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Dispositional mindfulness, executive functioning, and
everyday creative behaviour

Lauren Coppin

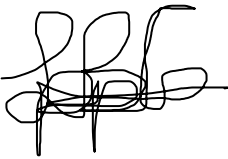
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Research Supervisor: Dr Nicky Israel

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Plagiarism Declaration

I, Lauren Coppin, declare that this research project (Ethics clearance number: MASPR/20/03) is my own, unaided work. It has not been submitted before for this or any other degree or for examination at this or any other university.

Signed: 

Date: 29/03/2021

Abstract

Everyday creative behaviour is an aspect of creativity that is of great interest to researchers internationally as well as in a South African context. Although previous studies have provided possible links between everyday creativity, executive functioning and dispositional mindfulness, there is very limited research that has directly explored the relationships between dispositional mindfulness, executive functioning, and everyday creativity.

The current study utilized a quantitative, cross-sectional, non-experimental, and correlational research design in order to explore the relationships between dispositional mindfulness, self-reported executive functioning, and everyday creative behaviour and whether dispositional mindfulness acted as a moderator in the relationship between self-reported executive functioning and everyday creative behaviour. A non-probability, convenience, and snowballing sampling strategy was used, and the final sample consisted of 1608 South African individuals between the ages of 18 and 50 years old. Participants completed the following self-report scales that made up an online survey: The Kaufman Domains of Creativity Scale (KDOCS), The Amsterdam Executive Functioning Inventory (AEFI), and the Mindfulness Attention Awareness Scale (MAAS). Correlations and moderated hierarchical multiple regressions were used to analyse the data.

The study found significant positive correlations between executive functioning and overall everyday creative behaviour, scholarly creative behaviour, self/everyday creative behaviour, and mechanical/ scientific creative behaviour. Further, significant positive correlations were found between dispositional mindfulness and overall everyday creative behaviour, scholarly creative behaviour, self/everyday creative behaviour, and mechanical/ scientific creative behaviour. Interestingly, a significant negative relationship between artistic creativity and dispositional mindfulness was also found.

Furthermore, there were three significant moderation models found in the results of the study. Firstly, dispositional mindfulness was found to be a significant moderator of the relationship between self-reported executive functioning and overall everyday creative behaviour. Specifically, dispositional mindfulness acted as a stronger facilitator of overall everyday creative behaviour for individuals with high levels of executive functioning. Secondly, dispositional mindfulness was also found to be a significant moderator of the relationship between self-reported executive functioning and scholarly creative behaviour. Specifically,

dispositional mindfulness acted as a stronger facilitator of scholarly creative behaviour for individuals with high levels of executive functioning. Lastly, dispositional mindfulness was found to be a significant moderator of the relationship between self-reported executive functioning and artistic creative behaviour. Specifically, dispositional mindfulness did not have any effect on artistic creative behaviour for those with low levels of dispositional mindfulness, regardless of level of executive functioning; it only facilitated artistic creative behaviour for those with high levels of dispositional mindfulness.

The current study's results suggest that there are relationships between dispositional mindfulness, executive functioning and everyday creative behaviour and, further, that level of mindfulness may change the nature of the relationship between executive functioning and overall everyday creative behaviour, scholar creative behaviour, and artistic creative behaviour. These findings provide interesting insight and possible explanations as to why there are conflicting reports regarding the nature of the relationships between executive functioning, dispositional mindfulness, and everyday creativity in the existing literature. They suggest that executive functioning and dispositional mindfulness may have different types of relationships with specific aspects or domains of creativity. Therefore, this study provides a theoretical contribution to the literature in the area and contributes to practical understandings of how certain aspects of everyday creative behaviour may be facilitated.

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Table of Contents

COVER PAGE	I
PLAGIARISM DECLARATION	II
ABSTRACT	III
ACKNOWLEDGEMENTS	V
TABLE OF CONTENTS	VI
CHAPTER 1: INTRODUCTION AND LITERATURE REVIEW	1
1.1. INTRODUCTION	1
1.2. LITERATURE REVIEW	3
1.3. RESEARCH QUESTIONS	20
CHAPTER 2: METHODOLOGY	21
2.1. RESEARCH DESIGN	21
2.2. SAMPLE AND SAMPLING	22
2.3. INSTRUMENTS	23
2.4. PROCEDURE	26
2.5. ETHICAL CONSIDERATIONS	26
2.6. DATA ANALYSIS	27
CHAPTER 3: RESULTS	30
3.1. INTERNAL CONSISTENCY RELIABILITY	30
3.2. DESCRIPTIVE STATISTICS AND NORMALITY	31
3.3. CORRELATIONS	34
3.4. HIERARCHICAL MODERATED MULTIPLE REGRESSIONS	38
CHAPTER 4: DISCUSSION	55
4.1. RELIABILITIES OF THE SCALES AND SUBSCALES	55
4.2. THE RELATIONSHIP BETWEEN EXECUTIVE FUNCTIONING AND EVERYDAY CREATIVE BEHAVIOUR	57
4.3. THE RELATIONSHIP BETWEEN DISPOSITIONAL MINDFULNESS AND EVERYDAY CREATIVE BEHAVIOUR	60
4.4. PREDICTIVE RELATIONSHIPS BETWEEN EXECUTIVE FUNCTIONING, DISPOSITIONAL MINDFULNESS, AND EVERYDAY CREATIVE BEHAVIOUR	63
4.6. CONCLUSION	68
4.7. STRENGTHS AND LIMITATIONS OF THE STUDY	70
4.8. FUTURE DIRECTIONS FOR RESEARCH	72
REFERENCES	73
APPENDIX A: ACCESS REQUEST LETTER	87
APPENDIX B: ELECTRONIC SURVEY INVITATION	88
APPENDIX C: PARTICIPANT INFORMATION SHEET	89
APPENDIX D: DEMOGRAPHIC QUESTIONNAIRE	90
APPENDIX E: THE KAUFMAN DOMAINS OF CREATIVITY SCALE (K-DOCS)	91
APPENDIX F: THE MINDFUL ATTENTION AWARENESS SCALE (MAAS)	93
APPENDIX G: THE AMSTERDAM EXECUTIVE FUNCTION INVENTORY (AEFI)	95
APPENDIX H: ETHICAL CLEARANCE CERTIFICATE	96

APPENDIX I: SAMPLE CHARACTERISTICS	97
APPENDIX J: NORMALITY RESULTS OF THE KAUFMAN DOMAIN OF CREATIVITY SCALE AND THE SUBSCALES (SELF/EVERYDAY, SCHOLAR, PERFORMANCE, MECHANICAL/SCIENTIFIC AND ARTISTIC).....	102
APPENDIX K: NORMALITY RESULTS OF THE AMSTERDAM EXECUTIVE FUNCTIONING INVENTORY (AEFI) AND THE MINDFULNESS ATTENTION AWARENESS SCALE (MAAS)	107
APPENDIX L: PEARSON R CORRELATIONS OF THE AMSTERDAM EXECUTIVE FUNCTIONING INVENTORY AND THE MINDFUL ATTENTION AWARENESS SCALE.....	109

List of Tables

TABLE 1 <i>INTERNAL CONSISTENCY RELIABILITIES</i>	30
TABLE 2 <i>DESCRIPTIVE STATISTICS</i>	32
TABLE 3 <i>PEARSON'S CORRELATIONS FOR CREATIVE BEHAVIOUR (AS MEASURED BY THE KAUFMAN DOMAINS OF CREATIVITY SCALE (KDOCS) (N=1608))</i>	35
TABLE 4 <i>PEARSON'S CORRELATIONS FOR CREATIVE BEHAVIOUR, DISPOSITIONAL MINDFULNESS, AND EXECUTIVE FUNCTIONING</i>	36
TABLE 5 <i>MODEL SUMMARY FOR PREDICTING TOTAL CREATIVE BEHAVIOUR</i>	39
TABLE 6 <i>COEFFICIENT AND COLLINEARITY DIAGNOSTICS FOR PREDICTING TOTAL CREATIVE BEHAVIOUR</i>	39
TABLE 7 <i>MODEL SUMMARY FOR PREDICTING SELF/EVERYDAY CREATIVE BEHAVIOUR</i>	43
TABLE 8 <i>COEFFICIENTS AND COLLINEARITY FOR PREDICTING SELF/EVERYDAY CREATIVE BEHAVIOUR</i>	43
TABLE 9 <i>MODEL SUMMARY FOR PREDICTING SCHOLAR CREATIVE BEHAVIOUR</i>	45
TABLE 10 <i>COEFFICIENT AND COLLINEARITY DIAGNOSTICS TABLE FOR PREDICTING SCHOLAR CREATIVE BEHAVIOUR</i>	45
TABLE 11 <i>MODEL SUMMARY FOR PREDICTING PERFORMANCE CREATIVE BEHAVIOUR</i>	48
TABLE 12 <i>COEFFICIENTS AND COLLINEARITY DIAGNOSTICS FOR PREDICTING PERFORMANCE CREATIVE BEHAVIOUR</i>	48
TABLE 13 <i>MODEL SUMMARY FOR PREDICTING MECHANICAL/SCIENTIFIC CREATIVE BEHAVIOUR</i>	49
TABLE 14 <i>COEFFICIENT AND COLLINEARITY DIAGNOSTICS FOR PREDICTING MECHANICAL/SCIENTIFIC CREATIVE BEHAVIOUR</i>	49
TABLE 15 <i>MODEL SUMMARY FOR PREDICTING ARTISTIC CREATIVE BEHAVIOUR</i>	51
TABLE 16 <i>COEFFICIENT AND COLLINEARITY DIAGNOSTICS FOR PREDICTING ARTISTIC CREATIVE BEHAVIOUR</i>	51
TABLE 17 <i>AGE GROUP OF THE SAMPLE</i>	97
TABLE 18 <i>GENDER OF THE SAMPLE</i>	97
TABLE 19 <i>RACE OF THE SAMPLE</i>	98
TABLE 20 <i>HOME LANGUAGE OF THE SAMPLE</i>	99
TABLE 21 <i>COMPLETED EDUCATION OF THE SAMPLE</i>	99
TABLE 22 <i>NUMBER OF FLUENT LANGUAGES OF THE SAMPLE</i>	100
TABLE 23 <i>CURRENT EDUCATION OF THE SAMPLE</i>	100
TABLE 24 <i>CURRENT EMPLOYMENT STATUS OF THE SAMPLE</i>	100
TABLE 25 <i>PEARSON R CORRELATIONS OF THE AMSTERDAM EXECUTIVE FUNCTIONING INVENTORY AND THE MINDFUL ATTENTION AWARENESS SCALE</i>	109

List of Figures

FIGURE 1 SIMPLE SLOPES ANALYSIS OF THE INTERACTION BETWEEN EXECUTIVE FUNCTIONING AND DISPOSITIONAL MINDFULNESS ON TOTAL CREATIVE BEHAVIOUR.....	41
FIGURE 2 SIMPLE SLOPE ANALYSIS OF THE INTERACTION BETWEEN EXECUTIVE FUNCTIONING AND DISPOSITIONAL MINDFULNESS ON THE SCHOLAR DOMAIN OF EVERYDAY CREATIVITY	46
FIGURE 3 SIMPLE SLOPES ANALYSIS OF THE INTERACTION BETWEEN EXECUTIVE FUNCTIONING AND DISPOSITIONAL MINDFULNESS ON THE ARTISTIC DOMAIN OF EVERYDAY CREATIVE BEHAVIOUR	53
FIGURE 4 HISTOGRAM SHOWING THE SUFFICIENTLY NORMAL DISTRIBUTION OF THE KAUFMAN DOMAINS OF CREATIVITY SCALE (TOTAL CREATIVITY).....	102
FIGURE 5 Q-Q PLOT SHOWING THE DISTRIBUTION OF TOTAL CREATIVE BEHAVIOUR	102
FIGURE 6 HISTOGRAM SHOWING THE SUFFICIENTLY NORMAL DISTRIBUTION OF THE SELF/EVERYDAY DOMAIN OF CREATIVITY	103
FIGURE 7 Q-Q PLOT SHOWING THE DISTRIBUTION OF THE SELF/EVERYDAY DOMAIN OF CREATIVITY	103
FIGURE 8 HISTOGRAM SHOWING THE SUFFICIENTLY NORMAL DISTRIBUTION OF THE SCHOLAR DOMAIN OF CREATIVITY.....	104
FIGURE 9 Q-Q PLOT SHOWING THE DISTRIBUTION OF THE SCHOLAR DOMAIN OF CREATIVITY	104
FIGURE 10 HISTOGRAM SHOWING THE SUFFICIENTLY NORMAL DISTRIBUTION OF THE PERFORMANCE DOMAIN OF CREATIVITY	105
FIGURE 11 Q-Q PLOT SHOWING THE DISTRIBUTION OF THE PERFORMANCE DOMAIN OF CREATIVITY	105
FIGURE 12 HISTOGRAM SHOWING THE SUFFICIENTLY NORMAL DISTRIBUTION OF THE MECHANICAL/SCIENTIFIC DOMAIN OF CREATIVITY	106
FIGURE 13 Q-Q PLOT SHOWING THE DISTRIBUTION OF THE MECHANICAL DOMAIN OF CREATIVITY.....	106
FIGURE 14 HISTOGRAM SHOWING THE SUFFICIENTLY NORMAL DISTRIBUTION OF THE AMSTERDAM EXECUTIVE FUNCTIONING INVENTORY (AEFI)	107
FIGURE 15 Q-Q PLOT SHOWING THE DISTRIBUTION OF THE AMSTERDAM EXECUTIVE FUNCTIONING INVENTORY (AEFI)	107
FIGURE 16 HISTOGRAM SHOWING THE SUFFICIENTLY NORMAL DISTRIBUTION OF THE MINDFULNESS ATTENTION AWARENESS SCALE (MAAS).....	108
FIGURE 17 Q-Q PLOT SHOWING THE DISTRIBUTION OF THE MINDFUL ATTENTION AWARENESS SCALE (MAAS)	108

Chapter 1: Introduction and Literature Review

1.1. Introduction

Creativity is one of the most vital human traits in individuals within the contemporary world (Bai et al., 2020). This is due to the crucial role it plays in human development and societal functioning due to its involvement in the workplace, in forming relationships, or in thinking open-mindedly about societal problems and how one can possibly solve these (Azimi & Fazelian, 2013; Jamet et al., 2015). Hence, researchers are fascinated with this aspect of cognition and want to understand it better, and individuals' creative behaviour has therefore been a prevalent topic of interest among researchers (Bhattacharya & Wiggins, 2014; Schooler & Zedelius, 2015). It has been studied across many different fields such as science, philosophy, psychology, and even politics; and researchers have created different models, theories, definitions, understandings, and tests of creativity both within and across these fields (Alloway et al., 2017; Memmert, 2011). Everyday creativity in particular, is debatably one of the most prevalent occurring forms of creativity (Benedek et al., 2020). It is argued that every individual can possess their own individual creativity and use it in their daily societal functioning (Elisondo & Vargas, 2019). Everyday creative behaviour can therefore be seen as an element of creativity, specifically attributed to novel and appropriate behaviours in certain tasks or in daily life (Kaufman, 2012).

Executive functions can be characterised as cognitive mechanisms that regulate mental processes and behaviour (Arendasy et al., 2014; Ward, 2015). Similarly, they are cognitive mechanisms used for goal-driven behaviour (Agnoli et al., 2018; Jolles et al., 2012). Research on executive functioning is vast, as many educators and researchers are fascinated by executive functions and the importance of these for human behaviour (Alexander & Baggetta, 2016; Biederman et al., 2004). It has been proposed in literature that creativity may rely on executive functioning to produce creative behaviour and a predictive relationship between the two has been noted (Arendasy et al., 2014; Benedek et al., 2020). This is due to researchers examining the role that executive functions could play in allowing for the shifting and adjusting of ideas to novel ones, resulting in creative behaviour (Arendasy et al., 2014).

Another factor associated with creativity is mindfulness. Mindfulness is a fairly new research topic, with research becoming more prevalent over recent years in behavioural science due to its proposed benefits (Brown et al., 2007a). A common definition of mindfulness is the

inclination to focus on and be aware of experiences in the present (Schooler & Zedelius, 2015). Dispositional mindfulness in particular is a type of mindfulness that is individualized based on past experiences (Jones et al., 2018). Dispositional mindfulness has been proposed as having a relationship with creativity and possibly influencing it (Capurso et al., 2014). However, research has indicated mixed results with some studies reporting negative associations and others arguing for positive associations between creativity and mindfulness (Kane & Smeekens, 2016). Moreover, the possibility that mindfulness may moderate the relationship between executive functioning and everyday creative behaviour has been suggested, due to mindfulness being thought to enhance executive functioning and having a relationship with certain executive functions, such as attention or self-control (Black et al., 2017; Flook et al., 2010). Tied to this, it has been proposed that dispositional mindfulness is related to creative behaviours, although the dynamics of this relationship are still unknown. Therefore both executive functioning and dispositional mindfulness have been shown to be possible predictors of everyday creativity (Arendasy et al., 2014; Capurso et al., 2014). Further, dispositional mindfulness may be a possible facilitator of the relationship between executive functioning and creativity, in that it impacts the relationship between executive functioning and creativity due to its possible relationship to both (Arendasy et al., 2014; Delis et al., 2007).

1.1.1. Study aims and contribution

The aim of this study is to understand the dynamics of the relationships between everyday creative behaviour, dispositional mindfulness, and executive functioning, specifically looking at whether there are predictive relationships between executive functioning and everyday creative behaviour as well as between dispositional mindfulness and everyday creative behaviour in the sample. Furthermore, the study aims to explore whether dispositional mindfulness acts as a moderator in the predictive relationship between executive functioning and everyday creative behaviour in the sample.

Taking this into account, this research will contribute to the mixed evidence available about relationships between everyday creative behaviour, dispositional mindfulness, and executive functioning. Hence, it will make a theoretical contribution to existing understandings of these concepts and provide further evidence to support or negate existing research findings. Similarly, this study may have possible practical implications by creating a deeper understanding of how to facilitate everyday creative behaviour in individuals. In addition, the association amongst these constructs in the South African context has yet to be looked at,

therefore conducting this research might create new insight and allow for possible inferences about everyday creative behaviour in the South African context.

In the next section of the chapter, the literature review will begin by discussing everyday creative behaviour, dispositional mindfulness, and executive functioning with an illustration of the importance of the concept of creativity as well as previous literature on each construct, followed by the proposed relationships between the constructs demonstrated in past literature, leading to the research questions for the current study. Following this chapter, the second chapter, the methodology chapter, will be presented looking at the research design, sample and sampling, procedure, instruments, ethical considerations, and the data analysis. The third chapter will be the results section, looking at the results of the descriptive statistics and the Pearson r correlations as well as the hierarchical moderated regressions and the simple slope analyses. The results section will be followed by the fourth chapter, the discussion chapter, which will present previous literature as well as the current study's findings, the strengths and limitations of the current study, and a discussion of the study's implications.

1.2. Literature review

In the following sections, a discussion of the concept of creativity and everyday creative behaviour will be presented, including its importance and relevant previous literature. Thereafter, both executive functioning and dispositional mindfulness will be discussed, with previous literature and their links to creativity given. In addition, the complex relationship between all three constructs will be discussed, with possible links being presented. The review will end with a discussion of the justification for the current study and the research questions that guided the current study.

1.2.1. creativity.

The concept of creativity is challenging to define, as there are various contrasting definitions and aspects of creativity that exist in the literature (Alloway et al., 2017; Jamet et al., 2015; Kawashima et al., 2011). Moreover, the meaning of the word itself is difficult to understand, as the construct often involves subjective judgment and the evaluation of what can be considered creative is a difficult task (Bhattacharya & Wiggins, 2014). One single definition of creativity has therefore not been concluded amongst researchers (Azimi & Fazelian, 2013; Benedek et al., 2012). Researchers have also debated on whether creativity should be looked

at through certain domains, in other words, whether it should be seen as a domain-general creative trait or if it should be looked at as a skill or set of separate skills (Kaufman et al., 2012). In literature, it has also been pointed out that a definition of creativity starts as a process (Azimi & Fazelian, 2013; Benedek et al., 2012). Thereafter, the process is related to an individual or a product executing the process which allows for certain behaviours, individuals, or products to be valued as 'creative' (Bhattacharya & Wiggins, 2014). Hence, definitions revolve around the idea of creativity being a skill that is used to produce outputs that are both relevant and unique (Kawashima et al., 2011). Further, it can be seen as an all-inclusive structure involving many elements such as: a mental thought process, making use of many perceptions of the environment, inventions of novel and new ideas, thinking of different ways to solve problems, and initiating original and unique behaviour (Azimi & Fazelian, 2013). Although a single definition is therefore difficult, creativity can be identified as the skill of being able to take known concepts and to adjust them to fit a new and unique idea or behaviour, a cognitive flexibility of adjusting the known to the unknown (Arendasy et al., 2014).

There are two common types of creativity, namely divergent and convergent creativity. Divergent thinking is associated with free association and fluidity in thinking and is constituted as generating multiple ideas or solutions to a problem (Davranche et al., 2015; Ganis & Zabelina, 2018; Hoffmann & Russ, 2012). It is often thought of as being important for creative production (Hoffmann & Russ, 2012). Divergent thinking assessments are often used as a method to assess generation of creative ideas and one of the most frequent methods to assess this is the Alternative Uses Task which looks at fluency, flexibility, and originality (Stevens & Zabelina, 2020). On the other hand, convergent thinking is the capability to obtain a unique solution to a closed-ended problem (Davranche et al., 2015; Groborz & Necka, 2003). It is defined as being a more controlled process that only focusses on one possible product. One of the more frequent methods of assessing convergent thinking is the Remote Associates Task (RAT) which asks an individual to identify one word that describes three concepts (Christoffels et al., 2011). Due to these two common types of creativity, research on this construct is often split into two, one being a focus on high-level cognitive skills and the other being on low-level cognitive skills (Benedek et al., 2012).

1.2.2. measuring and assessing creativity.

When it comes to measuring creativity, there are a few different categories of creativity that can be assessed. These categories include creative traits, creative products, creative cognition, and creative behaviour and accomplishments (Kaufman et al., 2012). As mentioned briefly earlier, a highly debated idea among researchers is whether creativity can be understood as having many different domains or if it is a single construct (Kaufman et al., 2017). Most measurements and assessments of creativity are primarily domain-focussed, meaning they rely on assessing creativity among a variety of domains. Due to many assessments being generalist, creativity assessments have come under a lot of criticism (Baer & Kaufman, 2004). There is strong existing evidence for both the domain-specific and generalist views of creativity and researchers have noted that differences in support of either side can be grounded in the method; for example, assessment looking at performance usually focuses on more domain specificity (Baer & Kaufman, 2004).

The difficulties and conflicting debates over creativity assessment can perhaps be attributed to the complexity of measuring creativity itself as this aims to capture atypical and innovative individuals or ideas (Kaufman et al., 2012). However, one theory that incorporates both domain-specific and domain-general ideas is the Amusement Park Theoretical Model of Creativity. This is based on a metaphor of an amusement park and emphasizes that individuals can become more specialized and creative in their work, the more they progress in life. Some aspects of creativity can be domain-general, which are variables, in any form, that are associated with creativity such as motivation or intelligence. Within an amusement park, the domain general aspects would be getting transport or purchasing a ticket (Guo et al., 2020). In addition, looking at creativity broadly, we can look at categories of creative behaviour such as everyday, scholarly, performance, science, and art (Kaufman, 2012). Similarly, looking at an amusement park, there are broad categories such as the various themes of the park being animal-themed, ride-based, or carnival-themed. There can also be specific domains of creativity such as psychology or anthropology, just as the domains of different amusement parks would be the different types or locations, such as Disney World or Universal Studios. Further, there are microdomains within this such as cognitive or social psychology that make up psychology, and the different rides that make up each amusement park location (Guo et al., 2020). The multiple levels and options for theorising about creativity demonstrated in the Amusement Park Theoretical model highlight the difficulty of defining and measuring the construct of creative behaviour.

Assessment of individual behaviour can occur in the form of direct observation or in a self-report manner whereby the individual reflects on their behaviour and reports it themselves (Bryman et al., 2004; Runco & Smith, 1992). In the social and behavioural sciences, particularly in psychology, self-report measures can be extremely useful to identify certain symptoms of psychological disorders or to identify certain behaviours (Demetriou et al., 2015). A possible disadvantage of self-report assessments that has been highlighted in research is potential bias. For example, the researcher may not know if the individual is self-reporting their behaviour correctly or if they are trying to please the researcher. In addition, systematic error such as the way the questions were phrased or the ordering of the items could be troublesome (Bryman et al., 2004). There are, however, numerous advantages to using self-report measures as well. One of these reasons is that self-report measures are helpful for large samples. Furthermore, self-report measures can be extremely useful, especially in behavioural studies, as individuals know their own behaviour well and results tend to be more accurate (Demetriou et al., 2015).

Looking at self-reported creativity in particular, an advantage of self-reported creativity scales is that they do not focus on particular domains but take a generalist outlook and tend to suggest that if a person is creative in a single domain, they are likely to be creative in other domains (Kaufman, 2012; Kaufman, et al., 2017). Moreover, people have different creative profiles, and hence self-reported creativity can be very useful as individuals are able to be assessed across a variety of domains and can identify where their differences lie. In many ways, creativity is a subjective matter, and thus measuring it by using self-report measures can be extremely useful (Baer & Kaufman, 2004). However, the researcher must ensure that the self-report measure is reliable and valid (Demetriou et al., 2015). Some of the most popular self-report questionnaires used for creativity are the Creative Achievement Questionnaire, the Biographical Inventory of Creative Behaviours, the Creative Behaviour Inventory, Creativity Domain Questionnaire, and the Kaufman Domains of Creativity Scale (K-DOCS) (Kaufman et al., 2012; 2017). Moreover, an interesting and growing method to assess creativity is electroencephalography (EEG) due to its impressive temporal resolution (Stevens & Zabelina, 2020).

1.2.3. everyday creative behaviour.

Everyday creative behaviour can be seen as an element of creativity, specifically attributed to novel and appropriate behaviours in certain tasks or in daily life (Kaufman, 2012). Everyday creativity can stem from either convergent or divergent creative processes and is constituted as uniqueness in work and leisure activities that can occur in diverse settings in everyday life. Therefore, creativity can be displayed in various everyday activities, including those in the interpersonal, academic, artistic, and scientific realms, and can vary across domains or contexts (Elisondo & Vargas, 2019). Further, everyday creative behaviour can be seen as activities that individuals engage in for own personal gratification rather than or in addition to societal achievements. Everyday creative behaviours can also be either intrapersonal (taking place in the individual's mind) or interpersonal (taking place between people) in nature (Kaufman et al., 2017) Although debatably one of the most prevalent forms of creativity, there is limited knowledge regarding the range of everyday creative behaviours (Benedek et al., 2012). Although many researchers disagree on definitions of everyday creativity behaviour, it is widely accepted that each individual's creative profile will differ according to their personality and sociocultural context (Baer & Kaufman, 2004).

Everyday creative behaviour can be evaluated by others (interpersonal evaluation) or by the individual themselves about their own behaviour (intrapersonal evaluation) (Runco & Smith, 1992). Everyday creative behaviours that are self-reported in nature and therefore examine perceived creative behaviours across different possible areas or domains in daily life from the perspective of the individual (i.e., intrapersonal evaluation). As proposed by Kaufman et al. (2012), these areas include the artistic, mechanical/scientific, performance, self/everyday, and scholarly domains (Guo et al., 2020; Kaufman et al., 2012). The self/everyday domain refers to interpersonal and intrapersonal intelligence and creative tendencies when carrying out daily activities such as solving problems, finding fun things to do, coping with difficulties, thinking of new ways to help people, and making oneself happy (Kaufman, 2012; Kaufman et al., 2017). The scholar domain includes linguistic and academic intelligence and creativity for activities such as writing, researching, debating, analysing, and critiquing (Kaufman, 2012; Kaufman et al., 2017). The performance domain refers to one's musical or kinetic creativity for activities such as composing lyrics or rhymes, singing, and playing instruments; and the artistic domain refers to spatial intelligence and art and expression creativity, as demonstrated through drawing, scrapbooking, photography, sculpting, and art appreciation (Kaufman, 2012; Kaufman et al., 2017) Lastly the mechanical/scientific domain includes naturalistic intelligence

as well as mathematical and logical solutions, shown, for example, by solving a mathematical problem or debugging a computer programme, construction and assembly, and experimenting/deconstructing (Kaufman, 2012; Kaufman et al., 2017).

These domains therefore represent everyday creativity as being able to engage in a wide range of different creative behaviours in daily life and as being able to recognize these across different activities that represent distinct aspects of everyday human behaviour (Kaufman, 2012; Kaufman et al., 2017).

1.2.4. the importance of creativity and previous research.

The role of creativity in human beings' everyday lives and interactions is emphasized in research and it is a construct of great interest to researchers due to its known importance (Azimi & Fazelian, 2013; Hoffmann & Russ, 2012). Within literature, it is noted that creativity is a comprehensive trait that is distinct in human beings in comparison to other species. The role it has in our lives is seen as important, as our fast-paced, advancing society demands novel solutions to problems, the innovation of new ideas, advancement in various fields, and complex problem solving of challenges facing society (Carruthers, et al., 2009; Jamet et al., 2015). Further, the facilitation of creativity in individuals is shown as important for children's development and the functioning of societies, and has been illustrated as being a necessary 21st century skill (Azimi & Fazelian, 2013; Kupers, et al., 2019). Hence, creativity is a construct that is popular in research, due to the need for it to be further understood in order to facilitate creative behaviour (Bhattacharya & Wiggins, 2014; Carruthers et al., 2009; Hoffmann & Russ, 2012).

Research on creativity has often focussed on the relationship between creativity and intelligence. Specifically, research has identified creativity as being associated with an individual's fluid intelligence (Alloway et al., 2017; Fugate et al., 2013; Ganis & Zabelina, 2018; Groborz & Necka, 2003). Moreover, some studies have concentrated on the relationship between creativity and cognitive inhibition and have found a positive correlation between the two constructs, although other studies have reported no correlation at all (Benedek et al., 2012). Hence, conflicting results have occurred in research, either finding creativity as being associated with high cognitive inhibition or with disinhibition (Benedek et al., 2012; Davranche et al., 2015). Several studies have also analysed the link between creativity and cognitive

control, specifically finding that high levels of flexible cognitive control are related to increased creative behaviour (Robinson & Zabelina, 2010).

Furthermore, growing evidence exists regarding bilingualism improving cognitive skills and studies have specifically looked into how bilingualism could improve creativity. Differences have been noted between bilinguals' divergent and convergent thinking and studies have found that bilingualism could have advantages for convergent thinking skills in particular (Christoffels et al., 2011). Moreover, the relationship between emotional intelligence and creativity has been explored, specifically looking at which creativity domains correlated with emotional intelligence. Studies found that emotional intelligence was correlated across all domains of creative behaviour as represented in the Kaufman (2012) model, specifically everyday, scholarly, performance, scientific, and artistic creativity (Guo et al., 2020).

In addition, in recent research, the relationship between creativity and working memory has been explored, including evaluating whether one's working memory can influence one's level of creativity. Mixed results have been found with some arguing that working memory and creativity are positively correlated, while others argue that they are negatively correlated (Alloway et al., 2017; Baas et al., 2012; Fugate et al., 2013; Kawashima et al., 2011). Also, in line with this, a link between creativity, working memory, and individuals with Attention Deficit-Hyperactivity Disorder (ADHD) has been reported in previous studies (Fugate et al., 2013). With reference to individuals with ADHD as an example, it has been proposed that wide attention might relate to increased creative performance. Due to individuals with ADHD having high impulsivity, risk-taking behaviour, distractibility, and broad attention, it has been reported in literature that individuals with ADHD are speculated to have high levels of creative behaviour. However, some research has speculated the opposing side, that those with ADHD will have low levels of creativity due to narrowed focussed attention leading to creative insights (Baas et al., 2012; 2017; Fugate et al., 2013; White, 2018). Research investigating the link between creativity and attention is increasing, as it can help to understand creative behaviour in those with ADHD, Autism Spectrum Disorders and others (Baas et al., 2017; Baron-Cohen & Craig, 1999).

In South Africa, research concerned with creativity has been limited, with few studies centring around this psychological construct (Kaufman & Sternberg, 2006). Studies that have been conducted have looked at the relationship between creativity and dyslexia for example

(Cockcroft & Hartgill, 2009). However, not enough research exists on everyday creative behaviour or creativity in a South African population. Interestingly, foundations and initiatives supporting the importance of creativity exist. The South African Creativity Foundation and the Global Creativity Network are examples of platforms that encourage practitioners and researchers to look at the importance of creativity and to develop creativity knowledge in Africa. Nonetheless, it is still an under-researched topic, with South Africa having few articles published relating to this (Kaufman & Sternberg, 2006). Therefore, research looking at creativity and everyday creative behaviour in a South African population is needed.

1.2.4. executive functioning: conceptualization and previous research.

In the field of neuropsychology, one of the most important discoveries was the role of the frontal lobes and the complexity of the cognitive functioning within this area of the brain. Cognitive skills that are high-level in nature are shown to originate in the prefrontal cortex of the frontal lobe region of the brain, and these high level cognitive skills are categorized as ‘executive functions’ (Blair, 2017; Delis et al., 2007). The frontal lobe regions are interconnected and influenced by other different brain regions as well, though, so one specific origin of executive functioning is debatable (Blair, 2017). Executive functions can be characterised as cognitive mechanisms that regulate mental processes and behaviour (Arendasy et al., 2014; Ward, 2015). Similarly, they are cognitive mechanisms used for goal-driven behaviour (Jolles et al., 2012). Universally, executive functions include many different cognitive processes that develop with age (Hoffmann & Russ, 2012). Prefrontal cortical development and functioning mediate executive function, and this undergoes structural and functional growth throughout one’s childhood and into adolescence (Black et al., 2017). It is also fair to assume that an individual could strengthen their executive functioning skills by strengthening the neural circuits that underlie them (Blair, 2017). For example, studies have found that engaging in mindfulness practices improves executive functions (Mazmanian et al., 2016).

There is an ongoing debate among researchers on the exact mechanisms that constitute executive functions and the relationships between these mechanisms (Arendasy et al., 2014). Mechanisms that fall under this umbrella term can include, but are not limited to, attention, planning, task switching, problem solving, decision making, and regulation of behaviour and emotions (Black et al., 2011; Black et al., 2017). The Executive Control System is one

conceptual framework for executive functioning which categorises executive functioning into four main domains: information processing, attentional control, cognitive flexibility, and goal setting (Anderson, 2002). All four domains make up one control system that functions in an integrative manner, with the different domains working together to carry out tasks. The information processing domain consists of fluency and output efficiency, attentional control refers to the ability to focus attention for a long period and to shift attention when needed, cognitive flexibility is the ability to learn from mistakes and switch between response sets, and goal setting is the ability to innovate new concepts and plan these tasks ahead. This conceptualization views executive functioning as a multifaceted system with individual systems working together (Anderson, 2002; Anderson & Reidy, 2012).

In this study the key executive functions that are highlighted are: attention, self-monitoring, self-control, planning, and initiative. Attention includes sustained and selective attention; self-monitoring includes abilities such as self-control, monitoring, and working memory; and planning and initiative are the functions that control behaviour and action. These key functions are all components of executive functioning that serve individual and integrated services (Jolles et al., 2012). Self-control or self-monitoring is the ability to regulate one's own thoughts, emotions or behaviours; in other words, to recognize one's internal thoughts or feelings, and allow for behaviours that achieve their set out goals (Baer & Bowlin, 2012). Attention is the ability to focus on someone or something and pay it interest. It is a neurological ability and can be split into different types, for example sustained attention (Blair, 2017; Memmert, 2011; White, 2018). Further, planning and initiative is the skill which allows for an individual to set their goals, plan ahead, time manage, and initiate their own behaviour (Blair, 2017; Mazmanian et al., 2016).

In the past few decades, research on executive functioning has been extensive. Many educators and researchers are fascinated by executive functions and the importance of these for human behaviour (Alexander & Baggetta, 2016; Biederman et al., 2004). The importance of executive functions has been highlighted due to their relatedness to: academic and learning abilities, positive behavioural functioning, and child development (Hoofs et al., 2014). Literature on executive function have focussed on its location, importance, potential benefits for various domains, and the difficulty in assessing it (Alexander & Baggetta, 2016; Arendasy et al., 2014; Jolles et al., 2012).

Executive functions have been shown to be very useful in our everyday lives. They can help in the completion of tasks, improve performance in academics or the workplace, as well as assist in our thinking abilities (Blair, 2017). Further, executive functions have been shown to be predictors of academic success as well as other important skills such as language. Hence, processes that influence executive functions as well as beneficial outcomes of executive functions are significant topics for research (Baker-Ward & Esposito, 2013). Executive functioning is a mechanism in an individual that is significant for everyday functioning and to ensure quality of life. This is due to executive functioning ensuring an individual's ability to engage in purposeful behaviour. When executive functioning is impaired, it can result in a decline in functional behaviour which can be detrimental to an individual's quality of life (Mallya & Fiocco, 2016). Moreover, impairments in executive functions are popular topics in research, with researchers attempting to make associations between impairments in executive functions and resulting behaviour and disorders, for example, research focussing on the association between executive functioning deficiencies and neurodevelopmental disorders such as ADHD and Autism Spectrum Disorders (Irvan, 2019).

1.2.5. the link between executive functioning and creativity.

In recent literature, connections have been made between executive functioning and creative behaviour (Benedek et al., 2012). Creativity includes being able to take known concepts and adjust them to fit new and unique ideas and behaviours. In this sense, creativity demands flexibility in what is known, and the ability to shift towards the creation of the unknown. Thus, creativity may rely on certain executive functions to help produce creative behaviours (Arendasy et al., 2014). Further, executive functions such as self-monitoring and self-control can be useful for generating creative behaviours. During an activity, an individual may think of certain responses that are previously known, but using self-control and self-monitoring may enable the individual to push those ideas away and generate innovative responses (Kane & Smeekens, 2016). Working memory, the process that allows for the retaining of information for complex cognitive tasks, has been found to be correlated with creativity in a large number of studies. This cognitive process is involved in executive functions such as planning and initiative, which could suggest that these executive functions are related to creativity. However, there are conflicting findings on this relationship (Alloway et al., 2017; Baas et al., 2012; Kawashima et al., 2011).

Current research has also represented creativity as an outcome of executive processing. To expand on this, creative behaviour is produced by higher executive functions that regulate conscious and goal-driven behaviour. Similarly, these higher executive functions allow for the individual to regulate interfering thoughts and ideas and enable creative insight (Alloway et al., 2017). Creativity not only allows one to create novel responses but also responses which are appropriate for the context at hand. This creative process allows for a production and evaluation of responses which may be indicative of higher order mechanisms. With this notion in mind, some authors have noted inhibition and focussed attention as necessary for creativity, highlighting the role of executive functions (Benedek et al., 2014). Moreover, during divergent thinking tasks, studies found that regions of the brain involved in executive functioning are activated (Poppenk & Sunavsky, 2020).

In congruence with this, recent research has emphasized the role of attention in creativity. It has been found that defocussed attention and allowing for task-irrelevant ideas may be beneficial for creativity (Baas et al., 2017). In studies on individuals with ADHD, findings have suggested that a wide attention focus, including distractibility, may be useful for creative behaviour and insight (Fugate et al., 2013). In contrast, some research has suggested that narrowed attention allows for concentration and can be beneficial for creative production (Carruthers et al., 2009; White, 2018). Although the research is conflicting, in either circumstance attention is highlighted as having a role to play in creative behaviour, which further suggests a possible link between executive processing and creative outcomes (Baas et al., 2017; Carruthers et al., 2009; Kane & Smeekens, 2016).

Moreover, creativity has been linked to critical thinking, which is a skill that many individuals use in their everyday lives (Bai et al., 2020). Critical thinking is the ability to gain a complex understanding of information at hand and to be able to interpret and analyse it effectively (Brinthaup et al., 2020). Studies have found that critical thinking originates in the neural substrates of the prefrontal cortex, therefore the same brain region that executive functioning is proposed to originate in (Sanz de Acedo Baquedano et al., 2012). Further, critical thinking and executive functioning are said to be tightly knitted skills, with executive functioning playing a crucial role in critical thinking (Brinthaup et al., 2020).

Internationally, possible relationships between executive functioning and creativity have been explored, with topics focussing on aspects of executive functioning or executive functioning

in general being related to creativity being especially popular (Alloway et al., 2017; Benedek et al., 2012; White, 2018). However, research in the South African context on this relationship is limited. Some studies in South Africa have looked at the relationship between creativity and learning disabilities (Cockcroft & Hartgill, 2009) or creativity origins and expressions that occur (Kaufman & Sternberg, 2006); however there does not appear to be research directly exploring the relationship between executive functioning and creativity that has been carried out in a South African context or sample.

1.2.6. dispositional mindfulness: Conceptual definition, origin, and previous research.

An interest in mindfulness has developed over the course of the last few years, especially in research carried out by psychology and medical professionals (Brown et al., 2007b). Although at times it can be defined in simple terms, mindfulness is a complex construct with numerous different understandings, however, universally it is known to concern consciousness (Brown et al., 2007a). It originated in association with Buddhist psychology and has similarities with beliefs derived from various philosophical traditions (Brown et al., 2007b). A common definition of mindfulness is the inclination to focus on and be aware of experiences in the present (Schooler & Zedelius, 2015). To engage in mindfulness is to let go of memories or previous thoughts and ideas, and engage with the present as if you are observing what is in front of you for the first time (Kassman & Ostafin, 2012). Further, it is a process that involves both consciousness as well as attention, and therefore is discussed in many consciousness papers in philosophy and psychology (Cauda et al., 2016).

Various elements of mindfulness exist, such as: a clear awareness of the internal-self and the external world, the emphasis on constructing our own world, flexible and stable awareness and attention, and present consciousness (Brown et al., 2007b). Levels of mindfulness can improve based on meditation training, although individual differences have been noted across levels, suggesting that mindfulness can be a dispositional trait (Darling et al., 2012). Hence, mindfulness can be investigated as a state as well as a trait characteristic. Dispositional mindfulness is therefore mindfulness that is individualized based on past experiences (Jones et al., 2018). Mindfulness shares similar elements with other concepts such as self-awareness and self-focussed attention, therefore some confusion often exists when discussing these topics (Brown et al., 2007a). Closely intertwined with this topic, and on the opposing spectrum to mindfulness, is mind-wandering, which is a behaviour constituted by conscious inattention and

a fluctuation from present experiences. Research on mind-wandering has reported that this construct is negatively correlated with inhibitory control (inhibitory control is linked to the concept of self-control, as assessed in the Amsterdam Executive Functioning Inventory, as both inhibitory control and self-control share very similar underlying executive functioning mechanisms). Neuroimaging studies have indicated that during mind-wandering the Default Mode Network in the brain is activated and the Executive Control Network is disabled (Schooler & Zedelius, 2015).

Research on mindfulness has often focussed on the potential benefits of engaging in this behaviour. For example, research on mindfulness training has shown that it may lower the impact of the past on the individual and allow for the individual to be in full touch with the present (Kassman & Ostafin, 2012). Moreover, mindfulness is often a topic in philosophical research, identifying mindfulness as important in consciousness as well as wellbeing (Brown & Ryan, 2003). In addition, literature on mindfulness has engaged in the positive implications of mindfulness such as improved cognitive and emotional functioning, as well as improved working memory capacity and stress reduction (Agnoli et al., 2018). Similarly, mindfulness, and specifically mindfulness meditation, can have benefits for executive functioning and attention (Capurso et al., 2014). On the other hand, research on mind-wandering has aimed at understanding its biological origins and the impact it has on cognitive processes. However, it has mostly fixated on the negative consequences, with specific reference to negative consequences for academic performance (Agnoli et al., 2018; Cosmelli et al., 2016).

In past research dispositional mindfulness has also been looked at as a potential moderator of the relationship between neuroticism and depressive symptoms, as a predictor of wellbeing, and as a predictor of improved executive functioning (Barnhofer et al., 2011; Deng et al., 2020; Mazmanian et al., 2016).

1.2.7. the theoretical link between mindfulness and creativity.

The link between mindfulness and creativity is a recent and growing interest in research (Agnoli et al., 2018; Capurso et al., 2014). Previous studies linking the two constructs have produced varied results (Agnoli et al., 2018). Much of the research has reported indirect evidence for a relationship between individual traits, mindfulness or mind-wandering, and creativity. For example, individuals with ADHD are known to have increased mind-wandering,

and have been reported in studies as having higher creativity in everyday life tasks than individuals who do not have ADHD (Cosmelli et al., 2016). Research on mind-wandering and creativity has also produced opposing results. On one hand, some research has reported that mind-wandering can have negative consequences for executive control and attention and therefore may lead to decreased attention (Agnoli et al., 2018; Baird et al., 2012). In addition, research studies have predicted that mind-wandering may be detrimental to complex creative behaviours such as creative problem solving (Kane & Smeekens, 2016). On the other hand, some research has reported that mind-wandering can have cognitive benefits such as problem solving, and can also be linked to enhanced creativity as there is broad attention leading to possible access to more creative ideas (Agnoli et al., 2018; Baird et al., 2012). Moreover, individuals with lower levels of latent inhibition, which can be defined as the ability to let go of irrelevant information from conscious awareness, have been shown to perform more strongly on creative measurements, supporting the idea that mind-wandering can lead to higher creative performance (Schooler & Zedelius, 2015).

Moreover, some studies of dispositional and situational mindfulness have concluded that mindfulness has creative benefits, and this could be due to the focus on the present moment leading to a reduction of responses that would otherwise be habitual in nature (Schooler & Zedelius, 2015). Further, mindfulness is reported as being able to allow for problem solving and creative responses to tasks at hand (Kassman & Ostafin, 2012). Other studies have found significant relationships between mindfulness and creativity, although it was also found that this depended on the type of mindfulness (Cosmelli et al., 2016). In recent studies, it has also been reported that mindful meditation training can improve creative behaviour (Hölzel et al., 2015). On the other hand, other research has concluded that mindfulness may hinder creative abilities and spontaneous insights may be reduced due to mindfulness. Similarly, a study looking at mindfulness and intuitive thinking found a negative association between the two. The contradictory results within the literature may perhaps be attributed to the complexity of mindfulness itself; different facets of mindfulness may predict creative behaviour in varying ways (Agnoli et al., 2018).

Internationally, mindfulness has gained a lot of research interest in recent years, and specifically relationships between mindfulness and creativity have begun to be explored (Bunting et al., 2016; Henriksen et al., 2020). In a South African context, studies have looked at mindfulness alone, and explored mindfulness techniques and their impact on stress

(Whitesman et al., 2018). There is also research looking at cases of mindful creativity (Krueger, 2017). However, studies exploring this relationship are very limited and there is an overall lack of research that has been carried out looking at this relationship in a South African sample.

1.2.8. relationships between executive functioning, dispositional mindfulness, and everyday creative behaviour.

As discussed in the previous sections, both executive functioning and dispositional mindfulness have been shown to have associations with everyday creative behaviour (Krueger, 2017). However, the specific dynamics between these three concepts remains relatively unexplored.

Literature that is available seems to support the notion that mindfulness and executive functioning are related, specifically suggesting that mindfulness may enhance executive functioning (Black et al., 2017; Deng et al., 2020; Flook et al., 2010; Mallya & Fiocco, 2016). Attention is a central part of executive functioning; however, dispositional mindfulness involves attention as well; specifically, research has found that mindfulness involves sustained attention and attention-switching (Anderson et al., 2007). Furthermore, one of the key benefits of being mindful is having self-control and self-regulation (An et al., 2020; Baer & Bowlin, 2012). Engaging in mindfulness meditation and improving one's dispositional mindfulness is seen as being connected to improving one's executive functioning (Mallya & Fiocco, 2016). Having a high level of dispositional mindfulness may allow one to focus sustained attention on their present experience and the recognition of their internal state. Engaging in mindfulness therefore involves executive functioning skills such as attention and self-control (Deng et al., 2020). Similarly, internal recognition of one's emotions, cognition, and attention can enable self-control (Vogel Trautt, 2017).

Further, a lack in executive functioning seems to result in negative behavioural, psychological, and physiological problems such as Attention-Deficit Hyperactivity Disorder or depression. Similarly, a lack of dispositional mindfulness has also been connected to negative behaviours such as depression, stress, or poor emotion regulation (Harold, Leve, Tang, & Yang, 2012). On the other hand, both an increase in executive functioning and an increase in mindfulness have shown positive developmental outcomes or cognitive abilities; for example, increased

mindfulness has been linked to decreasing depression and loneliness (An et al., 2020; Harold et al., 2012).

Critical thinking has been shown to involve mechanisms of executive functioning and to be an integral result of executive functioning; and mindfulness and critical thinking are also thought to be closely related (Brinthaupt et al., 2020). In many cases, assessments of mindfulness use critical thinking assessments. Further, critical thinking can enhance executive functioning and high levels of dispositional mindfulness are shown to facilitate critical thinking (Bunting et al., 2016). The link between creativity and critical thinking and the links between critical thinking, executive functioning, and mindfulness support the notion that these concepts may be closely associated with one another (Bai et al., 2020; Bunting et al., 2016).

Both dispositional mindfulness and executive functioning have been shown to act as potential predictors of everyday creative behaviour (Arendasy et al., 2014; Capurso et al., 2014). In both cases, there are also conflicting results regarding the nature of these predictive relationships. On the one hand, increased executive functioning may result in increased creative behaviours due to the idea that sustained attention may result in an increase of novel ideas (Arendasy et al., 2014; Delis et al., 2007). Increased levels of mindfulness may also increase levels of executive functioning due to being aware of the present moment and allowing for greater attention, self-control, and planning. Therefore, increased levels of mindfulness could enhance the relationship between executive functioning and creativity. On the other hand, increased executive functioning could have a negative relationship with creative behaviour, as it has been suggested that defocused attention results in improved creative behaviour (Baas et al., 2017). It could therefore also be possible that high levels of mindfulness as well as low levels of executive functioning (defocused attention) could result in creativity. The relationship between mindfulness and creativity is also conflicting, with some studies arguing that dispositional mindfulness and everyday creative behaviour have a positive relationship and others indicating a negative relationship between them (Agnoli et al., 2018; Henriksen et al., 2020).

Hence, it is apparent that a complex relationship exists among these variables, and these relationships need to be looked at more closely. The dynamics of these relationships need to be better understood, as it could be possible that high levels of mindfulness and high levels of executive functioning enhance creativity, although the inverse of this is also possible, with lower levels of executive functioning and mindfulness resulting in improved creativity. Due to

evidence in the existing literature, it can be assumed that executive functioning and dispositional mindfulness are both possible predictors of creativity. In addition, dispositional mindfulness has been linked to enhanced executive functioning and may therefore alter the nature of the relationship between executive functioning and everyday creative behaviour (Mallya & Fiocco, 2016). Given this, it seems appropriate to explore both dispositional mindfulness and executive functioning as predictors of everyday creative behaviour as well as the extent to which dispositional mindfulness may moderate the relationship between executive functioning and everyday creative behaviour in a South African sample.

1.2.9. conclusion: the current study.

From the above, creativity can be seen as a widely researched construct, with obvious importance in human development (Azimi & Fazelian, 2013; Hoffmann & Russ, 2012; Jamet et al., 2015). Everyday creative behaviour can be seen as encompassing multiple domains of creativity that are used in various daily activities (Elisondo & Vargas, 2019). Both mindfulness and executive functioning have been shown to be extensively researched in past literature, however research on their relationships to creativity, particularly in the South African context, is both limited and somewhat contradictory. Using the conceptualizations as well as the past research available for these constructs, possible theoretical links between dispositional mindfulness, executive functioning, and creative behaviour have been highlighted. A complex relationship among these variables could exist, and specifically a moderating relationship where the nature of the association between executive functioning and everyday creative behaviour may differ on the basis of dispositional mindfulness merits exploration. This research aims to address a gap in existing research by expanding on the existing knowledge of these constructs through exploring the nature of the relationships between dispositional mindfulness, executive functioning and everyday creative behaviour in a South African context and sample, including the specific potential for a moderating relationship as outlined above. Exploring these constructs in a South African context could potentially yield interesting results due to the high levels of cultural diversity, multilingualism, and socioeconomic diversity that exist in South Africa, and potentially interesting relationships not known in previous literature could be found.

1.3. Research Questions

1. What are the nature of the relationships between dispositional mindfulness, executive functioning, and everyday creative behaviour in a South African sample?
2. To what extent do dispositional mindfulness and executive functioning predict everyday creative behaviour in a South African sample?
3. To what extent does dispositional mindfulness moderate the relationship between executive functioning and everyday creative behaviour in a South African sample?

Chapter 2: Methodology

The following chapter discusses the methods used in the study, specifically the research design, sample and sampling, instruments, procedure, and data analysis of the current study.

2.1. Research design

The research design for this study was a quantitative research design, specifically using a post-positivist paradigm as an underlying framework. This framework is based on the idea that our social world can be investigated empirically however, all observation has a certain degree of error and absolute truth cannot be found (Cruickshank, 2012). The objective of this framework is to therefore identify trends, although it is understood that these cannot be fully generalized as research is situational and can be influenced by unique factors (Aliyu et al., 2014). Moreover, a constituent of this paradigm is that the objective is to learn and therefore the social researcher aims to learn about their topic rather than simply to test something. In contrast to positivism, which would aim to solve problems, the post-positivist researcher does not have to solve the problems they put forth, but the questions that are asked are of just as much importance as trying to find the answers. Therefore, post-positivism allows for open-mindedness of the complexity of relationships that exist (Ryan, 2008).

For the study, a quantitative, non-experimental, correlational, and cross-sectional design was used which assumed that the variables within the study were related to each other (Comiskey et al., 2016). This design looks at the nature of the relationships between the variables, especially looking at association and prediction, and is appropriate for the research question of whether there are associations between dispositional mindfulness, executive functioning, and everyday creative behaviour. In addition, this design does not allow for causal conclusions to be made, as there is no random assignment, no control group, and no manipulation of the independent variable. Therefore, non-spuriousness, temporal precedence, and covariation will not be met, which characterizes the design as non-experimental (Little, 2013). Despite this, this type of design is advantageous as it allows for conclusions to be drawn regarding the nature of the associations between variables and a greater understanding of the relationship complexities such as the direction of the relationship (Comiskey et al., 2016). Hence, utilizing this design allowed for the inference of the relationships that exist between dispositional mindfulness, executive functioning, and everyday creative behaviour in the sample.

2.2. Sample and sampling

The sample for this study consisted of volunteer participants from the South African population between the ages of 18 years old and 50 years old with access to a computer/ device and the Internet. The accessible population consisted of university students from first year through to postgraduate level studies as well as any other participants gained through social media that met the age criteria. The aim of the study was to have a large sample size which would allow for the reduction of sampling error (Botha & Laher, 2011). In addition, a large sample size would enable the study to meet the requirement for central limit theorem for normal distribution and could allow for generalizability to improve the external validity of the study (Laher, 2016).

Potential participants were invited to participate in the study through social media and electronic platforms such as: Facebook, Instagram, and LinkedIn (please see Appendix B). Furthermore, the researcher contacted a local university to request permission to send out invitations to students, from all departments, via their communication service (Appendix A). Therefore, the research used non-probability sampling which entails that the sampling is not random and rather due to availability and willingness to participate (Botha & Laher, 2011). Specifically, convenience and snowball sampling were used by spreading the invitation on social media and electronically and allowing the sample to be gathered through word of mouth. These types of sampling strategies allowed for convenient access to a large sample (Botha & Laher, 2011).

The questionnaire response rate was large, with a total of 2527 individuals logging onto the survey link and answering questions. However, of these individuals, only 1636 completed the entire questionnaire. From these participants, a further 28 (0.02%) individual responses had to be removed due to an excessive number of incomplete items. Therefore, the final total sample size was 1608 adult participants from the South African population.

The demographics of the final sample obtained were fairly diverse. It was found that the mean age of the sample was 24.50 with a standard deviation of 7.268. In addition, 68.2% (n = 1096) of the sample was aged between 18 and 24 years old. Further, 66.2% (n = 1065) of the sample identified as female, 32.4% (n = 521) identified as male, 0.3% (n = 5) identified as intersex, and 0.4% (n = 7) identified as other. Of the 1608 participants, 50.7% (n = 816) identified as Black, 30.3% (n = 487) identified as White, 11.1% (n = 179) identified as Indian, 4.5% (n = 72) identified as Coloured, and 1.5% (n = 24) identified as Asian. In addition, 50.1% (n = 805)

of participants highest completed level of education was matric and 18.6% (n = 299) of participants had completed a postgraduate degree or degrees. Other participants had postgraduate diploma/s (n = 44 (2.7%)); undergraduate diplomas (n = 47 (2.9%)), undergraduate degrees (n = 307 (19.1%)), and secondary education without Matric (n = 9 (0.6%)).

A majority of the sample identified English as their home language (n = 865 (53.8%)), followed by isiZulu (n = 183 (11.4%)), Sesotho (n = 94 (5.8%)), Sepedi (n = 83 (5.2%)), Afrikaans (n = 83 (4.5%)), Setswana (n = 73 (3.9%)), other (n = 66 (3.6%)), isiXhosa (n = 63 (3.9%)), Xitsonga (n = 35 (2.2%)), Tshivenda (n = 33 (2.1%)), siSwati (n = 21 (1.3%)), and isiNdebele (n = 5 (0.3%)). Moreover, 51.5% (n = 828) of participants identified that they were fluent in one language, 33.4% (n = 537) were fluent in two languages and 15% (n = 241) were multilingual, speaking three or more languages. A majority of the sample identified themselves as students studying full-time (n = 1036 (64.4%)), followed by those who were employed full-time (n = 222 (13.8%)), those who were part-time students (n = 36 (2.2%)), part-time employees (n = 23 (1.4%)), and those who were unemployed (n = 24 (1.5%)).

In summary, a majority of the participants in the study were undergraduate students hence the relatively low mean age of the sample. Most of the sample were female and approximately half identified as Black. In addition, approximately half the participants also indicated that English was their home language, with a majority of the sample being fluent in one language and approximately a third of the sample being fluent in two languages. For a full breakdown of the sample characteristics, please refer to Table 1-8 in Appendix I.

2.3. Instruments

All the questionnaires that were used within this study and that are described in this section were either self-developed or openly published and freely available for use with appropriate acknowledgement.

Demographic questionnaire.

The demographic questionnaire used was a self-developed, self-report questionnaire that asked participants to report on demographic factors such as age, gender, race, and language. In addition, it asked for level of education, employment status, and occupation. This information was used to describe the sample obtained from the accessible population.

The Kaufman Domains of Creativity Scale (K-DOCS).

The Kaufman Domains of Creativity Scale (K-DOCS) is a self-report questionnaire of everyday creative behaviour where people self-identify themselves as more or less creative compared to individuals of approximately the same age and life experience. The scale was developed in 2012 and contains 50 items to assess creative behaviours across five domains: self/everyday, scholarly, performance, mechanical/scientific, and artistic (Kaufman, 2012). Each item is answered on a five-point Likert-type scale ranging from 1 (much less creative) to 5 (much more creative), with higher scores indicating more creative behaviour.

In recent years, self-report questionnaires of everyday creative behaviour have become more popular, with research showing that assessing creativity based on self-report questionnaires can be a reliable and valid tool (Kaufman et al., 2012). The K-DOCS was validated for its psychometric properties on two samples: 825 adults from Amazon Mechanical Turk and 500 Polish adults. Due to it being a relatively new measure, more research needs to be done on its factor structure in different populations however it has shown evidence for construct validity. In addition, it has been shown to be a theoretical and psychometrically reliable and valid measure of self-report, everyday creative behaviours (Kaufman et al., 2017). Cronbach alpha internal consistency reliabilities for the subscales of the K-DOCS have shown high reliability as estimates for all of the subscales in a study by Kaufman (Kaufman, 2012) were above 0.80: Self/Everyday ($\alpha= 0.86$), Scholarly ($\alpha= 0.86$), Performance ($\alpha= 0.87$), Mechanical/Scientific ($\alpha= 0.86$), and Artistic ($\alpha= 0.83$). Hence, the K-DOCS seems to have high internal consistency reliability (Cronbach, 1951). Although the scale seems to have good properties internationally (Kaufman, 2012; Kaufman et al., 2012, 2017), it does not appear to have been used in a South African context previously.

The Mindful Attention Awareness Scale (MAAS).

The Mindful Attention Awareness Scale (MAAS) is a self-report questionnaire that assesses dispositional mindfulness, which can be defined as a state of mind of, attention to, and awareness of what is currently being experienced (Brown et al., 2007a; 2007b; Brown & Ryan, 2003). The MAAS is a 15-item scale; each item is answered on a 6-point Likert-type scale ranging from 1 (almost always) to 6 (almost never) (Brown & Carlson, 2005).

The MAAS has shown good psychometric properties, with support for good convergent and discriminant validity in a sample of cancer patients (Brown & Ryan, 2003). Further, in a study

to establish the psychometric properties of the MAAS, a sample of students from a United States population was used and it was shown to have good construct validity and overall to be a reliable and valid measure of mindfulness (Brown et al., 2007b; Brown & Carlson, 2005). Brown and Ryan (2003) also found that the reliability of the MAAS was good, with a Cronbach Alpha of 0.82 which is indicative of high internal consistency reliability and a test-retest reliability of 0.81 which indicates good reliability over time. Moreover, the diversity of the MAAS has been shown in cross-cultural research, for example, its use in an Argentinian population (García et al., 2014). Further, other studies have replicated the good internal consistency of the MAAS in various contexts, with some reporting a Cronbach alpha of 0.89 (Black et al., 2012; Schooler & Zedelius, 2015). In previous cross-cultural studies, the MAAS has also been shown to have good construct validity, specifically convergent as well as discriminant validity (Black et al., 2012; García et al., 2014; Riaño-Hernández, Ruiz & Suarez, 2016). Although the MAAS seems to have good properties internationally, it does not appear to have been used in a South African context previously.

The Amsterdam Executive Function Inventory (AEFI).

The Amsterdam Executive Function Inventory (AEFI) was originally designed in 2011 to assess executive functions of children and adolescents in a simple and time-saving self-report manner. It assesses three integrated but distinct executive functions: attention (including sustained and focused attention); self-control and self-monitoring (including working memory skills); and planning and initiative (instigating and planning behaviours) (Jolles et al., 2012). It includes 13 items which are measured on a 3-point Likert-type scale with 1 representing not true, 2 representing partly true, and 3 representing true (Baars et al., 2015).

The AEFI has shown good psychometric properties. Firstly, in a sample of adolescents between the ages of 15 and 18 years old in the Netherlands, it was shown that it accurately measures attention, self-control, and self-monitoring as well as planning and initiative which is indicative of construct validity (Jolles et al., 2012). Secondly, it was shown to be a reliable and valid measure of executive functioning in a large study conducted on first-year university students in the Netherlands (Baars et al., 2015). Cronbach Alpha internal consistency reliability scores were adequate for the subscales: Attention ($\alpha= 0.69$), Self-Monitoring ($\alpha= 0.60$), and Planning and Initiative ($\alpha= 0.54$). Although the planning subscale was low, the overall Cronbach alpha was shown to be adequate for the AEFI (Jolles et al., 2012). Although it was originally

designed for adolescents and children, the study showed that age does not impact the scores of the questionnaire and therefore it can be used on other age populations (Jolles et al., 2012). Although the AEFI seems to have reasonable properties internationally, it does not appear to have been used in a South African context previously.

2.4. Procedure

Firstly, permission from the University of the Witwatersrand Human Research Ethics Committee (Non-Medical) to conduct the study and to invite participants to be included in the study was obtained. Once permission was received, potential participants were sent an electronic survey invitation and a participant information sheet (please see Appendix B and Appendix C) as well as the corresponding link to the online electronic survey hosted on SurveyMonkey. This survey included the demographic questionnaire, the Kaufman Domains of Creativity Scale (K-DOCS), the Mindful Attention Awareness Scale (MAAS), and the Amsterdam Executive Function Inventory (AEFI) (please see Appendices D, E, F, and G). The invitation was circulated electronically and on social media platforms such as LinkedIn and Facebook. In addition, a local university was also approached for permission to invite students from all levels and faculties to participate in the study. After the registrar gave permission, Heads of School, Heads of Department, course coordinators, and lecturers (please see Appendix A) were then approached for permission to post the invitation (please see appendix B), participant information sheet (please see Appendix C), and link on the university's e-communication platform to invite students to participate. Participation was expected to take approximately 20 to 30 minutes and the survey was completed online. After approximately two months of the survey link being open, a sufficiently large sample had been collected and the survey was closed to allow for the data to start being analyzed. The questionnaire responses were coded into an MS Excel spreadsheet, thereafter, age groups, race groups, and gender groups were created. In addition, the spreadsheet was cleaned, whereby scales items were mean substituted where necessary, items reversed-scored where necessary, and subscale totals and scale totals calculated. Thereafter, the data was analyzed statistically.

2.5. Ethical Considerations

Ethical clearance and permission for this study was applied for through the University of the Witwatersrand Human Research Ethics Committee (Non-Medical) and granted (Protocol Number: MASPR/20/03) (please see Appendix H). In order to ensure informed consent,

participants were sent a brief invitation to participate (please see Appendix B) and a full participant information sheet (please see Appendix C). The participant information sheet comprised of the motive of the study and what participation would require (completion of an online survey expected to take approximately 20-30 minutes) as well as an invitation to participate with an assurance that choosing to do so would be completely voluntary. It also stated that there were no explicit benefits or foreseeable risks to taking part in the study and that participants would remain anonymous. Explanations of the processes for storing the data during and after the study, feedback, and contacting the researcher and research supervisor were also included as well as permission to store responses permanently in an anonymous electronic form to potentially use for future research. It was also made known to participants that they would be able to obtain a brief summary of the findings of the study when complete. Participants were requested to indicate whether they agreed to participate in the study and only giving consent to these terms allowed for the individual to continue to the questionnaires in the online survey. In order to ensure that participants' responses were protected, responses were stored in an anonymous electronic form on a password-protected laptop. The results of this study have been reported within this research report and it is possible that results may be published in a journal or presented at a conference in the future. The steps above ensured that the ethical principles of respect for persons, beneficence, non-maleficence, and justice were met in the study, specifically principles such as informed consent, voluntary participation, right to draw without penalty, protection of participant welfare, anonymity and confidentiality, and feedback (Rosenthal & Rosnow, 1997; United States, 1978).

2.6. Data Analysis

After a large sample of surveys were collected electronically, the survey link was closed, and the data analysis commenced which included capturing and scoring into MS Excel, cleaning the data, and exporting it into SPSS version 26 to run the statistical analyses. The analyses that were run were: internal consistency reliabilities, descriptive statistics, normality tests, Pearson's *r* correlation coefficients, and hierarchical moderated multiple regressions.

Firstly, the data was captured and scored appropriately on MS Excel. Some demographics were coded into groups such as age, gender, and race. Further, mean substitution was carried out where individual responses were left blank, however, if there were too many missing responses the individuals did not get a calculated subscale-total or they were deleted completely if they

had a large number of items missing. In addition, reverse scoring was completed for items 1, 5, 6, 7, 8, 12, and 13 of the AEFI and total scores for the subscales of all three scales were created as well as total scores for all three scales (the K-DOCS, the MAAS, and the AEFI).

Secondly, all scale items were treated as interval in nature, and thus descriptive statistics including the mean, range, minimum score, maximum score, skewness coefficients, kurtosis estimates, and histograms were run (Field, 2018). This allowed for the distribution of the data to be looked at to identify if the data was normally distributed. Data was considered to be sufficiently normally distributed if the skewness coefficients fell between -1 and 1 and the kurtosis values fell between -3 and 3 (Little, 2013). In addition, due to the sample being large ($n=1605$), the conditions for the Central Limit Theorem, which states that if a sample is larger than 30, the data is sufficiently normally distributed, were met (Field, 2018).

Thereafter, internal consistency reliabilities, specifically Cronbach's Alpha, were run for all three scales. Cronbach's Alpha is a commonly used statistical method to look at internal consistency reliability, as it investigates the degree to which the items on a measure are correlated with one another (Adamson & Prion, 2013). It is measured on a scale of 0 to 1, with closer to 1 indicating higher reliability (Cronbach, 1951). Frequencies for all of the categorical variables in the study, including gender, race, and home language, were also run to describe the characteristics of the sample (Field, 2018).

In order to answer the first research question, Pearson r correlation coefficients were run on the data. Pearson's correlation coefficients are a parametric statistical technique that can be used to establish the strength and direction of the association between two variables (Comiskey et al., 2016). The closer that the coefficient is to one, the stronger the relationship, whereas a coefficient closer to zero is indicative of a weak relationship. Furthermore, a coefficient of +1 is demonstrative of a perfect positive linear relationship, while a coefficient of -1 is indicative of a perfect negative linear relationship. When variables are shown to have a positive relationship, it indicates that the variables move in the same direction while a negative relationship indicates that the variables move in opposite directions (Boer et al., 2018; Field, 2018). Furthermore p -values were assessed for significance, with a p -value of less than 0.05 indicating a significant relationship (Field, 2018).

In order to answer the second and third questions, hierarchical moderated multiple regressions were run. The criterion (dependent) variable in the study was everyday creative behaviour, the predictor (independent) variables were executive functioning and dispositional mindfulness. Dispositional mindfulness was also entered as a moderator variable. A moderator is a variable that changes the relationship between an independent and dependent variable; hence, a moderation model exists when a moderator significantly changes the nature of the relationship between the predictor (independent) and the criterion (dependent) variables (Cham et al., 2019). A hierarchical regression is a type of multiple regression whereby variables are added at different steps in the analysis. This can be advantageous to allow for statistical control (Chu et al., 2015). Therefore, this type of regression allows for the dynamics of the relationship between the variables to be looked at. Assumptions of a moderated multiple regression are all variables need to be interval, there must be no significant outliers, the data should be normally distributed, there should be linearity and homoscedasticity, and there should be no multicollinearity. Multicollinearity refers to when the relationships between the predictors (independent variables) are too strong or almost perfect (Field, 2018). In this study, all assumptions for the hierarchical moderated multiple regressions were met. Therefore, six regression models were run, looking at the K-DOCS total score or one of the K-DOCS subscale scores as an outcome variable. Subsequently, simple slope analyses were run for the models that included a significant interaction. A simple slope analysis allows for a visual presentation of the moderation effect and therefore a clearer interpretation of the nature of the interaction between the variables (Cham et al., 2019; Field, 2018).

Chapter 3: Results

This chapter presents the results of the statistical analyses conducted in the current study using IBM SPSS Statistics version 26. The first analyses to be done were internal consistency reliability estimates, descriptive statistics, and normality tests. Thereafter, the research questions were answered by calculating correlations as well as hierarchical moderated multiple regressions.

3.1. Internal consistency reliability

In order to analyze their internal consistency reliability, Cronbach Alpha coefficients were calculated for all the scales and their corresponding subscales within the study (Cronbach, 1951). These calculations are represented in Table 1 below.

Table 1

Internal Consistency Reliabilities

	n	Variable	No. of items	Cronbach's alpha (α)
Scale	1608	K-DOCS	50	.907
Subscales		Self/Everyday	11	.723
		Scholarly	11	.831
		Performance	10	.871
		Mechanical/Scientific	9	.882
		Artistic	9	.887
Scale	1605	MAAS	15	.865
		AEFI	13	.737
Subscales	1608	Attention	3	.671
		Self-control/Monitoring	5	.645
		Planning and Initiative	5	.545

As shown in Table 2, the Kaufman Domains of Creativity Scale (KDOCS) had a high internal consistency reliability ($\alpha = .907$), with each subscale also having good internal consistency reliability estimates: self/everyday ($\alpha = .723$), scholarly ($\alpha = .831$), performance ($\alpha = .871$), mechanical/scientific ($\alpha = .882$), and artistic ($\alpha = .887$). Further, the Mindfulness Attention Awareness Scale (MAAS) had a high internal consistency reliability estimate ($\alpha = .865$). In addition, the Amsterdam Executive Functioning Inventory (AEFI) indicated an overall good internal consistency reliability ($\alpha = .737$).

The internal consistency reliability estimates for the subscales of the Amsterdam Executive Functioning Inventory were low: attention ($\alpha = .671$), self-control/monitoring ($\alpha = .645$) and planning and initiative ($\alpha = .545$). These results suggest that the subscales may not be internally consistent within the sample, however these results are in line with previous estimates established for the scale, and are in fact higher than some cases (Baars et al., 2015; Jolles et al., 2012). Despite this, it was decided that any results based on these variables (i.e., scores obtained for the subscales of the AEFI) should be treated with extreme caution, and therefore the total score for executive functioning was treated as a more reliable indicator of the construct. Further, due to the planning and initiative subscale having a very low internal consistency reliability, it was left out of further analyses in the study.

3.2. Descriptive statistics and normality

To look at the distribution of the continuous variables (scale scores), descriptive statistics were run which included the mean, the standard deviation, and the maximum and minimum scores (the range). Further, in order to establish whether the distribution of the data was sufficiently normal to allow for parametric analysis, skewness and kurtosis values were calculated for each variable (Field, 2018). These results are presented in Table 2.

As shown in Table 2, total creative behaviour had a mean of 157.94 and a standard deviation of 24.72. Furthermore, the minimum score for total creative behaviour was 83 and the maximum score was 234. The Kaufman Domains of Creativity Scale (KDOCS) has a maximum score of 250, hence a majority of individuals from the sample reported a moderate level of overall creative behaviour, with few individuals reporting very high or low levels of overall creative behaviour. Despite this, the maximum score in the sample was evident of an

extremely high score for creative behaviour and was close to being the maximum possible score on the KDOCS.

Table 2
Descriptive Statistics

Variables	N	Mean	Std. Deviation	Min	Max	Skewness	Kurtosis
Total creative behaviour	1608	157.94	24.717	83	234	.023	.021
Self/Everyday	1608	39.33	5.468	14	55	-.363	.714
Scholarly	1608	37.92	6.729	15	55	-.189	.284
Performance	1608	26.84	8.933	10	50	.217	-.551
Mechanical/Scientific	1608	24.98	8.414	9	45	.124	-.703
Artistic	1608	28.88	8.156	9	45	-.170	-.559
Dispositional mindfulness	1605	55.84	12.468	15	89	-.143	-.128
Executive Functioning	1608	28.72	4.521	14	39	-.268	-.497
Attention	1608	5.66	1.623	3	9	.132	-.756
Self-Control/Monitoring	1608	11.31	2.438	5	15	-.530	-.444
Planning and Initiative	1608	11.75	1.979	5	15	-.316	-.361

The self/everyday subscale of the K-DOCS had a mean of 39.33 and a standard deviation of 5.47, with a minimum score of 14 and a maximum score of 55. This demonstrates moderate levels of reported self/everyday creativity within the sample, as the maximum possible score of this domain was 55. The scholarly subscale of the KDOCS had a mean of 37.92 and a

standard deviation of 6.73 with a minimum score of 15 and a maximum score of 55. Levels of reported scholarly creative behaviour in the sample were therefore also moderate, with few individuals reporting very high or low levels of scholarly creative behaviour.

The performance subscale for the KDOCS had a mean of 26.84 and a standard deviation of 8.93 as well as a minimum score of 10 and a maximum score of 50. The reported levels of performance creative behaviour were therefore moderate in the sample, although some individuals obtained the maximum score for the subscale (50). The mechanical/scientific subscale of the KDOCS had a mean of 24.98, a standard deviation of 8.41, a minimum score of 9, and a maximum score of 45. This indicates that mechanical/scientific creative behaviour was the lowest scoring domain for the sample although levels of reported creative behaviour were still moderate. Lastly, the artistic subscale of the KDOCS had a mean of 28.88, a standard deviation of 8.16, a minimum score of 9, and a maximum score of 45. This scale was also one of the lower scoring domains, although it showed a higher average score than both the mechanical/ scientific and performance domains.

The average score for dispositional mindfulness was 55.84, with a standard deviation of 12.47, a minimum score of 15, and a maximum score of 89. Overall, the sample obtained moderate dispositional mindfulness scores, as the highest possible score was 90. There was, however, one participant who scored 89, indicating an extremely high level of dispositional mindfulness.

The average score for overall executive functioning was 28.72 with a standard deviation of 4.52, a minimum score of 14, and a maximum score of 29. This means that the sample had a moderate to high average score for executive functioning. The attention subscale had a mean of 5.66 and a standard deviation of 1.62. The minimum score was 3 and the maximum score was 9. The self-control/monitoring subscale had a mean of 11.31 with a standard deviation of 2.44, a minimum score of 5, and a maximum score of 15.

Normality for the scales was established by looking at the skewness and kurtosis estimates for each scale and subscale (evaluating whether these values fell between -1 and 1 for the skewness coefficients and between 3 and -3 for the kurtosis estimates), as well as looking at the histograms and making use of the Central Limit Theorem. Before establishing normality, all other assumptions were met (Field, 2018). As shown in Table 2, none of the skewness coefficients were larger than 1 or -1 and none of the kurtosis estimates exceeded 3 or -3, therefore a sufficiently normal distribution for each variable was able to be assumed.

Therefore total creative behaviour and all creative behaviour domains, dispositional mindfulness, and executive functioning and its related domains all had appropriate skewness and kurtosis values to assume a normal distribution (Field, 2018). In addition to this, histograms for all the scales were sufficiently normal in shape (please see Appendices J and K). Furthermore, the sample consisted of 1608 participants, and therefore the condition to assume Central Limit Theorem (a sample size of at least 30) was met as well. Therefore, when combined, these results suggested that all of the variables in the study could be assumed to be sufficiently normally distributed to allow for parametric statistical analyses (Field, 2018; Little, 2013).

3.3. Correlations

To answer the first research question, Pearson Product Moment (r) correlations were used to examine how the variables were associated with each other. The results of the correlations are presented in Table 3 and Table 4 below. Table 3 shows the correlations between total creative behaviour and the various subtypes of creative behaviour whereas Table 4 shows the correlations between creative behaviour, dispositional mindfulness, and executive functioning.

As shown in Table 3, the Kaufman Domains of Creativity Scale (KDOCS) total score (which represented total creative behaviour) and scores for all of the creative behaviour subscales were positively and significantly related to each other. The artistic subscale showed the highest correlation to total creative behaviour ($r = .724, p = .000$), however all of the subscales had a correlation above .5 with the total creative behaviour score, indicating moderate to strong positive linear relationships as expected. Further, all the subscales were significantly and positively related to each other as well, with the performance and artistic creative behaviour domains showing the highest positive linear relationship ($r = .456, p = .000$). This would suggest that the creative behaviours associated with the performance domain and artistic domain are similar, and that both the performance and artistic domains involve aspects relating to each other. Furthermore, performance and self/everyday creative behaviour ($r = .256, p = .000$), artistic and self/everyday creative behaviour ($r = .263, p = .000$), artistic and mechanical/scientific creative behaviour ($r = .261, p = .000$), scholarly and artistic creative behaviour ($r = .303, p = .000$), and performance and mechanical/scientific creative behaviour ($r = .204, p = .000$) were all moderately related. However, mechanical/scientific creative

behaviour was only weakly related to both self/everyday ($r = .141, p = .000$) and scholarly ($r = .178, p = .000$) creative behaviour, which implies that the creative behaviours underlying the mechanical/scientific domain differ to those underlying the self/everyday and scholarly domains.

Table 3

Pearson's Correlations for Creative Behaviour (As Measured by The Kaufman Domains Of Creativity Scale (KDOCS) (n=1608))

Variables	Self/Everyday	Scholarly	Performance	Mechanical/ Scientific	Artistic
Scholarly	.402** .000				
Performance	.256** .000	.343** .000			
Mechanical/ Scientific	.141** .000	.178** .000	.204** .000		
Artistic	.263** .000	.303** .000	.456** .000	.261** .000	
Total creative behaviour	.558** .000	.646** .000	.732** .000	.580** .000	.724** .000

* $p < .05$ two-tailed. ** $p < .01$ two-tailed.

Table 4 shows the Pearson's Correlation Coefficients for total creative behaviour and the creative behaviour subscales with dispositional mindfulness and executive functioning. Almost all of the creative behaviour subscales were significantly related to dispositional mindfulness. Both self/everyday creative behaviour ($r = .295, p = 0.000$) and scholarly creative behaviour ($r = -.101, p = .000$) showed a significant, positive, and weak relationship with dispositional mindfulness and mechanical/scientific creative behaviour showed a significant, positive, and very weak relationship with dispositional mindfulness ($r = .050, p = .046$). Artistic creative behaviour showed a significant, very weak, and negative relationship with dispositional mindfulness ($r = -.070, p = .005$). Performance creative behaviour was the only creative behaviour subscale that showed no significant relationship with dispositional mindfulness ($r =$

-.025, $p = .317$). Dispositional mindfulness was significantly and positively related to total self-reported creative behaviour although the relationship was very weak ($r = .078$, $p = .002$).

Table 4

Pearson's Correlations for Creative Behaviour, Dispositional Mindfulness, and Executive Functioning

Variables	Self/Everyday	Scholarly	Performance	Mechanical/ Scientific	Artistic	Total Creative Behaviour
Dispositional Mindfulness	.295** .000 1605	.101** .000 1605	-.025 .317 1605	.050** .046 1605	-.070** .005 1605	.078** .002 1605
Executive Functioning	.395** .000 1608	.266** .000 1608	.039 .121 1608	.137** .000 1608	.031 .215 1608	.231** .000 1608
Attention	.225** .000 1608	.163** .000 1608	-.040 .108 1608	.060* .017 1608	-.049* .049 1608	.084** .001 1608
Self- Control/Monitoring	.219** .000 1608	.071** .004 1608	-.045 .070 1608	0.33 .187 1608	-.064* .011 1608	.042 .095 1608

* $p < .05$ two-tailed. ** $p < .01$ two-tailed.

Further, a number of the creative behaviour subscales were positively and significantly related to executive functioning. Self/everyday creative behaviour showed a significant, positive, and moderate relationship with executive functioning ($r = .395$, $p = .000$) while both scholarly creative behaviour ($r = .266$, $p = .000$) and mechanical/scientific creative behaviour ($r = .137$, $p = 0.00$) showed weak, positive, and significant relationships with executive functioning. Performance creative behaviour ($r = .039$, $p = .121$) and artistic creative behaviour ($r = .031$, $p = .215$) showed no significant relationship with executive functioning. Executive functioning was significantly and positively related to total creative behaviour although the relationship was weak ($r = .231$, $p = .000$).

When looking at the executive functioning subscales, attention was significantly, positively, and weakly related to self/everyday ($r = .225, p = .000$), scholarly ($r = .163, p = .000$), and mechanical/scientific ($r = .060, p = .017$) creative behaviour. However, attention was significantly, negatively, and weakly related to artistic creative behaviour ($r = -.049, p = .049$) and had no significant relationship with performance creative behaviour ($r = -.040, p = .108$).

In addition, self-control/monitoring was significantly, positively, and weakly related to self/everyday ($r = .219, p = .000$) and scholarly ($r = .071, p = .004$) creative behaviour. However, it had a significant, negative, and weak relationship with artistic creative behaviour ($r = -.064, p = .011$). Moreover, it was not significantly related to performance ($r = -.045, p = .070$) and mechanical/scientific ($r = .033, p = .187$) creative behaviour. Due to the planning and initiative subscale of executive functioning having very low internal consistency reliability, it was left out of any further analysis. However, as noted in the previous section, results of the subscales for the attention and self-control/monitoring subscales should also be interpreted with a degree of caution as the internal consistency reliabilities for these two subscales were below .7.

Although not part of the analyses carried out to answer the research questions, correlations were also calculated between dispositional mindfulness and self-reported executive functioning and between the subscales for the Amsterdam Executive Functioning Inventory (please see Appendix L). Dispositional mindfulness had a significant, moderately strong positive linear relationship with overall executive functioning ($r = .577, p = .000$). Dispositional mindfulness had the strongest, significant positive linear relationship with the self-control/monitoring subscale ($r = .578, p = .000$), followed by a significant, positive, and moderate linear relationship with attention ($r = .483, p = .000$) and a significant, positive, and weak linear relationship with the planning and initiative subscale ($r = .211, p = .000$). Furthermore, overall executive functioning had the strongest significant positive linear relationship with self-control/monitoring ($r = .825, p = .000$) and also had significant, strong, positive linear relationships with attention ($r = .778, p = .000$) and planning and initiative ($r = .631, p = .000$).

3.4. Hierarchical Moderated Multiple Regressions

In order to answer the second and third research questions, hierarchical moderated multiple regressions were run on the variables. In order to run this analysis, all the assumptions for the test were checked. The assumptions were: additivity and linearity of the outcome to the predictors, homoscedasticity, normal distribution of errors, all variables at least interval, no multicollinearity, and non-zero variance (Field, 2018). In order to meet the assumptions, scatterplots were created, where it was shown that the relationships between creative behaviour, executive functioning, and dispositional mindfulness were linear and that there was homoscedasticity. Thereafter, histograms and Q-Q plots were looked at, and it was established that there was a normal distribution of errors. In order to assess the multicollinearity, the Variance Inflation Factor (VIF), Tolerance, and Condition Index were looked at. It was found that all assumptions were met to run the analysis (please see Appendices J and K; the multicollinearity assumption results are presented below).

This section shows the results of a total of six regression analyses that were performed. In each case, executive functioning and dispositional mindfulness were entered as predictors (independent variables) and a particular type of creative behaviour (total, self/everyday, scholarly, artistic, mechanical/scientific, or performance) was entered as the criterion (dependent) variable.

Table 5*Model Summary for Predicting Total Creative Behaviour*

	N	R	R²	Adjusted R²	Std. Error	Sig. F Change	F	Sig
Step 1	1602	.241	.058	.057	23.997	.000	49.409	.000
Step 2	1601	.250	.063	.061	23.946	.005	35.707	.000

Table 6*Coefficient and Collinearity Diagnostics for Predicting Total Creative Behaviour*

	N	B	Std. Error	Beta	t	Sig	Collinearity		CI		
							Tolerance	VIF	Condition Index	Lower	Upper
Step 1	1602	Constant	157.966	.599	263.720	.000			1.000	156.791	159.141
		Dispositional Mindfulness	-.166	.059	-2.816	.005	.667	1.499	1.256	-.281	-.050
		Executive Functioning	1.526	.162	9.411	.000	.667	1.499	1.931	1.208	1.844
Step 2	1601	Constant	157.060	.679	231.172	.000			1.000		
		Dispositional Mindfulness	-.162	.059	-2.763	.006	.667	1.500	1.065	-.277	-.047
		Executive Functioning	1.559	.162	9.610	.000	.664	1.507	1.764	1.241	1.877
		Interaction	.028	.010	2.807	.005	.989	1.011	1.963	.008	.047

Total creative behaviour, executive functioning, and dispositional mindfulness

Table 5 and Table 6 present the first regression model which examined whether dispositional mindfulness and executive functioning predicted total creative behaviour in the sample as well as whether dispositional mindfulness moderated the relationship between executive functioning and total creative behaviour.

In Table 5, the first step in the hierarchical moderated multiple regression looked at whether executive functioning and dispositional mindfulness predicted total creative behaviour in the sample. The predictive model was significant for this step ($F_{(2;1602)} = 49.909, p = .000$). Further, the coefficient of determination ($r^2 = 0.058$) indicated that 5.8% of the variance in total creative behaviour was explained by executive functioning and dispositional mindfulness. The second step looked at whether the model that included the interaction between executive functioning and dispositional mindfulness on total creative behaviour was significant. The model for this step was also significant ($F_{(1;1601)} = 35.707, p = .000$) and the coefficient of determination ($r^2 = 0.063$) indicated that 6.3% of the variance in everyday creative behaviour was accounted for by the predictors (dispositional mindfulness and executive functioning as well as the interaction between these).

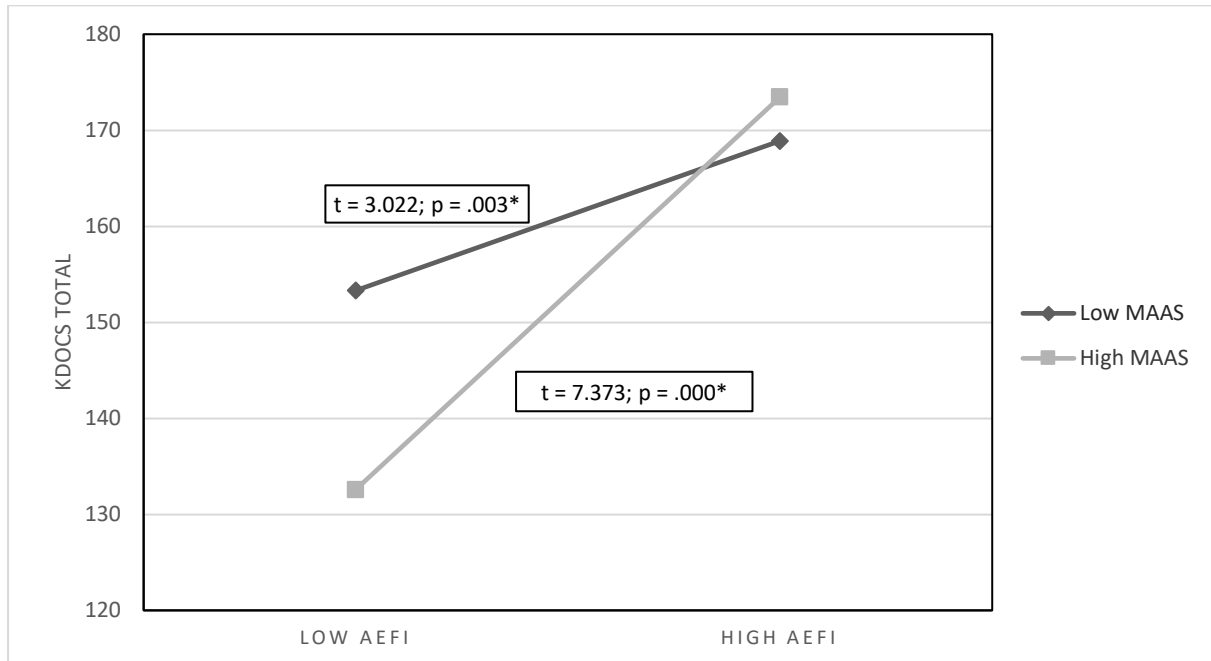
Table 6 shows the coefficients and collinearity diagnostics for both of the models. For both models, the condition index was under 30, the tolerances were all less than 1, and the VIF were all less than 2.5, which shows that multicollinearity was not a problem for the models.

In the first step, both dispositional mindfulness ($b = -.166, p = .005$) and executive functioning ($b = 1.526, p = .000$) were significant predictors of total creative behaviour. Moreover, in the second step, both executive functioning ($b = -.162, p = .006$) and dispositional mindfulness ($b = 1.55, p = .000$) continued to predict total creative behaviour and there was a significant interaction ($b = .028, p = .005$).

As the interaction was significant, a simple slopes analysis was carried out. A simple slope analysis is a graphical representation of the interaction which allows us to see at what stage of the moderator the interaction occurs (Field, 2018).

Figure 1

Simple Slopes Analysis of the Interaction Between Executive Functioning and Dispositional Mindfulness on Total Creative Behaviour



KDOCS = total creative behaviour score; MAAS = dispositional mindfulness; AEFI = executive functioning level

As shown in Table 6 and Figure 1, there was a significant interaction ($b = .028, p = .005$) between executive functioning (AEFI) and dispositional mindfulness (MAAS) on total creative behaviour (KDOCS). Both main effects (i.e. executive functioning as a predictor of everyday creative behaviour and dispositional mindfulness as a predictor of total creative behaviour) were significant as well; although it is necessary to interpret these with extreme caution due to the significant interaction (Bedeian & Mossholder, 1994).

Regression lines for the simple slopes analysis were plotted for high (two standard deviations above the mean) and low (two standard deviations below the mean) levels of dispositional mindfulness. As shown in Figure 1, for participants with low levels of executive functioning, those with high levels of dispositional mindfulness had significantly lower everyday creative behaviour scores than those with low levels of dispositional mindfulness ($t = 3.022, p = .003$). For participants with high levels of executive functioning, however, this relationship was inverted – specifically participants with high levels of dispositional mindfulness had significantly higher everyday creative behaviour scores than those with low levels of

dispositional mindfulness ($t = 7.373, p = .000$). This suggests that dispositional mindfulness acts as a stronger facilitator in the executive functioning-total creative behaviour relationship for individuals with high levels of executive functioning. In addition, it plays less of a facilitative role in the executive functioning-total creative behaviour relationship for those with lower levels of executive functioning. This pattern was supported by the shape of the interaction graph in Figure 1 which indicates that an antagonistic interaction occurred between the variables (Barron, et al., 2004).

Self/everyday creative behaviour, executive functioning, and dispositional mindfulness

Table 7 and Table 8 present the regression model created for the dependent variable self/everyday creative behaviour. As shown in Table 7, the first step in the model was significant ($F_{(2;1602)} = 156.708, p = .000$). This indicated that both executive functioning and dispositional mindfulness were significant predictors of self/everyday creative behaviour. Further, the coefficient of determination ($r^2 = 0.164$) showed that 16.4% of the variance in self/everyday creative behaviour was explained by executive functioning and dispositional mindfulness. The second step was also significant ($F_{(1;1602)} = 104.869, p = .000$), indicating that the model that included the interaction between executive functioning and dispositional mindfulness on self/everyday creative behaviour was significant. The coefficient of determination ($r^2 = 0.164$) indicated that 16.4% of the variance in everyday creative behaviour was accounted for by the predictors (dispositional mindfulness and executive functioning as well as the interaction between these) therefore adding the interaction did not improve the model.

Table 8 shows the coefficients and collinearity of the variables. Both models showed no evidence for multicollinearity as the condition index was below 30, the tolerance values were below 1, and the VIF values were below 2.5. Therefore the assumption of no multicollinearity was met. Further, in the first step, both dispositional mindfulness ($b = .044, p = .000$) and executive functioning ($b = .409, p = .000$) were shown to be significant predictors of self/everyday creative behaviour. In the second step, dispositional mindfulness ($b = .044, p = .000$) and executive functioning ($b = .411, p = .000$) remained significant predictors however the interaction between dispositional mindfulness and executive functioning was not significant ($b = .002, p = .281$). As there was no significant interaction between the predictors, no further analyses were carried out for this model.

Table 7*Model Summary for Predicting Self/Everyday Creative Behaviour*

	N	R	R²	Adjusted R²	Std. Error	Sig. F change	F	Sig
Step 1	1602	.405	.164	.163	5.003	.000	156.708	.000
Step 2	1601	.405	.164	.163	5.003	.281	104.869	.000

Table 8*Coefficients and Collinearity for Predicting Self/Everyday Creative Behaviour*

	N		B	Std. Error	Beta	t	Sig	Collinearity		CI		
								Tolerance	VIF	Condition Index	Lower	Upper
Step 1	1602	Constant	39.328	.125		314.925	.000			1.000	39.083	39.573
		Dispositional mindfulness	.044	.012	.100	3.585	.000	.667	.1499	1.256	.020	.068
		Executive Functioning	.409	.034	.338	12.091	.000	.667	1.499	1.931	.342	.475
Step 2	1601	Constant	39.256	.142		276.558	.000			1.000	38.977	39.534
		Dispositional mindfulness	.044	.012	.101	3.607	.000	.667	1.500	1.065	.020	.068
		Executive functioning	.411	.034	.030	12.138	.000	.664	1.508	1.764	.345	.478
		Interaction	.002	.002	.025	1.077	.281	.989	1.011	1.963	-.002	.006

Scholarly creative behaviour, executive functioning, and dispositional mindfulness

Table 9 and Table 10 present the third regression that was run to predict scholarly creative behaviour. As shown in Table 9, the model in the first step was significant ($F_{(2;1602)} = 64.938$, $p = .000$) and the coefficient of determination ($r^2 = 0.075$) showed that 7.5% of the variance in self/everyday creative behaviour was explained by executive functioning and dispositional mindfulness. In addition, the second model that included the interaction between executive functioning and dispositional mindfulness on scholarly creative behaviour was also significant ($F_{1;1601} = 45.877$, $p = .000$), and the coefficient of determination ($r^2 = 0.079$) showed that 7.9% of the variance in self/everyday creative behaviour was explained by the predictors (including the interaction).

As shown in Table 10, the condition index was below 30, the tolerance values were below 1, and the VIF values were below 2.5. This demonstrates that there was no evidence of multicollinearity. In the first step, both dispositional mindfulness ($b = -.042$, $p = .008$) and executive functioning ($b = .464$, $p = .000$) were significant predictors of scholarly creative behaviour. In the second step, dispositional mindfulness ($b = -.042$, $p = .009$), executive functioning ($b = .472$, $p = .000$), and the interaction between executive functioning and dispositional mindfulness ($b = .007$, $p = .007$) were significant. As the interaction was significant, a simple slopes analysis was carried out.

As shown in Table 10 as well as Figure 2, there was a significant interaction ($t = 2.692$, $p = .007$) between executive functioning (AEFI) and dispositional mindfulness (MAAS) on the scholarly domain of total creative behaviour (KDOCS). Both of the main effects for this relationship (i.e., executive functioning as a predictor of the scholarly domain of everyday creative behaviour and dispositional mindfulness as a predictor of the scholarly domain of everyday creative behaviour) were significant. However, as stipulated above, these main effects should be interpreted with caution due to the significant interaction (Bedeian & Mossholder, 1994).

Table 9*Model Summary for Predicting Scholar Creative Behaviour*

	N	R	R²	Adjusted R²	Std. Error	Sig. F change	F	Sig
Step 1	1602	.274	.075	.074	6.482	.000	64.938	.000
Step 2	1601	.281	.079	.077	6.469	.007	45.877	.000

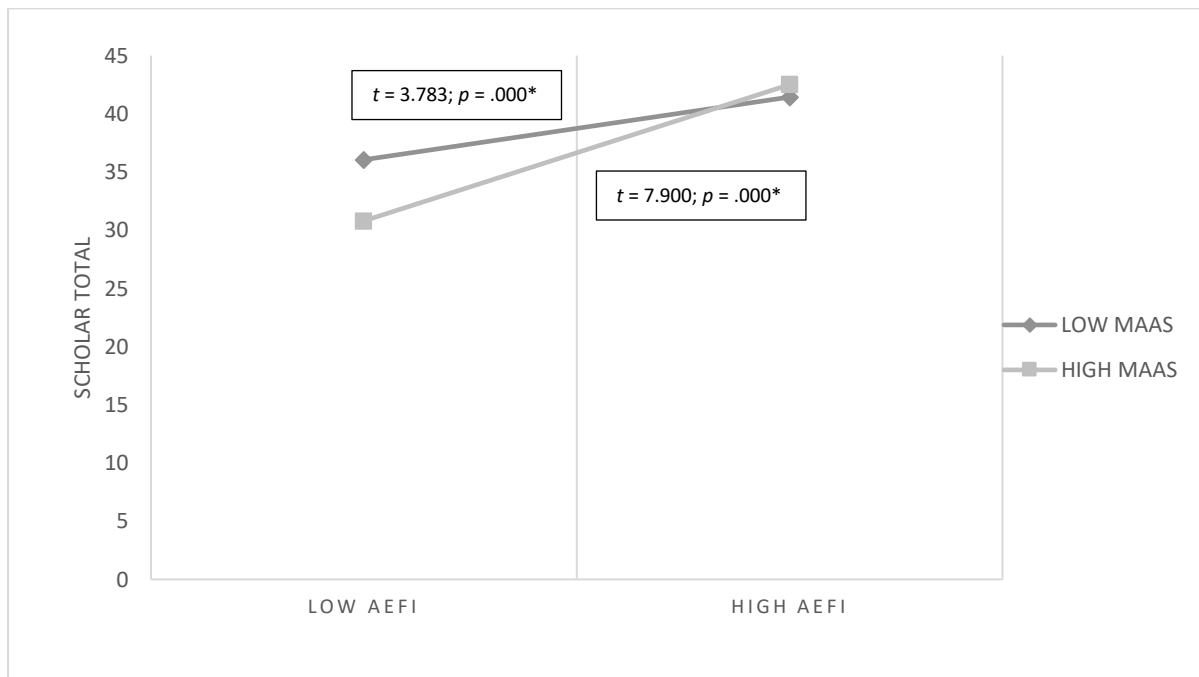
Table 10*Coefficient and Collinearity Diagnostics Table for Predicting Scholar Creative Behaviour*

	N	B	Std. Error	Beta	t	Sig	Collinearity		CI			
							Tolerance	VIF	Condition Index	Lower	Upper	
Step 1	1602	Constant	37.914	.162		234.336	.000			1.000	37.597	38.231
		Dispositional mindfulness	-.042	.016	-.079	-2.670	.008	.667	1.499	1.256	-.074	-.011
		Executive functioning	.464	.044	.312	10.589	.000	.667	1.499	1.931	.378	.550
Step 2	1601	Constant	37.679	.184		205.280	.000			1.000	37.319	38.039
		Dispositional mindfulness	-.042	.016	-.077	-2.618	.009	.667	1.500	1.065	-.073	-.010
		Executive functioning	.472	.044	.317	10.777	.000	.664	1.507	1.764	.386	.558
		Interaction	.007	.003	.065	2.692	.007	.989	1.011	1.963	.002	.012

Regression lines for the simple slopes analysis were plotted for high (two standard deviations above the mean) and low (two standard deviations below the mean) levels of dispositional mindfulness. As shown in Figure 2, it can be seen that for participants who had low executive functioning levels, those with high levels of dispositional mindfulness had lower scholarly creativity scores than those with low levels of dispositional mindfulness ($t = 3.783, p = .000$). However, for participants with high levels of executive functioning, those with lower levels of dispositional mindfulness had slightly lower scholarly creativity scores than those with higher levels of dispositional mindfulness ($t = 7.900, p = .000$) thus the pattern was inverted. This suggests that dispositional mindfulness acted as a stronger facilitator in the relationship between executive functioning and scholarly creativity for individuals with high levels of executive functioning and played less of a facilitative role for those with lower levels of executive functioning. The shape of the interaction graph in Figure 2 supports this pattern as it indicates that an antagonistic interaction occurred between the variables (Barron, et al., 2004).

Figure 2

Simple Slope Analysis of the Interaction between Executive Functioning and Dispositional Mindfulness on The Scholar Domain Of Everyday Creativity



Scholar = total score for the scholar domain of creative behaviour; AEFI = executive functioning level; MAAS = dispositional mindfulness score

Performance creative behaviour, executive functioning, and dispositional mindfulness

Table 11 and Table 12 examine the predictive relationships between executive functioning, dispositional mindfulness, and performance creative behaviour. As shown in Table 11, the prediction model for executive functioning and dispositional mindfulness on performance creative behaviour in the first step was significant ($F_{(2;1602)} = 3.922, p = .020$). However the coefficient of determination ($r^2 = .005$) showed that only a very small amount of the variance in performance creative behaviour was explained by the predictors (0.5%). Further, in the second step the interaction model was not significant ($F_{(1;1601)} = .001, p = .017$). Hence, the predictive model that included executive functioning, dispositional mindfulness, and the interaction between executive functioning and dispositional mindfulness was not significant and the coefficient of determination ($r^2 = .006$) confirmed that the predictors only explained a very small portion of the variance in performance creative behaviour (0.6%).

Table 12 presents the coefficients and collinearity for the two models. Multicollinearity was not a problem within the model, as the condition index was below 30, the tolerances were all under one, and the VIF values were under 2.5. Step 1 demonstrates that dispositional mindfulness ($b = -.052, p = .020$) was a significant predictor of performance creative behaviour and executive functioning ($b = .158, p = .009$) was also a significant predictor of performance creative behaviour. In the second step, although both dispositional mindfulness ($b = -.050, p = .022$) and executive functioning ($b = .164, p = .007$) were significant predictors, the interaction was not significant ($b = .006, p = .121$). This indicates that dispositional mindfulness was not a significant moderator in the relationship between executive functioning and performance creative behaviour.

Table 11*Model Summary for Predicting Performance Creative Behaviour*

	N	R	R²	Adjusted R²	Std. Error	Sig. F change	F	Sig
Step 1	1602	.070	.005	.004	8.915	.020	3.922	.020
Step 2	1601	.080	.006	.005	8.911	.121	3.418	.017

Table 12*Coefficients and Collinearity Diagnostics for Predicting Performance Creative Behaviour*

	N	B	Std. Error	Beta	t	Sig	Collinearity			CI	
							Tolerance	VIF	Condition Index	Lower	Upper
Step 1	1602	Constant	26.852	.223	120.668	.000			1.000	26.425	27.288
		Dispositional mindfulness	-.051	.022	-2.328	.020	.667	1.499	1.256	-.094	-.008
		Executive functioning	.158	.060	2.615	.009	.667	1.499	1.931	.039	.276
Step 2	1601	Constant	26.665	.253	105.468	.000			1.000	26.169	27.161
		Dispositional mindfulness	-.050	.022	-2.295	.022	.667	1.500	1.065	-.093	-.007
		Executive functioning	.164	.060	2.722	.007	.664	1.507	1.764	.046	.283
		Interaction	.006	.004	1.550	.121	.989	1.011	1.963	-.002	.013

Table 13*Model Summary for Predicting Mechanical/Scientific Creative Behaviour*

	N	R	R²	Adjusted R²	Std. Error	Sig. F Change	F	Sig
Step 1	1602	.142	.022	.020	8.329	.000	16.509	.000
Step 2	1601	.148	.022	.020	8.329	.085	12.010	.000

Table 14*Coefficient and Collinearity Diagnostics for Predicting Mechanical/Scientific Creative Behaviour*

	N	B	Std. Error	Beta	t	Sig	Collinearity			CI		
							Tolerance	VIF	Condition Index	Lower	Upper	
Step 1	1602	Constant	24.984	.208		120.103	.000			1.000	24.576	25.392
		Dispositional mindfulness	-.030	.020	-.044	-1.463	.144	.667	1.499	1.256	-.070	.010
		Executive functioning	.303	.056	.163	5.383	.000	.667	1.499	1.931	.193	.413
Step 2	1601	Constant	24.790	.236		104.907	.000			1.000	24.327	25.254
		Dispositional mindfulness	-.029	.020	-.043	-1.427	.154	.667	1.500	1.065	-.069	.011
		Executive functioning	.310	.056	.167	5.497	.000	.664	1.507	1.764	.199	.421
		Interaction	.006	.003	.043	1.724	.085	.989	1.011	1.963	-.001	.013

Mechanical/scientific creative behaviour, executive functioning, and dispositional mindfulness

Table 13 and Table 14 present the predictive relationships between executive functioning, dispositional mindfulness, and mechanical/scientific creative behaviour. The first step shows that the model containing executive functioning and dispositional mindfulness was significant ($F_{(2;1602)} = 16.509, p = .000$) and these predictors accounted for 2.2% of the variance in mechanical/scientific creative behaviour ($r^2 = 0.22$). The second step indicated that the model that included the interaction was also significant ($F_{(1;1601)} = 12.010, p = .000$) however adding the interaction did not change the proportion of variance explained – this remained 2.2.% ($r^2 = 0.22$).

Table 14 shows that multicollinearity was not a concern as the condition index was under 30, tolerance values were all under 1, and VIF values were all under 2.5. In the first step, executive functioning ($b = .303, p = .000$) was a significant predictor of mechanical/scientific creative behaviour however dispositional mindfulness was not a significant predictor ($b = -.030, p = .144$). In the second step, executive functioning remained a significant predictor ($b = .310, p = .000$) however dispositional mindfulness was not a significant predictor ($b = -.029, p = .154$). In addition, there was no significant interaction between executive functioning and dispositional mindfulness ($b = .006, p = .085$). Overall, this demonstrates that dispositional mindfulness was not a significant moderator of the relationships between executive functioning and mechanical/scientific creative behaviour.

Table 15*Model Summary for Predicting Artistic Creative Behaviour*

	N	R	R²	Adjusted R²	Std. Error	Sig. F change	F	Sig
Step 1	1602	.112	.013	.011	8.106	.000	10.229	.000
Step 2	1601	.123	.015	.013	8.098	.045	8.172	.000

Table 16*Coefficient and Collinearity Diagnostics for Predicting Artistic Creative Behaviour*

	N	B	Std. Error	Beta	t	Sig	Collinearity		CI		
							Tolerance	VIF	Condition Index	Lower	Upper
Step 1	1602	Constant	28.888	.202	142.775	.000			1.000	28.491	29.285
		Dispositional mindfulness	-.086	.020	-4.351	.000	.667	1.499	1.256	-.125	-.047
		Executive functioning	.193	.055	3.521	.000	.667	1.499	1.931	.085	.300
Step 2	1601	Constant	28.669	.230	124.772	.000			1.00	28.219	29.120
		Dispositional mindfulness	-.086	.020	-4.312	.000	.667	1.500	1.065	-.125	-.047
		Executive functioning	.201	.055	3.661	.000	.664	1.507	1.764	.093	.308
		Interaction	.007	.003	2.005	.045	.989	1.011	1.963	.000	.013

Artistic creative behaviour, executive functioning, and dispositional mindfulness

The last regression analysis performed investigated the predictive relationships between executive functioning, dispositional mindfulness, and artistic creative behaviour. Table 15 demonstrates that the first step of the model with executive functioning and dispositional mindfulness as predictors of artistic creative behaviour was significant ($F_{(2;1602)} = 10.229, p = .000$). The model in the second step, which also included the interaction between executive functioning and dispositional mindfulness, was also significant ($F_{(1;1601)} = 8.172, p = .000$).

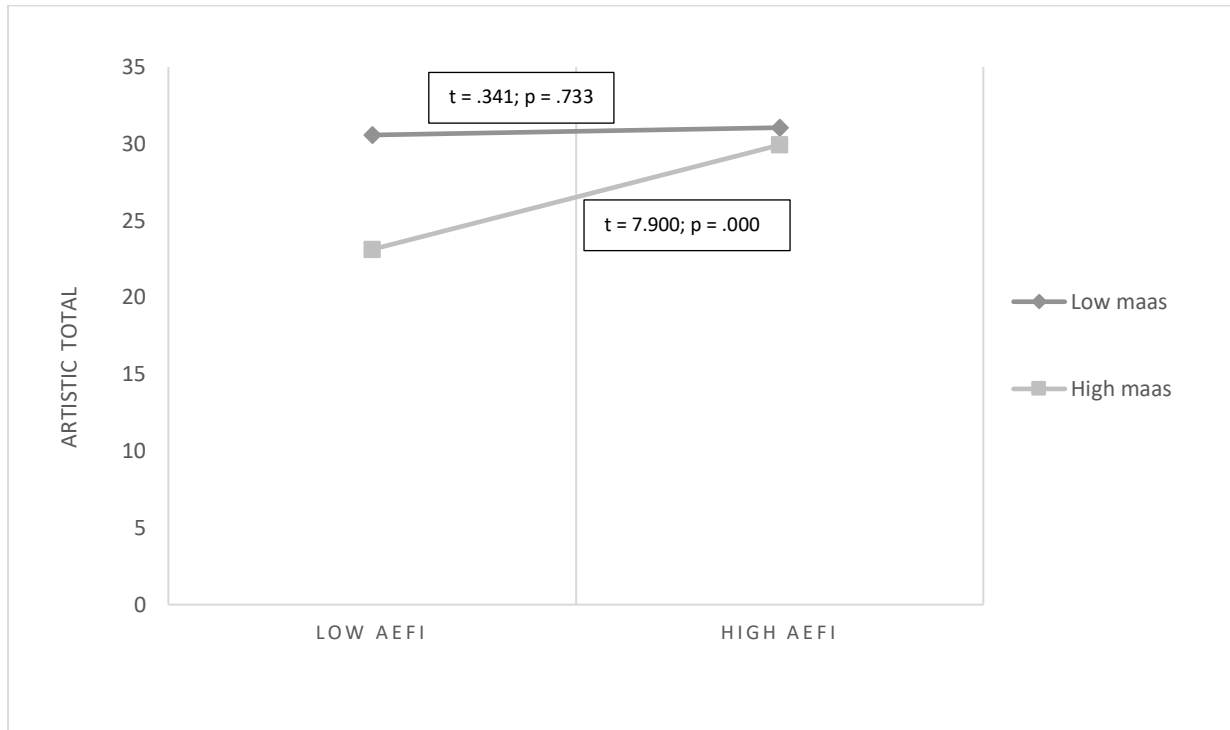
As shown in Table 16, multicollinearity was not a concern for this model as the condition index was below 30, the tolerance values were below 1, and the VIF values were below 2.5. In the first step of the regression, both dispositional mindfulness ($b = -.086, p = .000$) and executive functioning ($b = .193, p = .000$) were found to be significant predictors of artistic creative behaviour.

In the second step of the regression analysis, dispositional mindfulness ($b = -.086, p = .000$) and executive functioning ($b = .201, p = .000$) remained as significant predictors of artistic creative behaviour. Further, the interaction between executive functioning and dispositional mindfulness was also significant ($b = .007, p = .045$). This demonstrates that dispositional mindfulness was a significant moderator in the relationship between executive functioning and artistic creative behaviour. Due to there being a significant interaction present, a simple slopes analysis was carried out.

As shown in Table 16 and in Figure 3, there was a significant interaction ($t = 2.005; p = .045$) between executive functioning (AEFI) and dispositional mindfulness (MAAS) on the artistic everyday creative behaviour domain (KDOCS). Both of the main effects (i.e., executive functioning as a predictor of the artistic domain of everyday creative behaviour and dispositional mindfulness as a predictor of the artistic domain of everyday creative behaviour) were also significant; however these main effects should be interpreted with caution due to the significant interaction (Bedeian & Mossholder, 1994).

Figure 3

Simple Slopes Analysis of the Interaction between Executive Functioning and Dispositional Mindfulness on the Artistic Domain of Everyday Creative Behaviour



Artistic total = total score for the artistic creative behaviour domain; AEFI = level of executive functioning; MAAS = level of dispositional mindfulness

Regression lines for the simple slopes analysis were plotted for high (two standard deviations above the mean) and low (two standard deviations below the mean) levels of dispositional mindfulness. The interaction graph and simple slopes analysis indicated that when participants had low levels of executive functioning, participants with low levels of dispositional mindfulness had higher artistic creativity scores than participants with high levels of dispositional mindfulness ($t = 7.900, p = .000$). However for participants with high levels of executive functioning, those with low levels of dispositional mindfulness and those with high levels of dispositional mindfulness had very similar scores ($t = .341, p = .733$). This suggests that dispositional mindfulness did not have any effect on artistic creative behaviour scores for individuals with lower levels of dispositional mindfulness, regardless of their level of executive functioning. In contrast, for those with higher levels of dispositional mindfulness, level of artistic creative behaviour increased significantly when individuals also had higher levels of

executive functioning. The shape of the interaction graph in Figure 3 supports this pattern as it indicates that a terminative interaction occurred between the variables (Barron, et al., 2004).

In summary, the study found significant positive correlations between executive functioning and overall everyday creative behaviour, scholarly creative behaviour, self/everyday creative behaviour, and mechanical/ scientific creative behaviour. Further, significant positive correlations were found between dispositional mindfulness and overall everyday creative behaviour, scholarly creative behaviour, self/everyday creative behaviour, and mechanical/ scientific creative behaviour. Interestingly, a significant negative relationship between artistic creativity and dispositional mindfulness was also found.

Furthermore, there were three significant moderation models found in the results of the study. Firstly, dispositional mindfulness was found to be a significant moderator of the relationship between self-reported executive functioning and overall everyday creative behaviour. Specifically, dispositional mindfulness acted as a stronger facilitator of overall everyday creative behaviour for individuals with high levels of executive functioning. Secondly, dispositional mindfulness was also found to be a significant moderator of the relationship between self-reported executive functioning and scholarly creative behaviour. Specifically, dispositional mindfulness acted as a stronger facilitator of scholarly creative behaviour for individuals with high levels of executive functioning. Lastly, dispositional mindfulness was found to be a significant moderator of the relationship between self-reported executive functioning and artistic creative behaviour. Specifically, dispositional mindfulness did not have any effect on artistic creative behaviour for those with low levels of dispositional mindfulness, regardless of level of executive functioning; it only facilitated artistic creative behaviour for those with high levels of dispositional mindfulness.

Chapter 4: Discussion

The research on executive functioning, dispositional mindfulness, and everyday creative behaviour has shown mixed results. Although there is growing research on these topics internationally, there is a lack of empirical research examining the relationships between executive functioning, dispositional mindfulness, and everyday creative behaviour. In a South African context, there is also a lack of research on these topics individually, as well as no research that could be sourced that has looked at the relationships between these constructs simultaneously.

The aim of this study was to better understand the dynamics of the relationships between executive functioning, dispositional mindfulness, and everyday creative behaviour in a South African sample. The study specifically aimed to examine whether there were predictive relationships between the variables (whether executive functioning and dispositional mindfulness predicted everyday creative behaviour) as well as to explore whether dispositional mindfulness acted as a moderator in the relationship between executive functioning and everyday creative behaviour. This chapter will firstly discuss the reliabilities of the scales, thereafter it will engage with the study's aims by outlining the results of the analyses conducted in the study and making reference to the applicable literature to discuss these. Furthermore, it will present a discussion of the conclusions that can be drawn from the data, the strengths and limitations of the study, and potential future directions for research.

4.1. Reliabilities of the scales and subscales

A necessary first step in the study was to check whether the scales used within this study, namely the Kaufman Domains of Creativity Scale (KDOCS), the Amsterdam Executive Functioning Inventory (AEFI), and the Mindfulness Attention Awareness Scale (MAAS), were reliable in the sample, in other words, whether they measured the construct consistently and formed a coherent and stable instrument where all parts measured the same construct (Alexandre et al., 2017). Internal consistency reliability was analyzed in this study by calculating Cronbach's Alpha coefficients. Internal consistency reliability is an aspect of quantitative methods which can create rigor (Laher, 2016).

Internal consistency reliability estimates for the Kaufman Domains of Creativity Scale (KDOCS) were $\alpha = .91$ for the total score and as follows for the individual subscales: Self/Everyday ($\alpha = .72$), Scholarly ($\alpha = .83$), Performance ($\alpha = .87$), Mechanical/Scientific (α

= .88), and Artistic ($\alpha = .89$). The internal consistency reliability for the scale and individual subscales ranged from moderate (for the Self/Everyday subscale) to very strong (for the Scholarly, Performance, Mechanical/Scientific, and Artistic subscales) and all reliabilities were above the acceptable cut-off point of .70 (Alexandre et al., 2017). Previous literature has reported internal consistency reliability estimates of at least .80 for all of the subscales and for the overall scale, which suggests that internal consistency reliability for the scale in previous research has generally been strong (Kaufman, 2012; Kaufman et al., 2017). This study's results therefore replicated the findings of previous studies.

Furthermore, a series of correlations were calculated to represent the inter-relationships between the different subscales of the Kaufman Domains of Creativity Scale (KDOCS), representing the relationships between the different forms of everyday creative behaviour in the sample. Previous studies have found that all subscales were significantly and positively related, which showed good construct validity (Kaufman, 2012). Looking at the inter-correlations obtained in this study, all of the subscales were significantly and positively related to each other. This suggested that the scale was valid to be used within this study as it demonstrated that the subscales measured related aspects of the same construct.

The internal consistency reliability estimate for the Mindfulness Attention Awareness Scale (MAAS) was $\alpha = .87$, indicating high internal consistency reliability for the scale. This is in agreement with previous study findings, which have all found strong internal consistency reliabilities, with the lowest score being .85 (Christoffels et al., 2011; Kassman & Ostafin, 2012; Schooler & Zedelius, 2015). Therefore, this study extends previous findings on the high reliability of the MAAS.

The Amsterdam Executive Functioning Inventory (AEFI) reliability estimates were slightly lower than the estimates for the other scales. The estimate for the overall scale was $\alpha = .74$, indicating moderate internal consistency reliability. The subscales of the AEFI were as follows: Attention ($\alpha = .67$) and Self-Control/Monitoring ($\alpha = .65$). This indicated low to moderate internal consistency reliability, replicating previous findings (Jolles & Tetering, 2017). Although the Attention and Self-Control/Monitoring reliability estimates were also low, there are instances where an Alpha Coefficient above .60 is acceptable, and therefore these subscales were included in the results, although not studied extensively (Anderson et al., 2010). The

internal consistency reliability for the overall scale was above .70 and therefore sufficient to meet the requirements for adequate internal consistency reliability (Alexandre et al., 2017; Jolles et al., 2012). Moreover, researchers argue that if the correlations between items on a scale are adequate (above .30), then the scale measures the same construct (Alexandre et al., 2017). In this study, the inter-correlations between the AEFI subscales were above this cut-off (i.e., above .30) and therefore the scale as a whole could be seen as representing executive functioning in the sample.

4.2. The relationship between executive functioning and everyday creative behaviour

In order to answer the first research question of the study regarding the nature of the relationships between executive functioning, dispositional mindfulness, and everyday creative behaviour, Pearson's correlation coefficients were calculated.

As indicated in the literature, extensive research interest has been shown in executive functioning, with many researchers looking at the mechanisms involved within executive functioning as well as its importance in human everyday life (Alexander & Baggetta, 2016; Blair, 2017). In recent years, the relationship between executive functioning and creativity has begun to be a popular research interest, however, conflicting results have been found with some researchers identifying a positive or negative relationship and others finding no relationship at all (Arendasy et al., 2014; Benedek et al., 2014; Cosmelli et al., 2016; Kane & Smeekens, 2016).

In the current study, a significant, positive linear relationship was found between overall executive functioning and overall everyday creative behaviour ($r = .23$). This shows that as scores in executive functioning increased, everyday creative behaviour scores increased as well although the effect was small, with $r = .10$ representing a small effect and $r = .30$ representing a medium effect (Field, 2018). In other words, this relationship indicated that when an individual had high executive functioning abilities, they reported higher levels of everyday creative behaviour as well. This finding replicates previous studies that have proposed a positive relationship between executive functioning and creativity (Arendasy et al., 2014; Baas et al., 2012; Benedek et al., 2014; Kawashima et al., 2011). Studies have found that individuals with higher executive functioning were found to have higher creativity skills, therefore suggesting that the mechanisms behind executive functioning such as self-control and planning

play a role in creativity and that creativity may involve controlled processes that fall into executive functioning, and therefore increased levels of these skills could result in higher creativity (Arendasy et al., 2014; Benedek et al., 2014).

This study's findings therefore extend previous research by indicating that there is a relationship between executive functioning and everyday creative behaviour and that when there is an increased level of self-reported executive abilities, there is also an increased level of self-reported everyday creative behaviour. A relationship between executive functioning and creativity is plausible as neural mechanisms are needed that allow an individual to focus on the task at hand and shift between known ideas, therefore allowing for the creation of new ideas (Alloway et al., 2017). These findings suggest that higher-order processes do have a role to play in creative thought and imply that possible improvements in executive function could enhance creative behaviour, including in individuals who may have trouble with executive abilities such as those with Attention Deficit Hyperactivity Disorder or Autism Spectrum Disorder (Baas et al., 2017; Biederman et al., 2004; Healey & Rucklidge, 2006). This provides a future direction for research to investigate whether improvements in executive functioning could enable increased creative behaviour in individuals with deficits in executive functioning as well as in the general population.

The specific domains of everyday creative behaviour that were found to have a significant positive relationship with executive functioning were self/everyday creative behaviour ($r = .40$), scholarly creative behaviour ($r = .27$), and mechanical/scientific creative behaviour ($r = .14$). However, artistic creative behaviour and performance creative behaviour were found to have no significant relationship with executive functioning in the study. This suggests that although executive functioning may have a relationship with overall everyday creative behaviour, specific aspects of everyday creative behaviour, such as artistic or performance behaviours, may have no direct relationship with executive functioning. In addition, this implies that the processes behind artistic and performance creativity may not be the same as the processes behind self/everyday, scholarly, and mechanical/scientific creativity. Everyday artistic creativity refers to creativity expressed through artistic activities such as drawing, sculpture, art appreciation, and photography, while everyday performance creativity refers to creativity expressed through singing, composing, or playing music (Kaufman, 2012; Kaufman et al., 2017). Hence, these two domains of everyday creative behaviour are more flowing and unrestrained, and it is plausible that executive abilities such as planning, or self-control are not

needed in producing artistic or performance creativity. On the other hand, self/everyday, scholarly, and mechanical/scientific creativity incorporate executive abilities such as self-control/monitoring, planning, and attention in order to optimize creative performance. This supports theories which stipulate that having defocused attention and increased distractibility allow one to engage in more creative behaviours in certain domains (Baas et al., 2017; Carruthers et al., 2009; Davranche et al., 2015; Fugate et al., 2013). In addition, it supports theories that executive abilities are needed in order to carry out set goals, time manage, and plan which are associated with increased aspects of creativity in different creative domains (Blair, 2017; Mazmanian et al., 2016). These findings therefore provide a possible explanation for why there have been such conflicting results in previous literature (positive and negative relationships), as only some aspects of everyday creative behaviour may be linked to increased executive functioning and not others.

Further, a significant, positive linear relationship was found between attention and the overall creative behaviour scale ($r = .084$) indicating that when attention scores increased, overall everyday creative behaviour increased as well. Specifically, it was found that self-everyday creative behaviour had the largest significant and positive correlation with attention ($r = .225$), followed by scholarly everyday creativity ($r = .163$) and mechanical/ scientific everyday creativity ($r = .060$). Artistic everyday creativity and performance everyday creativity had no significant relationship with attention. Studies have proposed that the attention aspect of executive functioning is significant in the relationship between executive functioning and creativity, with conflicting results about the exact dynamics of this relationship. Some studies argue that narrow attention leads to increased creativity, and therefore a positive relationship between the two exists (Carruthers et al., 2009; White, 2018). The findings of this study suggest that there is a relationship between attention and creativity and that increased levels of attention lead to increased overall creativity, which corresponds with existing theories of increased attention resulting in more creative behaviour (Baas et al., 2017; Fugate et al., 2013). However, other studies argue that broad or defocused attention allows for more creative behaviour, which had been demonstrated within individuals with ADHD (Baas et al., 2017; Fugate et al., 2013). The current study's findings extend current literature by indicating that there are no significant relationships between self-reported attention and levels of artistic and performance creative behaviour, demonstrating that attention may only be of benefit for certain forms of everyday creative behaviour (specifically those that involve tasks that require more focus and sustained

concentration to perform effectively). This could account for the unclear results in the literature.

The self-control/monitoring aspect of executive functioning had a non-significant correlation with overall everyday creative behaviour ($r = .042$). It was, however, found to have a significant, positive relationship with the self/everyday domain of creative behaviour ($r = .219$) and with scholarly creative behaviour ($r = .071$). It was also found to have a significant, weak, negative linear relationship with artistic everyday creativity ($r = -.064$). Literature indicates that the self-control and monitoring aspect of executive functioning have a relationship with creativity. This notion is based on creativity involving taking known concepts and adjusting them to fit new, creative ideas, which suggests a shifting control mechanism involved in executive functioning (Kane & Smeeckens, 2016). The findings of this study demonstrate that some aspects of everyday creativity are related to the self-control and monitoring aspect of executive functioning, such as self/everyday, scholarly, and artistic creativity. In addition, it further supports the idea that artistic creativity is more free-flowing and relies less on structured concentration and focus, therefore it is negatively correlated with increased levels of self-control and monitoring. In other words, when there is decreased self-control and monitoring, there is increased artistic creative behaviour. This finding is interesting and further adds to previous research arguing that decreased monitoring and control aids in creativity (Baas et al., 2012; Carruthers et al., 2009).

4.3. The relationship between dispositional mindfulness and everyday creative behaviour

In order to answer the first research question of the study regarding the nature of the relationships between executive functioning, dispositional mindfulness, and everyday creative behaviour, Pearson's correlation coefficients were calculated; including correlations between dispositional mindfulness and everyday creative behaviour.

Mindfulness has become a prominent research interest among researchers from the social behavioural sciences and medical science fields (Brown et al., 2007b; Schooler & Zedelius, 2015). However, the relationship between dispositional mindfulness and creativity is a recent interest that has shown varied results, with some findings suggesting no relationship between

the two constructs and others suggesting either a positive or a negative association (Agnoli et al., 2018).

There was a significant, positive, linear relationship between dispositional mindfulness and everyday creative behaviour in the study ($r = .08$). Although this is a very weak effect (Field, 2018), it supports studies that have proposed that increased mindfulness is linked with increased creative behaviour (Kane & Smeekens, 2016). This finding further indicates that when an individual is aware of their present experience, they are able to perform more creatively, which makes sense as when an individual engages in creative behaviour, they have to be fully aware of their surroundings and themselves in order to pull out creative thoughts or innovative solutions. Moreover, this finding contrasts with research which has speculated that mind-wandering, the opposite to dispositional mindfulness, results in increased creativity, as found in individuals with ADHD (Cosmelli et al., 2016; Schooler & Zedelius, 2015). This implies that dispositional mindfulness, and not mind wandering, is related to individuals' self-reported levels of everyday creative behaviour and extends theory arguing for increased levels of mindfulness positively impacting creativity (Agnoli et al., 2018; Capurso et al., 2014; Henriksen et al., 2020).

Self/everyday creative behaviour had the strongest significant correlation with dispositional mindfulness ($r = .30$). In addition, scholarly creative behaviour ($r = .10$) and mechanical/scientific creative behaviour ($r = .05$) were also found to have significant, positive relationships with dispositional mindfulness. These results illustrate that increased mindfulness, focusing on the present moment, may enable the individual to reduce habitual responses in everyday activities and increase everyday creative behaviour, specifically in domains that tend to require more focus and concentration to achieve creative tasks successfully (Schooler & Zedelius, 2015). In addition, this fits with research suggesting that mind-wandering could result in a decrease in creative problem-solving needed in daily activities and intellectual behaviours; while increased mindfulness could result in increased creative problem-solving (Kane & Smeekens, 2016). Further, increased mindfulness allows individuals to focus on tasks at hand and be aware of their surroundings, enabling them to think creatively (Cauda et al., 2016). This was shown through the positive linear relationships between the self/everyday, scholarly, and mechanical/scientific domains of creativity and dispositional mindfulness. Hence, these positive relationships extend the existing theory on the role of dispositional mindfulness in creativity.

Interestingly, the relationship between artistic creative behaviour and dispositional mindfulness was found to be a significant, weak, negative relationship ($r = -.07$). In other words, it was found that when there was an increase in levels of dispositional mindfulness, there was a decrease in artistic creative behaviour. There was no significant relationship found between performance creative behaviour and dispositional mindfulness, although the correlation coefficient itself was negative ($r = -.03$). These findings are in line with some studies that have found that mind-wandering increases creative performance, and that mind-wandering enables distracted behaviours, which may result in more artistic creativity (Baird et al., 2012). Therefore, the relationships that other studies have found between mindfulness and creativity could possibly be attributed to the significant negative relationship between dispositional mindfulness and artistic creative behaviour in this study as well as the lack of a significant relationship with performance creative behaviour.

Further, this finding would suggest that when an individual has decreased awareness of the present moment, they have higher levels of artistic creativity. This finding is in line with the similar pattern of relationships found between executive functioning and performance and artistic creative behaviour, whereby executive functioning and dispositional mindfulness were both positively related to overall, self/everyday, scholarly, and mechanical/scientific creative behaviour and negatively or not significantly related to artistic and performance creative behaviour. This further illustrates that artistic behaviour may be more free-flowing and require less structured thinking or focus in comparison to the other creative behaviours, and therefore more distractibility and mind-wandering may be needed to allow for artistic creative behaviours to occur. These findings are in agreement with studies that have found that artistic creativity, relating in this sense to general artistic creativity as well as performance creativity, relates to more complex cognitive functioning such as intelligence, rather than cognitive functions such as attention (Lunke & Meier, 2016). In addition, this provides a potential explanation for the unclear findings in the literature and suggests a need to distinguish between different forms of creative behaviour when investigating the relationship between creativity and other cognitive abilities.

4.4. Predictive relationships between executive functioning, dispositional mindfulness, and everyday creative behaviour

In order to answer the second research question about whether executive functioning and dispositional mindfulness predict everyday creative behaviour and the third research question about whether dispositional mindfulness moderates the relationship between executive functioning and everyday creative behaviour, hierarchical moderated multiple regressions and simple slope analyses were run.

Previous literature suggests a possible predictive relationship between executive functioning and creativity, whereby executive functions are seen as mechanisms that allow for creative behaviours in a number of ways and creativity is seen as a product of executive functioning (Arendasy et al., 2014; Benedek et al., 2014; Delis et al., 2007). Similarly, dispositional mindfulness has been reported as a possible predictor of creativity, as increased mindfulness has been found to be related to increased creative behaviour and performance, therefore suggesting creativity may be a possible outcome of mindfulness (Baird et al., 2012; Krueger, 2017; Schooler & Zedelius, 2015). However, these relationships have only been looked at in international samples and there appear to be no studies that have looked at whether there are predictive relationships between executive functioning, dispositional mindfulness, and everyday creative behaviour in a South African context.

For the second research question regarding predictive relationships between everyday creative behaviour, executive functioning, and dispositional mindfulness, the results of the hierarchical regression analyses indicated that both executive functioning and dispositional mindfulness were significant predictors of everyday creative behaviour for each of the different models created (i.e. for each model, the first stage examining the main effects of the variables independently was significant for both predictors). Therefore, in the study both dispositional mindfulness and executive functioning were significant predictors of overall everyday creative behaviour, self-everyday creative behaviour, scholarly creative behaviour, mechanical/scientific creative behaviour, artistic creative behaviour, and performance creative behaviour. Although the main effects were significant for the first stage of each of the six models, the degree of variation in everyday creative behaviour explained by dispositional mindfulness and executive functioning was relatively small in all cases (between 1% and 5% at most). This matched with the findings from the correlations, which suggested that although

both executive functioning and dispositional mindfulness were significantly related to everyday creative behaviour, the effect sizes for this were small (Chu et al., 2015; Field, 2018).

These findings support the proposed predictive relationships proposed in literature (Arendasy et al., 2014; Baird et al., 2012; Benedek et al., 2014; Schooler & Zedelius, 2015). In addition, it suggests that both dispositional mindfulness and executive functioning may act as predictors of everyday creative behaviour and thus facilitating executive functioning and dispositional mindfulness may result in increased creative behaviour. However, the effects of the predictors vary depending on the type of creative output. In other words, enhanced levels executive functioning and/ or dispositional mindfulness might be more useful to facilitate self/everyday, scholarly, and mechanical/scientific creative behaviour as opposed to artistic or performance creative behaviour. Hence, future research needs to look into the nuanced relationships between dispositional mindfulness, executive functioning, and aspects of everyday creative behaviour in order to establish whether these do aid in producing increased creativity.

The third question in the study focused on whether dispositional mindfulness moderated the relationship between executive functioning and everyday creative behaviour (overall creative behaviour and the five types of everyday creative behaviour).

For the first model (for predicting overall creative behaviour), there was a significant interaction between dispositional mindfulness and executive functioning on overall everyday creative behaviour. As demonstrated by the simple slopes analysis, the interaction was antagonistic (Barron et al., 2004). Specifically, for participants with low levels of executive functioning, those with high levels of dispositional mindfulness had significantly lower everyday creative behaviour scores than those with low levels of dispositional mindfulness, whereas for participants with high levels of executive functioning, participants with higher levels of dispositional mindfulness had significantly higher everyday creative behaviour scores than those with low levels of dispositional mindfulness. This pattern thus suggested that dispositional mindfulness acted as a facilitator of everyday creative behaviour for those with higher levels of executive functioning; but did not act as a facilitator of everyday creative behaviour for those with lower levels of executive functioning and may actually have inhibited everyday creative behaviour.

There does not seem to be any previous literature that has explored the interaction between dispositional mindfulness, executive functioning, and everyday creative behaviour and thus this study's finding represents an important potential extension of existing literature. The finding above may explain why there are conflicting findings in previous literature, because the nature of the relationship between executive functioning and everyday creative behaviour seems to be conditional on level of dispositional mindfulness. If one has high levels of executive abilities and strong levels of mindfulness, then this will facilitate creative behaviour as expected from previous literature. Specifically, focused attention may allow for one to put aside previously known concepts and shift to create new insights and increased mindfulness may allow one to be aware in the present moment, free from distractions, and fully engaged with one's abilities to create new solutions (Arendasy et al., 2014; Cosmelli et al., 2016; Schooler & Zedelius, 2015). However, the finding also suggests that if one has good executive abilities and poor mindfulness, this seems to decrease everyday creative behaviour. This could be because even though one has the capacity to plan, the ability to focus and direct these skills to the task at hand is lacking. This finding has important implications because it suggests that mindfulness training will not necessarily be helpful for increasing creativity for everyone, which is in contrast to literature that suggests that mindfulness facilitates creativity (Kassman & Ostafin, 2012; Schooler & Zedelius, 2015). Therefore, the effect of mindfulness training for enhancing creativity may vary based on level of executive functioning, and it may therefore be important to incorporate assessments of executive functioning into training programmes when attempting to use mindfulness as a means to enhance creative behaviour.

For the second model, there was no significant interaction between executive functioning and dispositional mindfulness on self/everyday creative behaviour. The implication of this finding is that there was no interactive effect between these constructs, and thus level of dispositional mindfulness did not alter the nature of the relationship between executive functioning and self/everyday creative behaviour. There did not seem to be any previous literature looking at these relationships however studies have noted that executive functioning and dispositional mindfulness impact creativity in interpersonal and daily life (Alloway et al., 2017; Brown & Ryan, 2003; Cauda et al., 2016; Davranche et al., 2015). This may account for the separate relationships identified between executive functioning and self/everyday creative behaviour and between dispositional mindfulness and self/everyday creative behaviour in the sample despite the lack of a significant interaction.

For the third model (predicting scholarly creative behaviour), there was a significant interaction between executive functioning and dispositional mindfulness on scholarly creative behaviour. As shown within the simple slopes analysis, the interaction was antagonistic (Barron et al., 2004). For participants with low levels of executive functioning, those with low levels of dispositional mindfulness had significantly higher scholarly creative behaviour scores than those with high levels of dispositional mindfulness; in contrast, for participants with high levels of executive functioning, participants with lower levels of dispositional mindfulness had similar but slightly lower scholarly creative behaviour scores than those with high levels of dispositional mindfulness. This pattern therefore suggested that dispositional mindfulness acted as a facilitator of scholarly creative behaviour for those with higher levels of executive functioning; but did not act as strongly as a facilitator of scholarly creative behaviour for those with lower levels of executive functioning. This finding extends previous literature that linked these constructs together, especially as there do not seem to be previous studies that have examined the relationships between them.

The finding above implies that when an individual has lower executive functioning, level of mindfulness does not facilitate the relationship between executive functioning and scholarly creativity as strongly as when an individual has a higher level of executive functioning. Increased levels of executive functioning are linked to improved planning, attention, and self-control, which increase the capacity for mindfulness which may, in turn, increase engagement and enhance scholarly creative behaviour. This ties in with previous literature which proposes that scholarly creative behaviour involves executive abilities such as planning, attention, and self-control/monitoring and if an individual has increased executive abilities, then level of mindfulness will influence their ability to be more intellectually creative (Bai et al., 2020; Benedek et al., 2014; Brinthaup et al., 2020; Bunting et al., 2016). An important implication of this finding is that if one engages in mindfulness training, this may enhance an individual's intellectual and linguistic creativity if they already have a high level of executive functioning; however the training may be less effective for individuals with lower levels of executive functioning.

For the fourth model (predicting performance creativity), there was no significant interaction between dispositional mindfulness and executive functioning on performance creativity. This implies that level of dispositional mindfulness did not alter the nature of the relationship between executive functioning and performance creative behaviour, in other words, whether

one had increased or decreased mindfulness did not change the nature of the relationship between executive functioning and performance creativity. Previous literature does not seem to have looked at the dynamics of the relationship between these constructs, and therefore this finding extends current literature.

For the fifth model (predicting mechanical/scientific creative behaviour), there was a non-significant interaction between executive functioning and dispositional mindfulness on mechanical/scientific creative behaviour. This finding indicates that although executive functioning and dispositional mindfulness were both found to predict mechanical/scientific creative behaviour, there was no interactive effect and therefore level of dispositional mindfulness did not alter the nature of the relationships between executive functioning and mechanical/ scientific creative behaviour. Executive functioning and dispositional mindfulness may be useful in enhancing this aspect of creative behaviour, as planning, self-control, attention, intelligence, and present moment experience may be useful in engaging in building or innovations as noted in past literature (Agnoli et al., 2018; Delis et al., 2007). However, level of mindfulness not altering the nature of the relationship between executive functioning and mechanical/scientific creativity suggests that mindfulness training would be unlikely to enhance this aspect of creative behaviour. Past research does not seem to have investigated the links between these constructs and scientific/ mechanical creative behaviour previously and thus this finding adds to the existing literature.

For the last model (for predicting artistic creative behaviour), there was a significant interaction between executive functioning and dispositional mindfulness on artistic creative behaviour. As demonstrated by the simple slopes analysis, the interaction was catalytic/terminative (Barron et al., 2004). For participants with low levels of dispositional mindfulness, artistic creative behaviour scores remained similar regardless of their level of executive functioning. In contrast, for participants with high levels of dispositional mindfulness, artistic creative behaviour scores were significantly lower for those with lower executive functioning scores than for those with higher executive functioning scores. Therefore there was only a significant change in artistic creative behaviour scores when individuals had a high level of dispositional mindfulness.

These findings may explain the contradictory results in previous research, where some argue that higher levels of dispositional mindfulness may enhance aspects of creativity such as artistic

creative behaviour and others argue that low dispositional mindfulness results in more creative behaviour (Agnoli et al., 2018; Lunke & Meier, 2016). If one has higher levels of executive functioning and lower levels of mindfulness, they may have increased artistic creative behaviour due to artistic creativity being more free-flowing, similar to performance creativity, and thus more distractibility in conjunction with enhanced executive abilities may be beneficial. These findings also potentially account for literature that has found that individuals with Attention-Deficit Hyperactivity Disorder perform well on creativity assessments, indicating that decreased mindfulness may be beneficial for creativity (Baas et al., 2017; Biederman et al., 2004; Healey & Rucklidge, 2006). In addition, as found in the study, artistic creative behaviour had a significant, negative correlation with dispositional mindfulness, as well as a significant, negative relationship with self-control/monitoring executive functioning, which further strengthens the idea here that more distractibility, less awareness of the present moment, and a lack of self-control may allow for enhanced artistic creative behaviour. There does not appear to be any research that has explored the links between these constructs previously, therefore this finding contributes to better understanding artistic creative behaviour.

4.6. Conclusion

Executive functioning, dispositional mindfulness, and everyday creative behaviour are under-researched constructs, with very little literature on the nature of the relationships between them available. The literature that does exist about these relationships is based on international studies; and many have produced conflicting results (Arendasy et al., 2014; Baas et al., 2012; Baird et al., 2012; Delis et al., 2007; Henriksen et al., 2020). This study was conducted on a sample of 1608 adults from a South African population and appears to be the first study within the South African context to look at these relationships. The aim of this study was to better understand the nature of the relationships between dispositional mindfulness, executive functioning, and everyday creative behaviour; to infer to what extent dispositional mindfulness and executive functioning predict everyday creative behaviour; and to infer whether dispositional mindfulness acts as a moderator in the relationship between executive functioning and everyday creative behaviour.

In order to answer the first research question, Pearson r correlations were run on the variables. It was found that dispositional mindfulness and executive functioning had significant, positive

correlations with everyday creative behaviour. Moreover, different aspects of executive functioning (attention and self-control/monitoring) were found to have significant, positive correlations with everyday creative behaviour. Further, the attention domain of executive functioning had a significant, positive correlation with self/everyday, scholarly, and mechanical/scientific everyday creativity and a significant, negative correlation with artistic creative behaviour. The self-control/monitoring aspect of executive functioning had significant, positive correlations with self/everyday and scholarly creative behaviour, and a significant, negative correlation with artistic creative behaviour. Dispositional mindfulness was found to have significant, positive correlations with self/everyday, scholarly, and mechanical/scientific creative behaviour, as well as a significant negative correlation with artistic creative behaviour.

In order to answer the second and third research questions, hierarchical multiple regressions were conducted. It was found that dispositional mindfulness and executive functioning were significant predictors of everyday creative behaviour. In addition, they significantly predicted all domains of everyday creative behaviour. Furthermore, it was found that dispositional mindfulness was a significant moderator between executive functioning and everyday creative behaviour, executive functioning and scholarly creative behaviour, and executive functioning and artistic creative behaviour. Looking at these interactions more closely, dispositional mindfulness acted as a stronger facilitator in the relationships between executive functioning and everyday creative behaviour as well as between executive functioning and scholarly creativity when there were high levels of executive functioning and high levels of dispositional mindfulness. When individuals demonstrated high levels of dispositional mindfulness and high levels of executive functioning, they had increased everyday creative behaviour and increased scholarly creative behaviour. On the other hand, for artistic creative behaviour, dispositional mindfulness only facilitated artistic creative behaviour for individuals with high levels of executive functioning when levels of dispositional mindfulness were also high; in cases where levels of dispositional mindfulness were low, the nature of the relationship between executive functioning and artistic creative behaviour did not change. When individuals demonstrated low levels of dispositional mindfulness and executive functioning, they showed increased artistic creative behaviour, providing interesting new insight into the idea of mind-wandering and defocused attention potentially allowing for more free-flowing artistic creativity.

The findings of this study contribute to the limited research looking at the relationships between these constructs and thus provide a theoretical contribution to the literature. They support the notion that executive functioning and dispositional mindfulness are significant predictors of self-reported everyday creative behaviour and that dispositional mindfulness acts as a facilitator in the relationship between executive functioning and overall everyday creative behaviour. This suggests that the higher your executive abilities are, and the more mindful you are, the more everyday creative behaviour you will have. Moreover, these findings provide a possible explanation for the conflicting results seen in previous literature looking at these constructs as they imply that executive functioning and dispositional mindfulness may be related to specific aspects of everyday creative behaviour in different ways; this should be considered in future studies. In addition, possible training programmes incorporating both mindfulness and executive functioning may benefit from targeting specific facets of creative behaviour. This study appears to also be the first study looking at the relationships between these constructs in a South African sample. This allows for a deeper understanding of everyday creative behaviour in the South African context and creates a platform for future studies to explore these relationships in South Africa further.

4.7. Strengths and limitations of the study

The research design in this study was a cross-sectional, correlational, and non-experimental design. This design does not allow for any causation, in other words, a non-experimental design does not allow for any cause-and-effect knowledge claims due to a lack of manipulation (Comiskey et al., 2016; Little, 2013). Due to the lack of causation, no causal conclusions can be made regarding the relationships between the variables in this study. However, this design was useful for describing and better understanding the nature of the relationships between dispositional mindfulness, executive functioning, and everyday creative behaviour.

This study utilized a moderation analyses, which was useful for identifying not only if dispositional mindfulness predicted everyday creative behaviour, but also whether and how it had an interactive effect on the strength and direction of the relationship between executive functioning and everyday creative behaviour (Barron et al., 2004; Cham et al., 2019). Utilizing an analysis that investigates an interaction effect is important for psychological studies as this can provide a deeper and more complex understanding of relationships being studied (Barron et al., 2004). Further, a strength of this study was the large sample size of 1608 South African

adults from a South African population. A sample of this size allowed for a more representative sample of South Africa's diverse population and increased the external validity of the study and the effect size (Field, 2018; Laher, 2016).

In addition, there is a lack of research on creativity and constructs such as executive functioning and dispositional mindfulness globally, but especially in a South African context. Therefore, a major strength of this study was that it theoretically contributes to the lack of research on creativity in South Africa as well as the lack of research on the relationships between dispositional mindfulness, executive functioning, and everyday creative behaviour. Furthermore, previous research looking at these constructs has found conflicting results, with some studies arguing for positive relationships and others arguing for negative relationships or no relationship at all between the main constructs. The current study's findings provide a possible explanation as to why there are conflicting results; specifically, that executive functioning and dispositional mindfulness may be related to different aspects of creativity in different ways. In particular, the negative relationship between artistic creative behaviour and dispositional mindfulness, as well as dispositional mindfulness being a significant moderator between the relationship of executive functioning and artistic creative behaviour, proved to be an interesting and important finding, not known in previous research.

It is important to also consider the possible limitations of the current study. Firstly, the study utilized non-probability, convenience and snowball sampling which has its drawbacks. Due to the sample consisting of volunteers who were available to participate at the time, the sample did not fully represent the population as a whole, indicating possible biases in the results of the study (Botha & Laher, 2011). Moreover, although the sample size was large, the majority of the sample were from a specific subset of the population, South African students, due to the questionnaire being distributed on a university platform.

Furthermore, there are limitations associated with the scales used. Firstly, the Amsterdam Executive Function Scale (AEFI) had low internal consistency reliability in previous research and in the current study. In particular, the subscales (attention, self-control/monitoring and planning and initiative) had low reliabilities. Due to the very low reliability of the planning and initiative subscale, it was not included in further analyses within this study and the analysis of the other subscales had to be examined with caution. Moreover, all the scales have not been used in a South African context previously and therefore the reliability and validity of the use

of these scales in this context has not been fully demonstrated. In addition, all scales used within this study were self-report scales. There are limitations on self-report measures, such as the subjectivity of the measures and possible response bias (Demetriou et al., 2015).

4.8. Future directions for research

As noted earlier on in the study, there is a lack of research investigating the relationship between dispositional mindfulness, executive functioning, and everyday creative behaviour in a South African context. Therefore, future research in South Africa should aim to build on these findings and look further and in more depth at these constructs. In addition, although the sample size within this study was large, even larger and more representative samples should be used in further studies in order to fully generalize future findings.

In addition, due to the low reliability of the Amsterdam Executive Functioning inventory, the current study could not analyze each subscale within this measure to the extent that was hoped, and thus future research should look at adapting the items in this instrument and using alternate measures in order to improve the reliability of the measure and better understand the links between executive functioning and everyday creative behaviour. Further studies using more objective ability measures rather than self-report scales would also be highly recommended.

Furthermore, although this study did not analyze the demographics of the sample, future research should look at how demographics relate to creativity, which could potentially aid in understanding South African individuals' creativity and how specific demographic characteristics (e.g., age, home language) could potentially impact levels of creativity.

Lastly, future studies should look into how specific domains of creativity relate to different psychological constructs. As found in this study, there is conflicting research internationally regarding creativity, and this can perhaps be attributed to certain aspects of creativity relating to certain constructs and not others. Hence, future studies should specifically look at how different domains of creativity are related to dispositional mindfulness and executive functioning in order to address the debates in research. Looking at these relationships further could potentially improve current and future mediation and cognition training programmes by identifying specific methods through which to facilitate greater levels of everyday creative behaviour.

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Appendix A: Access Request Letter

[formal Departmental letterhead to be inserted]

Date: [to be inserted]

To [relevant title/ name to be inserted]

My name is Lauren Coppin, and I am conducting research at a university in Johannesburg in partial fulfilment of the requirements to obtain a Masters degree in Social and Psychological Research. My research aim is to explore the association between dispositional mindfulness, executive functioning, and everyday creative behaviour.

I am requesting permission to please be allowed to approach first year through to postgraduate students, registered in your [School/ Department/ class] to ask them to participate in my research study. If you are willing to allow this, please can you provide me with a brief formal letter or email giving consent for this. If you are a course coordinator and/or lecturer, I am also requesting that you please send out an invitation to participate in the study with a participant information sheet attached on SAKAI to the class. The study will ask student to volunteer to complete an electronic survey which will take a maximum of 20-30 minutes.

Participation is completely voluntary and will not advantage or disadvantage students in any way whether they choose to complete the questionnaire or not. There are also no direct benefits or foreseeable risks for participating in the study. Participants will be given a full participant information sheet with the invitation and will be asked to give consent to participate; submission of a completed questionnaire will be seen as informed consent to participate in the study. No identifying information, such as names or identity numbers, will be asked for and participants will therefore remain completely anonymous and the data they provide will not be linked to them as individuals in any way. Participants will be able to obtain feedback for the study in the form of a summary of general results; individual feedback will not be possible as the data is anonymous. Participants will also be asked for permission to store their data in anonymous electronic form and to use this for future research. The research and research supervisor's contact details will be provided in the participant information sheet.

This research will help to better understand the relationship between dispositional mindfulness, executive functioning, and everyday creative behaviour which will contribute to theoretical knowledge on these topics and may inform practice. If you choose to allow me to approach students for their participation, it would therefore be greatly appreciated.

If you have any questions or concerns, please feel free to contact me or my supervisor as per the details below. Any queries regarding ethical issues can also be directed to: The University of the Witwatersrand Human Research Ethics Committee (non-medical): 011-717-1408; Shaun.Schoeman@wits.ac.za.

Yours sincerely,
Lauren Coppin (082 902 8886; laurenbiancacoppin@live.co.za)

Supervisor: Dr Nicky Israel (011-717-4557; Nicky.Israel@wits.ac.za)

Appendix B: Electronic Survey Invitation

Hi,

My name is Lauren Coppin and I am a Masters in Social and Psychological Research student at a University in Johannesburg. I am doing a study to explore the relationships between dispositional mindfulness (awareness of our emotions thoughts in our present experience), executive functioning (mental thought processes that regulate our behaviour), and everyday creative behaviour. In order to get data for the study, I am asking for volunteers aged between 18 and 50 years old, from the South African population, with access to a computer/device and the Internet, to please fill out some online questionnaires.

I would really appreciate if you would consider participating in my study!

Please follow the link below which will take you to an online survey with the participant information sheet and questionnaires.

[link address inserted]

If you know of anyone else who would fit in the sample, please pass this invitation on to them as well.

Thank you in advance,

Researcher: Lauren Coppin (laurenbiancacoppin@live.co.za)

Supervisor: Dr Nicky Israel (Nicky.Israel@wits.ac.za)

Appendix C: Participant Information Sheet

[formal Departmental letterhead to be inserted]

Date: [to be inserted]

Hello,

My name is Lauren Coppin and I am a student currently completing my Masters in Social and Psychological Research at a University in Johannesburg. As part of the requirements for my degree, I am conducting research. My research aims to explore the relationship between dispositional mindfulness (awareness of our emotions thoughts in our present experience), executive functioning (mental thought processes that regulate our behaviour), and everyday creative behaviour. I will be using data obtained from volunteers from the South African population aged between 18 and 50 who have access to a computer/device and the Internet in order to answer the research questions.

If you meet these criteria, I would like to ask you to please consider participating in my study. Participating will require you to access and complete a set of online questionnaires at a convenient time for you. These questionnaires should take approximately 20-30 minutes to complete and you are asked to do this within the next two to three weeks. Once you have answered the questionnaires, you can submit the completed answers online.

Participation is completely voluntary and you will not be advantaged or disadvantaged in any way, whether you choose to complete the questionnaire or not. There are also no direct benefits or foreseeable risks for participating in the study. You will be asked for informed consent to participate in the study and submission of the completed questionnaire will be regarded as consent to participate in the study. No identifying information, such as your name or identity number, will be asked for and you will therefore be completely anonymous. Your responses will remain confidential and your anonymity is guaranteed as no identifying information or IP addresses will be recorded.

You will be able to obtain feedback for the study in the form of a summary of the general results; individual feedback will not be possible as the data is anonymous. With your permission, we would also like to store your responses permanently in anonymous, electronic form to possibly use for future research projects.

This research will help to better understand whether dispositional mindfulness and executive functioning are related to everyday creative behaviour which will contribute to theory and may inform practice. If you have any questions or concerns, please feel free to contact me or my supervisor as per the details below. Ethical queries can also be directed to: The University of the Witwatersrand Human Research Ethics Committee (non-medical): 011-717-1408; Shaun.Schoeman@wits.ac.za.

Yours sincerely
Lauren Coppin (laurenbiancaccoppin@live.co.za)

Supervisor: Dr Nicky Israel (Nicky.Israel@wits.ac.za)

I have read the details of this study and consent to participate in the study on a voluntary basis. I also understand that I may withdraw at any point up to submission.

YES	NO
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Appendix D: Demographic Questionnaire

Please complete the following. Please note that all questions are for descriptive and analytic purposes only and are in no way meant to be offensive.

1. What is your age? _____ years

2. What is your gender?

Male	Female	Intersex/ undefined	Other (please specify):

3. To which group do you belong?

Asian	Black	Coloured	Indian	White	Other (please specify):

4. Which language/s do you speak **fluently**?

5. Which language do you speak **most often** at home?

6. What is your highest level of education?

	Below Matric (Grade 12)	Matric (Grade 12)	Undergraduate degree/s	Undergraduate diploma/s	Postgraduate degree/s	Postgraduate diploma/s
Completed						
Currently completing						
	Other (please specify):					

7. What is your current status (please mark all the options that apply)?

Employed full-time	Employed part-time	Self-employed	Not employed	Studying full-time	Studying part-time	Other (please specify):

8. If you are currently employed (full-time, part-time and/or self-employed), what is your occupation/ job title and field of work?

Appendix E: The Kaufman Domains of Creativity Scale (K-DOCS)

Compared to people of approximately your age and life experience, how creative would you rate yourself for each of the following acts? For acts that you have not specifically done, estimate your creative potential based on your performance on similar tasks.

		Much less creative (1)	Less creative (2)	Neither more or less creative (3)	More creative (4)	Much more creative (5)
1	Finding something fun to do when I have no money					
2	Helping other people cope with a difficult situation					
3	Teaching someone how to do something					
4	Maintaining a good balance between my work and my personal life					
5	Understanding how to make myself happy					
6	Being able to work through my personal problems in a healthy way					
7	Thinking of new ways to help people					
8	Choosing the best solution to a problem					
9	Planning a trip or event with friends that meets everyone's needs					
10	Mediating a dispute or argument between two friends					
11	Getting people to feel relaxed and at ease					
12	Writing a non-fiction article for a newspaper, newsletter, or magazine					
13	Writing a letter to the editor					
14	Researching a topic using many different types of sources that may not be readily apparent					
15	Debating a controversial topic from my own perspective					
16	Responding to an issue in a context-appropriate way					
17	Gathering the best possible assortment of articles or papers to support a specific point of view					
18	Arguing a side in a debate that I do not personally agree with					
19	Analysing the themes in a good book					
20	Figuring out how to integrate critiques and suggestions while revising a work					

21	Being able to offer constructive feedback based on my own reading of a paper					
22	Coming up with a new way to think about an old debate					
23	Writing a poem					
24	Making up lyrics to a funny song					
25	Making up rhymes					
26	Composing an original song					
27	Learning how to play a musical instrument					
28	Shooting a fun video to air on YouTube					
29	Singing in harmony					
30	Spontaneously creating lyrics to a rap song					
31	Playing music in public					
32	Acting in a play					
33	Carving something out of wood or similar material					
34	Figuring out how to fix a frozen or 'buggy' computer					
35	Writing a computer programme					
36	Solving maths puzzles					
37	Taking apart machines and figuring out how they work					
38	Building something mechanical (like a robot)					
39	Helping to carry out or design a scientific experiment					
40	Solving an algebraic or geometric proof					
41	Constructing something out of metal, stone, or similar material					
42	Drawing a picture of something I've never actually seen (like an alien)					
43	Sketching a person or object					
44	Doodling/ drawing random or geometric designs					
45	Making a scrapbook page out of my photographs					
46	Taking a well-composed photograph using an interesting angle or approach					
47	Making a sculpture or piece of pottery					
48	Appreciating a beautiful painting					
49	Coming up with my own interpretation of a classic work of art					
50	Enjoying an art museum					

Appendix F: The Mindful Attention Awareness Scale (MAAS)

Below is a collection of statements about your everyday experience. Using the 1-6 scale below, please indicate how frequently or infrequently you currently have each experience. Please answer according to what really reflects your experience rather than what you think your experience should be. Please treat each item separately from every other item.

		Almost always (1)	Very frequently (2)	Somewhat frequently (3)	Somewhat infrequently (4)	Very infrequently (5)	Almost never (6)
1	I could be experiencing some emotion and not be conscious of it until sometime later						
2	I break or spill things because of carelessness, not paying attention, or thinking of something else						
3	I find it difficult to stay focused on what's happening in the present						
4	I tend to walk quickly to get where I'm going without paying attention to what I experience along the way						
5	I tend not to notice feelings of physical tension or discomfort until they really grab my attention						
6	I forget a person's name almost as soon as I've been told it for the first time						
7	It seems I am "running on automatic" without much awareness of what I'm doing						
8	I rush through activities without being really attentive to them						
9	I get so focused on the goal I want to achieve that I lose touch with what I'm doing right now to get there						
10	I do jobs or tasks automatically, without being aware of what I'm doing						

11	I find myself listening to someone with one ear, doing something else at the same time						
12	I drive places on "automatic pilot" and then wonder why I went there						
13	I find myself preoccupied with the future or the past						
14	I find myself doing things without paying attention						
15	I snack without being aware that I'm eating						

Appendix G: The Amsterdam Executive Function Inventory (AEFI)

Please indicate whether each of the following statements is true, partly true, or not true.

		Not true (1)	Partly true (2)	True (3)
1	I am not able to focus on the same topic for a long period of time			
2	I can make fast decisions (e.g. in lessons or at work)			
3	I am well-organised. For example, I am good at planning what I need to do during a day			
4	I am curious, I want to know how things work			
5	I am easily distracted			
6	I often react too fast. I've done or said something before it is my turn			
7	My thoughts easily wander			
8	It is difficult for me to sit still			
9	It is easy for me to come up with a different solution if I get stuck when solving a problem			
10	I am full of new ideas			
11	It takes a lot of effort for me to remember things			
12	I often forget what I have done yesterday			
13	I often lose things			

Appendix H: Ethical Clearance Certificate



SCHOOL OF HUMAN AND COMMUNITY DEVELOPMENT ETHICS COMMITTEE
CONSTITUTED UNDER THE UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

CLEARANCE CERTIFICATE:

PROTOCOL NUMBER: MASPR/20/03

PROJECT TITLE:

Dispositional mindfulness, executive functioning, and everyday creative behaviour

INVESTIGATOR

Coppin Lauren (1432157)

SCHOOL/DEPARTMENT OF INVESTIGATOR

SHCD/Psychology

DATE CONSIDERED

12 June 2020

DECISION OF THE COMMITTEE

Approved unconditionally

RISK LEVEL

Minimal Risk

EXPIRY DATE

31 December 2022

ISSUE DATE OF CERTIFICATE

21 June 2020

CHAIRPERSON


(Dr Sahba Besharati)

cc: Dr Nicky Israel (Supervisor)

DECLARATION OF INVESTIGATOR

To be completed in duplicate and **ONE COPY** returned to the Chairperson of the School/Department ethics committee.

I fully understand the conditions under which I am authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee.


Signature

Date

25 / 06 / 2020

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

Appendix I: Sample characteristics

Table 17

Age Group of the Sample

Age Group		
	Frequency	Percent
Between 18 and 24	1096	68.2
Between 25 and 30	217	13.5
Between 31 and 35	121	7.5
Between 36 and 40	76	4.7
Between 41 and 45	43	2.7
Between 46 and 50	34	2.1
Total	1593	85.9

Table 18

Gender of the Sample

Gender		
	Frequency	Percent
Male	521	32.4
Female	1065	66.2
Intersex	5	.3
Other	7	.4
Total	1598	99.4

Table 19*Race of the Sample*

	Race	
	Frequency	Percent
Asian	24	1.5
Black	816	50.7
Coloured	72	4.5
Indian	179	11.1
White	487	30.3
Other	14	.9
Total	1592	99.0

Table 20*Home Language of the Sample*

Home Language		
	Frequency	Percent
English	865	53.8
Afrikaans	83	5.2
isiZulu	183	11.4
isiXhosa	63	3.9
Sesotho	94	5.8
Tshivenda	33	2.1
Sepedi	83	5.2
Xitsonga	35	2.2
isiNdebele	5	.3
Setswana	73	4.5
siSwati	21	1.3
Other	66	4.1
Total	1604	99.8

Table 21*Completed Education of the Sample*

Completed Education		
	Frequency	Percent
Below Matric	9	.6
Matric	805	50.1
Undergraduate degree/s	307	19.1
Undergraduate diploma/s	47	2.9
Postgraduate degree/s	299	18.6
Postgraduate diploma/s	44	2.7
Total	1511	94.0

Table 22*Number of Fluent Languages of the Sample*

Number of Fluent Languages		
	Frequency	Percent
One language	828	51.6
Two languages	537	33.4
Three or more languages	241	15.0
Total	1606	99.9

Table 23*Current Education of the Sample*

Current Education		
	Frequency	Percent
Matric	8	.5
Undergraduate degree/s	978	60.8
Undergraduate diploma/s	15	.9
Postgraduate degree/s	390	24.3
Postgraduate diploma/s	54	3.4
Total	1445	89.9

Table 24*Current Employment Status of the Sample*

Current Employment Status		
	Frequency	Percent
Employed Full-time	222	13.8
Employed Part-time	23	1.4
Self-Employed	22	1.4
Not-Employed	24	1.5
Studying Full-time	1036	64.4
Studying Part-time	36	2.2

Employed Full-time & Part-time Student	113	7.0
Full time Student and part time Employed	129	8.0
Other	1	.1
Total	1608	100

Appendix J: Normality results of the Kaufman Domain of Creativity Scale and the subscales (Self/Everyday, Scholar, Performance, Mechanical/Scientific and Artistic)

Figure 4

Histogram Showing the Sufficiently Normal Distribution of The Kaufman Domains of Creativity Scale (Total Creativity)

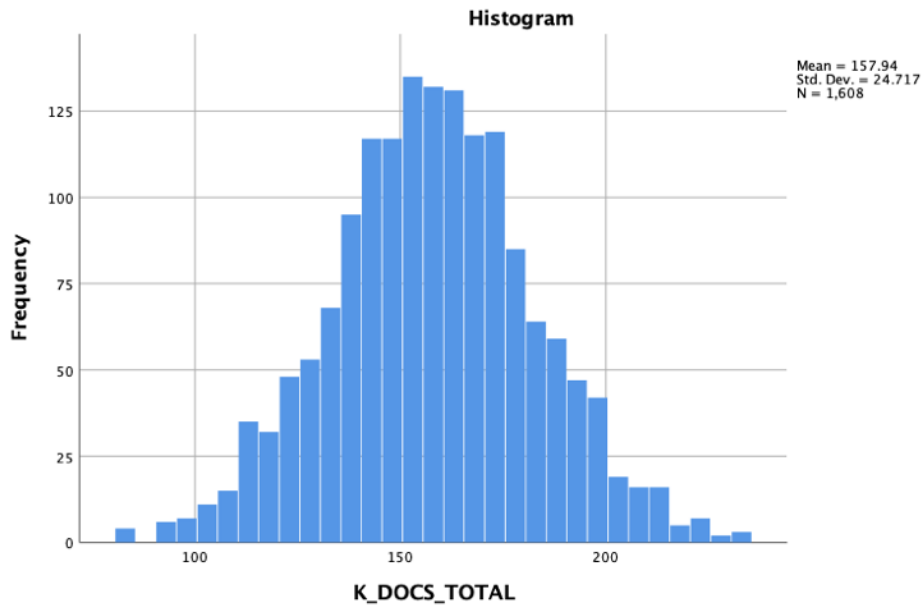


Figure 5

Q-Q Plot Showing the Distribution of Total Creative Behaviour

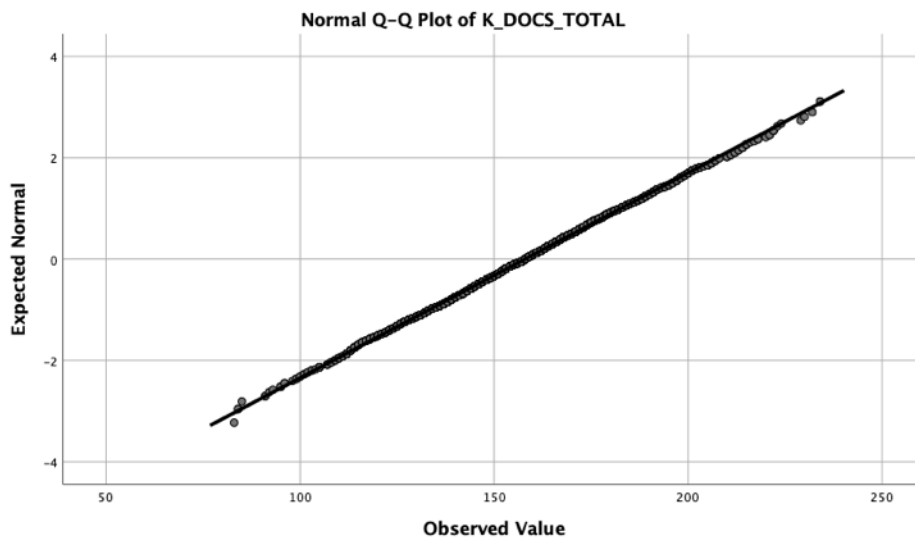


Figure 6

Histogram Showing the Sufficiently Normal Distribution of the Self/Everyday Domain of Creativity

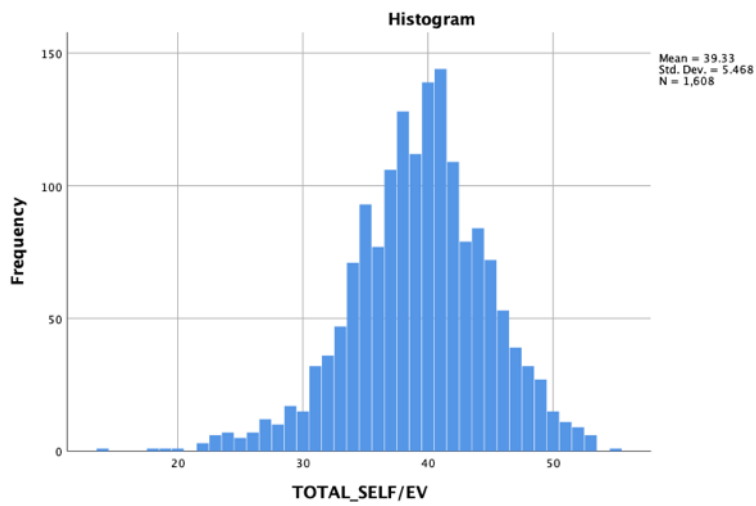


Figure 7

Q-Q Plot Showing the Distribution of the Self/Everyday Domain of Creativity

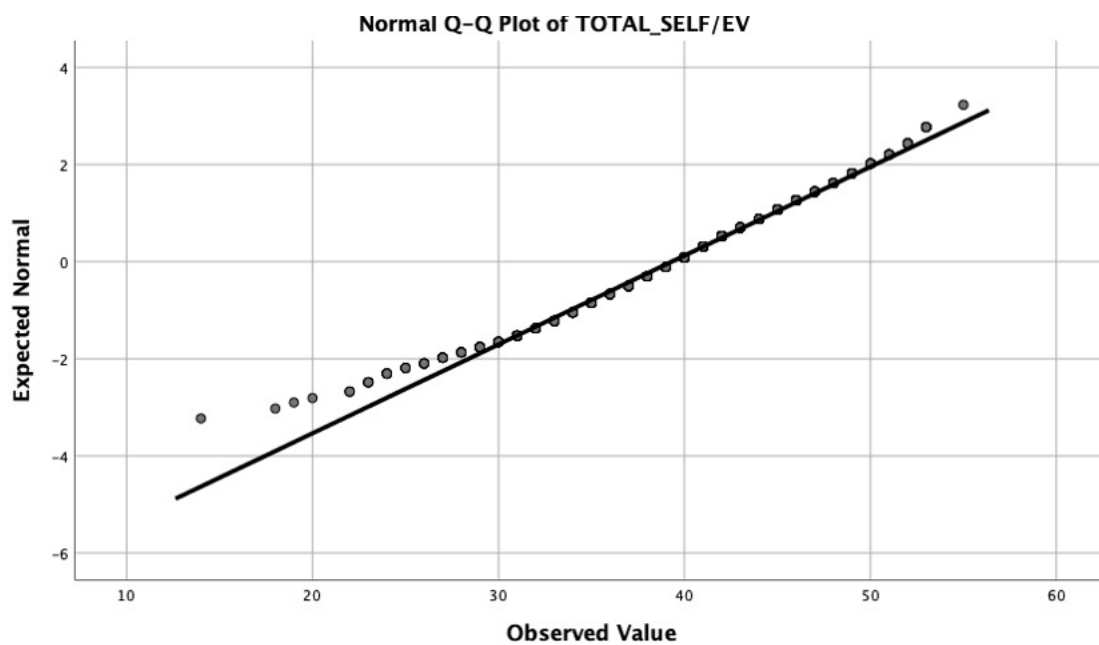


Figure 8

Histogram Showing the Sufficiently Normal Distribution of the Scholar Domain of Creativity

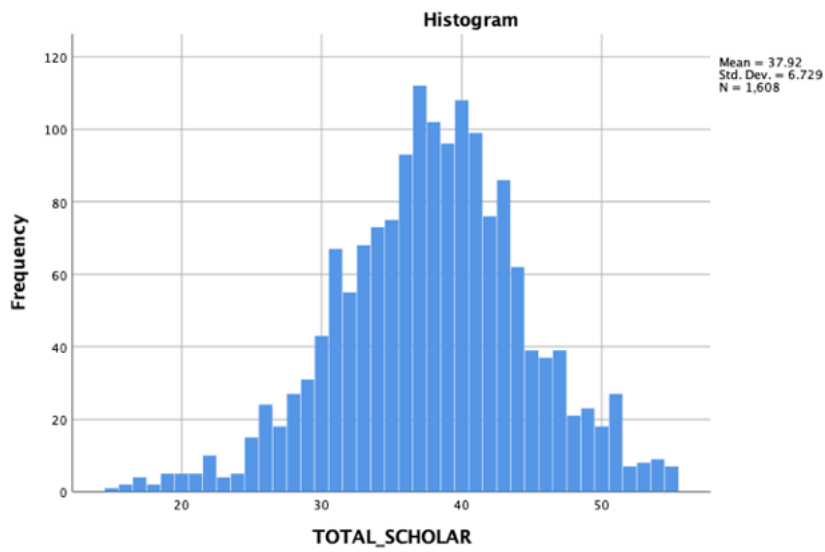


Figure 9

Q-Q Plot Showing the Distribution of the Scholar Domain of Creativity

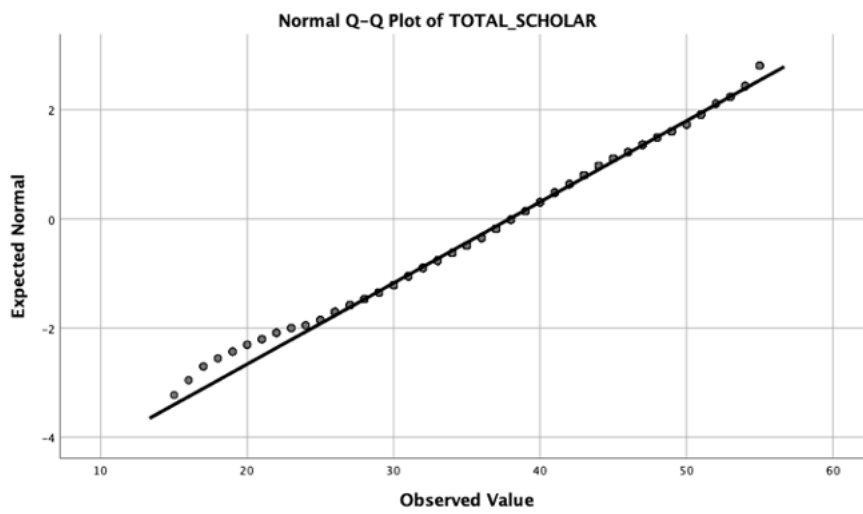


Figure 10

Histogram Showing the Sufficiently Normal Distribution of the Performance Domain of Creativity

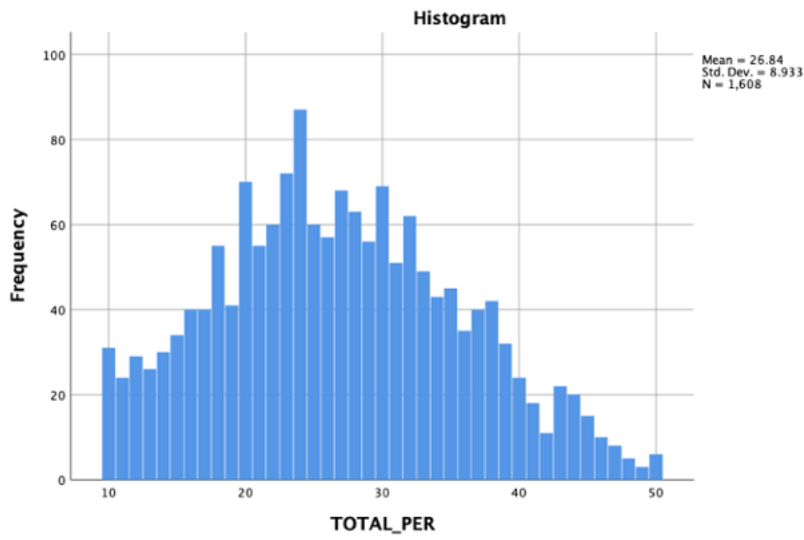


Figure 11

Q-Q Plot Showing the Distribution of the Performance Domain of Creativity

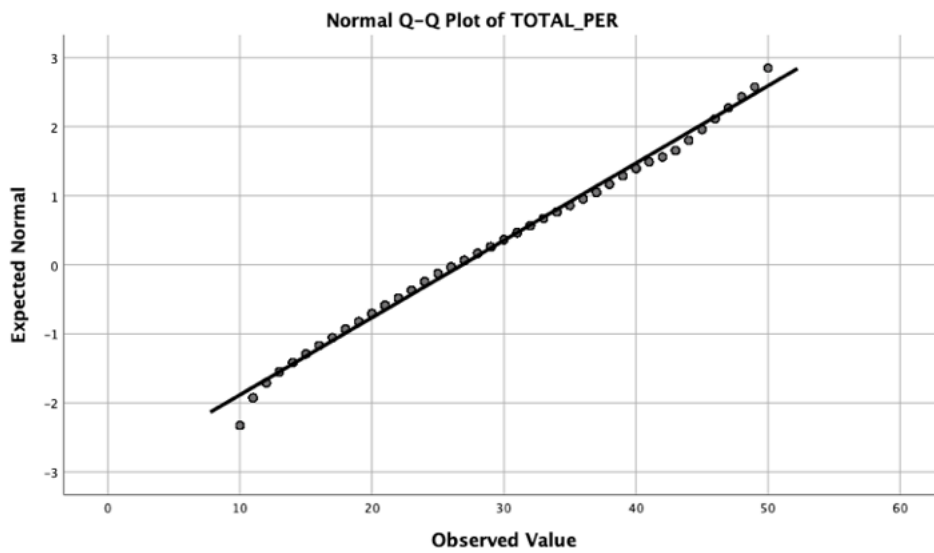


Figure 12

Histogram Showing the Sufficiently Normal Distribution of the Mechanical/Scientific Domain of Creativity

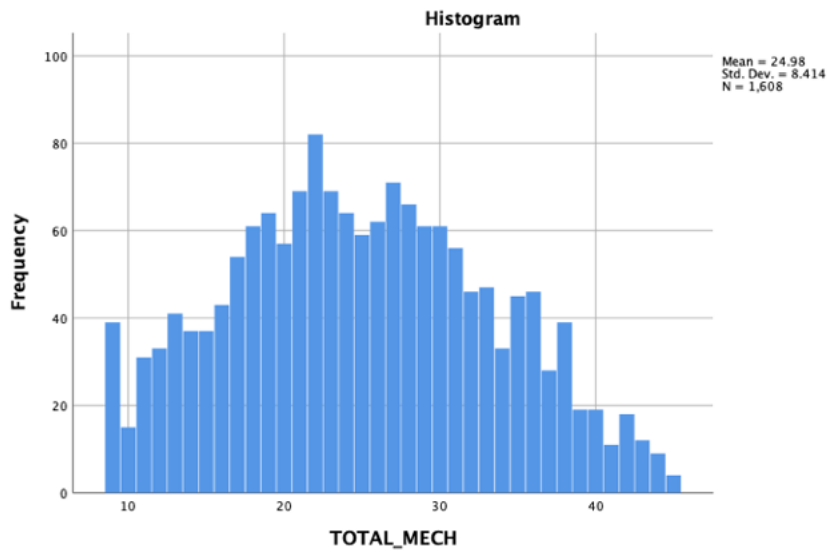
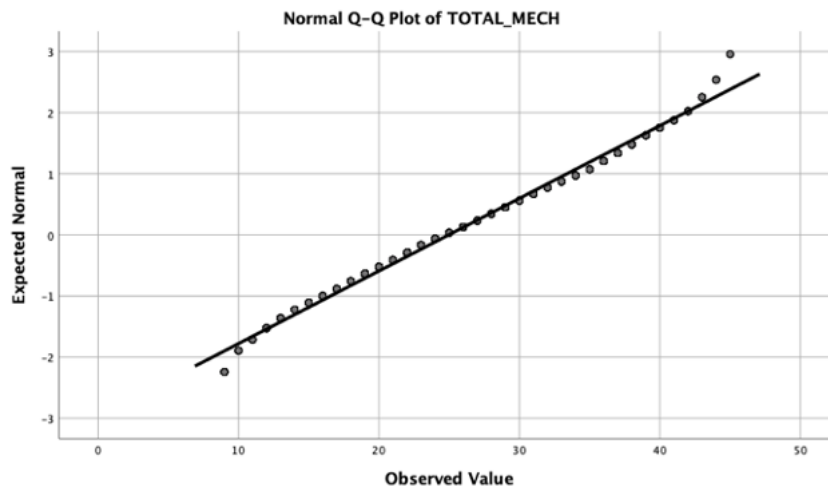


Figure 13

Q-Q Plot Showing the Distribution of the Mechanical Domain of Creativity



Appendix K: Normality results of the Amsterdam Executive Functioning Inventory (AEFI) and the Mindfulness Attention Awareness Scale (MAAS)

Figure 14

Histogram Showing the Sufficiently Normal Distribution of the Amsterdam Executive Functioning Inventory (AEFI)

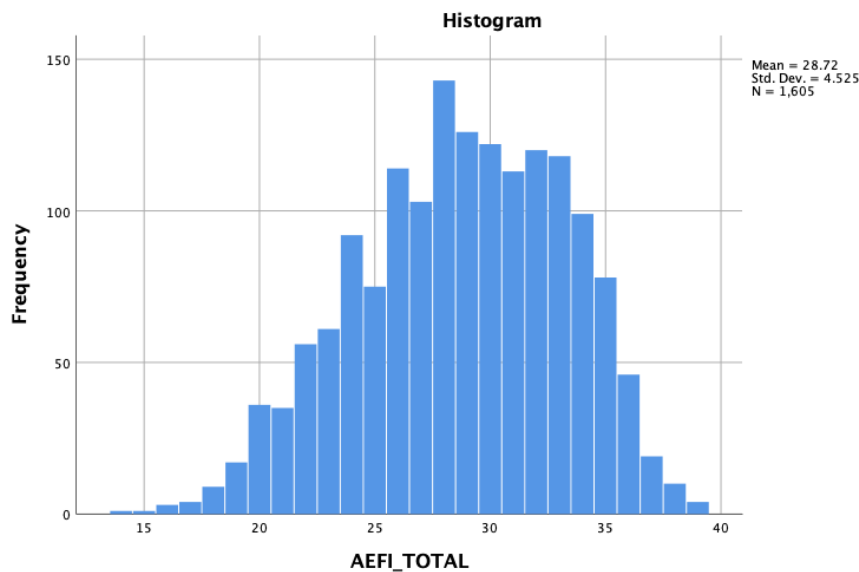


Figure 15

Q-Q Plot Showing The Distribution of the Amsterdam Executive Functioning Inventory (AEFI)

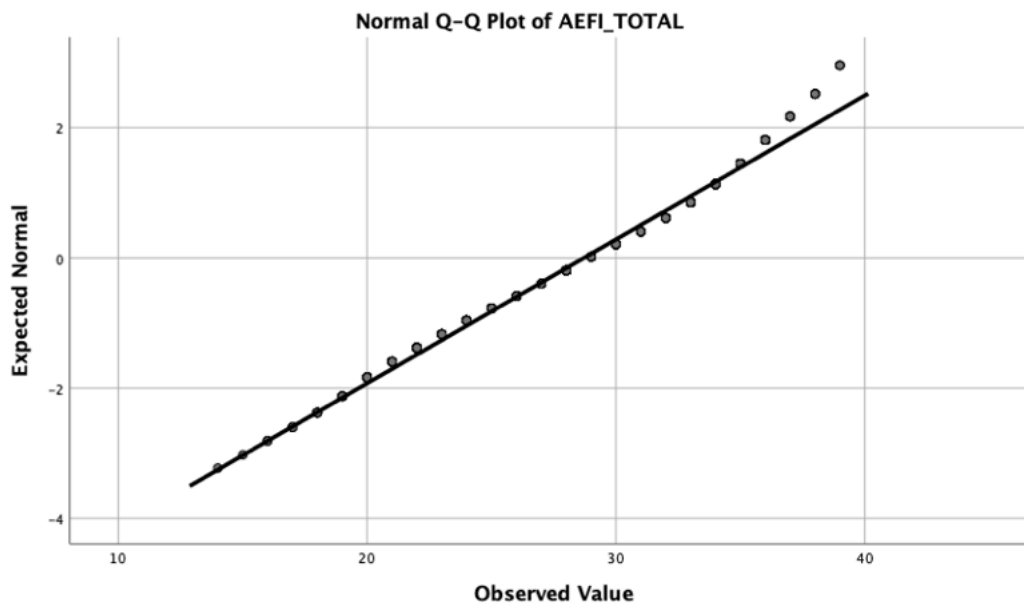


Figure 16

Histogram Showing the Sufficiently Normal Distribution of the Mindfulness Attention Awareness Scale (MAAS)

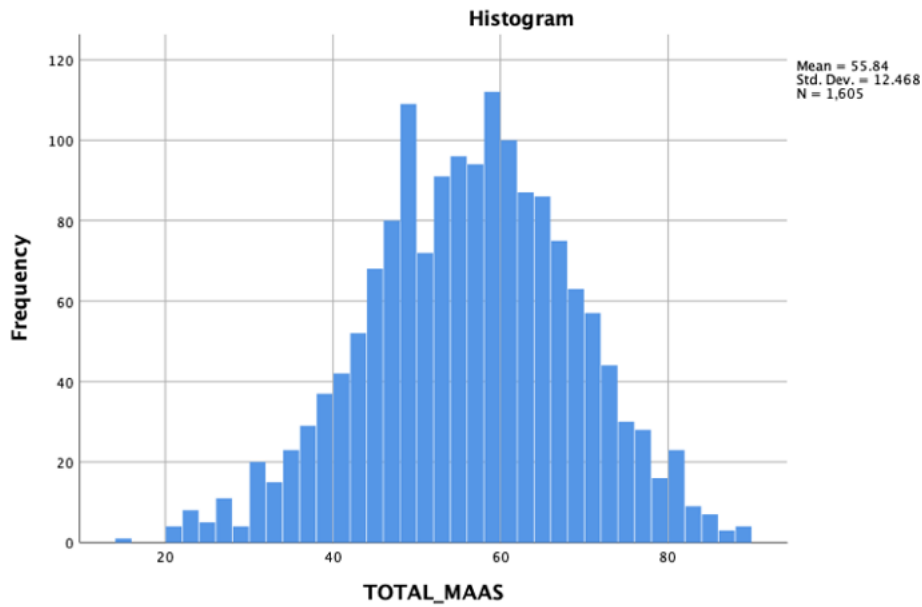
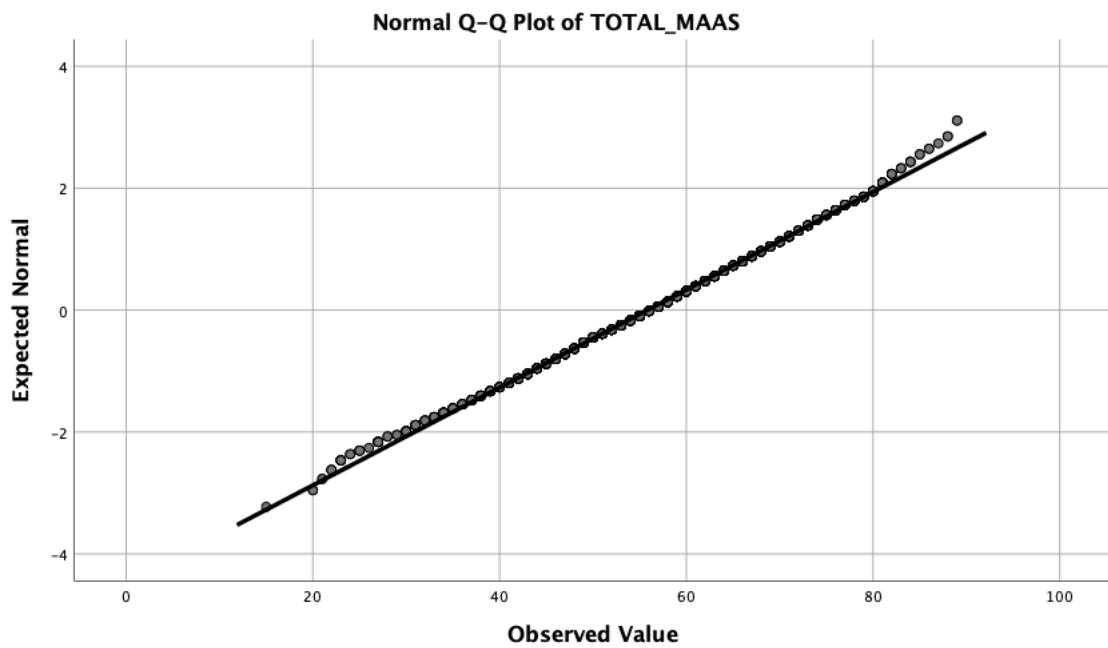


Figure 17

Q-Q Plot Showing the Distribution of the Mindful Attention Awareness Scale (MAAS)



Appendix L: Pearson r Correlations of the Amsterdam Executive Functioning Inventory and the Mindful Attention Awareness Scale

Table 25

Pearson r Correlations of the Amsterdam Executive Functioning Inventory and The Mindful Attention Awareness Scale

Variables	MAAS	Attention	Planning and Initiative	Self- control/Monitoring	AEFI
MAAS	1	.483**	.211**	.578**	.577**
Attention	.483**	1	.258**	.567**	.778**
Self- Control/Monitoring	.578**	.567**	.187**	1	.825**
Planning and Initiative	.211**	.258**	1	.187**	.631**
AEFI	.577**	.778**	.631**	.825**	1

**p < .01 two-tailed.