand and manage how you feel, think and act. TAO recently created mindfulness video exercises to help students cope with their feelings.

**Mindfulness in Nova Scotia (MindWell-U)** <https://app.mindwellu.com/novascotia> – MindWell-U is a free 30-day mindfulness challenge. This online tool is only five minutes per day and helps lower stress and improve wellbeing.

**ICAN (I Conquer Anxiety and Nervousness):**

<https://login.strongestfamilies.com/folder/1963/> – ICAN Anxiety Program is available to those 18 years and older who are experiencing symptoms of anxiety and depression. This program includes online tools for tracking and managing symptoms, and weekly phone calls with an anxiety coach.

**Willow House Crisis Line:** 1-866-634-4198, service for women and children experiencing violence (e.g., domestic violence, sexual assault).

## **Appendix D: In-Person Consent Form**

### **Project Title: Investigating the Psychological Effects of Adult Coloring using a Mixed Methods Approach**

#### **Researcher**

Anna George  
Bachelor of Science Psychology Honours Student  
Cape Breton University  
(902) 565-4338  
[cbu18nnb@cbu.ca](mailto:cbu18nnb@cbu.ca)

#### **Supervisor**

Peter MacIntyre  
Psychology Professor  
Psychology Department  
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(902) 563-1315  
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#### **What is the purpose of this study?**

The purpose of the present study may help understand the effects of adult coloring on psychological measures. Several claims have been made concerning the positive effects of coloring on well-being yet it is still unclear whether its effects are supported by research. The current study will further our knowledge on various positive aspects of psychological measures effected by adult coloring such as satisfaction with life, mindfulness. This study is for the completion of my honours thesis project for my Bachelor of Science (Honours) degree at Cape Breton University.

#### **What will happen during this study?**

For this study, you will complete four (one-hour) coloring sessions at Cape Breton University, two of which will include mindful breathing. A semi-structured qualitative interview will take place after the fourth coloring session which should take about 30-45 minutes. The interview will include questions about demographic information, school/work load, satisfaction with life, anxiety, burnout, desire of control, and mindfulness.

#### **Confidentiality**

All information collected for this study is confidential. All data collected will be stored on a personal, password protected computer and password-protected USB drive. Access to this information will only be granted to the researchers listed above. With your permission, this interview will be recorded to ensure that your voice is captured accurately. This audio recording will be done through a local password-protected recording device. If you decide to participate in an interview, please remember that there are no wrong answers; we want your honest opinion. Your participation in this study is 100% voluntary and completely confidential. Only the researchers and supervising professor named above will have access to the audio recordings and transcripts. Once the audio recordings have been transcribed, they will be erased, and no names will be recorded on the transcripts. When reporting the study results, some direct quotes from the

interviews will be shared with others but all identifying information will have been removed in order to protect your privacy and confidentiality.

### **Right to Withdraw**

Participation is voluntary. You can choose to end your participation in this study at any time without having to provide a reason and without penalty. During the interview, you can tell me to turn off the recorder at any time. If you believe that the subject matter would cause you any distress or discomfort, you can stop the interview early, decline to answer any question, or decline to participate in the study altogether.

### **What are the risks/discomforts of participating in this study?**

The only potential cause for discomfort in this study are questions surrounding anxiety and burnout. You may find questions difficult if you are currently struggling with your ability to cope with anxiety and burnout. The topics of anxiety and burnout can be emotionally difficult to talk about, for that reason we will provide the interview questions 1 week in advance, as well as provide a detailed list of counselling and other mental health resources. Please refer to the bottom of the consent form for a list of mental health resources. If there is a specific question that you have difficulty answering, you may skip this question and continue the interview with no consequence. If you have difficulty answering these questions, you may stop at any time and discard your answers.

### **What are the benefits of participating in this study?**

The purpose of the present study is to further understand the effects of adult coloring on individual's psychological measures. It is beneficial to explore how adult coloring may impact psychological measures in a positive way.

### **Study Follow-up**

If participants would like to learn about the results of the study, they can contact the researcher in April through phone or email. Further, a summary of the results will be posted on the CBU Psychology Department website in April 2023. The Psychology Department website can be accessed by following this link: <https://cbucommons.ca/psychology/>

### **Informed Consent**

By signing this consent form, I agree that I fully understand the above information and agree to participate in this study.

Participant's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

If you have any questions that have not been answered satisfactorily by the researcher(s) or supervisor(s) named above, please contact:

- Co-chairs of the Research Ethics Board at CBU, Tracey Harris ([tracey\\_harris@cbu.ca](mailto:tracey_harris@cbu.ca)), or Bishakha Mazumdar ([bishakha\\_mazumdar@cbu.ca](mailto:bishakha_mazumdar@cbu.ca))
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*Note: Participants are to be informed of the researcher(s) "Duty to disclose" suspected abuse or neglect of a child or an adult in need of protection. Under section 23(1), Nova Scotia Children and their Family, The Protection of Children and Adoption (1990) states that "Every person who*

*has information, whether it is confidential or privileged, indicating that a child is in need of protective services shall forthwith report that information to an agency.” Agency is defined as “an agency continued by or established and incorporated pursuant to the act...” that is, Nova Scotia Department of Community Service Child Welfare. This may vary across provinces within Canada and different regions outside of Canada.*

#### Mental Health Services available to Participants

##### Resources at Cape Breton University

**CBU Counselling Services** are available by contacting the Nancy Dingwall Health and Counselling Centre. To book an appointment, contact the Nancy Dingwall Health and Counselling Centre by calling 902-563-1359 or email [healthservices@cbu.ca](mailto:healthservices@cbu.ca). The Health Centre also has a doctor, nurse, physiotherapy & can make referrals.

Academic Success Coaching For appointments: <https://cbusuccess.mywconline.com>  
CBUSU executive, (902) 539-2886, email: [su\\_administration@cbu.ca](mailto:su_administration@cbu.ca)

**Judy Kelley**, Director Health and Counselling, (902) 563-1359, [judy\\_kelley@cbu.ca](mailto:judy_kelley@cbu.ca)  
**Leslie MacIsaac**, Registered Nurse, (902) 563-1433, [leslie\\_macIsaac@cbu.ca](mailto:leslie_macIsaac@cbu.ca)  
**Jennifer Comer**, Sexual Health Nurse, (902) 563-1359, [jennifer\\_comer@cbu.ca](mailto:jennifer_comer@cbu.ca)  
**Lydia McIsaac**, Mental Health Nurse, (902) 563-1359, [lydia\\_mcisaac@cbu.ca](mailto:lydia_mcisaac@cbu.ca)  
**Scott Thomas**, CBU Human Rights and Diversity Officer, (902) 563-1875 (office), or (902) 574-2350 (cell), [scott\\_thomas@cbu.ca](mailto:scott_thomas@cbu.ca)  
**Donalda Roper**, Manager, Student Support Services, (902) 563-1278, [donalda\\_johnston@cbu.ca](mailto:donalda_johnston@cbu.ca)

**CBUSU Women’s Centre:** [su\\_womenscentre@cbu.ca](mailto:su_womenscentre@cbu.ca), Instagram: [cbusu\\_womenscentre](#)  
**CBUSU Pride & Ally Centre:** [su\\_pac@cbu.ca](mailto:su_pac@cbu.ca), Instagram: [cbusu\\_pac](#)  
**CBUSU Multicultural Hub:** [su\\_mhc@cbu.ca](mailto:su_mhc@cbu.ca), Instagram: [cbusu\\_multicultural\\_hub](#)  
**CBUSU Ekkian Indigenous Centre:** [su\\_ilo@cbu.ca](mailto:su_ilo@cbu.ca), Instagram: [cbusu\\_indigenous](#)

**Mywellnessplan:** [www.mystudentplan.ca/cbusu/en/mywellness](http://www.mystudentplan.ca/cbusu/en/mywellness) online mental health tools available through CBUSU health plan

**Keep.meSAFE:** [www.keepmesafe.myissp.com](http://www.keepmesafe.myissp.com) - mental health supports available in language of choice through International students’ health plan

#### Additional Supports

**Nova Scotia Mental Health Crisis Line:** 1-888-429-8167 24 hours a day, 7 days a week  
**Canada Suicide Prevention:** 1-833-456-4566, or text 45645, or go to [www.crisisservicescanada.ca](http://www.crisisservicescanada.ca) to chat

**Crisis Text Line:** [www.crisistextline.ca](http://www.crisistextline.ca) or text 686868 via SMS

**Local Sexual Assault Nurse Examiner care:** 1-844-858-8036 or at the Regional Hospital

**Good2Talk:** 1-833-292-3698 24 hours a day, 7 days a week service for students

**7 Cups:** [www.7cups.com](http://www.7cups.com) - Free online peer support service for students

**Kognito:** <https://healthymindsns.kognito.com> – free health simulation to assist with identifying students in psychological distress, how to approach to discuss concerns, and make referrals

**TAO (Therapy Assistance Online)** <https://www.taoconnect.org/mindfulness-exercise/> – An online mental health library with interactive modules to help you understand and manage how you feel, think and act. TAO recently created mindfulness video exercises to help students cope with their feelings.

**Mindfulness in Nova Scotia (MindWell-U)** <https://app.mindwellu.com/novascotia> – MindWell-U is a free 30-day mindfulness challenge. This online tool is only five minutes per day and helps lower stress and improve wellbeing.

**ICAN (I Conquer Anxiety and Nervousness):**

<https://login.strongestfamilies.com/folder/1963/> – ICAN Anxiety Program is available to those 18 years and older who are experiencing symptoms of anxiety and depression. This program includes online tools for tracking and managing symptoms, and weekly phone calls with an anxiety coach.

**Willow House Crisis Line:** 1-866-634-4198, service for women and children experiencing violence (e.g., domestic violence, sexual assault).

**Cape Breton Youth Project:** 902-578-5801, provides support services for lesbian, gay, bisexual, and transgender individuals 25 years old and under.

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