An Exploratory Analysis of the Role of Mindfulness in Decision-Making

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Table of Contents

Declaration

"I declare that this thesis that I have submitted to Dublin Business School for the award of HDip Psychology is the result of my own investigations, except where otherwise stated, where it is clearly acknowledged by references. Furthermore, this work has not been submitted for any other degree".

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Signed: Ingrid Rodrigues de Moraes

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Abstract

Decision-making is a cognitive process with implications into psychological well-being. Mindfulness, in its turn, encompasses several cognitive processes that can potentially increase awareness of decision outcomes patterns and improve decision-making competency. This research proposed to analyse the relationship between mindfulness measured by the Mindful Attention Awareness Scale, and decision outcomes measured by the Decision Outcome Inventory, while also controlling for the reasoning ability assessed by the Relational Ability Index. The main aim was to identify if levels of mindfulness would be positively correlated with decision outcomes. Results did not indicate for a statistically significant correlation between the variables, concluding that levels of mindfulness collected from the sample population, is not correlated with their decision outcomes. It was neither considered to be statistically significant the relationship between levels of mindfulness and regular practice. The findings of this research are controversial. Future research is encouraged to test similar hypotheses using different measurements.

1. INTRODUCTION

Psychological well-being has become a recurrent topic of discussion since the outbreak of the Second World War. Abraham Maslow, renowned in introducing the branch of Humanistic Psychology, has asserted that "Psychology is not purely descriptive or academic; it suggests action and implies consequences; it helps to generate a way of life, not only for the person himself within his own private psyche, but also for the same person as a social being, a member of society" (1968, p. iii). Thus, the study of the human mind is fundamental for the manifestation of life, mainly when human freedom involves the ability to pause between stimulus and responses, and decide where to throw its weight, as inspired by the words of the psychologist Rollo May. Inside this framework, a few years later John Kabat-Zinn has incorporated into the Western Psychology literature the term mindfulness (2003). Often associated with an array of positive outcomes (Yela, Crego, Gómez-Martínez, & Jiménez, 2020), mindfulness can be operationally defined as the constant attentive state of being aware of the surroundings and the related inner experience in a non-judgmental perspective (Kabat-Zinn, 2003, p. 145). In other words, it is a way of living life experiences attentively and with fewer prejudices and bias as possible, so to be aware of the present moment and act accordingly.

Due to its nature of understanding the cognition underpinning the human experience itself, mindfulness has become a central element in some Evidence-Based Cognitive Behavioural Treatments, such as the Mindfulness-Based Cognitive Therapy (MBCT), in which, for instance, has been linked to treating depression and anxiety very effectively (Brown, Ryan, & Creswell, 2007; Oertel, 2017). Nevertheless, not many studies have explored the correlation between mindfulness and decision-making, which intrinsically incorporates the meanings of well-being (Liu, Liu, & Ni, 2018). This study is designed to explore if dispositional mindfulness can be a

contributor to competent decision-making, considering that humans have a dispositional capacity to attend and to be aware of whatever is happening in their surroundings (Brown & Ryan, 2003). It is expected to understand how much of mindfulness is present in the decision-making process considering its outcomes and the underlying reasoning.

1.1. Defining the Domain of Mindfulness

Mindfulness can be defined as a concept that encompasses several practices and cognitive processes characterised by the individual capacity to engage attentively in the activities throughout the day, be aware of the given context, and have discernment when responding to stimuli (Demick, 2000; Kabat-Zinn, 2003; Van Dam, van Vugt, Vago, Schmalzl, Saron, Olendzki, Meissner, Lazar, Kerr, Gorchov, Fox, Field, Britton, Brefczynski-Lewis, & Meyer, 2017). Mindfulness used to be more philosophical than scientific, but, from the past two decades, a peak of researches has remarkably analysed it across clinical and counselling psychology, social and personality psychology, neuroscience, medicine, education, business and workplace (Dane & Brummel, 2014). Moreover, it has been observed that people that engage with mindfulness practices, such as meditation, usually report to experience greater mental health in comparison with non-practitioners (Yela et al., 2020). Besides, regular mindfulness practice had been positively correlated with scores in the Mindful, Attention, Awareness Scale – MAAS, which is associated with high levels of self-regulation, awareness, attention and a number of well-being indicators (Brown & Ryan, 2003, p. 843).

Research has shown that the abilities developed from being mindful or undergoing mindfulness training are a critical component of mental health and well-being enhancement (Kabat-Zinn, 2003; Brown & Ryan, 2003). In the 2000s, the researcher Jack Demick compiled

several studies that had demonstrated the enhancement of abilities to attend and self-regulate, summed with experiencing less anxiety and stress, on clinical and non-clinical population when practising mindfulness as a result of Mindfulness-Based Interventions – MBIs (2000). Sometime later, Harvard Business School published an article saying that mindfulness should no longer be considered a "nice-to-have" but a "must-have" to executives due to its consistent statistical significance with a healthier lifestyle and effective decision-making capabilities (Congleton, Holzel, & Lazar, 2015). In terms of vocational decision-making, an experimental study explored the effectiveness of the Post-Engagement Reflection –PER, a mindfulness-based intervention designed to enhance physical and emotional awareness upon occupational engagement. It has detected that mindfulness was correlated with effective career decision-making on graduated students (Oertel, 2017). Another quantitative study has also identified a statistical significance between mindfulness and higher levels of vocational identity, which represents greater self-advocacy skills (Galles, Lenz, Peterson, & Sampson, 2019).

Mindfulness has also been linked with qualities instrumental to task performance, such as judgment accuracy, insight-related problem solving, and academic performance (Dane & Brummel, 2014), which indicates that mindfulness potentially promotes executive functioning directly linked with higher cognitive abilities (Moore & Malinowski, 2009). Nevertheless, much has yet to improve concerning mindfulness research (Liu et al., 2018; Van Dam et al., 2017). There is an urge to empirically revisit mindfulness in order to increase its methodology and definition, so to prevent cofounding variable, that is, an underlying latent variable from some other general cognitive process (Van Dam et al., 2017). Thus, this research aims to provide more robust data to such urge by analysing if the different length of regular mindfulness practices influences dispositional levels of mindfulness (Yela et al., 2020).

1.1.1. Mindfulness as a Dispositional Trait

Dispositional mindfulness can be characterised as a personality tendency to consciously engage in an array of activities with awareness (Harrington, Loffredo, & Perz, 2014). Being mindful has shown to help regulate emotions, combat mental illness such as depression and anxiety, enhance executive functions and overall well-being (Brown et al., 2007; Moore & Malinowski, 2009; Oertel, 2017). In the opposite hand, being mindless is characterised by living experiences without noticing them. A mindless person is either in the past or the future, but not in the present moment (Oertel, 2017). As lectured by Jack Demick, "mindlessness has been conceptualised as a state of mind characterised by an overreliance on past categories and distinctions whereby the individual is context-dependent and oblivious to novel (alternative) aspects of situations" (p. 142, 2000). Nevertheless, not many studies have approached it as a naturally occurring personality trait.

Assuming that mindfulness is an inherent capacity of the human mind to attend and to be aware (Brown et al., 2007), correlational and experience-sampling research conducted by Brown and Ryan have developed a psychometrical scale that reliably identifies variations of such capacity as a trait (2003). The MAAS not only has strong correlations with personality traits (e.g., neuroticism and extroversion) but with specific cognitive mechanisms, such as self-regulation and emotional experience (Brown & Ryan, 2003; Brown et al., 2007). For instance, "Mindful" stands for an ability to immediately engage to events as they occur "without the overlay of discriminative, categorical, and habitual thought" (Brown et al., 2007, p. 215); "Attention" is the complete engagement within a given internal and external stimulus; and, "Awareness" embraces the ability of perceiving the reality through the five physical senses (Brown et al., 2007). In summary, those attributes enhance clarity and cognitive flexibility, permitting more conscious and self-regulatory

behavioural responses. Hence, inspired by Demick words when referring that future research in mindfulness is warranted if analysing the construct validity of mindfulness/mindlessness in given contexts (2000, p.146), this research proposes to analyse the efficacy of such personality tendency as a dispositional trait through a cognitive behavioural approach.

1.2. Mindfulness and Decision-Making

Decision sciences and mindfulness theory have equally focused their approach on the discovery of the aspects underlying the thought process but through different perspectives. Typically, researches in decision-making have studied this cognitive phenomenon in isolation from other psychological elements (Brune et al., 2007; Oertel, 2017). Moreover, as asserted by Raglan and Schulkin, "decision sciences focus on better understanding the patterns and impacts of human decision-making, particularly in instances of flawed decision-making" (2014, p. 168). This approach has allowed an in-depth analysis of one facet of the decision-making process, but it was obnoxious to the influence of non-intellective variables, such as personality traits (Dewberry et al., 2013; Raglan & Schulkin, 2014). On the other hand, mindfulness researches generally provide a poor empirical framework to their findings (Van Dam et al., 2017). This challenge is due to the subjective approach that mindfulness theory has, as it aims to analyse the individual thought and behaviour process and propose a reduction of negative responses (Raglan and Schulkin, 2014). A meta-analysis study has detected that the insufficiency of reasonable and valid mindfulness measurements "can neither properly determine how this mental faculty changes through instructions and guided practice, nor can one assess how increased mindfulness affects the cognitive capacities and/or symptoms of various mental and physical dysfunctions" (Van Dam et al., 2017, p.8).

Recent studies that analysed the correlation between mindfulness and decision-making had empathised on the validation of mindfulness in decision-making. Not only because there is a need to improve analytical tools (Van Dam et al., 2017), but mainly due to its unique role in successful decision-making in respect to well-being (Oertel, 2017; Liu et al., 2018). Moreover, mindfulness has been consistently linked with well-being and proven to directly affect the underlying process of decision-making (Liu et al., 2018). For instance, a study detected that "trial lawyers who were mindful during decision making were better able to integrate information from their previous experience with other relevant information to arrive at an optimal decision" (Dane as cited in Oertel, 2017, p. 11). Another study based in the report of over 2,000 adults has predicted that the average decision-maker, when not mindful, can miss essential context cues that potentially lead to successful outcomes (Killingsworth & Gilbert as cited in Oertel, 2017, p. 14). Thus, understanding how those variables are intertwined is essential for empowering one's cognition and unravelling human behaviour. Dewberry et al., on a study about the role of personality on competent decision-making, have detected that personality scales accounted for statistically significant variance in decision outcomes measured by the Decision Outcome Inventory (DOI), proposing that personality traits should be considered when studying decision-making (2013, p. 787). Hence, this study is proposing to provide more data to the before-mentioned rationale.

1.3. Conceptualising Competency in Decision-Making

Indeed, the act of deciding is elementary and unavoidable to all people. Moreover, due to this aspect, decision-making is consisted of a cognitive process comprised of a stream of variables, such as "the ability to understand information, integrate information in an internally consistent manner, identify the relevance of information in a decision process, and inhibit impulsive

responding" (Finucane & Gullion, 2010). Research on decision-making have been willing to understand how people choose and pursue goals in several and possible ways, so to maximise potential gains and minimise potential losses (Oppenheimer & Kelso, 2015). This rationale has analysed human cognition in the realm of decision-making as a mathematical formula that would result in promising control of the variability in outcomes (Tversky & Kahneman, 1992). This direction, however, resulted to be oblivious to aspects not empirically easy to measure or mathematically calculated, such as personality and individual differences, like when analysing mental shortcuts, e.g. heuristics and biases, for instance (Bruine de Bruin et al., 2007; Raglan & Schulkin, 2014; Oppenheimer & Kelso, 2015). In order to address this gap, theorists attempted to explain the connection between decision processes and other cognitive systems, and to question "whether anomalous phenomena that heuristics were meant to explain could be modelled as emergent properties of a more integrated cognitive framework" (Oppenheimer & Kelso, p. 283, 2015). Hence, this shift on the scientific analysis in Decision-Making Competence – DMC started to consider it not separate but part of cognitive science.

Bruine de Bruin et al. have helped to develop an inventory that has shown high reliability to measure adult DMC, also referred to as A-DMC (2007). The A-DMC is an index defined by seven different components, like resistance to framing, under/overconfidence, risk perception, resistance to sunk costs, recognition of social norms, independent choice, and appliance of decision rules, where response (in)consistency among those components would represent indicators of latent cognitive skills in decision-making (Bruine de Bruin et al., 2007). Results suggested that individual differences were correlated across the performance scores on the behavioural decision-making tasks, such as maladaptive risk-taking behaviour, which reflected that traits might significantly impact the cognitive process underlying decision-making (Bruine de Bruin et al.,

2007). Under this framework of revolutionising paradigms in decision science (Oppenheimer & Kelso, 2015), Finucane and Gullion have conceptualised DMC as a complex multidimensional form of cognition because it "requires several key skills including the ability to understand information, integrate information in an internally consistent manner, identify the relevance of information in a decision process, and inhibit impulsive responding" (2010, p. 2). This concept is linked to the functional construct of intelligence coined by the Relational Frame Theory when referring that intelligence is a measurable individual quality compiled of a set of skills that are relational and intrinsically linked to a given context (Colbert, Dobutowitsch, Roche, & Brophy, 2017).

Hence, the scores obtained when utilising inventories to measure DMC, potentially reflect how individuals can integrate their cognitive abilities and personality characteristics to the challenges provided by a given situation, in a given context (Finucane, Mertz, Slovic, & Schmidt, 2005; Colbert et al., 2017). The challenge of linking research and the real-world across diversity and multiple backgrounds remain vivid nevertheless. To understand how and why individual differences can help some achieve better decision outcomes than others is self-evidently important (Dewberry et al., 2013). The lack of resources to make meaningful decisions and obtain satisfactory outcomes can lead to catastrophic consequences in one's life, like endeavouring through experiences that do not relate to ones' desires and values. Therefore, good decision-making skills during adulthood can ultimately ensure psychological well-being (Finucane & Lees, 2005).

1.3.1. Measuring Decision Competency through the Decision Outcome Inventory

In the absence of direct measures of real-world decision-making experience, scientific research has used self-report inventories as a way to measure decision outcomes, like the Decision Outcome Inventory – DOI (Bruine de Bruin et al., 2007). The DOI has shown good internal consistency and predictive validity with the previously mentioned A-DMC (Bruine de Bruin et al., 2007). While the latest has been measuring decision making performance related to cognitive abilities and styles, such as risk-taking behaviour, the latest has been examining its consequences in people's life. The results found that lower decision-making scores are directly linked to lousy decision outcomes, as the subjects tend to report more challenging life experiences in which the stress has the potential to undermine the quality of one's well-being (Bruine de Bruin et al., 2007; Martinovic, 2017). Although any measures relying on self-reports should be analysed cautiously, "overall performance on the A-DMC and most of its component tasks are associated with better decision outcomes" (Bruine de Bruin et al., 2007, p. 949).

Recent research has analysed the correlation between decision outcomes and mindfulness, in which the results revealed a significant correlation between high DOI scores and one of the facets of mindfulness related to non-judgmental behaviour (Martinovic, 2017). It asserted that the abstinence of being critical and biased is statistically significant with better decision outcomes (Martinovic, 2017). This finding helps to begin understanding how individual differences relate to past, present, and future outcomes (Parker, Bruine de Bruin, Fischhoff, & Weller, 2018, p.15). In general, cognitive-behavioural science has been advocating for the importance to analyse decision outcome patterns in conjunction to personality differences, in order to overcome poor decision-making (Raglan & Schulkin, 2014; Dewberry et al., 2013). Efforts to increase awareness of decision outcomes patterns, potentially through mindfulness practices, might improve a person's overall decision-making performance (Dewberry et al., 2013). This research aims, therefore, to

address this gap in predicting and explaining decision outcomes in respect of levels of mindfulness as personality differences (Brown et al., 2007), so to ultimately understand how mindfulness can improve flawed decision making.

1.3.2. Evaluating Reasoning Performance through the Relational Ability Index

Due to the mentioned challenge of measuring real-life experiences in a self-report task, the Relational Ability Index – RAI+ (Colbert, Malone, Barrett, & Roche, 2019), aims to add value in validating decision outcomes by assessing the reasoning ability of the participants. The RAI+ is comprised of relational statements or nodal that solely function as an index to provide the fluency of the intellectual skills related to the individual reasoning abilities (Colbert et al., 2019). Human cognition is considered to be a form of behaviour that responds to stimuli under a construal of relational frames (Colbert et al., 2019). Those frames can be understood as a set of skills obtained from a repertoire of nodal that evokes coordination, distinction, opposition, comparison, temporality, analogy, hierarchy, and deixis (Colbert et al., 2019). In alignment with the goals of the current research, it was considered just the core statements of same/opposite (e.g., A is opposite to B), and more than/less than (e.g., A is greater than/less than B), because of their significant levels of correlation with IQ tests (e.g., the Wechsler Abbreviated Scale of Intelligence – WASI), in which conceives reasoning performance (Colbert et al., 2019, p. 14).

The Relational Frame Theory that underlies the RAI+ construct proposes that human cognition can be derived. Moreover, it understands that the acquisition of the skills underlying the relational frames involves a larger number of stimuli, in which has the potential to offer progressively offer a larger number of responses, taught or novel (i.e., derived) (Colbert et al., 2019, p. 3). For instance, if an individual is taught that A is greater than B, but later is presented

with another nodal that suggests B is same as C, that individual will be able to derive the relationship between A and C (e.g., A is more than C), regardless if it has not been taught initially. Nonetheless, it has not been determined what defines the probability of an individual to acquire relational skills more easily than the others. Personality seems to offer substantial incremental validity over general reasoning performance, in which helps to understand the variation of individual differences obtaining better performance or greater decision outcomes than others (Sollarova & Kaliska, 2019; Dewberry et al., 2013). The current research aims to utilise the RAI+ as an instrument of measuring the reasoning ability of the participants, so to explore if the relationship between decision outcomes and levels of mindfulness can become stronger while controlling for the performance on the RAI+. The main idea is to provide a reasoning validation of the underpinning decision-making process of the participants.

1.4. Research Aim

In summary, studies in mindfulness are deficient in analysing it empirically as a dispositional trait (Brown et al., 2007). Instead, they have generally focused on the outcomes seen in the participants upon completion of training, e.g., MBCT (Van Dam et al., 2017; Liu et al., 2018), which leaves an opportunity to explore mindfulness as naturally occurring personality trait. Also, there is little empirical data that evaluates whether exposure to mindfulness plays a determinant role in explaining the effects of mindfulness, including the mere exposure to its teachings (Brown et al., 2007). Additionally, behavioural science has little understanding of how decision competence is influenced by personality differences (Raglan & Schulkin, 2014; Finucane & Gullion, 2010).

Therefore, in order to address these gaps, the primary goal of the current study is to evaluate the impact of mindfulness on competent decision-making. As it has become crucial to research whether mindfulness is conducive of cultivating, developing, and promoting one's cognitive ability to skilful decisions (Liu et al., 2018), the second main goal is to validate the potential to improve decision-making through practice. It will be analysed if different engagement frequencies with mindfulness practice, or previous exposure to it, is correlated with different levels of mindfulness regarding its dispositional aspect. Both aims will facilitate an exploratory analysis of mindfulness as a dispositional trait and perceive any influence on decision-making measured by its outcomes, while also controlling for the underlying cognitive process.

1.4.1. Research Hypotheses

Hence, the following hypotheses are derived from the above rationale:

1.   There will be a significant positive correlation between levels of mindfulness measured by the MAAS and decision outcomes scores measured by the DOI;

2.   There will be a significant positive correlation between scores in the reasoning assessment measured by the RAI+ and decision outcomes scores measured by the DOI;

3.   There will be a significant correlation between decision outcomes measured by the DOI and levels of mindfulness measured by the MAAS while controlling for the reasoning ability scores assessed by the RAI+;

4.   Different frequency in regular mindfulness practices across different sets of time (daily, weekly, and monthly/yearly) will be associated with higher levels of mindfulness as measured by the MAAS; and,

5.   There will be a significant difference of levels of mindfulness as a dispositional trait measured by the MAAS scale, between groups with or without previous exposure to the practice of mindfulness or acknowledgement on what is mindfulness.

2. METHOD

2.1. Participants

A total of 181 participants (Male = 77; Female = 97; Other = 7), ranging from 18 to 63 years old (M = 27.39, SD = 8.50), were recruited from the general population to partake the survey. Participation was voluntary and anonymous, where the only inclusion criteria were to determine to be 18 years of age or older. The participants were asked about their age and gender and six other demographic questions (see Appendix B). They were consubstantiated of common life events that could potentially occur to any person from the general population, such as if the participants had been exposed to the term Mindfulness and/or undergone any related training; if they had engaged in activities related to being present at a given moment; what type of activities have they engaged with, choosing one or more predetermined options (e.g. meditation/breathing activity, physical exercise, play of an instrumental music) and/or specifying any other activity; for how long would they have engaged in such activities per day (none, between 1 to 30 minutes, between 30 to 60 minutes, over 60 minutes), per week (none, less than 3 times a week, between 3 to 5 times a week, over 5 times a week), and over the years (none, less than 6 months, over a year, couple of years). Table 1 below outlines a breakdown of the participants' profiles across the demographic measures:

Table 1: *Demographic Descriptive of Participants.*

Characteristics	n	%
Exposure to Mindfulness		
Yes.	108	60.7
No.	70	39.3
Practice benefits		
Yes.	83	46.1
No.	97	53.9
Type of practice		
(1) Physical activity, e.g. yoga, pilates, workout, sports, cycling, etc.	10	11.6
(2) Meditation/Breathing exercises.	23	26.7
(3) Play a musical instrument.	5	5.8
1 and 2.	27	31.4
1 and 3.	6	7
2 and 3.	4	4.7
1, 2 and 3.	11	12.8
Daily Practice Engagement		
None.	67	43.5
Between 1 to 30 minutes.	60	39
Between 30 to 60 minutes.	21	13.6
Over 60 minutes.	6	3.9
Weekly Practice Engagement		
None.	68	44.4
Less than 3 times a week.	45	29.4
Between 3 to 5 times a week.	27	17.6
Over 5 times a week.	13	8.5
Monthly/Yearly Practice Engagement		
None.	66	42.6
Less than 6 months.	25	16.1
Over a year.	26	16.8
Couple of years now.	38	24.5

2.2. Recruitment

The survey was circulated online and open to the general public. It was used the convenience and snowball methods of recruitment. The link was primarily posted and shared consequently on social networking media, like Facebook (www.facebook.com), LinkedIn

(www.linkedin.com), Instagram (www.instagram.com), Reddit (www.reddit.com), Twitter (www.twitter.com); and, also via email and direct messages over Slack (www.slack.com) and WhatsApp (www.whatsapp.com).

2.3. Design

The primary aim of this research was to determine the relationship between mindfulness and decision-making competency through individual psychometric tests. It was expected to do not infer causality but relationships among those variables. Hence, the criteria to conduct non-experimental quantitative research using the correlational cross-sectional design with non-probability sampling was met.

2.4. Materials

The survey was generated online and composed by a cover letter containing the research information, and the required consent and age majority questions (see Appendix A); the demographic questions (see Appendix B); the psychometric instruments consisted of: the 15-item MAAS scale to measure the levels of dispositional mindfulness (Brown & Ryan, 2003) (see Appendix C), the 34-item DOI questionnaire to measure decision outcomes scores (Bruine et al., 2007) (see Appendix D), and the 27-item RAI+ to assess the reasoning performance of the participants (Colbert et al., 2019) (see Appendix E); and, a final page of debrief with a list of support services and researcher details (see Appendix F).

2.4.1. Demographics

The demographic questions were created by the Researcher based on ordinary life factors or events that could potentially occur regularly in the selected sample population (see Appendix B). Besides for age and gender questions, it was asked whether the participants had previous or ongoing exposure to mindfulness and correlated practice. Amongst those that have been familiarized with mindfulness, it was asked for them to select or specify which type of practice they were engaging with, such as meditation/breathing exercises, playing a musical instrument, and engaging in physical activity. All of them were correlated with repetitive awareness in internal and external stimuli, in which characterises a mindful state of mind (Brown et al., 2003). Most importantly, it was asked for them to state the frequency in which they were or were not regularly engaging with those practices, either in minutes per day, times a week, months and years, due to the high correlation detected in previous research between regular mindfulness practices and mental health (Yela et al., 2020).

2.4.2. Mindful Attention Awareness Scale – MAAS

The Mindful Attention Awareness Scale – MAAS, is an ideal scale to assess dispositional mindfulness levels, which are related to self-regulation and well-being constructs (Brown & Ryan, 2003). Comprised of 15 questions, each of these questions is focused on evaluating the presence or absence of attention and awareness elements in the present moment, e.g. "I snack without being aware that I am eating" (see Appendix C). It uses a 6-point Likert scale, ranging from 1 (almost always) to 6 (almost never), where higher scores represent greater mindfulness levels. To prevent bias or social desirability from the participants, it was instructed for them to respond accordingly to their actual experiences instead of their expected experiences. Previous research has reported a

Cronbach's alpha score of .81 (Brown & Ryan, 2003), which represents a satisfactory reliability score for the scale.

2.4.3. Decision Outcomes Inventory – DOI

The Decision Outcome Inventory – DOI, is a self-evaluation questionnaire that aims to provide a measurement of real-world decision outcomes experienced by adults (Brune et al., 2007). It is consisted of 69 "Yes" or "No" statements, which are divided into 24 item-pairs, 4 item-groups and 6 individual items (see Appendix D). Those statements are consisted on asking whether the participants had made decisions that would make that outcome possible, e.g. "Taken the train or the bus" followed by "Taken the wrong train or bus". Due to the recruitment method, some items of the DOI were modified from the original version to suit the vocabulary and currencies from the countries of the expected participants, primarily based in Europe. For instance, the money currency was changed from US Dollars to Euro in four pair-items, and the abbreviation "DUI" was changed to "fine" in one pair-item. The score measurement considers the proportion of participants who reported not experiencing negative outcomes against those that have had the opportunity to experience it. The Professor Wandi Bruine de Bruin, who helped to develop the DOI (Brune et al., 2007), conceded a SPSS script document to help calculate the variable score. The reversed-coded results closer to zero reflect better outcomes (Brune et al., 2007). Previous research has reported a Cronbach's alpha score of .87 (Martinovic, 2017), which represents a satisfactory reliability score for the scale.

2.4.4. Relational Ability Index – RAI+

A revised version of the Relational Ability Index – RAI+, is an assessment that helps to measure the intellectual performance in adults based on their syllogistic relational skills displayed at the moment of the assessment (Colbert et al., 2019). The RAI+ originally uses 67 syllogistic relational puzzles. However, for this study, it was used 28-items, in which 15 trials were from the Same/Opposite battery, and 13 from the More/Less battery (see Appendix E). The format of the trials was mirrored on the tasks utilised in previous research (Colbert et al., 2019; Colbert, 2017a; Colbert, 2017b). Each task consisted of one to three nodal, using nonsense "consonant-vowel-consonant" words, e.g., "LUX is the same as TIV", or "FAD is more than KAD". They were followed by a question based on the relationship(s) specified in the nodal, e.g., "Is LUX the opposite to TIV?", or "Is KAD more than FAD?", respectively. Participants had to indicate their responses by signalling either "Yes" or "No" to each trial. The sum of the correct responses represented greater performance in the reasoning assessment. Previous research has detected a strong correlation between the WASI Full Scale IQ and two of the core relational skills, More/Less (rho = .49, p < .001), and Same/Different (rho = .49, p < .001) (Colbert et al., 2019), which represents a satisfactory construct for the measurement of the reasoning ability in the adult population.

2.5. Procedure

The survey was generated on Google Forms in order to allow online access through a web link. Once approved by the Ethical Committee Board, the survey was shared across social media sites, targeting adults from the general population. The link to the survey advised participants of the research's nature, the duration of the survey, how their data would be collected and stored, and requesting for consensual and voluntary participation after confirming to be over 18 years old. It

was disclosed the researcher, the supervisor and assistance services contacts, namely Aware and the Samaritans, in case of need. In order to avoid biased responses, the eligible participants did not know the purpose of the utilisation of the psychometric instruments used until the final debrief page. The data was collected anonymously through individual psychometric tests, and it was expected to do not infer causality but relationships among the measured variables. Once the data was collected and a reasonable number of responses was obtained, it was exported from Google Forms to an Excel spreadsheet, in which it was possible to perform the data coding. After this step, the coded data was exported to the IBM SPSS Statistics version 26, allowing for its descriptive statistical analysis. Data is stored in an encrypted computer and will be until the lapse of one year from the submission of this research.

2.6. Ethics

Prior to conducting this research, a proposal was submitted and approved by the Ethical Committee Board at Dublin Business School. In alignment with the Psychological Society of Ireland Code of Professional Ethics (2011), it was outlined how the data would be collected, stored, handled, exported and destroyed, as per principles of Competence and Responsibility. Besides, in observance of the rule 4.3.5, the participants were advised about the nature of the research on the survey's cover sheet (Appendix A) and debriefed accordingly about the psychometric tests used on the final page (Appendix F). Both pages contained the Researcher's and the Supervisor's email addresses in need of clarification.

Participation was voluntarily, and, in the name of the principle of Respect for the Rights and Dignity of the Person, the option to withdraw envisioned on the rule 1.3.5 was ensured during the survey. This right to withdraw only decayed after response submission, but this was made clear

from the beginning so to ensure the integrity of the scientific process. Also, participants were acknowledged to have minimal risk or harm, but, in case of any distress, while doing the self-assessment task, it was shared a list of contact details from support services at the end of the survey in respect to the rule 3.1.3. Hence, this study was conducted for the only purpose of academic requirements, and there is no other reason that could be construed as a potential conflict of interest. No ethical concerns shall involve this research.

2.7. Data Analysis

First and foremost, as per requirements established on the Cohen's power prime research (1992), there is an effect sample size for the data analysis to be conducted in this study because it was recruited 181 participants from the general population. Considering the different research hypotheses, the different type of the variables, and the assumptions entitled to each statistical test, it was chosen different tests to statistically analyse the data. For Hypotheses 1 and 2, it was chosen the non-parametric test of Kendall's tau-b correlation coefficient to analyse the strength and direction of scores obtained in the MAAS and the DOI, and RAI+ and DOI, respectively. The reason behind it is because the data for RAI+ and DOI was not normally distributed, and the assumptions to run a parametric statistical test (e.g., Pearson's Correlation) was not met. The Kendall's tau-b test is considered to be a robust non-parametric test to use when the data shows some outliers, as it is the case.

For Hypothesis 2, it was also chosen the non-parametric test of Kendall's tau-b correlation coefficient, in order to analyse the strength and direction of scores obtained in the RAI+ and the DOI. The Hypothesis 3 that aims to assess the correlation of decision outcomes (DOI) and mindfulness (MAAS) while controlling for reasoning ability (RAI+) met the criteria to run the

Multiple Regression test with the caveat that the DOI and the RAI scores are not normally distributed. For Hypothesis 4, the criteria to run the parametric test of One-Way Anova was met, in order to analyse the relationship between levels of mindfulness and regular mindfulness practice. Lastly, for Hypothesis 5, it was chosen the parametric Independent-Samples T-Test to explore the difference of levels of mindfulness in the participants with or without previous acknowledgement of what is mindfulness (nominal variable).

3. RESULTS

3.1. Descriptive Statistics

The scores for the scale type of variables were calculated by following individual instructions. The total score for the MAAS was calculated by summing the responses and averaging it by the number of items (Brown & Ryan, 2003). The total for the DOI was achieved by running a script, which computed the frequency of responses and averaged it by the number of participants (Brune et al., 2007). The total for the RAI+ was calculated by coding the correct answers to the value of "1" and incorrect to the value of "0", where the sum of scores result in the final score. Due to some controversy regarding the correct answer for the reasoning behind the question 2.11 from the RAI+ assessment (see Appendix E), it was decided to exclude it from the analysis to avoid erroneous assumptions.

Table 2: *Descriptive Statistics of Variables*

Variables	n	Mean	Standard Deviation
Mindfulness, Attention, Awareness Scale (MAAS)	175	3.56	0.77
Decision Outcome Inventory (DOI)	181	0.13	0.07
Relational Ability Index (RAI+)	172	22.77	2.71

3.1.1. Reliability Validation

In overall, the scales used in this research were found to have good internal reliability. The 15-item MAAS scale demonstrated to have a strong reliability based on the Cronbach's alpha reliability value (α = 0.82). The DOI scale presented a satisfactory internal reliability among 29-items (α = 0.74). And, among the 27-item, the RAI+ scale also presented a satisfactory internal reliability (α = 0.73).

3.2. Inferential Statistics

3.2.1. Hypothesis 1

The hypothesis states that there will be a positive correlation between levels of mindfulness measured by the MAAS and decision outcomes scores measure by the DOI. A Kendall's tau-b correlation was used to determine the relationship between MAAS and DOI scores (N = 175). There was a weak monotonic relationship between levels of mindfulness and decision outcomes scores, and the results did not find a statistically significant correlation between them (τ_b = .064, p = .278). Hence, the null hypothesis has to be accepted.

3.2.2. Hypothesis 2

The hypothesis states that there will be a positive significant correlation between scores in the reasoning assessment measured by the RAI+ and decision outcomes scores measured by the DOI. A Kendall's tau-b correlation was used to determine the relationship between RAI+ and DOI scores (N = 181). There was a weak monotonic relationship between reasoning performance and decision outcomes scores, and the results did not find a statistically significant correlation between them (τ_b = .064, p = .122). Hence, the null hypothesis has to be accepted.

3.2.3. Hypothesis 3

The hypothesis states that there will be a positive significant correlation between decision outcomes measured by the DOI and levels of mindfulness measured by the MAAS, while controlling for the reasoning ability scores assessed by the RAI+. After excluding for some outliers, it was identified a weak but positive linear relationship between the variables, and Shapiro-Wilk has shown a good score in the normality test (DOI, $p = .081$; MAAS, $p = .773$). Outliers were excluded from the data for this test. The Multiple Linear Regression was chosen to assess how much of variance in decision outcomes (N = 149, M = -.12, SD = .059) could be predicted by levels of mindfulness (N = 149, M = 3.56, SD = 0.77) and performance in the reasoning ability assessment (M = 23.28, SD = 1.88); as well as to understand which variable would be the best predictor of decision outcomes. The Mahal. distance was 11.075, which ensures that there was no multivariate outliers for the analysis. The results of the regression indicated only 2% of variance in decision outcomes explained by levels of mindfulness and reasoning ability (R^2 = .020; F(2, 146) = 1.48, p = .230). Between the predictor variables, levels of mindfulness showed a slight better predictability (ß = 0.54, p = .509, CI (95%) = -.008, .017) than reasoning performance (ß = .130, p = .114, CI (95%) = -.001, .009). However, neither was statistically significant and the null hypothesis has to be accepted.

Table 3: *Correlation table*

Scale	MAAS	DOI	RAI+
Mindfulness, Attention, Awareness Scale (MAAS)	-	.255	.499
Decision Outcome Inventory (DOI)	.255	-	.056
Relational Ability Index (RAI+)	.499	.056	-

3.2.4. Hypothesis 4

The hypothesis states that the frequency in engaging with mindfulness practices across different sets of time will be associated with higher levels of mindfulness as measured by the MAAS. Because the dependent variable was normally distributed, and the categorical variables obeyed the homogeneity of variance, considering the closeness of the skewness and kurtosis scores, it was chosen the One-Way Anova statistical test. This test explored the impact of 3 different categories of regular practice in levels of mindfulness. Each category (daily, weekly and monthly/yearly), contained 4 different groups (see Table 1).

The daily category (M = 1.78, SD = .82), contained participants on the group with inexistent practice (M = 3.48; SD = .78); with practice that would last from 1 to 30 minutes (M = 3.64; SD = .77); with practice that would last between 30 to 60 minutes (M = 3.56; SD = .87); and, with practice that would last over 60 minutes (M = 3.50; SD = .74). An analysis of variance showed that the daily frequency was not statistically significant in predicting levels of mindfulness measured by the MAAS (F(3, 147) = .456, p = .714).

For the weekly category (M = 1.90, SD = 0.97), there was participants on the group with inexistent practice (M = 3.46, SD = .78); with a regular practice of at least 3 times a week (M = 3.55; SD = .75); with a regular practice between 3 to 5 times a week (M = 3.68; SD = .88); and, regular practice in over 5 times a week (M = 3.66; SD = .80). An analysis of variance showed that the weekly frequency was not statistically significant in predicting levels of mindfulness measured by the MAAS (F(3, 146) = .588, p = .624).

Last, for the monthly/yearly category (n = 155, M = 2.23, SD = 1.23), there was participants on the group with inexistent practice (M = 3.52; SD = .78); a group that have been practicing in less than 6 months (M = 3.38; SD = .88); another group that has been practicing over a year (M =

3.69; SD = .78); and, a group that have been practicing in a couple of years (M = 3.61; SD = .76).

An analysis of variance showed that the monthly/yearly frequency was not statistically significant

in predicting levels of mindfulness measured by the MAAS (F(3, 148) = .72, p = .542).

Hence, the null hypothesis has to be accepted.

3.2.5. Hypothesis 5

The last hypothesis aimed to explore if there was a difference of levels of mindfulness as

a dispositional trait measured by the MAAS scale, between participants with or without previous

acknowledgment of the concept of mindfulness or exposure to its practices. Considering that the

dependent variable was normally distributed (MAAS), the categorical groups were independent,

and there was homogeneity of variance (p = .979), the assumptions to run a parametric test were

met. Hence, it was chosen an Independent-Samples T-Test to analyse the degree of relationship

between levels of mindfulness across different groups with or without acknowledgment to what is

mindfulness. The results indicated that there was not a statistical significant difference in the

relationship between levels of mindfulness and participants with previous exposure (M = 3.55; SD

= .78) , or without exposure to mindfulness concept and its practices (M = 3.58; SD = .77) (t (171)

= -.26, p = .789, CI (95%) = -.273, .207). Hence, the null hypothesis has to be accepted.

4. DISCUSSION

4.1. Research Aims and Hypotheses

This research proposed to analyse the efficacy of a personality tendency, such as a

dispositional facet of mindfulness measured by the MAAS, in the underlying cognitive process of

decision-making through a cognitive behavioural approach. The mentioned cognitive process was

evaluated by the decision outcomes measured by the DOI, in conjunction with the performance obtained in the reasoning ability test assessed by the RAI+. The results did not indicate for any statistical significance among the scores obtained in any of these three variables: MAAS, DOI, and RAI+.

The research Hypothesis 1 revealed a weak linear relationship that could explain the correlation between mindfulness and decision outcomes. Indeed, not having a normally distributed data on the DOI variable did influence in a less robust analysis of the data in general. However, although it is not possible to conclude that individual differences do not correlate with decision-making, the results reveal that dispositional mindfulness is not positively correlated with the outcomes obtained by the participants in this research. For the correlation between the decision outcomes scores and the reasoning performance stated in Hypothesis 2, it also had a weak linear relationship. The results indicated that performance in the relational tasks did not predict decision outcomes. While this could mean that decision outcomes are influenced by another intellectual variable that is not related to the reasoning ability measured by the RAI+, it also means that the RAI+ was not used in its entirety but only the More/Less and Same/Opposite nodal. This finding leaves the opportunity for future research to explore the relationship between the entire RAI+ set of nodal and the DOI.

Nonetheless, it is crucial to note that neither DOI and RAI+ data were normally distributed, and it does not allow to draw persuasive conclusions to either direction. Additionally, when exploring for the relationship among mindfulness, decision outcomes, and reasoning ability in Hypothesis 3, the results also did not reveal a statistical significance in the regression p-value. It was excluded the outliers from the analysis in order to obtain a more robust result. However, the predictability score remained low, which concludes that levels of mindfulness from the sample

population did not predict their decision outcomes even after controlling for the reasoning ability of the participants.

This research also aimed to validate the potential to improve decision-making through mindfulness practice. It was evaluated the different engagement frequencies with regular mindfulness practice (e.g. meditation and physical exercise like yoga), varying from inexistent engagement to a couple of years of practice. The overall idea was to explore the potential to improve decision-making through mindfulness practice, solely if decision outcomes were positively correlated with levels of mindfulness. It was not the case. The term mindfulness used in this study was intended to measure a naturally occurring personality trait (Brown & Ryan, 2003), instead of some attribute acquired or enhanced with regular practice.

The results from the Hypotheses 4 and 5 provide data in the sense that levels of mindfulness measured by the MAAS are not directly influenced by regular practice or acknowledgement of mindfulness. The acceptance of the null hypothesis for both hypotheses essentially suggests two main conclusions. The first is that different frequency with mindfulness practices across different sets of time (daily, weekly, and monthly/yearly), is not associated with the dispositional facet of mindfulness. The second is that exposure to what is mindfulness and what it entails as a practice, do not hold a direct relationship with the scores obtained in the MAAS scale. On the other hand, it does suggest that dispositional mindfulness disregards practice or actual knowledge and exposure to what it represents. Moreover, exposure is a component of mindfulness interventions (Brown et al., 2007), and the absence of significant statistical p-value with the dispositional aspect of mindfulness can suggest that the latest does not play an influential role in the effects of mindfulness practices.

The findings of this research are controversial. From one side, it does relate to previous findings from a study that has not identified a statistical significance between decision outcomes and mindfulness, apart from its non-judgmental facet (Martinovic, 2017). On the other hand, previous findings have detected statistical significance between mindfulness and decision-making (Dane & Brummel, 2014), in particular to vocational choice (Galles et al., 2019), and career decision-making on graduated students (Oertel, 2017). It was also previously detected a correlation between mindfulness and executive functioning directly linked with higher cognitive abilities (Moore & Malinowski, 2009). However, this research has not identified any statistical significance between MAAS and RAI+, when controlling for reasoning performance on Hypothesis 3.

Besides, in opposition to the findings of Hypothesis 4, recent research has observed that people report to experience greater mental health when engaging with mindfulness practices in comparison with non-practitioners (Yela et al., 2020). Nevertheless, the mentioned hypotheses did not find a strong relationship among different categories of regular practice and dispositional mindfulness, which entails positive mental health (Brown et al., 2007). It concludes that the exploratory analysis of mindfulness as a dispositional trait does not seem to correlate with the objective measurements used in this study, either it being the DOI or the demographic questions regarding actual practice and exposure to mindfulness.

4.2. Strengths and Limitations of the Study

A strength of the current study is the power of the sample size, which provided a good opportunity to draw some interesting conclusions from the collected data. Another strength is the fact that it used a psychometric test to empirically measure mindfulness in an objective instead of a subjective manner. Moreover, such strength is linked to the gap mentioned by the meta-analysis

study from Liu et al., where it asserts for the need to scientifically undercover mindfulness as an empirical construct (2018). Additionally, it was possible to scientifically evaluate if exposure and ordinary practice with mindfulness could relate to the actual dispositional aspect of mindfulness, understanding it as a naturally occurring trait (Brown et al., 2007). Hence, it provides some data that helps fulfil some of the gaps present in the cognitive behavioural studies.

Notwithstanding, it is vital to mention that this quantitative research uses self-report measures, which brings advantages and disadvantages by itself. An advantage is that it was cost-effective. Another advantage is that the participants could express their perceptions of their experiences while doing the DOI questionnaire, and reflect on their life while doing the MAAS scale. One of the primary disadvantages, though, is the assumption that the responses are valid and accurate to the participant's reality. Mainly when there could be the presence of reduced motivation or social desirability. This fact is directly linked to one of the limitations of this study related to the access to only what the participants believe to be experiencing but not the actual content of their subjective experience.

Another limitation is about the demographic questions regarding the frequency in practising mindfulness. The options were not based on any previous research that ascertained a specific amount of time that would determine the flourishment of mindfulness. It was at the discretion of the Researcher to determine the frequency of regular mindfulness practice into three different categories, divided into four different groups. Such a lack of empirical data to back up the demographic questions is a weakness when analysing the results of Hypothesis 4. Additionally, because the collected data was not normally distributed for the DOI and the RAI+ scales, it inhibited the opportunity to derive reliable conclusions from the results. Lastly, the DOI scale needed a script to calculate its score. Although it followed the same rationale as in previous studies,

the current one could only verify reliability for 23-items when running the reliability test on SPSS. Therefore, those would be the limitations of the current study.

4.3. Future Research

Future studies, if willing to preserve the same variables as used in this study, need to explore other measurements that do not solely rely on self-report questionnaires or psychometric tests. Although MAAS, DOI, and RAI+ scales were selected carefully, other scales might yield other results and uncover different aspects of the constructs of mindfulness and decision-making. A suggestion would be an experimental design to explore the correlation of mindfulness and decision-making in a controlled environment, so to avoid covariance and derive more robust conclusions from their relationship. Another suggestion would be to explore the relationship between decision outcomes measured by the DOI, and the entire RAI+ set of nodal that includes not only distinction and opposition but also coordination, comparison, temporality, analogy, hierarchy, and deixis (Colbert et al., 2019). It would help to detect any correlation between reasoning performance assessed by the relational ability test and decision outcomes.

4.4. Conclusion

Inspired by Jack Demick words when referring that future research in mindfulness was warranted if analysing the construct of mindfulness in given contexts (2000), this research proposed an exploratory analysis of mindfulness in decision-making through a cognitive behavioural approach. Cognitive science has been advocating for the importance to analyse decision outcome patterns in conjunction to personality differences, in order to overcome poor decision-making competency (Raglan & Schulkin, 2014; Dewberry et al., 2013). The challenge of

this research was to link a subjective experience, still not yet fully recognised as a personality trait (Brown & Ryan, 2003), and analyse how much of such individual difference could be present in decision outcomes (Parker et al., 2018). Despite not being able to derive a statistically significant p-value with the data collected in this research, the question regarding if personality differences in respect to mindfulness could improve flawed decision-making, is still unanswered. Future research is still encouraged to analyse the implications of mindfulness in any real-life context.

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APPENDICES

Appendix A: Survey Cover Letter

How Good is Your Decision Making?

Dear Potential Participant,

My name is Ingrid de Moraes and I am conducting the current research as part of my studies in the Department of Psychology at the Dublin Business School (DBS), which will be ultimately submitted for examination. It aims to explore the impact of personality in the underlying cognitive process of decision-making.

You are invited to partake this study that involves completing and submitting the anonymous survey available in the next pages. It consists of answering questions in accordance with yourself and shall take up to 20 minutes from your time. While the posed questions have been widely used in previous researches, some of them might cause minor negative feelings. If any of the questions do raise difficult feelings for you, contact information with support services is included at the end of the survey.

Participation is completely voluntary and so you are not obliged to take part.

Participation is anonymous and confidential. Thus, responses cannot be attributed to any participant specifically. For this reason, it will not be possible to withdraw from participation once the survey has been submitted.

Data will be stored on a password protected computer and destroyed after one year of collection.

It is important that you understand that by completing and submitting the questionnaire, you are consenting to participate in this study.

Should you require any further information about the research, please contact:

. Researcher: Ingrid de Moraes at ▮▮▮▮▮▮▮@mydbs.ie

. Supervisor: Dr Dylan Colbert at ▮▮▮▮▮▮▮@dbs.ie

Thank you in advance for taking the time to complete this survey in the name of science!

Are you over 18 years old? *Required*
Tick the box.
Yes.

Do you consent to voluntarily participate in this research? *Required*
Tick the box.
Yes.

Gentle reminder after consent:

Hey! Just before we continue... Thank you for consenting on participating in this research!

As a friendly reminder, please make sure to:

1. Be in a tranquil place with as less distraction as possible surrounding you;

2. Have time and disposition as some of the following questions will require you to look inside yourself and to test your thought process;

3. And, enjoy!

This is an attempt to analyse yourself through the lens of a scientific method. Your input will not only help me as a Researcher but also the scientific community looking into unravelling human behaviour.

Keep in mind that your participation has the potential to impact how we make decisions!

Kindest Regards,
Ingrid de Moraes

Appendix B: Demographic Questionnaire

D1. What is your gender?
Choose one of the options
1. Female
2. Male
3. Other/Prefer not to say.

D2. What is your age? Please state it below.
Short answer numerical text.

D3. Have you heard about Mindfulness and undergone any training related to such practice (e.g. doing exercises through meditation app, training course, etc.)?
Choose one of the options.
Yes.
No.

D4. Do you practice Mindfulness or any other activity that makes you feel more present at a given moment?
Choose one of the options below.
Yes.
No.

D5. If you have replied yes on the previous question, what type of mindfulness practice do you regularly engage with?
Choose one or more than one options below.
Physical activity, eg. yoga, pilates, workout, sports, cycling, etc.
Meditation/Breathing exercises.
Play a musical instrument.
Other.

D6. How many times do you engage in such activity(ies) in a weekly basis?
Choose one of the options below.
1. None.
2. Less than 3 times a week.
3. Between 3 to 5 times a week.
4. Over 5 times a week.

D7. How long such activity(ies) last(s) in minutes in a daily basis?
Choose one of the options below.

1. None.
2. Between 1 to 30 minutes.
3. Between 30 to 60 minutes.
4. Over 60 minutes.

D8. For how long have you been practising any Mindfulness activity in your life?
Choose one of the options below.
1. None.
2. Less than 6 months.
3. Over a year.
4. Couple of years now.

Appendix C: Mindful Attention Awareness Scale – MAAS

Dispositional trait

Instructions:

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.

For reference:

1= Almost Always

2= Very Frequently

3= Somewhat Frequently

4= Somewhat Infrequently

5= Very Infrequently

6= Almost Never

1.   I could be experiencing some emotion and not be conscious of it until sometime later. 1 2 3 4 5 6

2.   I break or spill things because of carelessness, not paying attention, or thinking of something else. 1 2 3 4 5 6

3.   I find it difficult to stay focused on what's happening in the present. 1 2 3 4 5 6

4.   I tend to walk quickly to get where I'm going without paying attention to what I experience along the way. 1 2 3 4 5 6

5.   I tend not to notice feelings of physical tension or discomfort until they really grab my attention. 1 2 3 4 5 6

6.   I forget a person's name almost as soon as I've been told it for the first time. 1 2 3 4 5 6

7.   It seems I am "running on automatic," without much awareness of what I'm doing. 1 2 3 4 5 6

8.   I rush through activities without being really attentive to them. 1 2 3 4 5 6

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. 1 2 3 4 5 6

10.   I do jobs or tasks automatically, without being aware of what I'm doing. 1 2 3 4 5 6

11.   I find myself listening to someone with one ear, doing something else at the same time. 1 2 3 4 5 6

12.   I drive places on 'automatic pilot' and then wonder why I went there. 1 2 3 4 5 6

13.   I find myself preoccupied with the future or the past. 1 2 3 4 5 6

14.   I find myself doing things without paying attention. 1 2 3 4 5 6

15.   I snack without being aware that I'm eating. 1 2 3 4 5 6

Appendix D: Decision Outcome Inventory – DOI

Life Events

Instructions:

The following questions ask whether different events have happened to you in the last 10 years. Please indicate "yes" or "no" for each:

1	a	__Yes __No	Rented a movie
	b	__Yes __No	Returned a movie you rented without having watched it at all
2	a	__Yes __No	Bought new clothes or shoes
	b	__Yes __No	Bought new clothes or shoes you never wore
3	a	__Yes __No	Gone shopping for food or groceries
	b	__Yes __No	Threw out food or groceries you had bought, because they went bad
4	a	__Yes __No	Done your own laundry
	b	__Yes __No	Ruined your clothes because you didn't follow the laundry instructions on the label
5	a	__Yes __No	Been enrolled in any kind of school
	b	__Yes __No	Been suspended from school for at least one day for any reason
6	a	__Yes __No	Had any kind of job
	b	__Yes __No	Quit a job after a week
7	a	__Yes __No	Had a driver's license
	b	__Yes __No	Had your driver's license taken away from you by the police
8	a	__Yes __No	Driven a car
	b	__Yes __No	Been accused of causing a car accident while driving
	c	__Yes __No	Gotten more than 5 parking tickets
	d	__Yes __No	Gotten more than 5 speeding tickets
	e	__Yes __No	Gotten lost or gone the wrong way for more than 10 minutes while driving
	f	__Yes __No	Locked your keys in the car
9	a	__Yes __No	Bought any kind of car
	b	__Yes __No	Had to spend at least 500 euro to fix a car you had owned for less than half a year
10	a	__Yes __No	Taken a trip by airplane
	b	__Yes __No	Missed a flight
11	a	__Yes __No	Taken the train or the bus
	b	__Yes __No	Taken the wrong train or bus
12	a	__Yes __No	Had any form of ID (driver's license, passport, birth certificate)
	b	__Yes __No	Had your ID replaced because you lost it
13	a	__Yes __No	Lived in a rented apartment or other rental property
	b	__Yes __No	Been kicked out of an apartment or rental property before the lease ran out
14	a	__Yes __No	Carried a key to your home
	b	__Yes __No	Had the key to your home replaced because you lost it
	c	__Yes __No	Locked yourself out of your home

15	a	__Yes __No	Been responsible for electricity, cable, gas or water payments
	b	__Yes __No	Had your electricity, cable, gas or water shut off because you didn't pay on time
16	a	__Yes __No	Been responsible for a mortgage or loan
	b	__Yes __No	Foreclosed a mortgage or loan
17	a	__Yes __No	Been responsible for rent or mortgage payments
	b	__Yes __No	Paid a rent or mortgage payment at least 2 weeks too late
18	a	__Yes __No	Used checks
	b	__Yes __No	Had a check bounce
19	a	__Yes __No	Had a credit card
	b	__Yes __No	Had more than 5,000 euro of cash in credit card debt
20	a	__Yes __No	Invested in the stock market
	b	__Yes __No	Lost more than 1,000 euro on a stock-market investment
21	a	__Yes __No	Been to a bar, restaurant, or hotel
	b	__Yes __No	Been kicked out of a bar, restaurant, or hotel by someone who works there
22	a	__Yes __No	Loaned more than 50 euro to someone
	b	__Yes __No	Loaned more than 50 euro to someone and never got it back
23	a	__Yes __No	Had a romantic relationship that lasted for at least 1 year
	b	__Yes __No	Cheated on your romantic partner of 1 year by having sex with someone else
24	a	__Yes __No	Been married
	b	__Yes __No	Been divorced
25	a	__Yes __No	Had sex
	b	__Yes __No	Been diagnosed with an STD
	c	__Yes __No	Had an unplanned pregnancy (or got someone pregnant, unplanned)
26	a	__Yes __No	Had sex with a condom
	b	__Yes __No	Had a condom break, tear, or slip off
27	a	__Yes __No	Had an alcoholic drink
	b	__Yes __No	Consumed so much alcohol you vomited
	c	__Yes __No	Received a fine for drunk driving
28	a	__Yes __No	Been out in the sun
	b	__Yes __No	Got blisters from sun burn
29	a	__Yes __No	Been in a jail cell overnight for any reason
30	a	__Yes __No	Been in a public fight or screaming argument
31	a	__Yes __No	Declared bankruptcy
32	a	__Yes __No	Forgotten a birthday of someone close to you and did not realize until the next day or later.
33	a	__Yes __No	Been diagnosed with type 2 diabetes
34	a	__Yes __No	Broke a bone because you fell, slipped, or misstepped

Appendix E: Relational Ability Index – RAI+

Cognitive Ability Part 1/2

Instructions:

In the following task, you will be presented with statements which outline the relationship between nonsense words.

For example:

A is the same as B. You will then be asked a question based on this statement, for example: is B opposite to A? In this case, the answer is no, as A is the same as B.

- Gentle reminder -
Strive to spend less than 30 seconds on each question, please. You won't need longer than that.

Good luck!

Q.1.1
LUX is the same as TIV
Is LUX the opposite to TIV?
Choose one of the options below.
Yes.
No.
Answer: No.

Q.1.2
GEQ is the same as HAP
HAP is the same as JEY
Is GEQ the same as JEY?
Choose one of the options below.
Yes.
No.
Answer: Yes.

Q.1.3.
HIW is the same as YUH
YUH is the same as WOC
Is HIW the same as WOC?
Choose one of the options below.
Yes.
No.
Answer: Yes.

Q.1.4.
BEM is opposite to CEN
CEN is opposite to TIQ
Is TIQ the same as CEN?
Choose one of the options below.
Yes.
No.
Answer: No.

Q.1.5.
KUV is the same as YID
YID is the same as TIK
Is TIK the same as KUV?
Choose one of the options below.
Yes.
No.
Answer: Yes.

Q.1.6.
VUZ is the same as VIP
LOZ is the same as VUZ
Is VIP opposite to LOZ?
Choose one of the options below.
Yes.
No.
Answer: No.

Q.1.7.
MOV is opposite to XIZ
XIZ is opposite to NAV
Is NAV the same as MOV?
Choose one of the options below.
Yes.
No.
Answer: Yes.

Q.1.8.
FEY is opposite to XAH
QOR is opposite to FEY
Is FEY the same as QOR?

Answer: No.

Q.1.9.
QIG is opposite to XOQ
DIV is opposite to QIG
Is XOQ the same as QIG?
Choose one of the options below.
Yes.
No.
Answer: No.

Q.1.10.
HIG is opposite to LEZ
LEZ is the same as CEL
Is CEL opposite to HIG?
Choose one of the options below.
Yes.
No.
Answer: Yes.

Q.1.11.
WAZ is opposite to JOP
WEL is the same as WAZ
Is WAZ the opposite to WEL?
Choose one of the options below.
Yes.
No.
Answer: No.

Q.1.12.
VOK is the same as GOX
GOX is the same as PIV
PIV is the same as KUY
Is KUY opposite to GOX?
Choose one of the options below.
Yes.
No.
Answer: No.

Q.1.13.
RUP is opposite to FUZ

FUZ is opposite to YEZ
YEZ is opposite to BOM
Is BOM opposite to RUP?
Choose one of the options below.
Yes.
No.
Answer: Yes.

Q.1.14.
NIC is the same as PUR
PUR is the opposite to DAG
DAG is the opposite to PAG
Is PAG the same as NIC?
Choose one of the options below.
Yes.
No.
Answer: Yes.

Q.1.15.
FOC is the opposite to WIS
WIS is the opposite to NIL
NIL is the same as VAQ
Is WIS the opposite to NIL?
Choose one of the options below.
Yes.
No.
Answer: Yes.

Cognitive Ability Part 2/2

Q.2.1.
FAD is more than KAD
Is KAD more than FAD?
Choose one of the options below.
Yes.
No.
Answer: No.

Q.2.2.

GAP is more than DUX
DUX is more than HAJ
Is GAP more than DUX?
Choose one of the options below.
Yes.
No.
Answer: Yes.

Q.2.3.
WIN is more than QEN
QEN is more than YEG
Is QEN less than YEG?
Choose one of the options below.
Yes.
No.
Answer: No.

Q.2.4.
LEN is less than QAZ
QAZ is less than VAF
Is LEN less than VAF?
Choose one of the options below.
Yes.
No.
Answer: Yes.

Q.2.5.
RIH is less than CAM
CAM is less than BEV
Is CAM more than BEV?
Choose one of the options below.
Yes.
No.
Answer: No.

Q.2.6.
FOM is more than RIV
WUZ is more than FOM
Is FOM more than WUZ?
Choose one of the options below.
Yes.
No.

Answer: No.

Q.2.7.
WIY is more than BEL
WOZ is more than WIY
Is WOZ more than BEL?
Choose one of the options below.
Yes.
No.
Answer: Yes.

Q.2.8.
BOK is less than XEL
YIB is less than BOK
Is YIB more than BOK?
Choose one of the options below.
Yes.
No.
Answer: Yes.

Q.2.9.
WAP is more than SAK
SAK is more than DER
DER is more than XIJ
Is WAP more than DER?
Choose one of the options below.
Yes.
No.
Answer: Yes.

Q.2.10.
TEG is less than FIJ
FIJ is less than YOG
YOG is less than XOX
Is YOG less than FIJ?
Choose one of the options below.
Yes.
No.
Answer: No.

Q.2.11. *[Removed]*

QON is more than POY
PEH more than POY
DEG more than PEH
Is DEG less than QON?
Choose one of the options below.
Yes.
No.
Answer: No.

Q.2.12.
GIK is more than QAN
HAW is more than GIK
MUH is more than HAW
Is MUH less than QAN?
Choose one of the options below.
Yes.
No.
Answer: Yes.

Q.2.13.
RAF is less than HUQ
VAV is less than RAF
YEK is less than VAV
Is YEK less than VAV?
Choose one of the options below.
Yes.
No.
Answer: Yes.

Appendix F: Final Page of the Survey

Thank you for your answers!

Debrief:

To prevent bias on the responses, it was omitted the name of the psychometrics questionnaires used in this survey. The actual measurements cover: (a) decision outcomes measured by the Decision Outcome Inventory (DOI); (b) mindfulness as a dispositional trait measured by the Mindfulness, Attention, and Awareness Scale (MAAS); and, (c) relational ability measured by the Relational Abilities Index (RAI).

If you feel that answering this survey has raised some issues for you, please consider contacting some of the support services listed below - or speak to a friend, family member or professional such as your GP:

. Aware:

The Aware Support Line on: 1800 80 48 48

Available Monday – Sunday, 10am to 10pm.

Email for support at: supportmail@aware.ie

. Samaritans

Call on: (01) 671 0071 or 116 123

Available 24hrs a day, 365 days a year. Free to call.

Email: jo@samaritans.org

You can contact me or my Supervisor with questions or comments relating to the survey at 10361809@mydbs.ie or dylan.colbert@dbs.ie, respectively.

Thank you once again for your participation and don't forget to hit "SUBMIT" in order to record your answers!

Kind regards,

Ingrid de Moraes