

The Relative Stability of the Dark Triad of Personality

Audrey Renaud-da Costa, B.A.

Thesis submitted to the University of Ottawa
in partial Fulfillment of the requirements for the
PhD with Specialization in Clinical Psychology

School of Psychology
Faculty of Social Sciences
University of Ottawa

Supervisor
Dave Miranda, Ph.D.

© Audrey Renaud-da Costa, Ottawa, Canada, 2025

General Abstract

The Dark Triad (DT) is a controversial personality profile that includes subclinical traits of psychopathy, Machiavellianism, and narcissism. In recent years, the DT has become a significant concern for social scientists, as its traits are associated with disagreeableness and a socially competitive and dominant interpersonal style. The DT is potentially problematic considering that psychopathy, Machiavellianism, and narcissism are *traits*, and as such, are supposedly generally stable (i.e., consistent) across time and situations. Nonetheless, personality can change to adapt to, and manifest in, specific situations or moments, known as personality states. Thus, personality is at once, stable *and* changing over time and in different situations, which is referred to as the *relative stability* of personality. This relative stability has already been demonstrated with normative traits from the Big Five or Five Factor Model of personality. However, it has rarely been studied with the DT of personality. My doctoral thesis addresses this research caveat by first exploring patterns of stability and change of the DT traits through short time-period (Article 1) and then testing it across situations (Article 2). The results from this doctoral thesis showed greater DT state stability over a ten-day period due to personality traits, despite some state variability due to changes in situations. This was comparable to patterns of relative stability of Big Five Agreeableness. Furthermore, results demonstrated that brief engagement in fictitious social situations did not prompt significant differences in DT states, suggesting that more prolonged and in-depth exposure might be necessary to observe more significant changes in DT states. Overall, these results are aligned with trait theories of personality that consider traits as stable personality attributes.

Keywords: Dark Triad, personality traits vs. states, experimental design, longitudinal design, narcissism, Machiavellianism, psychopathy, relative stability, person-situation debate.

Acknowledgements

There are so many important people who have helped me along this — long, challenging, rewarding — path! Thank you to my supervisor, Dr. Dave Miranda, for your guidance, support, and wisdom these past ten (!) years. Thank you to my evaluation committee members, Dr. Marie-France Lafontaine, Dr. Martin Lalumière and Dr. Stuart Hammond, for your astute comments and encouragements. Thank you as well to Dr. Dominick Gamache, my external evaluator for your contributions in evaluating my project. Thank you to Dr. Julien Morizot for your help, generosity, reassurance, and knowledge. This doctoral project would not have come to fruition without you all.

To my dear loved ones who have been with me since the beginning of this journey, to those who embarked somewhere along the way, and to those who only stayed awhile: I owe you **so much**. To my forever girlfriends — Andrée-Anne, Catherine, Laurence, Maude, Natasha, Renée, Sandrine, and Teri Essa — thank you for cheering me up, making me laugh, and making life exciting. To my Hurricane Honeys, the deep bonds we formed has felt like a safe harbour. To Theo, your practical help, and motivational encouragements have helped me expedite this completion. Life is sunny and breezy with you. Finally, a special thank you to my fellow friends and colleagues who, like me, made the crazy decision to undertake a PhD in psychology. To Nicolas, Nicole, Camille, Severina, Muna, Amélie, Nicole, Stephanie(s), Enya, Najat and my friends and colleagues at work. Your compassion, understanding, encouragements, and guidance has felt like a warm hug at the end of a long day.

To my parents, Marie-Claude and Daniel, who were potentially more excited than me to see this through, thank you for your patience. Your support and safety during rockier times helped me persevere. Thank you for instilling in me the belief that I can do whatever I set myself to achieve. To my sister, Brianne, thank you for cheering me on all the way to the finish line. You inspire me to do good every day. To the rest of my (big, loud, loving!) family, the time we spend together brings me solace. I cherish it dearly.

Lastly, to myself — you did it girlie! I'm so proud! You deserve all the good that will come from it. Now go and enjoy the little things in life.

With gratitude,

Audrey

Statement of Co-Authorship

The articles in my doctoral thesis were prepared collaboratively with my thesis supervisor, Dr. Dave Miranda.

As the main researcher in all my research studies, I was responsible for developing the literature review, establishing the research questions and consequent study designs, managing the Research Ethics Board approval process, preparing and overseeing data collection, completing the analyses and writing each manuscript.

My thesis supervisor, Dr. Dave Miranda supported me through offering suggested readings, refining my research questions and study designs, navigating the ethics process, offering insightful knowledge on appropriate analyses for my research questions, reviewing the details of my analyses and running the final analyses jointly, as well as giving constructive feedback for the writing of my manuscripts.

The analyses of my second article were completed in collaboration with Dr. Julien Morizot, from the Université de Montréal. Dr. Morizot provided his analytical expertise in Latent State-Trait Models for our Trait-State-Occasion analyses, offered support in solving methodological and analytical issues, and provided insightful directions for consideration and interpretation of results.

Table of Contents

General Abstract	ii
Acknowledgements	iii
Statement of Co-Authorship	iv
List of Tables	xi
List of Figures	xii
List of Appendices	xiii
CHAPTER 1: General Introduction	1
Overview of this Thesis	2
Defining Personality: Studying the Personality Process	3
Traits	4
States	6
The Relative Stability of Personality Throughout the Life Span	7
Measurement Considerations	7
Personality Etiology and Development in Childhood	8
Relative Stability from Adolescence to Adulthood	9
Relative Stability of Normative Personality Traits in Emerging Adulthood	10
The Person-Situation Debate	11
Dark Triad: The Concept and its Correlates	12
Psychopathy	12
Machiavellianism	12
Narcissism	13
Mapping the Dark Triad: Interrelations and Structural Debates Within the Dark Triad ...	13
The Dark Triad on the Spectrum of Personality Disorders	15
Dark Triad Personality: Etiology and Development	16
Relative Stability of Dark Triad Traits Throughout the Life Span	18
Dark Triad Traits and Emerging Adulthood	20
Gender Differences in the Dark Triad	20
Social Competition, Collaboration, Dominance, and the Dark Triad	22

The Present Doctoral Thesis	24
CHAPTER 2: Assessing the Relative Stability of the Dark Triad Through Time	27
Big Five and the Five Factor Models	29
Relative Stability of Normative Personality Throughout the Life Span	29
Relative Stability of Normative Personality Throughout Shorter Timespan	30
The Dark Triad of Personality	30
The Dark Triad Personality and Social Attitudes	31
The Relative Stability of Dark Triads Across The Lifespan	32
The Relative Stability of Dark Triads Throughout Shorter Timespan	32
The Present Research: The Relative Stability of Dark Triad Traits Over Time	33
Trait-State-Occasion Modeling: A Conceptual Overview	34
Hypotheses	35
STUDY 1	37
Method	37
Sample Description	37
Measures	38
Demographics	38
Big Five Traits	38
Dark Triad Traits	39
Social States of Mind	40
Procedures	40
Plan of Analysis	42
Preliminary Analysis: Longitudinal Measurement Invariance	42
Main Analysis: Trait-State Occasional Model	43
Results	45
Longitudinal Measurement Models	45
Agreeableness	45
Machiavellianism	46
Narcissism	46
Psychopathy	46
Trait-State-Occasion Analyses	46
Agreeableness	48
Machiavellianism	48

Narcissism	49
Psychopathy	50
STUDY 2	51
Method	51
Sample Description	51
Measures	51
Social Dominance Orientation	52
Procedure	52
Plan of Analysis	53
Results	53
Longitudinal Measurement Models	53
Agreeableness	53
Machiavellianism	54
Narcissism	54
Psychopathy	54
Trait-State-Occasion Analyses	54
Agreeableness	56
Machiavellianism	56
Narcissism	57
Psychopathy	58
General Discussion	59
Measurement Invariance: Implications for our Findings	59
Person-Situation Debate: The Importance of Personality Traits	61
The DT and Normative Personality: More Similar than Dissimilar	63
Social Attitudes, Gender, and the DT: Chicken or the Egg?	63
Limitations and Future Direction	66
Conclusion	68
CHAPTER 3: Assessing the Relative Stability of DT Traits Across Situations	69
The Dark Triad of Personality	71
Social Competition, Collaboration, and The Dark Triad	72
The Relative Stability of Traits in Social Situations	72
Social Situations and Personality Change	73
The Relative Stability of Dark Triad Traits in Situations	75

Social Games as a Proxy for Social Situations	76
The Present Research: The Relative Stability of Dark Triad Traits Across Situations	78
Hypotheses	79
Method	79
Sample Description	79
Measures	80
Demographics	80
Dark Triad	80
Procedure	81
Analysis Strategy	83
Missing Values	84
Power Calculation	84
Results	85
Discussion	85
Limitations and Future Direction	87
Conclusion	88
CHAPTER 4: General Discussion	89
Summary and Contributions of the Articles	90
The Relative Stability of Dark Triad Traits Over Time	90
Summary of Article	90
Key Findings	90
Contributions	92
Conclusion	94
The Relative Stability of Dark Triad Traits Across Situations	94
Summary of Article	94
Key Findings	94
Contributions	95
Conclusion	96
Research and Theoretical Implications	96
Relationships	97
Detection of Dark Triad Personality	97
The Dark Triad and Psychopathology	98

Personality Change: Can it Happen?	100
Volitional Personality Change	100
The Person-Situation Debate	103
Limitations and Future Research	104
The Challenges of Conducting Complex Designs Online	104
Sample	106
The Contributions of Inter-Individual Differences to our Understanding of Personality	107
Conclusion	108
References	110
Appendix A	150
Study Description	150
Online Consent Forms	152
Reminder Email	159
Appendix B	160
Appendix C	161
Appendix D	167
Appendix E	169
Appendix F	170
Study Description	170
Online Consent Forms	172
Email Reminder	179
Appendix G	180
Appendix H	186
Appendix I	187
Experimental Scripts	187
Hypercompetitive Condition Script	187
Collaborative Condition Script	187
Control Condition Script	188
Distraction Task	188

Appendix J	192
Study Description	192
Consent Forms	194
Debrief Forms	200
Demographic Questionnaire	204
Appendix K	205
Appendix L	206

List of Tables

CHAPTER 1: General Introduction

CHAPTER 2: Assessing the Relative Stability of the Dark Triad Through Time

Table 1.	Longitudinal Measurement Invariance Models	161
Table 2.	Omega Values of Internal Consistency	162
Table 3.	Descriptive Statistics	163
Table 4.	Standardized Factor Loadings and Regression Coefficients for Unconditional Models	164
Table 5.	Trait-State-Occasion Fit Indices for Unconditional and Conditional Models	165
Table 6.	Partition of Variance for Baseline Unconditional TSO Models	165
Table 7.	Standardized Regression Coefficients for Conditional TSO Models	166
Table 8.	Longitudinal Measurement Invariance Models	180
Table 9.	Omega Values of Internal Consistency	181
Table 10.	Descriptive Statistics	182
Table 11.	Standardized Factor Loadings and Regression Coefficients for Unconditional Models	183
Table 12.	Trait-State-Occasion Fit Indices for Unconditional and Conditional Models	184
Table 13.	Partition of Variance for Baseline Unconditional TSO Models	184
Table 14.	Standardized Regression Coefficients for Conditional TSO Models	185

CHAPTER 3: Assessing the Relative Stability of the Dark Triad Traits Across Situations

Table 1.	Descriptive Statistics	206
Table 2.	Analysis of Covariance — Machiavellianism	206
Table 3.	Analysis of Covariance — Narcissism	207
Table 4.	Analysis of Covariance — Psychopathy	207

CHAPTER 4: General Discussion

List of Figures

CHAPTER 1: General Introduction

CHAPTER 2: Assessing the Relative Stability of the Dark Triad Through Time

Figure 1. Theoretical Trait-State-Occasion Model (Simplified Example)..... 167

Figure 2. Applied TSO Model (Simplified Example) 168

Figure 3. Partition of Variance for Unconditional Baseline Models..... 169

Figure 4. Partition of Variance for Unconditional Baseline Models..... 186

CHAPTER 3: Assessing the Relative Stability of the Dark Triad Traits Across Situations

CHAPTER 4: General Discussion

List of Appendices

CHAPTER 1: General Introduction

CHAPTER 2: Assessing the Relative Stability of the Dark Triad Through Time

Appendix A. Study Materials (Study 1)	150
Appendix B. Demographic Questionnaire (Study 1 and 2)	160
Appendix C. Tables (Study 1)	161
Appendix D. Figures of Trait-State-Occasion Models (Study 1 and 2)	167
Appendix E. Bar Graph of Partition of Variance (Study 1)	169
Appendix F. Study Materials (Study 2)	170
Appendix G. Tables (Study 2)	180
Appendix H. Bar Graph of Partition of Variance (Study 2)	186

CHAPTER 3: Assessing the Relative Stability of the Dark Triad Traits Across Situations

Appendix I. Experimental Tasks Materials	187
Appendix J. Study Material	192
Appendix K. G*Power3.1 Analysis for 3x2 ANCOVA	205
Appendix L. Tables	206

CHAPTER 4: General Discussion

CHAPTER 1: General Introduction

Successful social interactions often rely on individuals' ability to understand others through the prediction of their thinking, feeling, and behaving, which when they become stable patterns, are referred to as personality traits (John et al., 2008). More recently, a new profile of personality traits has emerged in the literature, namely, the Dark Triad of personality (DT; Paulhus & Williams, 2002). The DT is a profile of non-pathological yet abrasive personality traits that share the commonality of disagreeableness (Muris et al., 2017; Paulhus & Williams, 2002; Stead & Fekken, 2014) and dishonesty (Lee & Ashton, 2005; Lee et al., 2013; Muris et al., 2017) through higher levels of Machiavellianism, subclinical psychopathy, and subclinical narcissism. In their seminal work on the DT traits, Paulhus and Williams (2002) explained that "to varying degrees, all three entail a socially malevolent character with behaviour tendencies toward self-promotion, emotional coldness, duplicity, and aggressiveness" (p. 557). Hence, the DT is particularly concerning because personality traits are generally known to be stable across time (McCrae & Costa, 1994), situations (R. A. Sherman et al., 2010) and throughout the lifespan (Roberts et al., 2006). Thus, the societal concern is that people high on the DT will tend to chronically repeat their malevolent actions through time and across situations, and thus throughout their lives, with most people. However, what the literature on the DT often underestimates is that personality traits are at once, stable and changing across time and situations, and this is referred to as the *relative stability* of traits. The overarching research question of my doctoral thesis is as follows: What are the patterns of relative stability of the DT traits over time and across situations? This relative stability of traits has already been demonstrated with normative traits from the Big Five or Five Factor Model of personality (extraversion, agreeableness, conscientiousness, neuroticism and openness) over shorter periods like days (Fleeson, 2001), as well as longer periods like years (Roberts et al., 2006). Yet, the relative stability of DT traits has been largely overlooked, despite over 20 years of research (Williams et al., 2022). My doctoral thesis addresses this research caveat by investigating how the DT traits remain stable or change in emerging adulthood over short periods

of time and across different situations. As such, my thesis contributes to foundational knowledge in personality, by applying longitudinal and experimental designs to a personality profile neglected by such methodology, up until now.

Overview of this Thesis

We explored the research question through two original articles, each targeting one aspect of relative stability, namely longitudinal and situational relative stability. The first article focuses on investigating the relative stability of the DT traits in everyday life through time to describe the patterns of stability and change in DT over a ten-day period. We conducted preliminary longitudinal measurement invariance testing to ensure that our latent variables of interest were measured consistently. In light of measurement invariance problems, adjustments were made to render our main analyses feasible. Then, to examine the relative stability of DT across a short period, we applied the robust Trait-State-Occasion (TSO) model, which is rooted in Latent-Trait-State (LST) theory and based on structural equation modelling (SEM). SEM examines the relationships between latent independent and dependent variables. The TSO model examines the rank order of a personality construct over time and partitions the sources of variance of state personality between that explained by a stable latent trait versus that explained by changes in situations. As such, the TSO model allows quantifying the extent to which individuals in a group remain stable versus variable in their personality over a given period. The TSO model was tested on each DT trait separately and on Big Five agreeableness. Secondary analyses focused on observational comparisons between the relative stability of DT traits and their Big Five antithesis, agreeableness, over the span of days. Secondary analyses also examined how gender and social attitudes contribute to changes in DT states through multiple linear regressions. To achieve this, we conducted a ten-day short-term longitudinal design. Acknowledging the significance of replicating results to ensure the validity of findings, the TSO models were tested in two independent studies on independent samples of emerging adults ($n = 196$ and $n = 107$). An incremental adjustment to the examined variables was made from Study 1 to Study 2 to broaden the potential predictors of daily state personality. Specifically, in Study 1, the tested social attitude

predictors of daily DT states were competitiveness and collaborativeness. In Study 2, another social attitude, namely social dominance orientation, was added as a potential predictor.

The second article investigates the relative stability of the DT traits across situations, to test whether exposure to certain social situations can explain differences in DT states. To this aim, we tested an experimental design using three separate 3x2 Analyses of Covariance (ANCOVA), one per DT trait. ANCOVAs determine if there are significant differences between group means while accounting for the influence of other variables that might impact the dependent variable, which allows us to truly isolate the effect of the independent variable. In our study, emerging adult participants ($n = 276$) were randomly assigned to one of three experimental conditions where they participated in an online activity. The experimental conditions consisted in: (a) a competitive, (b) collaborative, or (c) neutral (i.e., control) individual activity where they had to create slogans that aligned with these concepts. Participants reported their DT states immediately before and after being immersed in the experimental conditions. Gender and baseline DT traits were considered as covariates. Post-test DT states were the dependent variables.

Across both articles, the concepts of relative stability, trait versus state personality, and person-situation debate will be discussed. Although my thesis focuses on the DT of personality, it is important to understand these foundational concepts of personality psychology. Consequently, I will begin this introduction by presenting these core concepts in personality research as we understand them in normative personality models. I will then continue with an in-depth review of the DT of personality and its correlates, which will be important to explain my research questions and methodological designs. Afterwards, I will proceed with each study, presenting in detail the specific pertinent concepts at play, method, results, and discussion. I will conclude with a comprehensive discussion that will highlight empirical and theoretical contributions, as well as underscore limitations, and directions for future research endeavours.

Defining Personality: Studying the Personality Process

The desire to define the characteristics of what makes someone a *coherent* someone, has been a longstanding endeavour of personality psychology. But what *is* personality? Allport

(1937) is often credited with founding the field through his definition of personality as a “dynamic organization within the individual of those psychophysical systems that determine his unique adjustments to the environment” (p. 48). In this definition, Allport highlighted both the uniqueness of the individual — what distinguishes them from others — and the importance of the environments in which they exist. Today, researchers generally agree that personality refers to individual differences in enduring and distinctive patterns of thinking, feeling, and behaving (APA, 2018; Cervone & Pervin, 2013).

Traits

There are probably three key concerns of personality psychology. Firstly, personality research aims to *differentiate* people (Ashton, 2022; Eysenck, 1994). Indeed, the pertinence of personality traits is in their ability to (in)directly compare us to others (Ashton, 2022). As such, personality traits reflect *interindividual* differences, or in other words, the quantitative features that distinguish us from others (Cervone & Pervin, 2013; Morizot & Miranda, 2007).

Consequently, the second concern of personality research has been to develop *taxonomies* (John, 1989) that *describe* individuals. In both research and in daily life, we often describe people with adjectives (e.g., adventurous, funny, compassionate). When these descriptions become relatively consistent or stable across time and different situations, they are considered a personality *traits*. Importantly, traits are latent psychological constructs that are inferred, rather than directly observed (Morizot & Miranda, 2007). These latent traits are operationalized through more concrete manifestations, such as (a) affect (how we feel); (b) behaviour (observable actions); (c) cognition (how we think, including attitudes, beliefs, appraisal, and interpretations); and, less frequently, (d) desire (the motivations behind behaviours, goals, and needs; (Morizot & Miranda, 2007; Wilt & Revelle, 2015). These manifestations are usually measured through self-reports, but also sometimes with naturalistic observations, and performance in experimental tasks (Morizot & Miranda, 2007).

Personality traits tend to be organized in hierarchical factors, typically through a five-factor (Big 5; Goldberg, 1990), or six-factor (HEXACO; Ashton & Lee, 2005) model. The

Five Factor Model (FFM; McCrae & Costa, 1987) and the Big Five (Goldberg, 1990, 1992) widely used normative models that describe the structure of personality traits. The two models are highly similar in construct and often used interchangeably in research. According to the FFM/Big 5 model, personality is organized into five traits, representing specific patterns of thinking, feeling and behaving: extraversion (i.e. individuals scoring higher on this trait are more prone to feel positive emotion, being warm and energetic, etc.), agreeableness (i.e. individuals scoring higher on this trait are more prone to be altruistic, forgiving, compliant, etc.), conscientiousness (i.e. individuals scoring higher on this trait are more prone to be self-disciplined, efficient, etc.), neuroticism (i.e. individuals scoring higher on this trait are more prone to feel anxiety, hostility, etc.), and openness (i.e. individuals scoring higher on this trait are more prone to be curious, artistic, unconventional, etc.; McCrae & John, 1992). These five traits have been shown to be highly stable over time (McCrae & Costa, 1994; Roberts et al., 2006), across situations (R. A. Sherman et al., 2010), and to be similar across cultures (McCrae & Costa, 1994; McCrae et al., 2000). Over the past two decades, a new model of personality has emerged, which is the focus of this thesis: The Dark Triad (DT; Paulhus & Williams, 2002). This personality model presents subclinical narcissism, Machiavellianism, and subclinical psychopathy as a triad of intercorrelated traits observable in normal populations. Individuals high on these traits tend to be disagreeable (O’Boyle et al., 2015; Paulhus & Williams, 2002; Stead & Fekken, 2014) and to show some level of callousness (Paulhus, 2014). This profile of abrasive traits will be the main interest of this thesis and discussed in further details later in this introduction.

The third concern in personality research is *predicting* and *explaining* behaviour (Back et al., 2009; Hassabis et al., 2014; S. J. Sherman & Fazio, 1983). Why is it important to be able to tell people apart and describe them accurately? Because it helps us predict and infer others’ behaviours, which is essential for navigating social interactions successfully. Traditionally, traits have been largely inferred from behaviours, with many researchers investigating “behaviour consistency/continuity” or “trait-relevant behaviours.” In this context, trait theories often describe personality traits as behavioural dispositions — individual attributes that arise from stable

qualities of a person and predispose them to engage in certain behaviours (Eysenck, 1994; John & Gosling, 2000). These theories propose that traits have predictive or influential value in shaping life outcomes (Beck & Jackson, 2022), such as events, careers, and situations (Furr & Funder, 2021). As such, understanding the foundations of personality traits, such as their etiology, development, and manifestation, is important to psychology.

States

Although personality traits tend to be stable across time and situations, it is unlikely that we maintain complete trait stability — such stability would be considered inflexibility, which is associated with disordered personality (APA, 2022) and psychopathology (for a review, see Morris & Mansell, 2018). It is, therefore, expected that our traits show some variability depending on the situation. For instance, someone who is generally extraverted might not feel particularly extraverted when alone at the library. Similarly, someone who is typically calm may not always feel calm, for instance during a job interview. Instead, their personality may fluctuate at a given time or in a specific context. The momentary expression of personality in a particular time or situation is referred to as a personality *state* (Eysenck, 1994).

Because personality states are more finite and context-specific, they are conceptualized as more variable (for a thorough review, see Horstmann & Ziegler, 2020). This variability can be explained by (a) the states' corresponding traits, (b) environmental influences such as situational characteristics, or (c) context-dependent attributes of individuals (e.g., ongoing affect, roles, etc.; Horstmann et al., 2021). For example, changes in affect are strongly associated with within-person fluctuation in state extraversion, neuroticism, openness and agreeableness (Wilson et al., 2017). Wilson et al. (2017) also noted that different situations influence different states. For instance, in their research, participants reported (a) being less extraverted, less agreeable, more conscientious, more neurotic, and less open when they were studying or working; (b) being more open to new experiences in novel and less constraining situations; and (c) being more agreeable when they felt positively about and engaged in their situations. Hence, in contrast to traits, states may lead to more variability in the manifestation of personality.

States will be important in this thesis. In my first chapter's studies, participants were instructed to provide daily reports on their personality over the past 24 hours, thus assessing personality states. In my second chapter's study, post-test DT scores also represent momentary personality reactions, effectively making it a state construct.

The Relative Stability of Personality Throughout the Life Span

One of the core concerns of personality psychology has been to solve the paradox of personality being both stable and changing. Indeed, the concept of traits involve stability, and yet we can recognize that people change over time or from one context to another. This paradoxical pattern of stability and change in personality traits is referred to as the relative stability of traits. Empirical evidence supports both stability and change in personality throughout the lifespan.

Measurement Considerations

Relative stability has been typically studied in personality psychology by looking at rank-order consistency, test-retest correlations, and mean-level change (e.g., Roberts et al., 2006). Personality rank order refers to the relative position of individuals within a group, and rank-order consistency assesses whether there is a uniform change in personality levels in the group (Ashton, 2022). If individuals in the group all change in the same direction, rank-order consistency will be high despite the actual change observed. Rank-order consistency is often indicated by test-retest correlations, which represent the correlation between scores on a construct when administered multiple times over relatively short periods (Dragostinov & Möttus, 2023). Relatedly, mean-level stability refers to whether people, as a group, increase or decrease on each trait dimension (Roberts & DelVecchio, 2000) over time or across situations. These measures of trait consistency look at inter-individual differences by comparing individuals to others.

It is important to note that although it will not be the focus of this thesis, another way to study relative stability is to compare people to themselves at a different time or in a different context, which is called intra-individual relative stability. Intra-individual relative stability examines the magnitude of variance (how much one increases or decreases) or stability (how much one stays the same) shown by each individual compared to themselves in terms of their own

personal average scores (rather than the group's average) for any given trait over time (e.g., Fleeson, 2004), regardless of their ranking in the group. In other words, intra-individual relative stability is about the extent to which people are consistently similar to themselves over time.

Personality Etiology and Development in Childhood

When examining interindividual differences, personality and developmental researchers have interested themselves in the etiology and development of personality traits from infancy to adulthood. Like most psychological constructs, personality traits are partly attributable to genetics and partly attributable to environmental influences. For example, a meta-analysis (Vukasović & Bratko, 2015) including 62 studies and over 100 000 participants of all genders and ages found that personality traits were between 40-to-50% genetically inherited. Heritability is amplified because genetics influence parental behaviours relative to establishing environments for their children, which in turn reinforces the relationship between genetic propensities and the environment (Kendler & Baker, 2007; Kendler & Eaves, 1986). For example, if a parent is quite agreeable, they might not only transmit this trait to their children but also expose them to more communal, social, and collaborative environments, which in turn would reinforce their children's inherited propensities to agreeableness. At the same time, research has shown that nonshared environments (i.e., the different environmental experiences that lead to different outcomes) most significantly contribute to individual differences (for a thorough review, see A. M. Johnson et al., 2008). This means the unique experiences people are exposed to also contribute to shaping them into unique individuals. Hence, it seems that both environment and genetics play a role in the development of personality traits.

When examining individual differences in childhood, the focus is on temperaments, and methods rely strongly on informants (e.g., parents and teachers), integrating self-reports only later in older childhood and adolescence. Broadly, temperament refers to children's individual differences in (re)activity and self-regulation in response to the environment, mainly influenced, but not solely, by biological and hereditary factors and primarily expressed in primary emotions (MacNeill & Pérez-Edgar, 2020; McClellan, 1992; Rothbart et al., 2000). As we mature from

infancy to adulthood, our personality develops, adapts, and solidifies through life experiences, at least partly because of our expectations about the appropriate ways we should behave in those experiences (Wood & Roberts, 2006). The consensus is that temperaments, as children mature, eventually consolidate into personality traits that can be generally explained by the FFM model (Shiner et al., 2013; Soto et al., 2008).

Relative Stability from Adolescence to Adulthood

Meta-analytic studies on personality change show that people typically become more Conscientious, Emotionally Stable, Open, and Agreeable as they age, from their 20s to their 70s (Roberts et al., 2006). This trend aligns with the *maturity principle* and *social investment theory* (Roberts & Nickel, 2021), which suggests that as people go through life experiences and take on important roles (e.g., education, family, work) they become more Agreeable, Conscientious, and Emotionally Stable (Wood & Roberts, 2006). In other words, as people mature, they tend to become psychologically healthier, more stable, and more active contributors to society (Caspi et al., 2005; Schwaba et al., 2022) through their involvement in prosocial activities.

Relatedly, evidence shows that rank-order and mean-level trait stability tend to both increase with age (Hopwood et al., 2011; Terraciano et al., 2010) with some traits potentially leveling off in early adulthood (Bleidorn et al., 2022). This means that as people get older, their personality tends to change less. Research that examined the rank-order consistency of traits across long intervals (e.g., forty years) show that while most traits have small to medium correlations over time, traits like neuroticism and agreeableness show the weakest correlations (e.g., neuroticism $r = -0.02 - 0.00$, and agreeableness $r = 0.08$). In contrast, traits like Extraversion have stronger correlations ($r = 0.22 - 0.29$; Edmonds et al., 2013; Hampson & Goldberg, 2006). Nevertheless, other meta-analytic research suggest that rank-order consistency of personality traits follows an inverted U-shape: it becomes more stable from age 15, levels off in middle age, and then starts to decrease around age 50 (Seifert et al., 2022). This suggests that in late adulthood, people may become more open to new experiences that could affect their

personality. It is important to note that in almost all these studies, test-retest correlations differ from zero, indicating that certain aspects of our personality stay stable over time, supporting the idea of a stable “core” of personality traits.

In summary, as people age, they tend to experience typical personality changes due to maturation, gaining new experiences, and taking on roles that shape their identity. However, the way individuals differ from each other in traits (like how agreeable one person is compared to others in a group) tends to remain fairly stable throughout life.

Relative Stability of Normative Personality Traits in Emerging Adulthood

One developmental period is particularly interesting to the study of relative stability, namely, emerging adulthood (EA). EA is a developmental period between ages 18 and 25 (which corresponds to the age of undergraduate students) where individuals transition into social roles from adolescence through adulthood (Arnett, 2014). Meta-analytic findings suggested that emerging adulthood was the period during which personality changes the most (Roberts et al., 2006). EA is characterized by instability and exploration in residential status, employment and education, beliefs and goals, relationships, self-development and financial independence (Arnett, 2014; Luyckx et al., 2006; Roberts et al., 2004). This identity exploration has implications for emerging adults' personality development. For example, in their sample of college students, Hudson and Roberts (2014) identified that 87% wanted to change at least one personality trait. Similarly, Robinson et al. (2015) found that for any Big Five trait, 56% of college students reported a desire to change their traits. If emerging adults explore different levels of expression for their personality traits, they may also explore levels of expression for their DT traits.

Given that emerging adulthood has been claimed to be a period during which personality changes the most (Roberts & Davis, 2016), it may represent an excellent period to study the relative stability of traits. There are at least three arguments in favour of this developmental assumption. Firstly, meta-analytic results from cohort studies indicated that young adulthood is the developmental period with the most personality changes (Roberts et al., 2006). Secondly, the stability of traits increases throughout adulthood (Roberts & DelVecchio, 2000; Roberts et al.,

2006). Thirdly, young adults undergo important growth and experiences that shape their self-identity development. Based on these results, change and stability are expected in emerging adults' personality traits. For these reasons, this thesis will focus on emerging adult populations.

The Person-Situation Debate

This paradox of relative stability has initiated a longstanding debate in the field, namely, the person-situation debate (Epstein & O'Brien, 1985). On one end of this argument, an essentialist trait position stated that personality is heavily influenced by genetics and physiology (Geen, 1997), fixed (i.e., stable), only minimally susceptible to environmental influence (e.g., Caspi & Roberts, 2001; Wiggins, 1997), and thus largely predictive of behavioural variance (Tellegen, 1991). On the other, a social-contextualist position stated that people's observable behaviour is inconsistent across situations (e.g., Mischel, 1968), that personality development is influenced by situations such as life events, roles, and experiences (e.g., Roberts & Davis, 2016), and thus that said situations are primarily responsible for behavioural variance. Today, research suggests that these two models coexist and that an *interactionist* conceptualisation probably better depicts how personality manifestations, such as trait-relevant behaviour, are influenced by both personality predispositions and situational characteristics¹ to explain personality in situations (J. A. Johnson, 1999; Mischel & Shoda, 1995). This interactionist conceptualisation allows for the possibility that personality manifestations can be generalized (i.e., trait-like) and context-specific (i.e., state-like), which explains how personality is at once stable *and* changing (Epstein & O'Brien, 1985; Fleeson, 2004; Funder, 2006), or relatively stable.

The main objective of this thesis is to examine the relative stability of DT traits. As such, our research methodologies aimed to capture the influence of both personality dispositions and environmental characteristics. Consequently, our results will directly help to inform on the person-situation interactions of DT traits and their conceptualisation in the person-situation debate.

¹ Please note that the terms "situation" and "environment" are used interchangeably for the purpose of this thesis.

Dark Triad: The Concept and its Correlates

The Dark Triad (DT) is a problematic profile of personality composed of three subclinical personality traits, namely psychopathy, Machiavellianism, and narcissism (Paulhus & Williams, 2002). The psychopathic trait describes individuals who have high impulsivity, high thrill-seeking tendencies, exhibit disregard for others, and have low empathy and anxiety (Paulhus & Williams, 2002). The Machiavellian trait describes individuals who are cold, manipulative (Paulhus & Williams, 2002), lack morality, and have such great cynical views of the world that they also expect others to cheat and betray them (Christie & Geis, 1970; Jones & Paulhus, 2014). Finally, the narcissistic trait describes individuals who feel entitled, superior to others, grandiose, and dominant (Paulhus & Williams, 2002).

Psychopathy

The psychopathic personality trait is characterized by pervasive patterns of interpersonal, affective, and behavioural callous features and tendencies of recklessness. These include a lack of empathy and remorse (Jonason & Krause, 2013), and impulsivity (Jones & Paulhus, 2011); deceit (Jonason, Lyons, Baughman, & Vernon, 2014); irritability, aggressiveness, and irresponsibility (Gordts et al., 2017); and in clinical settings, violation of other's rights and failure to conform to social norms and laws (APA, 2013; Stead et al., 2012). These characteristics are captured by various scales that share a similar factorial structure, typically including aspects of antisocial behaviours, erratic lifestyle, callous affect, short-term manipulation, deceit, impulsivity/low fear, sensation seeking, and criminal tendencies (Cooke & Michie, 2001; Fowles & Dindo, 2009; Hare et al., 2013; Jones & Paulhus, 2014; Williams et al., 2007).

Machiavellianism

The Machiavellian personality trait consists of self-initiated manipulations for one's profit; lack of morality; coolness and detachment from affect (own and others'); rational and emotionally detached thinking and decision making; goal and performance orientation; limit testing; instrumental exploitation of resources; and expediency (Christie & Geis, 1970; Jones & Paulhus, 2009). Moreover, individuals high in Machiavellianism do not usually feel bounded by

social norms of cooperation and helpfulness towards others, and have low levels of empathy (Bereczkei, 2017). Higher scores on Machiavellianism scales indicate higher Machiavellian attitudes and/or behaviours. The aforementioned characteristics are captured by various scales through similar factorial structures, typically including aspects of interpersonal tactics (positive, negative, manipulation); self-monitoring and impression management; cynical worldviews; competition; lack of morality, and self-interest (Christie & Geis, 1970; Corral & Calvete, 2000; Jones & Paulhus, 2009; Rauthmann & Will, 2011).

Narcissism

The narcissistic personality trait consists in a pervasive pattern of grandiosity (Back et al., 2013), feelings of self-importance and entitlement (APA, 2013), lack of empathy (Delić et al., 2011), lying (Jonason, Lyons, Baughman, & Vernon, 2014), inflated self-evaluations (Gabriel et al., 1994), envy (Krizan & Johar, 2012), and interpersonal exploitation (Jonason & Schmitt, 2012). Moreover, high scorers on measures of narcissism are associated with being relatively dominant, extraverted, exhibitionistic, aggressive, impulsive, self-centered, subjectively self-satisfied, self-indulgent, and nonconforming (Raskin & Terry, 1988). These characteristics are captured by various scales that have a similar factorial structure, typically including aspects of leadership/authority, superiority/arrogance, self-love, entitlement, exploitativeness, exhibitionism, interpersonal manipulation, sensation seeking/impulsivity, and vanity (Corry et al., 2008; Emmons, 1984; Kubarych et al., 2004; Raskin & Terry, 1988).

Mapping the Dark Triad: Interrelations and Structural Debates Within the Dark Triad

The DT traits exhibit notable overlap. For instance, a comparison of nearly 100 intercorrelations among the three traits found that all were positive and significant, with nearly 25% being large ($r > 0.5$). The highest intercorrelation was observed between Machiavellianism and psychopathy, while Machiavellianism and narcissism showed the weakest overlap (Furnham et al., 2014). Intercorrelations were somewhat higher among student samples than in nonstudent populations, and when using individual trait measures as opposed to the Short Dark Triad (SD3; Jones & Paulhus, 2014). More recent meta-analytic research highlighted

correlations ranging from small to medium ($r = 0.22 - 0.46$) between Machiavellianism and narcissism, and medium to large ($r = 0.45 - 0.70$) between Machiavellianism and psychopathy (Muris et al., 2017). These findings were supported by Vize and colleagues (2018) who also identified moderate-to-large intercorrelations, ranging from $r = 0.35$ between Machiavellianism and narcissism, to $r = 0.52$ between Machiavellianism and psychopathy.

Considering these intercorrelations, debate continues regarding the structure of the DT traits. Some researchers suggest that the three traits are intercorrelated, yet distinct from one another (Muris et al., 2017; Paulhus & Williams, 2002; Vize et al., 2018) and better understood as a three-factor model. For example, results from Confirmatory Factor Analyses (CFAs) of the SD3 supported a three-factor structure (Jones & Paulhus, 2014). Similarly, CFAs of the Dirty Dozen scale (DD; Jonason & Webster, 2010) showed poor fit in one-factor models, while three-factor models consistently showed good fit across genders and age groups, ranging from early adolescence to late adulthood (Klimstra et al., 2020). Other researchers highlight that despite their conceptual distinctions, psychopathy and Machiavellianism have not been clearly distinguished empirically, leading them to view narcissism and psychopathy as distinct traits, with Machiavellianism as a facet of psychopathy. For example, results from SEM in samples of culturally diverse participants showed that a two-factor model (narcissism and psychopathy-Machiavellianism) had excellent fit to the data, compared to poor fit in single- or three-factor models (Egan et al., 2014; Rogoza & Cieciuch, 2020), supporting the idea of a Dark Dyad. Finally, other researchers propose that all three traits may be better understood as a single core DT factor. For example, some results from SEM show that the DT traits fit better under a single latent factor compared to when the traits were assumed as independent concepts (Bertl et al., 2017). Similarly, CFAs of the SD3 have shown similar fit between a two- and three-factor model, although most of the explained common variance (ECV) was explained by a single latent factor (Persson et al., 2019). However, the authors highlighted the ambiguity of their results, stating that the ECV was not large enough to strongly support a definite single factor model (Persson et al., 2019). Empirical evidence also supports that a core “Dark Factor” better

accounts for the commonalities underlying nine dark traits, including those of the DT. This *Dark Factor of Personality* (D; Moshagen et al., 2018) refers to behavioural and attitudinal dispositions aimed at maximizing one's own utility while minimizing that of others. SEM results showed that D best explained the shared variance among all dark traits; it specifically explained most (but not all) of the variance for psychopathy (ECV = 0.75) and Machiavellianism (ECV = 0.60), but only modestly (ECV = 0.18) explained the variance for narcissism (Moshagen et al., 2018).

One reason that could explain the commonalities between the DT traits is their shared negative relations to agreeableness in the FFM (O'Boyle et al., 2015; Paulhus & Williams, 2002; Stead & Fekken, 2014) and Honesty-Humility in the HEXACO² model (Lee & Ashton, 2005; Lee et al., 2013; Muris et al., 2017). This overlap has led some researchers to claim that the DT traits were redundant such that Antagonism (i.e., reversed FFM agreeableness) could more concisely capture this personality profile, supported by high intra-class correlations ($r_{ICCs} > 0.90$; Rose et al., 2023).

In sum, debates about the meaning of the intercorrelations and factorial structure of the DT traits have resulted in ambiguous conceptualisations of this personality profile. Nevertheless, in this thesis, each DT trait remains individually relevant for study and will thus be examined separately, rather than as a single concept. This decision aligns with the original conceptualization of the DT (Paulhus & Williams, 2002) and will hopefully allow to provide more nuance in the relative stability profiles of the DT traits.

The Dark Triad on the Spectrum of Personality Disorders

The DT is theorized to be subclinical, meaning it is nonpathological and expressed in the general population. However, DT psychopathy and narcissism traits are conceptually rooted in their clinical personality disorder (PD) counterparts. It is important to understand that from a dimensional perspective, PDs are characterized by abnormally high levels of certain normal personality traits that manifest on a spectrum (Miller & Maples, 2011). This means that at lower levels, certain traits and behaviours may still indicate narcissism or psychopathy, without meeting

² However, the HEXACO model is not the focus of this thesis. For a review, see Lee and Ashton (2004).

the criteria for a full-fledged personality disorder. Traits are considered normative when they vary along a continuous spectrum, meaning people can show a wide range of expressions, from extreme (either high or low) to average levels of a given trait (Cervone & Pervin, 2013; Morizot & Miranda, 2007). To distinguish between clinical and normative (but high) narcissism and psychopathy, it is not the traits and behaviours themselves that matter, but their *degree*, *magnitude*, and *frequency*. DT traits are defined as subclinical traits in their degree, magnitude, and frequency, and are usually normally distributed in the normal population (Hodson et al., 2009; Kajonius et al., 2016). Consistently, DT traits have been found in nonclinical populations, including university students (e.g., Krick et al., 2016; Paulhus & Williams, 2002), high school adolescents (e.g., Klimstra et al., 2014; Muris et al., 2013; Zhang et al., 2015), and older adults in the community (e.g., Barlett & Barlett, 2015). Therefore, when discussing narcissism and psychopathy in this thesis, the focus is on subclinical traits, not the associated PDs, unless stated otherwise. This aligns with the nonclinical conceptualization of the DT (Paulhus & Williams, 2002) and will be a key focus of my doctoral project.

Dark Triad Personality: Etiology and Development

Researchers have explored the origins of DT traits and why people continue to engage in DT-related behaviours. One possible explanation is that these traits may serve a protective function, particularly in the case of narcissism. Unlike psychopathy and Machiavellianism, narcissism appears to have a potentially protective effect. For instance, studies show that narcissism is negatively correlated with depression (Bonfá-Araujo et al., 2022) and can even predict lower levels of depression (Wei et al., 2025). Narcissism is also positively linked to social skills (Jonason, Baughman, et al., 2015), adaptive coping strategies (Gómez-Leal et al., 2023), and overall well-being (Blasco-Belled et al., 2024; Giacomini & Jordan, 2016a; Gómez-Leal et al., 2023; Jonason, Baughman, et al., 2015). Furthermore, narcissism has been shown to buffer the negative impact of stressful life events on psychosis and depression (Lyons et al., 2019). This protective nature aligns with the psychodynamic view of narcissistic personality disorder as a defence mechanism against early negative life experiences that lead to negative

self-beliefs (Teicholz, 1978), sometimes referred to as a “narcissistic defence.”

While the protective function of narcissism is well-documented, there is less evidence for such a role in Machiavellianism and psychopathy, as these traits are generally associated with negative personal outcomes. However, some studies suggest that Machiavellianism is linked to good social skills (Jonason, Baughman, et al., 2015) and has positive effects on leadership positions and career satisfaction (Spurk et al., 2016). Some theorists propose that Machiavellianism may develop as an unskilled coping mechanism against feelings of shame or unlovability resulting from parental neglect (McIlwain, 2011). Similarly, psychopathic traits have been connected to childhood adversity, maltreatment, and physical abuse (see Frazier et al., 2019, for a review). Therefore, all DT traits, whether clinical or subclinical, may serve as enduring coping strategies against childhood adversity, particularly those stemming from parental influences.

From an evolutionary standpoint, the idea that DT traits serve a protective function aligns with the *Life History Theory* (LHT; Stearns, 2000). LHT explores how individuals allocate resources to survival (somatic efforts) and reproduction (mating efforts). These strategies are typically categorized as “fast” or “slow” life history strategies. Fast strategies focus on short-term gains and mating, while slow strategies prioritize survival and long-term outcomes, such as improving conditions for one’s descendants. According to LHT, individuals’ life history strategies are shaped by the environmental conditions they experience during childhood (Brumbach et al., 2009). It is theorized that individuals exposed to more unpredictable or harsh environments may adopt fast-life strategies, as such environments can decrease life expectancy and make long-term planning less advantageous (Brumbach et al., 2009). In these conditions, short-term goals (e.g., casual relationships, thrill-seeking) may be more beneficial for survival. In two mediation analyses, studies found that Machiavellianism and psychopathy were positively associated with fast life-history strategies, while narcissism was negatively associated with fast-life-history strategies (Birkás et al., 2020). Other studies have also highlighted the pertinence of LHT to conceptualize psychopathy (e.g., Jonason, Koenig, & Tost, 2010).

Following this, it is well-established that DT traits are correlated with childhood unpredictability, such as chaotic environments and unstable parenting (Jonason, Lyons, & Bethell, 2014; Tajmirriyahi et al., 2021). Additionally, all DT traits are linked to insecure attachment styles (anxious and avoidant; Brewer et al., 2018; Čopková & Lörincová, 2021; Jonason, Duineveld, & Middleton, 2015), which can result from deficiencies in early parenting (Jonason, Lyons, & Bethell, 2014). From an evolutionary perspective, the development of DT traits, especially in childhood, may be an adaptive response to unpredictable environments and inconsistent parenting, favoring a fast-life approach (i.e., focused on immediate, certain rewards). This might also be true in emerging adulthood (EA), where positive correlations between DT traits and instability have been found (Barlett & Barlett, 2015).

Genetic studies support the idea that the development of DT traits is at least partly influenced by genetics. Heritability estimates indicate that 31% of the variance in Machiavellianism, 59% in narcissism, and 64% in psychopathy can be attributed to genetic factors (Vernon et al., 2008). Numerous studies suggest that psychopathy, in particular, is more strongly influenced by genetic and biological factors than by socioenvironmental influences (Blair et al., 2006; Lalumière et al., 2001), though gene-environment interactions are also acknowledged (Frazier et al., 2019).

Relative Stability of Dark Triad Traits Throughout the Life Span

There is limited longitudinal data on the normative changes in mean levels or the rank-order stability of DT traits across the lifespan. However, a four-wave, 10-year longitudinal study investigated the developmental trajectories of maladaptive behaviours (e.g., Aggression, Dominance, Narcissism, Lack of Empathy) from childhood to DT traits in emerging adulthood (Clercq et al., 2017). The study found that while children showed individual differences in their developmental trajectories, maladaptive behaviours generally declined throughout childhood. Notably, the study also revealed that these maladaptive behaviours tended to covary (echoing the shared variance seen in adult DT traits) and were positively correlated with adult DT traits a decade later (Clercq et al., 2017). These findings suggest that the maladaptive

behaviours exhibited during childhood can influence the development of maladaptive personality traits in adulthood.

Research also suggests that DT traits, like the Big Five traits, also exhibit some natural maturation. For example, in a nonclinical sample, it was found that age negatively predicted psychopathy and psychopathic traits (Gill & Crino, 2012), indicating that these traits may decrease with age. Similarly, cross-sectional studies on Machiavellianism have also noted a negative correlation between age and Machiavellianism (Christie & Geis, 1970; Mudrack, 1989), again suggesting that this trait may also decrease with age, particularly regarding components of deceit and flattery (Mudrack, 1992). Meta-analysis of mean-level change in cross-sectional studies similarly showed an inverted U-shaped trend, with an increase in Machiavellianism peaking in adolescence that then continuously decreases in adulthood until it reaches a low plateau after 65 years of age (Götz et al., 2020). Cross-sectional cohort research on narcissism demonstrated a similar trend. Specifically, narcissistic traits tend to increase until emerging adulthood and continuously decrease onward until they plateau in the fifties (Foster et al., 2003; Roberts et al., 2010). In adulthood, correlation analyses of cross-sectional studies note negative associations between age and the DT (Barlett & Barlett, 2015; Parma, 2024), which suggests that the DT decreases with age. A cohort study by Klimstra and colleagues (2020) revealed an inverted U-shaped trend in the development of DT traits, showing that men and women follow distinct trajectories. Specifically, the study found that for men, mean levels of DT traits initially rise through adolescence, plateau in late adolescence/emerging adulthood, and then gradually decline in middle adulthood. In contrast, for women, DT mean levels increase steadily until late adolescence, at which point they plateau before steadily decreasing until reaching a low plateau in late adulthood. Overall, these results highlight a normative increase in DT traits throughout childhood that generally peak in emerging adulthood before decreasing. This suggests that DT traits also follow a maturation process that mirrors the normative developmental trajectories seen in the Big Five.

Dark Triad Traits and Emerging Adulthood

Emerging Adulthood (EA) is a period of personality exploration that could be of particular interest to the DT. For example, a study found that the Instability/Negativity facet of EA (i.e., feeling stressed and under pressure due to the confusion, instability and restrictions they experience) was positively correlated with all DT traits (Barlett & Barlett, 2015). Hence, the natural instability that comes with life transitions in EA might make it a period where DT traits are naturally more elevated. Moreover, results from this study also found a partial mediation by which older participants scored lower on the DT traits because of having successfully transitioned through emerging adulthood (Barlett & Barlett, 2015). This means that, as emerging adults start settling into more stable financial, residential, relational, and work settings, they endorse fewer feelings of being in-between, negativity, identity exploration and being focused on themselves, possibly leading to lower levels of DT. This finding is consistent with the literature in two ways. Firstly, higher adult DT traits are associated with growing up in unpredictable households as children (Jonason et al., 2016). Indeed, unpredictability might prompt a child to understand the world as fickle, in turn discouraging their development of long-term and socially mutualistic strategies. Secondly, both EA and DT are characterized by some degree of instability. In EA, this instability comes from the exploration and transitions characteristic of this developmental period from adolescence to adulthood. Conversely, individuals high on the DT try creating volatility (e.g., instability in relationships, social environments, and friendships) to benefit from a broader range of opportunities from different social situations. Hence, uncertainty might be an important common element to both EA and DT.

Gender Differences in the Dark Triad

There is a substantial body of research that points to gender differences in DT traits. Psychopathic traits, for instance, have consistently been found to be higher in men than in women (Cale & Lilienfeld, 2002). Similarly, Machiavellian traits are more common in men as well (Czibor et al., 2017). Meta-analytic studies also show that men score higher than women on narcissistic traits; however, there are no significant gender differences in vulnerable narcissism,

which is associated with low self-esteem, neuroticism, and introversion (Grijalva et al., 2015). Research examining the DT construct has also found that men tend to score higher on these traits (Chiorri et al., 2019; Gluck et al., 2020; Muris et al., 2017; Paulhus & Williams, 2002) and present different DT profiles compared to women (McLarnon, 2022). Interestingly, the effect sizes are larger for psychopathy than for Machiavellianism and narcissism. For example, in the development of the Short Dark Triad measure by Jones and Paulhus (2014), the effect sizes ($d = 0.52 - 0.65$) for psychopathy were larger than those for Machiavellianism and narcissism ($d = 0.24 - 0.35$) across various validation studies.

Life History Theory (LHT; Stearns, 2000) may also help explain some of these gender differences in DT traits. Studies suggest that individuals high in the DT tend to adopt a fast-mating strategy, meaning they focus on short-term, opportunistic mating (Jonason, Koenig, & Tost, 2010), or a combination of fast and slow strategies (Jonason et al., 2017; McDonald et al., 2012). These strategies could reflect gender differences in how risk and benefits are assessed, with a fast mating strategy being more advantageous for men than for women. This is in line with traditional gender roles, which often see men as more suited to short-term mating strategies, while such approaches might not be as beneficial for women (Jonason & Davis, 2018). Moreover, fast mating strategies could potentially harm women's sexual health (Jonason & Lavertu, 2017).

These gender differences are particularly noticeable in romantic and sexual relationships. In one study, Jonason and Kavanagh (2010) found that narcissism was linked to playful (e.g., engaging with multiple partners) and pragmatic (e.g., considering how a partner might reflect on one's career) love styles. Machiavellianism was related to most love styles except for the erotic love style, while psychopathy was associated with both playful and selfless love (e.g., doing anything for a lover). These findings point to a more involved, calculated, and fast-paced approach to romantic and sexual relationships, particularly among men. In another study on mate poaching, Jonason, Li, and Buss (2010) found that DT traits were associated with both poaching others' mates and having their own partners poached, in both short- and long-term relationships. Gender differences in mate poaching tactics also emerged: women tended to use more subtle

tactics, such as emotional manipulation or increased vigilance, while men were more likely to engage in aggressive tactics like punishing infidelity or enhancing their appearance (Jonason, Li, & Buss, 2010). These findings further highlight a greater investment in short-term mating efforts, particularly in men with high DT traits (Jonason et al., 2009). Given these consistent gender differences in how DT traits manifest, this thesis will further explore gender differences related to these traits.

Social Competition, Collaboration, Dominance, and the Dark Triad

Perhaps the most relevant aspect of the DT traits — and the likely reason for the growing research interest in them — is their potential negative impact on others: On a personal, interpersonal level, but also more broadly on society. The DT traits have been linked to multiple interpersonal and social correlates. For example, these traits have been associated with aggression, delinquency, interpersonal difficulties (Muris et al., 2017; Stead & Fekken, 2014), schadenfreude (i.e., experiencing pleasure from another's misfortune; James et al., 2014), strategic manipulative mating (Vize et al., 2018), as well as befriending (Jonason & Schmitt, 2012), mate poaching, and being poached by others (Jonason, Li, & Buss, 2010). They also correlate with a need for sexual variety (Jonason et al., 2009), and a competitive, individualistic social style (Jonason, Li, & Teicher, 2010).

These diverse correlates share at least two things: First, they are all at play in social interactions, and second, they are linked to interpersonally competitive attitudes. For instance, a manipulative mating strategy or a competitive social style has little impact unless it is used successfully at the expense of others — just as social dominance cannot develop without others to be prejudiced against. These interpersonal correlates of the DT traits likely refer to a more specific type of interaction, namely social competition. Social competition involves the use of strategies to outdo others or gain resources, such as mates, social status, or material goods (West-Eberhard, 1983). If successful, these strategies allow individuals to “win” or gain from social interactions. Of course, social competition itself is not necessarily toxic. However, when it becomes extreme — what is often referred to as hypercompetitiveness — it takes on a

“winner-takes-all” approach, where the desire to win at any cost could become harmful. This extreme form can undermine moral behaviour and encourage cheating (Kohn, 1992). Indeed, hypercompetitiveness has been positively linked with the DT traits, particularly narcissism (Luchner et al., 2011) and Machiavellianism (Houston et al., 2015).

Social competition is often contrasted with collaboration (or cooperation). Unlike competition, collaboration involves engaging in behaviours that benefit both the recipient and the donor (West et al., 2007). Collaboration can be mutually beneficial — through shared interests and goals or through the reinforcement of positive behaviours, such as rewarding cooperation and punishing cheating. However, collaboration can also be costly to the donor, particularly when they help another without direct benefit (Sachs et al., 2004). As previously noted, the DT traits are characterized by a lack of morality, manipulation, aggression, hypercompetitiveness, and entitlement. All three DT traits have also been linked to lying (Jonason, Lyons, Baughman, & Vernon, 2014). It is therefore unsurprising that psychopathy (Rilling et al., 1969) and Machiavellianism (Bereczkei & Czibor, 2014; Paal & Bereczkei, 2007) are negatively correlated with cooperation. Meta-analytic findings (O’Boyle et al., 2012) revealed that Machiavellianism and narcissism are positively linked to counterproductive work behaviours (CWB), while Machiavellianism and psychopathy are negatively associated with job performance—even in collectivistic work settings, where the expectation is for workers to act in a way that benefits the whole group. These findings suggest that individuals high in DT traits are more likely to disrupt collaborative environments by favouring self-interests to the detriment of others in their group, while also not successfully improving their own performance. As such, these results suggest that individuals high in DT traits potentially ignore collaborative cues from their environments to — possibly unsuccessfully — benefit themselves.

The tendency of people high in DT traits to be disruptive in even collaborative social contexts may also be connected to their inclination toward higher social dominance attitudes. *Social Dominance Orientation* (SDO; Stewart & Pratto, 2015) refers to one’s preference for group-based inequality and dominance, rather than equality and inclusion. Those higher in SDO

also tend to score higher on authoritarianism (Duriez & Van Hiel, 2002) and favour hierarchical ideologies and policies (Pratto et al., 1994). Meta-analytic research has shown strong correlations between SDO and competitive worldviews (Perry et al., 2013). The DT traits have long been associated with SDO (Jonason et al., 2020; Jones & Figueredo, 2013; Lee et al., 2013) and with prejudiced attitudes that correlate with SDO, such as racism (Jonason et al., 2020; Jones & Figueredo, 2013), and sexism (Gluck et al., 2020; Jonason et al., 2020).

In light of the associations between the DT traits, social competition (versus collaboration), and SDO, it seems logical to expect more DT-related behaviours in contexts that encourage social competition and group-based inequalities, and fewer such behaviours in environments that foster collaboration and equity. Consequently, this thesis will explore if these social attitudes could explain DT traits.

The Present Doctoral Thesis

The overarching goal of my doctoral thesis is to better understand the patterns of relative stability of the DT personality traits. Patterns of relative stability can be observed on different occasions through time, and in different social situations. Hence, to address my overarching goal, my doctoral thesis consists of two studies that assess different aspects of relative stability in the DT.

Much of the work on social competition and the DT has focused on a) cross-sectional and correlational data and b) have not sufficiently taken the environmental influence into account. Thus, little is known about patterns of stability versus variability in DT traits through time and situations, and about what social situations and attitudes might contribute to those patterns. My thesis directly addresses these research caveats in two articles: The first article consists of two independent short-term longitudinal studies, whereas the second article consists in an online experimental study.

The first article was longitudinal (online daily surveys for up to ten days) and explored what were the patterns of relative stability of the DT through *time* across two studies with independent samples of emerging adults ($n = 196$ and $n = 107$). Specifically, we used a

short-term longitudinal design through a ten-day follow-up. Participants answered personality measures of the DT and the Big Five once a day for up to ten days. Additionally, they rated their interest in socially competitive and collaborative contexts, as well as indicators of social dominance orientation (Study 2 only). We began with preliminary analyses to test for longitudinal measurement invariance. Then, using SEM, we applied a Trait-State-Occasion model (TSO; Cole et al., 2005; Prenoveau, 2016) to examine: a) the magnitude of stability (explained by a latent trait) versus variability (explained by changes in daily situations) of DT states over a 10-day period, b) the impact of social attitudes like competitiveness, collaborativeness, and SDO, on the DT, and c) how did the DT's patterns of relative compare to those of their common anti-counterpart in the Big Five, agreeableness. This research design and statistical model was examined across two separate samples to test replicability of results, and to allow an incremental adjustment of the measured variable (i.e., addition of SDO as a potential predictor of DT state in Study 2).

The second article was experimental (online experimental conditions) and examined if DT states could be influenced by different social *situations* with a sample of emerging adults ($n = 276$). Three separate 3x2 ANCOVAs (one per DT trait) tested whether three different social situations (i.e., hypercompetitive, collaborative, or neutral) could explain change in mean levels of DT at post-test while accounting for baseline DT and gender. Originally, this article included two independent samples (intended for replication purposes). To this end, in-person data was collected during the Winter 2020 university semester, and a total of 80 participants completed the study. However, due to the unexpected COVID-19 pandemic, data collection was stopped prematurely. In the transition from in-person to remote work, the (physical) signed debrief forms (that confirm that participants still want to be included in the study after having been informed of the true purpose of the study) were lost. As such, we did not include in my thesis any data

collected from that in person sample³, and have only used the data collected online during the Winter 2021 semester.

Together, my studies directly place the DT in the person-situation debate through reflections on the structure of state and trait DT personality over short-term periods, and its interaction with social environments. It contributes to the existing but rare bodies of research that have applied longitudinal and/or experimental designs to the DT. As such, my studies contribute to better understanding patterns of relative stability of the DT of personality and may further establish this profile of personality as a nonclinical yet socially abrasive constellation of traits.

³ As per Article 3.7B of the TCPS 2: “Debriefing must be a part of all research involving an alteration to consent requirements (Article 3.7A) whenever it is possible, practicable and appropriate.” We noticed the loss of the debrief forms approximately one year after data collection. In consultation with the Research Ethics Board (REB) of the university of the main researcher, it was determined that no confidentiality breach occurred, as the forms only contained their participation ID (i.e., nonidentifying information). Although the REB permitted the researchers to retrace the 80 participants to confirm their consent, it was determined that doing so, one year later, would be impractical. Notably, retracing these participants would necessitate breaking the anonymity of their participation because their email address would need to be revealed to the researchers, which makes this option inappropriate. The decision to exclude them from this thesis was verified and approved by the REB.

CHAPTER 2: Assessing the Relative Stability of the Dark Triad Through Time**Abstract**

Personality traits such as those from the Big Five or Five Factor Model have been shown to be *relatively stable*, in that they express consistency across time and situations, while also showing change to adapt to situations. However, the relative stability of the Dark Triad (DT) traits remains understudied. Hence, this study examined the relative stability of the DT traits through assessing the natural manifestation of daily DT states over a ten-day period. A short-term longitudinal design was applied across two independent studies to attempt replication. In both studies, we applied a latent Trait-State-Occasion (TSO) model to partition the daily state variance explained by a stable latent trait versus that explained by situational changes. In both studies, participants completed daily self-reports of DT, agreeableness, competitiveness, and collaborativeness. In our replication study (i.e., Study 2), participants additionally completed daily self-reports of social dominance orientation. Results were replicated across two independent studies on emerging adult university students ($n = 196$ and $n = 107$). Findings demonstrated that state stability over ten days was mostly explained by a latent trait (80–88%), while some state variability was attributed to changes in situations. This profile of relative stability was highly similar across all DT traits and Big Five agreeableness. Moreover, results across both studies showed partial effects of social attitudes on state variability, and partial support for gender differences (i.e., when gender differences were observed, men tended to score higher than women on some DT traits).

Keywords: Dark Triad, longitudinal design, narcissism, Machiavellianism, psychopathy, relative stability, person-situation debate, trait-state-occasion modeling.

Evidence from decades of research has shown that, paradoxically, personality tends to remain stable and yet variable through time. This paradox is at the root of the longstanding person-situation debate of personality that pits two opposing views. The trait position states that personality is mainly defined by fixed determining traits responsible for our behaviours (Costa & McCrae, 1998; Wright & Jackson, 2023). Conversely, the contextualist position argues that environmental influences dictate personality development and expression and, as such, are responsible for our behaviours (Roberts & Davis, 2016). In itself, the concept of trait involves stability. It describes one's generally consistent patterns of thinking, feeling, and behaving. As such, it is assumed that when one is "extraverted", they are extraverted most of the time, or in most situations, compared to others (Cervone & Pervin, 2023). At the same time, we must adapt to our environment, so that our personality at a specific time or situation might differ from our general tendencies. For example, one might feel more extraverted at a networking event than they might during a lone walk. This momentary manifestation of personality is what researchers have called personality state (Eysenck, 1994). It is believed that because states are finite, they are more variable than traits (Horstmann & Ziegler, 2020). This paradox of continuity and change in personality is known as *relative stability*. Relative stability has been widely studied in normative personality models, such as the Big Five and the Five Factor Model (FFM), but rarely in other personality models, such as the Dark Triad (DT; Paulhus & Williams, 2002). This gap creates three problems. First, the lack of knowledge on the relative stability of DT traits translates in the inability to understand some fundamental elements of personality trait functioning. Second, it does not allow to establish the DT profile in the person-situation debate. Third, it borrows its conceptual legitimacy by extension from the theories of normal personality, without having confirmed it. Hence, this thesis will address this caveat by investigating the relative stability of DT traits directly across a ten-day period. This introduction will begin by reviewing the current literature on the Big Five and FFM and our knowledge of its relative stability. Then, we will discuss the DT personality model and the (albeit scarce) research on its relative stability. Finally, we will summarize the research objectives, analytical strategy, and hypotheses.

Big Five and the Five Factor Models

The Big 5 (Goldberg, 1990, 1992) and the Five Factor Model (FFM; McCrae & Costa, 1987) are well-evidenced normative personality models that have been used to describe the structure of personality traits. Their similarities have often rendered them interchangeable in research. According to the Big 5/FFM, personality is organized in a set of five broad latent traits (McCrae & John, 1992): extraversion (i.e., assertiveness, warmth, energy levels, etc.), agreeableness (i.e., altruism, compliance, trust, etc.), conscientiousness (i.e., self-discipline, achievement motivation, dutifulness, etc.), neuroticism (i.e., anxiety, impulsivity, self-consciousness, etc.), and openness (i.e., fantasy, ideas, values). As demonstrated by decades of research, the FFM personality traits tend to be stable through time (Atherton et al., 2022; Roberts & DelVecchio, 2000), situations (R. A. Sherman et al., 2010), and across cultures (McCrae & Costa, 1994; McCrae et al., 2000).

Relative Stability of Normative Personality Throughout the Life Span

An important aspect of personality traits is their ability to be both stable and susceptible to normative change across the lifespan—that is, to be relatively stable. One way to observe relative stability is through test-retest correlations. Like rank-order consistency, test-retest correlations indicate the stability of personality traits through time. Rank-order consistency and test-retest correlations measure individuals' standing on a concept relative to others in a group, with test-retest correlations specifically being used in short-term designs (McCrae et al., 2011). As such, if stability is observed, it is more likely to reflect actual personality characteristics rather than biases introduced by momentary situations or fleeting states (e.g., mood, emotions).

Longitudinal research consistently demonstrates that while personality remains remarkably consistent, it also undergoes meaningful developmental shifts. For example, conscientiousness, emotional stability, openness, and agreeableness tend to increase with age, particularly from young adulthood to older adulthood (Roberts et al., 2006). Both rank-order and mean-level stability tend to increase with age (Hopwood et al., 2011), with the greatest stability observed for extraversion and somewhat lower consistency for neuroticism and

agreeableness (Edmonds et al., 2013). These results suggest that personality traits become more socially desirable and stable as we mature. The enduring nature of traits over time may reflect a core component of personality. Notably, emerging adulthood has been identified as a period of heightened personality change, likely due to increased identity exploration and life transitions related to education, work, and relationships (Arnett, 2014). While these findings highlight long-term patterns, comparatively less research has explored personality stability over shorter intervals.

Relative Stability of Normative Personality Throughout Shorter Timespan

In addition to demonstrating a pattern of relative stability across the lifespan, personality traits have also shown this pattern across shorter periods, from days to months. For example, the intraclass correlation coefficients (r_{ICC}) for test-retest stability of the Big Five Inventory (BFI; John et al., 1991) were good for all Big Five traits (all $r \geq 0.78$) when measured two weeks apart (Chmielewski & Watson, 2009), and surprisingly even stronger (all $r \geq 0.93$) when measured six months apart (Arterberry et al., 2014).

Although less compelling, evidence shows respectable test-retest correlations (r^{tt}) across an 8-week interval ($r^{tt} = 0.65 - 0.79$) for a shortened (2 items per scale) version of the BFI (Rammstedt & John, 2007). More recently, a newer version of the BFI, namely the Big Five Inventory 2 (BFI-2; Soto & John, 2017a), showed excellent test-retest reliability ($r^{tt} = 0.87 - 0.92$) across three-to-six weeks (Seybert & Becker, 2019).

The Dark Triad of Personality

A newer model of personality has increased in popularity in the past 25 years, namely the Dark Triad of personality (DT; Paulhus & Williams, 2002). The DT represents three intercorrelated socially aversive personality traits: Psychopathy (e.g., low empathy, low anxiety), narcissism (e.g., grandiosity, entitlement) and Machiavellianism (e.g., manipulation, cool-headedness). The implied premise of this personality model is that despite being abrasive, these traits operate within normal personality such that we all manifest, to some nonpathological degree, these personality traits in everyday life.

The Dark Triad Personality and Social Attitudes

One of the reasons behind the accrued popularity of the study of these traits is their abrasive interpersonal nature. This has potentially harmful implications for others, more immediately on their interpersonal relationships, and potentially more broadly on society. The DT traits have been shown to be negatively associated with Big Five agreeableness (O'Boyle et al., 2015; Paulhus & Williams, 2002; Stead & Fekken, 2014) and prosociality (Jonason, Li, & Teicher, 2010). Unsurprisingly, the DT traits have been positively associated with agentic (Rauthmann & Kolar, 2013) and strategic (Jonason & Webster, 2012) interpersonal styles, counterproductive work behaviour (O'Boyle et al., 2012), and bullying (Baughman et al., 2012). Together, these attitudes denote *social competition*. Social competition consists of strategies to win against others to gain or distinguish oneself from them (West-Eberhard, 1983). Although research on social competition and the DT is scarce, there is some empirical evidence of the associations between the two. For example, Roulin and Krings (2016) found that all DT traits correlated positively with competitiveness in work interviews. Similarly, Spurk and Hirschi (2018) found a reciprocal predictive relationship between the DT composite and a psychologically competitive work climate. This means that people with higher DT traits become more competitive at work over one year and vice-versa. The DT traits have also been associated with intrasexual competition (i.e., rivalry between same-sex competitors for mates) tactics such as mate derogation (Goncalves & Campbell, 2014) and mate poaching (Jonason, Li, & Buss, 2010).

One way people can assert social competition is through social dominance. *Social Dominance Orientation* (SDO; Pratto et al., 1994) is a sociopolitical attitude that favours inequality and hierarchy among social groups. Meta-analytic findings have noted strong correlations between SDO and competitive worldviews (Perry et al., 2013). DT traits and SDO have been found to share the commonality of interpersonal manipulation and callous affect (Jones & Figueredo, 2013). These similarities are congruent with research finding positive associations between DT traits and SDO (Hodson et al., 2009; Jonason et al., 2020; Jones & Figueredo, 2013; Lee et al., 2013). In sum, these results highlight how individuals high on the DT are disagreeable,

which might present through socially competitive attitudes such as SDO, that they enact through exploitative interpersonal strategies. Because of the DT traits negative association with Big Five agreeableness, agreeableness will be a particular focus in this article, allowing for a more direct and specific comparison between the Big Five and DT traits. Furthermore, considering that individuals high on the DT traits show opportunistic tendencies (Jonason & Sherman, 2020), it is possible that being in socially competitive situations would encourage tendencies towards SDO, competition, and an exploitative interpersonal style. As such, competition and SDO, along with their opposite, collaboration, will be of interest in this article to examine if they could impact the expression of DT traits.

The Relative Stability of Dark Triads Across The Lifespan

Like the Big Five traits, the DT traits seem to exhibit normative developmental changes, reflecting maturation over time. Longitudinal research shows that maladaptive behaviours linked to DT traits (e.g., aggression, narcissism) generally decline throughout childhood (Clercq et al., 2017). Studies also indicate that psychopathy and psychopathic traits decrease with age (Gill & Crino, 2012), and Machiavellianism decreases, particularly its deceitful components (Götz et al., 2020; Mudrack, 1989). Narcissism tends to increase until emerging adulthood, then decreases and plateaus in later adulthood (Foster et al., 2003; Roberts et al., 2010).

Further studies suggest an inverted U-shaped developmental trajectory for DT traits, with an increase until adolescence (for women) or emerging adulthood (for men), followed by a gradual decline into adulthood (Klimstra et al., 2020). While longitudinal data on the relative stability of DT traits is limited, the evidence suggests that, like the Big Five traits, DT traits exhibit a normative increase through childhood, peak in emerging adulthood, and decline thereafter.

The Relative Stability of Dark Triads Throughout Shorter Timespan

The research on the relative stability of DT traits through shorter periods is sparse, and that specifically of studies that used the brief Short Dark Triad (SD3; Jones & Paulhus, 2014) even more so. The few studies that examined the relative stability of DT traits through short

periods generally indicate that they tend to remain quite stable. For example, DT scores on the SD3 measured over a 12-day interval showed strong test-retest correlations for the overall scale as well as for individual traits (r^{tt} overall = 0.9; r^{tt} Mach = 0.85; r^{tt} Narc = 0.88; and r^{tt} Psych = 0.85; Dragostinov & Möttus, 2023). This demonstration of strong test-retest reliability was replicated in a German sample where DT scores on the SD3 were measured twice over a 4-week interval (r^{tt} Mach = 0.81; r^{tt} Narc = 0.74; and r^{tt} Psych = 0.83; Malesza et al., 2017). Similarly, DT traits measured with the SD3 every six months over two years showed good rank-order consistency (r^{T1-T4} Mach = 0.79; r^{T1-T4} Narc = 0.80; and r^{T1-T4} Psych = 0.72; Wolff & Wetzel, 2023).

Over a two-year period, researchers observed a linear decline of Machiavellian and psychopathic traits through time and an inverted U-shaped trend in narcissistic traits that suggests a peak in young adulthood followed by a linear decline (Wolff & Wetzel, 2023). This is similar to the maturation trends observed throughout the lifespan of DT traits.

In sum, there is some evidence that the DT traits could express normative change throughout the lifespan while also remaining highly stable in shorter periods. However, the available data on the relative stability of interindividual differences in daily life (i.e., as measured daily) remains, to our knowledge, very rare.

The Present Research: The Relative Stability of Dark Triad Traits Over Time

We know from normative Big Five traits that they tend to simultaneously exhibit patterns of normative change and continuity. As such, these traits express relative stability, which reflects more recent conceptualizations of personality. The empirical evidence available to discuss the relative stability of the DT traits is scarcer, although available results support potential simultaneous patterns of stability and change at the interindividual level. However, longitudinal evidence from examining the DT traits in everyday life is rare and much needed (Williams et al., 2022). The lack of knowledge on the fundamental nature of these traits makes it difficult to place the DT traits in the person-situation debate and discuss their patterns of relative stability.

Hence, this article aimed to assess patterns of relative stability of the DT through a

short-term 10-day longitudinal design. Considering the need for replication of results in psychology, this design was replicated across two independent studies. More specifically, this study had four objectives:

1. Examine if and how much people tend to vary or remain stable through short periods on the DT;
2. Decompose the sources of stability versus change;
3. Compare the DT traits' patterns of relative stability compared to a normal personality trait, namely agreeableness;
4. Identify potential predictors of variability in DT states.

Our studies focused on samples of emerging adults for two reasons. First, Emerging Adulthood (EA) has been claimed to be a period during which personality changes the most (Roberts & Davis, 2016), due in part to natural instability associated with this transitional developmental period (Arnett, 2014) and to mindful identity exploration (Roberts et al., 2006). As such, EA might be an optimal period to observe relative stability (i.e., personality variability *and* change). Secondly, EA facets (self- and other-focused, feeling in-between, negativity towards instability, etc.) have all been associated with some DT traits (see Barlett & Barlett, 2015), suggesting that EA might be a crucial period to observe DT traits.

Trait-State-Occasion Modeling: A Conceptual Overview

Trait-State-Occasion (TSO; Cole et al., 2005; Prenoveau, 2016) models are a form of Latent State-Trait models (LST; Steyer et al., 2012) rooted in Structural Equation Modeling (SEM) that examines the longitudinal rank-order consistency of latent constructs. As such, it is ideal to analyze intensive longitudinal data, such as daily diary studies (Castro-Alvarez, Tendeiro, Meijer, & Bringmann, 2022). In TSO models, the State construct represents the momentary manifestation of a psychological variable over time (Castro-Alvarez, Tendeiro, Meijer, & Bringmann, 2022). State variance is decomposed in that explained by the *trait* factor and that explained by the *occasion* factor. The Trait factor represents the stable between-individual

differences, while the Occasion factor represents the fluctuations (for example, in situations) at each measurement occasion (Castro-Alvarez, Tendeiro, de Jonge, et al., 2022; Wu, 2021). Finally, TSO models include auto-regressive pathways from a given Occasion factor onto the previous measurement's Occasion factor to allow accounting for residual influences of past measurement occasions (Prenoveau, 2016). Because of its ability to longitudinally determine the sources of variance in state personality between that explained by a stable personality trait and varying situation characteristics (including the residual experiences from previous situations), TSO analyses will empirically examine the DT traits' position in the person-situation debate.

Hypotheses

Trait versus Occasion variance in Dark Triad Traits (Study 1 and 2). The research on the relative stability of the DT traits is scarce and has yielded mixed results that reflect both the tendency of these traits to be highly stable through time, and the ability of these traits to show adaptive change over time. Moreover, few research has assessed daily rank-order consistency in longitudinal models. This makes it difficult to have specific hypotheses on this matter. Hence, rather, I will make three broad alternative hypotheses.

- The ***Shared Trait-Situation*** relative stability hypothesis (H1a): The variance explained by the Trait and Occasion factors will be comparable — for example, each accounting for approximately 40 – 60% of the total variance. That is, the DT traits will show similar levels of consistency and variability over the ten-day period.
- The ***Trait-Anchored*** relative stability hypothesis (H1b): The variance explained by the Trait factor will substantially exceed that explained by the Occasion factor — for instance, accounting for more than 60% of total variance. In this case, the DT traits will show high levels of consistency over the ten-day period.
- The ***Situation-Sensitive*** relative stability hypothesis (H1c): The variance explained by the Occasion factor will substantially exceed that explained by the Trait factor — for example, accounting for more than 60% of total variance. This would mean that the DT traits exhibit

greater rank-order variability than consistency over the ten-day period. However, based on the current literature, this hypothesis is not expected to be supported.

Person-Situation Considerations (Study 1 and 2). Based on these alternative hypotheses, it is also difficult to emit hypotheses about the source of variance of DT traits. Hence, an exploratory examination of variance will help answer the question. If the results confirm the *Shared Trait-Situation* hypothesis (H1a), it would mean that personality traits and characteristics of situations both equivalently explain personality states at a given time. If the results confirm the *Trait-Anchored* hypothesis (H1b), it would mean that it is people's personality traits that mostly explain their personality states at a given moment. In the unlikely event that results demonstrate the *Situation-Sensitive* hypothesis (H1c), this would mean that it is the characteristics of situations that mostly explains people's personality states at a given time.

Comparisons Between Dark Triad and Big Five Agreeableness (Study 1 and 2). To the best of our knowledge, no research has directly compared the relative stability of DT traits to the ones of the Big Five. Although DT narcissism and psychopathy are conceptualized as non-pathological, they are rooted in personality disorders. As such, it is possible that the DT traits would still exhibit more disordered personality characteristics, such as trait rigidity (i.e., inadaptability), compared to other normative personality traits.

- Consequently, it is hypothesized (H2) that the DT traits will be more rigid (i.e., stable) than Big Five agreeableness across 10 days. This would be confirmed by observing that the explained variance related to the trait factor (i.e., consistency of trait) is higher in the DT traits than it is for agreeableness. Another way to observe this would be through more evenly partitioned explained variance between the trait and occasion factors in agreeableness than for the DT traits.

Sources of Variance in Dark Triad Traits: Competition and Collaboration (Study 1 and 2). The DT traits have been positively linked to a volatile, manipulative, agentic, socially competitive and aggressive interpersonal style. It also has been negatively associated to

cooperation and collaboration.

- Hence, it is hypothesized (H3a) that higher socially competitive attitudes will predict higher DT levels.
- Similarly, it is hypothesized (H3b) that higher socially collaborative attitudes will predict lower DT levels.

Sources of Variance in Dark Triad Traits: Gender (Study 1 and 2). There is strong empirical evidence demonstrating gender differences in DT levels.

- As such, we hypothesize (H4) that men will exhibit higher DT levels compared to women.

Sources of Variance in Dark Triad Traits: Social Dominance Orientation (Study 2). Research has highlighted positive associations between the DT traits and SDO, as well as other related attitudes such as competition, agentic interpersonal tactics and racism.

- As such, it is hypothesized (H5) that higher SDO scores will predict higher DT levels.

STUDY 1

The purpose of Study 1 is to examine the relative stability of the DT traits across 10 days using a Trait-State-Occasion model. Results will decompose variance explained by a stable trait from that explained by changes in situations. This will provide crucial information on the fundamental nature of the Dark Triad patterns of relative stability and provide insight into its position in the person-situation debate. Study 1 also attempts to provide insight into potential sources of variability, if any, by examining the effect of competition, collaboration, and gender on daily Dark Triad personality.

Method

Sample Description

The sample consisted of 196 participants who were undergraduate students at the university of the first two authors (mean age = 18.67, *SD* = 1.50). Seventy-eight percent

(78.06%) of participants identified as women (21.94% men)⁴. Sixty-three percent (63.27%) of participants identified English as their first language (13.78% identified French, 22.96% identified another). Participants came from a variety of university programs (19.6% from psychology; 33.67% from Health Sciences; 22.61% from Sciences; 10.05% from Social Sciences; 7.54% from Arts; 2.51% from Engineering; and 0.5% each from Management and from Law; and 1.01% from other programs). Of participants in the sample, 44.39% identified as White (Caucasian or European); 26.02% as Asian (East or West); 9.69% as Arab (Middle Eastern or North African); 6.63% as Black (Caribbean or African); 5.10% as multiethnic; 2.04% as Aboriginal or Native; 1.53% as Latino; and 4.59% identified to another ethnic identity. After data cleaning, participants answered on average 6.23 out of a possible total of 10 entries. In other words, the median participant answered 7 out of 10 days of survey-collection.

Measures

Demographics

On the first day of survey collection, participants answered questions pertaining to demographic information, namely their (a) age, (b) gender identity, (c) native language, (d) cultural and ethnic identity, (e) student status (full or part time), (f) academic program, and (g) years in their program. Students who did not participate on the first day of survey collection had their demographic data obtained from the pool of participation to research. See Appendix B for a copy of the demographic questions.

Big Five Traits

Big Five agreeableness was measured using the Big Five Inventory-2 Short form (BFI-2-S; Soto & John, 2017b). The BFI-2-S is a 30-item self-report measure of the Big Five personality traits that asks participants to rate to which extent they *strongly disagree* (1) to *strongly agree* (5) to a series of statements related to their personality. The scale comprises five

⁴ In our final TSO analysis, gender is used as a predictor variable. In our original ($n = 199$) final sample (i.e., after data cleaning), two participants identified as trans men, and one as nonbinary. The low number of participants in each of these categorical variables does not allow to use them effectively as predictors in the statistical model. As such, these three participants have been removed from the final sample and analyses.

subscales: Extraversion (e.g., *I am someone who is outgoing, sociable*); Agreeableness (e.g., *I am someone who is compassionate, has a soft heart*); Conscientiousness (e.g., *I am someone who is reliable, can always be counted on*); Negative Emotionality or Neuroticism (e.g., *I am someone who is temperamental, gets emotional easily*); and Openness (e.g., *I am someone who is complex, deep thinker*).

The BFI-2-S retains about 90% of the BFI-2 domain scales' reliability, self-peer agreement, and external validity (Soto & John, 2017b), making it a reliable measurement of the Big Five personality traits. Across an internet community, a college, and a university sample, alpha reliabilities of the domain scales ranged $\alpha = 0.73 - 0.83$, with test-retest reliability ranging from 0.69 – 0.88 (Soto & John, 2017b). The authors suggest that the BFI-2-S takes three to five minutes to complete. For the purpose this study, participants were specifically asked to rate the statements according to their personality *in the past 24hrs*. Questions were presented in random order to minimize habituation effect over the 10 days of participation.

Dark Triad Traits

The DT personality traits were measured using the Short Dark Triad (SD3; Jones & Paulhus, 2014). The SD3 is a 27-items self-report measure of the DT traits where respondents rate their agreement to a series of statements related to DT traits on a 5-point Likert-type scale (1 = *disagree strongly*; 5 = *agree strongly*). The scale comprises three subscales: narcissism (e.g., *I insist on getting the respect I deserve*), Machiavellianism (e.g., *It's not wise to tell your secrets*) and psychopathy (e.g., *I'll say anything to get what I want*); each measured by nine items. The SD3 was developed on a sample of adults in a series of three studies. In young adult samples, the SD3 has shown acceptable internal consistency; Cronbach alphas range from 0.68 to 0.78 (e.g., Davis et al., 2019; Dragostinov & Möttus, 2023; Nnam et al., 2023). In general adult samples, the SD3 subscales have shown good concurrent ($r_{SD3_{Mach} - Mach-IV} = 0.82$; $r_{SD3_{Psych} - SRP-III} = 0.92$; and $r_{SD3_{Narc} - NPI} = 0.87$; Jones & Paulhus, 2014) and convergent ($r_{SD3_{Mach} - Mach-IV} = 0.74$; $r_{SD3_{Psych} - SRP-III} = 0.84$; and $r_{SD3_{Narc} - NPI_{facets}} = 0.43 - 0.72$; Maples et al., 2014) validity against standard measures.

However, the SD3 is criticized for its discriminant validity between Machiavellianism and psychopathy subscales (e.g., Knitter et al., 2025; O’Boyle et al., 2015; Persson et al., 2019) and its focus on grandiose narcissism at the detriment of vulnerable narcissism (e.g., Maples et al., 2014).

Maples and colleagues (2014) have suggested that the SD3 takes approximately 99 seconds to answer. Unlike other measures of the DT traits (such as the Dirty Dozen; Jonason & Webster, 2010), the items of the questionnaire focus less on behaviours and more on attitudes (e.g., *I like to use clever manipulation to get my way*), beliefs (e.g., *payback needs to be quick and nasty*), and feelings (e.g., *I hate being the center of attention*). This means that DT traits could still be assessed even in the absence of DT-oriented behaviours, which is helpful for shorter time-intervals between reports where participants might not have had the opportunity to engage in such behaviours. For the purpose of this study, again, participants were specifically asked to rate the statements according to their personality *in the past 24hrs*. Questions were also presented in random order to minimize habituation effect over the 10 days of participation.

Social States of Mind

To assess contextual potential predictors of the DT traits, participants rated their competitive versus collaborative social attitudes in the past 24hrs on a single-item original measure. Specifically, they were asked to what extent they were in the mood for: (a) “*competing against others to gain something for themselves*”; and (b) “*collaborating with others to help everyone*.” Participants rated these statements on a 5-point Likert-type scale from *None of the time* (1) to *Almost all of the time* (5). These items were designed to address both competitiveness and collaboration.

Procedures

Participants could select from four waves of data collection in which they would be assessed daily for 10 consecutive days (i.e., September 18–27, October 7–16, October 26–November 4, and November 14–23). Individuals aged 17 to 25 from all areas of studies were eligible to participate, which corresponds to emerging adulthood. Participants were recruited through a pool for participation in research at the university of the first two authors

during the Fall 2019 semester. They received points worth up to two percent of their overall mark in an introductory course. The attribution of points was proportional to the estimated time of their participation. The completion of all the surveys took about 10 minutes. Participants received 0.5 percent for every approximated 30 minutes of participation (i.e., for each third submitted survey). The ethical aspects of this study were assessed and ethical approval was granted by the research ethics board at the university of the first two authors.

Data was collected through online surveys on Qualtrics. Participants provided their informed consent for each day they participated. They received one daily email reminder at noon for the duration of the selected wave of participation to increase retention rates. Online self-reports were open between noon and 23:59, every day. Participants answered demographic questions on the first of the ten days of surveys. For those who missed the first day of participation, demographics were obtained directly from the said pool of participation in research main database. Then, they answered personality and attitudinal measures. The order of questionnaires and questions within questionnaires were randomly determined. To target state-like personality, we asked participants to answer the survey measures specifically based on the past 24 hours rather than generally. Once participants completed the study (i.e., after 10 days), the reminders were discontinued, and a debriefing email was sent to them to finalize their participation. See Appendix A for a copy of the study materials.

Following McCabe and colleague's (2012) guidelines, reports were excluded from the analyses for the following reasons: a) careless, inconsistent or incomplete responses (i.e., comprised at least 50% missing values, comprised at least 90% identical responses, or had response patterns faster than 1 second/item); b) invalid entries (e.g., were submitted unreasonably outside of the allotted time); c) invalid participation (e.g., were submitted by participants outside of inclusion criteria or from participants who did not receive compensation); and d) duplicates (e.g., two submissions from the same participant on the same day). Finally, reports that did not meet the criteria for a longitudinal design were also excluded (e.g., reports from participants who, before or after data cleaning, only had one valid submitted questionnaire, effectively making their

participation cross-sectional). In total, 203 of the 1424 reports (14.26%) were excluded for one of these reasons.

Plan of Analysis

Preliminary Analysis: Longitudinal Measurement Invariance

One of the benefits of Structural Equation Modeling (SEM) is the ability to assess whether each personality trait maintains the same psychometric properties across ten days. To this end, we first tested longitudinal measurement invariance (MI) using MPlus version 8.10 (Muthén & Muthén, 2017). Measurement invariance involves applying a series of increasingly restrictive steps to item measurement characteristics (Goulet & Morizot, 2023). We tested for configural invariance (i.e., the equivalence of factorial structure over time), metric invariance (i.e., the equivalence of factor loadings onto the latent factor), scalar invariance (i.e., intercepts and thresholds of items are equivalent over time), and residual invariance (i.e., the equivalence of residual variance and measurement error; for a detailed explanation, see Putnick and Bornstein [2016]). To do so, we conducted separate Confirmatory Factor Analyses (CFA) for each trait across the ten days and assessed how well the specified model fit the observed data. In these models, we allowed repeated-measure indicators (i.e., items) to correlate with themselves in adjacent time points.

We used a model-building approach (Kline, 2023) to test measurement invariance, where we incrementally increased model complexity (i.e., more time measurements) and restrictiveness (i.e., measurement invariance level). We first started with a simpler model, which included the first three measurement occasions (T1 – T3), and tested for configural invariance. If configural invariance was satisfactory, the model was re-tested with more restrictions (i.e., metric invariance, then scalar invariance, and finally, residual invariance). If all levels of MI were confirmed for this model, a more complex model, which included measurement occasions one to seven (T1 – T7), tested increasingly restrictive MI (from configural to residual). Again, if all levels of MI were confirmed for the second model, a final model including all measurement occasions one to ten (T1 – T10) tested increasingly restrictive MI (from configural to residual). Testing measurement

invariance on increasingly restrictive models allowed us to identify convergence problems that arose more efficiently. We used an absolute fit indices (i.e., how well a theoretical model explains the observed data), namely the Root Mean Square of Error of Approximation (RMSEA), and an incremental (i.e., the relative improvement in fit of the proposed model over the baseline model) fit indices, namely the Comparative Fit Index (CFI; Kline, 2023). Although the chi-square test is the most frequently used fit index in CFA, it is susceptible to Type I errors when fitting small to moderate samples (Alavi et al., 2020; Moshagen, 2012). As such, in the present research, it has not been considered when estimating goodness (or badness) of fit. $CFI \geq 0.90$ and $RMSEA \leq .10$ were considered to be of adequate fit (based on the summary of empirical considerations in Kline, 2023) for assessing configural invariance. However, some suggest that $CFI \geq 0.8$ could be considered reasonable (Doll et al., 1994). RMSEA 90%CI values below 0.05 and above 0.08 for the lower and upper bound, respectively, indicated acceptable fit (MacCallum et al., 1996). A change (Δ) of $\leq 0.005 - 0.01$ in CFI and of $\leq 0.01 - 0.015$ in RMSEA were considered to represent measurement invariance (based on recommendations for small samples total $N \leq 300$ from Chen, 2007) for the assessment of metric, scalar, and residual invariance. Because MI is tested on manifest categorical variables, missing values were estimated with Weighted Least Squares Mean and Variance (WLSMV). WLSMV is a robust estimator for categorical and ordered data that tests models without the assumption of normality (Brown, 2006).

Main Analysis: Trait-State Occasional Model

We tested our models with Mplus Version 8.10 (Muthén & Muthén, 2017) using Trait-State-Occasion modelling (TSO; Cole et al., 2005; Prenoveau, 2016). TSO models (see Figure 1, Appendix D) are rooted in Latent State-Trait theory (LST; Steyer et al., 2012), specific type of Structural Equation Modeling (SEM), which is interested in observing the same person in different situations or at different times, to avoid assessing people in a situational vacuum. LST models are structural equation models that identify and quantify the sources of variability (versus stability) of the rank order of a construct over time (Steyer et al., 2012), which directly addresses the person-situation debate. Specifically, the manifest (i.e., observable) variance of a construct of

interest is decomposed into a state component and a measurement error component (Steyer et al., 2012). The state component describes individuals' relative standing on the studied latent construct at a given time after accounting for measurement error (Prenoveau, 2016). The state component variance is then further partitioned into a trait factor (i.e., variance free of situational interactions or effects) versus an occasion factor (i.e., variance due to the characteristics of a situation; Prenoveau, 2016; Steyer et al., 2012). The trait factor, referred to as trait variance, represents the time-invariant interindividual component that remains stable across assessment points and reflects the stability factor of relative stability (Castro-Alvarez, Tendeiro, de Jonge, et al., 2022; Prenoveau, 2016). The occasion factor, referred to as occasion variance, represents the time-varying interindividual component at any specific assessment point and reflects the variability factor in relative stability (Castro-Alvarez, Tendeiro, de Jonge, et al., 2022; Wu, 2021).

However, the closer assessment points are to each other in time, the more the occasion factor (i.e., situational component) influencing state standing at a given point risks carrying over and influencing state standings at other time points. To remedy this issue, the TSO model applies autoregressive pathways between adjacent time measurements to account for the temporal effect of previous occasions on the next occasion (Prenoveau, 2016). For example, if a person had a positive experience yesterday, they might still feel optimistic about it today and, in turn, feel more agreeable or extraverted. The autoregressions further decompose which part of the variance of the occasion factor at a given time is due to the unqualifiable carry-over effect of previous occasion factors (Prenoveau, 2016). The combination of the occasion factor and autoregressive pathways represents the influences of person-environment interactions on interindividual differences for the construct of interest.

Because our research also aimed to identify potential causes of variability, if any, in daily personality states, we included some predictors in our analytical model. More specifically, we regressed daily personality states onto daily scores of social attitudes and gender. In Study 1, social attitudes predictors were competition and collaboration. In Study 2, we added SDO as a third social attitude predictor. Again, we incrementally increased the complexity of the model for

each trait separately, this time by gradually including predictors of personality states. As such, we initially tested the TSO analysis on an unconditional baseline model. Then, in conditional models, we included regressions of the targeted DT state onto social attitudes, followed by gender.

In sum, TSO models are ideal for longitudinal data because they allow us to decompose what part of personality is explained by traits (i.e., rank-order stability) versus situations (i.e., rank-order variability). The addition of predictors to our model will allow us to examine potential sources of variability, if any, in daily personality states.

Missing Values. For our TSO analyses, missing values were estimated with Maximum Likelihood (ML), which is a preferred parameter estimator for continuous nonnormal data (Myung, 2003) missing at random or completely random (Enders, 2022). ML uses all the available data, complete or not, to estimate the most probable values of the missing cases that would have produced the rest of the sample in the data (Baraldi & Enders, 2010). ML does not require complete data because it will compute a squared z-score with whatever data is available for the participants with missing information (Baraldi & Enders, 2010). As such, ML estimates parameters without discarding or filling in data (Baraldi & Enders, 2010). This is especially helpful in longitudinal designs where retention of participants is a challenge.

Results

Longitudinal Measurement Models

Our findings revealed measurement noninvariance at different levels across all models for all personality traits. A summary of the longitudinal measurement invariance testing results can be found in Table 1 in Appendix C.

Agreeableness

Configural and metric invariance testing showed no significant decrease in fit to the data for models A1.0 and A1.1 (see Table 1). Results showed an unsatisfactory and above-threshold decrease fit in scalar and residual invariance testing for models A1.2–1.3 (see Table 1). However, results continued to show acceptable fit to the data for models A2.0–2.3 (i.e., encompassing

occasion measurements 1 – 7) in configural⁵, metric, scalar, and residual MI. Nevertheless, the models did not converge when testing for the full models A3.0-3.3 (i.e., encompassing all occasion measurements 1 – 10).

Machiavellianism

Configural, metric, scalar, and residual MI can be assumed due to acceptable and improving fit indices for models M1.0 – M1.3. However, the models did not converge when testing for models M2.0 – M2.3 (i.e., encompassing occasion measurements 1 – 7). See Table 1 for details.

Narcissism

Configural, metric, scalar, and residual MI can be assumed due to acceptable and improving fit indices for models N1.0 – N1.3. Results generally showed an unsatisfactory and above-threshold decrease in CFI and increased RMSEA in configural, metric, scalar, and residual MI testing for models N2.0 – N2.3 (i.e., encompassing occasion measurements 1 – 7). Furthermore, the models did not converge when testing for the full models N3.0 – 3.3 (i.e., encompassing all occasion measurements 1 – 10). See Table 1 for details.

Psychopathy

Configural, metric, scalar, and residual MI can be assumed due to acceptable and improving fit indices for models P1.0 – P1.3. However, the models did not converge when testing for models MP2.0 – P2.3 (i.e., encompassing occasion measurements 1 – 7). See Table 1 for details.

Trait-State-Occasion Analyses

We conducted the TSO analyses with Mplus Version 8.10 (Muthén & Muthén, 2017). Due to convergence problems in longitudinal MI, fully latent models with all measurement occasions could not be estimated. To mitigate this issue, composite scores (i.e., means) were used to

⁵ The following equality constraints on thresholds were removed from the analysis at all levels of MI testing of models A2.0 – 2.3 due to convergence problems: BFI-2-S item 2 threshold 4 at occasion measurement 1, 2, and 4; BFI-2-S item 22 threshold 3 at occasion measurement 1.

estimate all TSO models (see Figure 1, Appendix D). More specifically, state personality was changed to correspond to the average score on a given construct on that day (for e.g., state psychopathy on day 2 was defined as the average score on the SD3 Psychopathy subscale). Four separate TSO models were tested; one for each trait. A model building approach was used, where we incrementally increased the complexity of the model starting with an unconditional baseline model (i.e., including only the targeted personality trait), to a partial conditional model with initial predictors (i.e., regressing the targeted personality trait onto collaborative and competitive attitudes), to a complete conditional model (i.e., regressing the targeted personality trait onto social attitudes and gender). In all TSO models, we did not apply simplifying assumptions or model constraints (see Prenoveau, 2016). All tables related to TSO models can be found in Appendix C. All figures pertaining to TSO models can be found in Appendices D and E.

Because estimating the models on composite scores does not estimate the part of the variance due to measurement errors, we used Omegas (McNeish, 2018)⁶ as a measure of internal consistency (reliability). The Omegas for each trait for each time measurement are provided in Table 2: more than 80% of Omegas were above 0.8 (range between 0.754–0.952), which suggests that measurement error did not negatively impact our TSO estimates, and that our model holds good internal consistency. The descriptive statistics for the main analyses can be found in Table 3, Appendix C.

A summary of our baseline TSO models, which detail the standardized factor loadings and regression coefficients of the baseline models, can be found in Table 4. A comparison of unconditional (i.e., baseline) TSO models goodness-of-fit can be found in Table 5. More information on the partitioning of trait vs. occasion specific variance for the unconditional models can be found in Table 6 and Figure 3. Finally, more details about the conditional (i.e., predictor) models' standardized regression coefficients can be found in Table 7.

⁶ Omega is a measure of composite reliability that is conceptually similar to Cronbach's alpha (Cortina, 1993; Cronbach, 1951) but does not rely on the same assumptions. Cronbach's alpha is often criticized for its rigid assumptions of tau equivalence (i.e., equality of factor loadings) and uncorrelated errors (Dragostinov & Möttus, 2023; McNeish, 2018; Savalei & Reise, 2019). By contrast, Omega does not assume tau equivalence (McNeish, 2018), which makes it a more realistic measure of internal consistency.

Agreeableness

As can be seen in Table 4, all standardized loadings of daily state agreeableness loaded strongly and significantly on the trait factor, and loaded weakly-to-moderately, but still significantly, onto the occasion specific factor. Autoregression pathways showed small-to-moderate significant effect of daily agreeableness onto next-day agreeableness on four (out of nine) occasions, highlighting inconsistent effects of past measurement occasions on current measurement occasions.

Relative Stability and Person vs. Situation. As shown in Table 5, the unconditional TSO model (1.0) offered good fit to the data. As can be seen in Table 6 and Figure 3, trait variance explained most of the total variance (79.6% vs. 20.38% for occasion specific variance) across the ten-day period. Furthermore, the carry-over effect of occasion specific variance explained only a marginal portion of total variance (1.31%).

Predictor Models. As can be seen in Table 7 (model 1.2), the daily standardized coefficient loadings for competition, collaboration, and gender as predictors of daily agreeableness tended to be small and statistically nonsignificant. The significant effects across the ten-day period showed that the occasion specific part of state agreeableness was negatively predicted by competition on three occasions and positively predicted by collaboration on four occasions. This means that on those days, participants felt more competitive which made them feel less agreeable, and on the days they felt more collaborative, it made them feel more agreeable. Only one (out of ten) standardized coefficient of the binary variable gender showed a significant effect where women scored higher on the occasion specific part of state agreeableness.

Machiavellianism

As can be seen in Table 4, all standardized loadings of daily state Machiavellianism loaded strongly and significantly on the trait factor, and loaded weakly-to-moderately, but still significantly, onto the occasion specific factor. Autoregression pathways showed small-to-medium significant effects of daily Machiavellianism onto next-day Machiavellianism on three (out of nine) occasions, highlighting inconsistent effects of past measurement occasions

on current measurement occasions.

Relative Stability and Person vs. Situation. As shown in Table 5, the unconditional TSO model (2.0) offered good fit to the data. As can be seen in Table 6 and Figure 3, trait variance explained most of the total variance (86.89% vs. 13.01% for occasion specific variance) across the ten-day period. Moreover, the carry-over effect of occasion specific variance explained a marginal portion (0.72%) of total variance.

Predictor Models. As can be seen in Table 7 (model 2.2) the daily standardized coefficient loadings for competition, collaboration, and gender as predictors of daily Machiavellianism tended to be small and statistically nonsignificant. The significant effects across the ten-day period showed that the occasion specific part of state Machiavellianism was positively predicted by competition on three occasions and negatively predicted by collaboration on one occasion. This means that on those days, participants felt more competitive which made them feel more Machiavellianistic, and on the days they felt more collaborative, it made them feel less Machiavellianistic. No effect of gender was found.

Narcissism

As can be seen in Table 4, all standardized loadings of daily state Narcissism loaded strongly and significantly onto trait factor, and loaded weakly-to-moderately, but still significantly, onto the occasion specific factor. Autoregression pathways showed medium significant effect of daily narcissism onto next-day narcissism on three (out of nine) occasions, highlighting inconsistent effects of past measurement occasions on current measurement occasions.

Relative Stability and Person vs. Situation. As shown in Table 5, the unconditional TSO model (3.0) offered good fit to the data. As can be seen in Table 6 and Figure 3, trait variance explained most of the total variance (84.23% vs. 15.80% for occasion specific variance) across the ten-day period. Moreover, the carry-over effect of occasion specific variance explained only a marginal portion (0.82%) of total variance.

Predictor Models. As Table 7 (model 3.2) shows, the daily standardized regression coefficient for competition and collaboration tended to be small, yet statistically significant on

four of the ten days. Interestingly, on those four days, competition and collaboration both positively predicted the occasion specific part of state narcissism, which indicates participants were more narcissistic when they were more competitive and collaborative on those days. Additionally, standardized coefficient of the binary variable gender showed a significant effect of gender on seven (out of ten) days where men scored higher on the occasion specific part of state narcissism.

Psychopathy

As can be seen in Table 4, all standardized loadings of daily state psychopathy loaded strongly and significantly onto trait factor, and loaded weakly-to-moderately, but still significantly, onto the occasion specific factor. Autoregression pathways showed medium significant effect of daily Psychopathy onto next-day psychopathy on two (out of nine) occasions, highlighting minimal and inconsistent effects of past measurement occasions on current measurement occasions.

Relative Stability and Person vs. Situation. As shown in Table 5, the unconditional TSO model (4.0) offered acceptable fit to the data. As can be seen in Table 6 and Figure 3, trait variance explained most of the total variance (79.76% vs. 20.21% for occasion specific variance) across the ten-day period. Again, the carry-over effect of occasion specific variance explained only a marginal portion (0.81%) of total variance.

Predictor Models. Table 7 (model 4.2) shows that the daily standardized regression coefficient for competition were small yet statistically significant on six (out of 10) days, positively predicting the occasion specific part of state psychopathy on those days. This means that on those days, participants felt more competitive, which made them feel more psychopathic. No significant relationship with collaboration was identified. Finally, the standardized coefficient of the binary variable gender showed a significant effect of gender on four (out of ten) days where men scored higher on the occasion specific part of state psychopathy.

STUDY 2

The purpose of Study 2 is to replicate a Trait-State-Occasion model on DT personality traits to confirm the patterns of relative stability of DT traits. Study 2 attempts to build on Study 1 by examining the effect of an additional potential source of variability, namely SDO.

Method

Sample Description

The second study consisted of 107 participants (mean age = 19.02, $SD = 1.62$) recruited through a pool for participation in research at the university of the first two authors during the Winter 2020 semester. The sample was made up of 85.05% women (14.95% men)⁷. Fifty-one percent (51.4%) of participants identified English as their first language (18.69% identified French, and 29.91% identified another language). Participants came from a variety of university programs (14.02% from Psychology; 27.10% from Sciences; 21.5% from Social Sciences; 18.69% from Health Sciences; 7.48% from Arts; 3.74% from Engineering; 2.80% from Management; and 0.93% each from Education and from Medicine; and 1.87% from other programs). Of participants in the sample, 38.32% identified as White (Caucasian or European); 24.30% as Asian (East or West); 14.02% as Arab (Middle Eastern or North African); 10.28% as Black (Caribbean or African); 7.48% as multiethnic; 1.87% as Latino; and 3.74% identified to another ethnic identity. After data cleaning, participants answered on average 7.3 out of a possible total of 10 entries. In other words, the median participant completed 8 out of 10 surveys.

Measures

Exactly as in Study 1, participants answered a demographic questionnaire on their first day of participation. For those who did not participate on the first day of survey collection, demographics were obtained directly from the previously mentioned pool of participation in research main database. As per Study 1, the BFI-2-S (Soto & John, 2017b) was used to measure

⁷ Similarly to the footnote 1, in the second original final sample (i.e., after data cleaning), one participant identified as a trans man, and two as nonbinary. For the same reason, these three participants have been removed from the final sample and analyses.

Big Five Agreeableness and the SD3 (Jones & Paulhus, 2014) was used to measure the DT traits. The same single-item original measure was used to measure competitive and collaborative social attitudes. See Appendix B for a copy of the demographic questions.

Social Dominance Orientation

In Study 2, participants additionally answered daily reports of Social Dominance Orientation (SDO). Specifically, participants answered two items of the Social Dominance Orientation 7 (SDO7; Ho et al., 2015). We decided to only include two items from the complete scale to minimize the added time commitment from participants and maintain the duration of daily participation under 10 minutes. The first item we selected pertained to the Dominance subdimension (i.e., a preference for group-based dominance hierarchies where there is active oppression of subordinate groups by dominant groups), specifically, “*an ideal society requires some groups to be on top and others to be on the bottom*” (Ho et al., 2015, p. 1028). The second item pertained to the (anti)Egalitarianism subdimension (i.e., an opposition to equality between groups through systemic oppression), specifically, “*no matter how much effort it takes, we ought to strive to ensure that all groups have the same chance in life*” (reversed; Ho et al., 2015, p. 1028). Unlike the traditional 7-point Likert-scale anchors of the SDO7, participants rated these statements on a 5-point Likert-type scale from *None of the time* (1) to *Almost all of the time* (5) in order to remain consistent with the other scales they answered as part of this study. The SDO7 presented good construct validity, factorial structure, and internal consistency (Cronbach’s alphas all > 0.89 across samples; Ho et al., 2015).

Procedure

The participants’ selection and inclusion criteria, compensation for participation, procedure, and data cleaning guidelines were the same as in Study 1. Participants could select from five waves of data collection (i.e., January 20–29, February 3–12 and 17–26, and March 2–11 and 16–24) during the Winter 2020 university semester. In total, 45 of the 826 reports (5.44%) were excluded in data cleaning for careless responses, invalid entries and participation, duplicates, and single (i.e., cross sectional) entries. As in Study 1, the research ethics board at the

university of the first two authors reviewed the ethical aspects of this study and granted their approval. See Appendix F for a copy of the study materials.

Plan of Analysis

Study 2 followed the exact same analytical plan as Study 1. First, preliminary Longitudinal Measurement Invariance analyses were conducted separately for each DT trait and Big Five agreeableness. As in Study 1, $CFI \geq 0.90$ and $RMSEA \leq 0.10$ were considered to be of adequate fit, with $RMSEA$ 90%*CI* values below 0.05 and above 0.08 for the lower and upper bound, respectively, indicated acceptable fit. A change (Δ) of $\leq 0.005 - 0.01$ in CFI and of $\leq 0.01 - 0.015$ in $RMSEA$ were considered to represent measurement invariance. Missing values were estimated with WLSMV.

Second, as in Study 1, TSO modeling with autoregressive pathways was applied separately for each DT trait and Big Five agreeableness. Missing values were handled using Maximum Likelihood estimator.

Results

Longitudinal Measurement Models

As in Study 1, our findings revealed measurement noninvariance at different levels across all models for all personality traits. A summary of the longitudinal measurement invariance testing results can be found in Table 8 in Appendix G.

Agreeableness

Configural, metric, scalar, and residual invariance testing⁸ showed no significant decrease in fit to the data for models A1.0 – A1.3 (see Table 8). The models did not converge when testing for models A2.0 – A2.3 (i.e., encompassing occasion measurements 1 – 7).

⁸ The following equality constraints on thresholds were removed from the analysis at all levels of MI testing due to convergence problems: BFI-2-S item 22 threshold 3 at occasion measurement 1 (for models A1.0 and A1.1); BFI-2-S item 2 threshold 4 at occasion measurement 1 and 2 (for models A1.2 and A1.3).

Machiavellianism

The model M1.0 for configural MI (encompassing occasion measurements 1 – 3) did not converge. After correcting likely problem sources, a second trial of testing for configural MI model M1.0 was conducted⁹. Again, the model did not converge. After further corrections of likely problem sources, a third and final trial of testing for configural MI model M1.0 was conducted¹⁰. Again, the model did not converge, such that MI cannot be assumed.

Narcissism

Configural, metric, scalar, and residual invariance testing¹¹ showed no significant decrement in fit to the data for models A1.0 – A1.3. However, MI testing for models N2.0 – N2.3 (i.e., encompassing occasion measurements 1 – 7) did not converge. See Table 8 for details.

Psychopathy

Configural, metric, scalar, and residual invariance testing showed moderate fit to the data and no significant decrease in fit for models P1.0 – P1.3. Configural invariance testing for model including occasion measurement 1-to-7 showed an above-threshold decrease in CFI but an improved RMSEA, although still within moderate fit. Metric, scalar, and residual invariance testing for models P2.1 – 2.3 showed no significant decrease in fit. However, MI testing for models P3.0 – P3.3 (i.e., encompassing occasion measurements 1 – 10) did not converge. See Table 8 for details.

Trait-State-Occasion Analyses

As in Study 1, TSO analyses were conducted using Mplus Version 8.10 (Muthén & Muthén, 2017) with the Maximum Likelihood (ML) estimator. Again, convergence problems in

⁹ For this updated model M1.0, the variance of SD3 item 1 at occasion measurement 3 was constrained to 0. The following equality constraints on thresholds were removed from the analysis at all levels of MI testing due to convergence problems: SD3 items 1, 7 and 9 at occasion measurement 1 threshold 4.

¹⁰ The following model constraints were added or this final update of model M1.0 due to continued convergence problems: SD3 item 1 at occasion measurement 3 was liberated from the analysis. Additionally, equality constraints on thresholds were removed from the analysis at all levels of MI testing on SD3 items 1, 7 and 9 threshold 4 at occasion measurement 1, as well as for SD3 items 7 and 9 threshold 4 at occasion measurement 2.

¹¹ The following equality constraints on thresholds were removed from the analysis at all levels of MI testing for models N1.0 – N1.3 due to convergence problems: SD3 item 18 threshold 4 at measurement occasion 2.

longitudinal MI testing were present so that fully latent models with all measurement occasions could not be estimated. To remedy this problem, composite scores were used to estimate all TSO models (see Figure 2) where state personality was set to correspond to the average score on a given construct on that day (for e.g., state psychopathy on day 2 was defined as the average score on the SD3 Psychopathy subscale). Four separate TSO models were tested; one for each trait. A model building approach was used, where we incrementally increased the complexity of the model starting with an unconditional baseline model (i.e., including only the targeted personality trait), to an initial partial conditional model with initial predictors (i.e., regressing the targeted personality trait onto collaborative and competitive attitudes), to a second partial conditional model with predictors (i.e., regressing the targeted personality trait onto collaborative, competitive *and* social dominance attitudes), to a complete conditional model (i.e., regressing the targeted personality trait onto social attitudes — collaboration, competition and social dominance attitudes, *and* gender).

On par with Study 1, we did not apply simplifying assumptions or model constraints (see Prenoveau, 2016) for all TSO models. All tables related to TSO models can be found in Appendix G. All figures related to TSO models can be found in Appendices D and H. We used Omega (McNeish, 2018) as a reliability measure of internal consistency (see Table 9). More than 95% of Omegas were above 0.8 (range between 0.748 – 0.947), which suggests that measurement error did not negatively impact our TSO estimates, and that our model holds good internal consistency. The descriptive statistics for the main analyses can be found in Table 10, Appendix G.

The details of our unconditional baseline TSO models, which report the standardized factor loadings and regression coefficients, can be found in Table 11. A comparison of the different unconditional baseline TSO models' goodness-of-fit can be found in Table 12. More information on the partitioning of trait vs. occasion specific variance for the unconditional baseline TSO models can be found in Table 13 and Figure 4. Finally, more details about the conditional (i.e., predictor) models' standardized regression coefficients can be found in Table 14.

Agreeableness

As can be seen in Table 11, all standardized loadings of daily state agreeableness loaded strongly and significantly onto the trait factor, and loaded weakly-to-moderately, but still significantly, onto the occasion specific factor. Autoregression pathways showed small-to-moderate significant effect of daily agreeableness onto next-day agreeableness on four (out of nine) occasions.

Relative Stability and Person vs. Situation. As shown in Table 12, the unconditional baseline TSO model (1.0) offered acceptable fit to the data. As can be seen in Table 13 and Figure 4, trait variance explained most of the total variance (82.38% vs. 17.61% for occasion specific variance) across the ten-day period. Furthermore, the carry-over effect of occasion specific variance explained only a marginal portion of total variance (1.92%).

Predictor Models. As can be seen in Table 14 (model 1.4¹²) the daily standardized coefficient loadings for competition, collaboration, and gender as predictors of daily agreeableness tended to be small and statistically nonsignificant. The significant effects across the ten-day period showed that the occasion specific part of state agreeableness was negatively predicted by competition on one occasion and positively predicted by collaboration on three occasions. This means that on those days, participants felt more competitive, which made them feel less agreeable, and when they felt more collaborative, it made them feel more agreeable. No relationship with gender was identified.

Machiavellianism

As can be seen in Table 11, all standardized loadings of daily state Machiavellianism (i.e., mean Machiavellianism score on a given day) loaded strongly and significantly onto trait factor, and loaded poorly-to-moderately, but still significantly, onto the occasion specific factor. Autoregression pathways also showed medium and statistically significant effects of daily Machiavellianism onto next-day Machiavellianism for the first four days of the ten-day period.

¹² The addition of SDO as a predictor caused model nonconvergence. As such, SDO was removed from the final model (1.4).

Afterwards, effects remained low-to-moderate and statistically nonsignificant.

Relative Stability and Person vs. Situation. As shown in Table 12, the unconditional baseline TSO model (2.0) offered acceptable fit to the data. As can be seen in Table 13 and Figure 4, trait variance explained most of the total variance (83.71% vs. 16.26% for occasion specific variance) across the ten-day period. Furthermore, the carry-over effect of occasion specific variance again explained only a marginal portion of total variance (2.2%).

Predictor Models. As can be seen in Table 14 (model 2.4¹³), the daily standardized coefficient loadings for competition, collaboration, and gender as predictors of daily Machiavellianism were small and almost all statistically nonsignificant. Specifically, competition significantly and positively predicted the occasion specific part of state Machiavellianism on two (of ten) days. This means that on those days, participants felt more competitive, which made them feel more Machiavellianistic. No significant relationship with collaboration or gender was identified.

Narcissism

As can be seen in Table 11, all standardized loadings of daily state narcissism loaded strongly and significantly onto the trait factor, and loaded weakly-to-moderately, but still significantly, onto the occasion specific factor. All autoregression pathways were statistically nonsignificant, meaning that the experiences of previous occasion measurements did not impact the occasion specific part of state narcissism on the following days.

Relative Stability and Person vs. Situation. As shown in Table 10, the baseline TSO model (3.0) offered good fit to the data. As can be seen in Table 13 and Figure 4, trait variance explained most of the total variance (88.38% vs. 11.58% for occasion specific variance) across the ten-day period. Furthermore, the carry-over effect of occasion specific variance again explained only a marginal portion of total variance (0.25%).

¹³ As with Agreeableness, the inclusion of SDO in the model plummeted the CFI values to model nonconvergence. As such, a final model (2.4) was tested without this predictor.

Predictor Models. Table 14 (model 3.4¹⁴) shows that the daily standardized coefficient loadings for competition, collaboration, and gender as predictors of daily narcissism are small and almost all statistically nonsignificant. Specifically, collaboration significantly and positively predicted the occasion specific part of state narcissism on two (of ten) days. This means that on those days, participants felt more collaborative, which made them feel more narcissistic. No significant relationship with competition or gender was identified.

Psychopathy

As can be seen in Table 11, all standardized loadings of daily state psychopathy loaded strongly and significantly onto trait factor, and loaded poorly-to-moderately, but still significantly, onto the occasion specific factor. Autoregression pathways showed small-to-moderate significant effect of daily Psychopathy onto next-day psychopathy on five (out of nine) occasions.

Relative Stability and Person vs. Situation. As shown in Table 12, the baseline TSO model (4.0) offered good fit to the data. Table 13 and Figure 4 demonstrate that trait variance explained most of the total variance (85.95% vs. 14.07% for occasion specific variance) across the ten-day period. Furthermore, the carry-over effect of occasion specific variance again explained only a marginal portion of total variance (1.6%).

Predictor Models. As demonstrated in Table 14 (model 4.4¹⁵), the daily standardized coefficient loadings for competition and collaboration were all weak and almost exclusively statistically nonsignificant. Specifically, competition significantly and positively predicted the occasion specific part of state psychopathy on three (of ten) days. This means that on those days, participants felt more competitive, which made them feel more psychopathic. No significant relationship with collaboration was identified. In contrast, standardized coefficient of the binary variable gender showed a significant effect of gender on most days (nine out of ten) where men scored higher on the occasion specific part of state psychopathy.

¹⁴ As with agreeableness and Machiavellianism, the inclusion of SDO as a predictor of narcissism in the model seemed to plummet the CFI values. As such, a final model (3.4) that excluded SDO was tested.

¹⁵ To stay consistent with the other personality traits under study, a final model (4.4) that did not include SDO as a predictor was tested.

General Discussion

The primary goal of the current article was to examine the relative stability of DT traits over short periods of time. To this end, we used a short-term longitudinal design through a ten-day follow-up on two independent samples of emerging adults ($n = 196$ and $n = 107$) across two semesters. We assessed the stability (versus variability) of DT levels by applying a Trait-State-Occasion model (see Prenoveau, 2016), a subtype of Latent-State-Trait model rooted in SEM, with autoregressive pathways to allow accounting for the impact of previous days on current day personality. To our knowledge, this is the first application of this statistical method to the DT traits. Preliminary measurement invariance testing was conducted. Results provide insight into the daily expression of individual differences in DT traits. This discussion will explore the implications of our findings for the DT personality model in the person-situation debate and future opportunities for research.

Measurement Invariance: Implications for our Findings

Before carrying out our main analyses, we conducted preliminary tests of longitudinal measurement invariance (MI). We used a model-building approach to test longitudinal MI on increasingly restrictive (i.e., from configural to residual invariance) and complex (i.e., including increasingly more time measurements) models. Our results from preliminary analyses revealed that longitudinal MI could not be confirmed for all personality traits under examination. This was evidenced by a general pattern of above-acceptable-threshold change of CFI and RMSEA indices paired with nonconvergence in more complex models (see Table 1 and Table 8 summaries). This issue was present across both studies. However, it is important to note that our results demonstrated a good fit to the data in less restrictive (e.g., in configural invariance) and simpler (e.g., including only three occasion measurements) models. The only exception was observed for Machiavellianism in Study 2, where even configural invariance in the simpler baseline model could not be confirmed.

Two possible explanations exist for the observed nonconvergence in restrictive and complex models. One possible interpretation could be that the longitudinal measurement

invariance of the SD3 and BFI-2-S does not hold for more than three days. This would mean that the structure (configural) of the DT traits and agreeableness, the strength of the relationship between these traits and their measurement items (metric), the threshold for these traits (scalar), and the influence of random error in their measurement (residual) only remain invariant and thus comparable across three occasion measurements. Research has not frequently examined longitudinal MI of the DT traits, and even less so using the SD3, making it difficult to assess the soundness of this possible interpretation. Nevertheless, we found one research that also studied this concept to compare our results. The results demonstrated strict (i.e., configural, metric, scalar, and residual) measurement invariance in DT across three occasion measurements or less (see Zettler et al., 2021). We could thus expect also to confirm longitudinal MI on all DT traits for as many as three occasion measurements. We could not do so with Machiavellianism in Study 2. Furthermore, the notion that measurement invariance could not hold past three occasion measurements is unlikely, as much empirical evidence has demonstrated that strong (i.e., configural, metric, and scalar) measurement invariance of agreeableness (and other Big Five traits) holds on more than three occasion measurements (see e.g., Lucas & Donnellan, 2011; Specht et al., 2011). These empirical findings may refute our original proposed interpretation that longitudinal measurement invariance for the BFI-2-S and SD3 does not hold for past three days.

An alternative and more parsimonious explanation is that our models did not have enough statistical power to observe longitudinal MI, if present, due to sample size. A generally accepted rule states that the ratio of observation to parameters should be roughly 20 to 1 or, ideally, 10 to 1 (Kline, 2023). This means that for a model that estimates 10 parameters, a minimum sample of $n = 100 - 200$ would be necessary to support any conclusions meaningfully. Of course, more complex models with more parameters necessitate bigger sample sizes because they require more estimates, which require more observations to estimate with reasonable accuracy (Kline, 2023). For context, in Study 1 Model A2.3 (i.e., residual measurement invariance testing for Agreeableness, see Table 1 in Appendix C), there were 100 free parameters, meaning that a minimum sample size of 1000 to 2000 participants might have been necessary. In Study 2 Model

N2.3 (i.e., residual measurement invariance testing for Narcissism, see Table 8 in Appendix G), there were 70 free parameters, meaning that a minimum sample size of 700 to 1400 participants might have been necessary to obtain sufficient power. Hence, in hindsight, it is unlikely that longitudinal MI could be observed with the complexity of our models and the available sample sizes.

Person-Situation Debate: The Importance of Personality Traits

To observe the relative stability of the DT over a short time-period, we conducted TSO analyses with autoregressive pathways to decompose the variance explained by a stable latent trait from that explained by changing daily situations (i.e., occasions) while accounting for the influence of participants' experiences in previous days. In both studies, results from our TSO analyses showed a strong fit to the data and strong omegas in unconditional baseline models (i.e., without predictors). This suggests that the structure of personality, as presented in our TSO models, is a reliable and accurate representation of the expression of personality in daily life across ten days. In both studies, our results demonstrated that across ten days, interindividual rank-order consistency is primarily stable (rather than variable), and explained mainly by a latent personality trait rather than by changes in the situations individuals find themselves in. Moreover, the carry-over effect of the experience of the previous day had only explained a small portion of variation in DT states (4–13%), suggesting that the effects of recent circumstances could be limited in scope or duration. As such, of the three alternative hypotheses, the hypothesis H1b (*Trait-Anchored* stability hypothesis) received the most empirical support. This was evidenced by the fact that for all traits under examination, in both studies, the total variance explained by the trait factor was much greater than that explained by the occasion factor (80–88% compared to 11–20%). This means that personality states in our samples remained mostly stable over ten days due to latent stable personality traits rather than fluctuate because of changes in the situations on occasion measurements. This stability in rank-order is consistent with evidence showing high test-retest correlations (i.e., $r^{tt} = 0.72–0.93$) in Big Five (Arterberry et al., 2014; Chmielewski & Watson, 2009) and DT (Dragostinov & Möttus, 2023; Malesza et al., 2017; Wolff & Wetzel,

2023) traits.

One reason for our observed stability might be that a ten-day period might be too short to have a big enough variety of situations that would prompt changes in personality states. If people tend to choose situations that align with their personality (Ickes et al., 1997; Wrzus et al., 2016), it is possible that our participants tended to mostly engage with situations that matched their personality, which may in turn have homogenized the situations they encounter, further reducing environmental variability. Furthermore, research has shown that people tend to behave more similarly in similar situations than in dissimilar situations (R. A. Sherman et al., 2010). This might, in part, be explained by the possibility that people's personality correlates with how they interpret situations. For example, higher DT traits are associated with perceiving more opportunities for deception in social interactions (Jonason & Sherman, 2020). The aforementioned results highlight the predominance of personality traits in the interaction with one's environment. The rank-order stability observed in our studies might reflect such a tendency, at least in short periods. It is possible that participants did not encounter, or select, a wide enough range of situations during the ten-day period to exhibit the variety of behaviours and attitudes that would be captured by personality measures. This hypothesis is aligned with the stance of some researchers who argue that true personality change should not occur over short time periods (Cattell et al., 1970) but rather might take six to twelve months to observe (Chmielewski & Watson, 2009).

Despite the strong rank-order consistency observed in our results, we also found non-negligible variability (11 – 20%) in personality states driven by situational differences at each measurement occasion. This suggests that, even over a relatively short time frame like days, interindividual differences in personality states showed meaningful fluctuations in response to daily situational changes. This result may be attributable to the selection of the SD3 (Jones & Paulhus, 2014) as a measure of DT traits. The SD3 focuses on beliefs and attitudes rather than observable behaviours. This would allow participants to still identify with the questionnaire items without tangible behaviours enacted within the last 24-hour period. Hence, the variability we

observed in our results might reflect the more state-like nature of self-concepts. Furthermore, our research design allowed participants to join the studies in one of several waves of data collection of their choosing. As such, participants, in theory, presented a heterogeneous pool of individual situational experiences that could have influenced their personality states in short periods.

In sum, TSO analyses showed that in our samples, although there was some situational variability in rank order across ten days, personality states mainly stayed stable due to their corresponding personality trait. Our results are aligned with the trait theories of personality supporting personal characteristics, such as genetics (Geen, 1997), influence the development of stable personality traits (McCrae & Costa Jr., 2008; McCrae et al., 2000). Our studies are part of the few investigations of rank-order consistency of the DT in daily life (rather than in longer time intervals), prompting us to interpret these results with caution.

The DT and Normative Personality: More Similar than Dissimilar

TSO analyses can be used to descriptively compare the expression of relative stability between different variables (Prenoveau, 2016). To this end, we assessed participants' daily agreeableness to descriptively compare its patterns of relative stability to the DT's. Our results were incompatible with our original hypothesis (H2) and instead highlighted similar expressions of relative stability across both studies for all traits, Dark Triad and Big 5 agreeableness alike. Specifically, the portion of total variance explained by trait variance was approximately four times greater than that explained by occasion variance (see Table 6 in Appendix C and Table 13 in Appendix G). The substantial similarity between the traits' expression of relative stability is in keeping with the theoretical assumption that the DT traits operate similarly as, and share commonalities with, other normative traits such as the Big Five (Jakobwitz & Egan, 2006; O'Boyle et al., 2015; Paulhus & Williams, 2002; Vernon et al., 2008; Vize et al., 2020).

Social Attitudes, Gender, and the DT: Chicken or the Egg?

The DT is most often studied as a trait and, as such, as a predictor variable. Our research design was original, as it placed the DT as a predicted variable to see if certain social attitudes (that reflect attitudes towards corresponding social contexts) and gender might help predict

variability in DT states.

In our results, competitive and collaborative attitudes showed varying and inconsistent influences the occasion specific portion of DT states. For Machiavellianism, competition showed a significant positive effect 20–30% of the time across studies and collaboration showed a significant negative effect 10% of the time or less across studies. For narcissism, competition showed a positive significant effect 40% of the time in Study 1, but no effect in Study 2. Collaboration showed a significant positive effect on narcissism 20–40% of the time across studies. For psychopathy, competition showed a positive significant effect 30–60% of the time across studies and collaboration showed no effect at all on psychopathy across both studies.

Considering our results, competitive and collaborative social attitudes sometimes, but not consistently significantly predict daily DT, which only partly supports our hypotheses H3a and H3b. Considering that the expression of personality tends to vary across social contexts (Robinson, 2009), we expected our results to more consistently find that competition would predict higher DT states and that collaboration would predict lower DT states. One possible explanation for our inconsistent results could be that personality might better predict attitudes than be predicted by them. Personality is known to predict cultural (Blais-Rochette et al., 2022; Hodson et al., 2009), peaceful (Cavarra et al., 2021), SDO and Right-Wing Authoritarianism (Perry & Sibley, 2012), and sociosexual (Fernández del Río et al., 2019), attitudes, but less so for being predicted by attitudes. As such, the reason for our unexpected results may be our misconception of the directionality of the relationship between personality and social attitudes.

Although the associations were not as systematic as anticipated, the direction of the predictions are aligned with the established positive associations between DT traits and competition (Jonason, Baughman, et al., 2015; Jonason, Li, & Teicher, 2010; Spurk & Hirschi, 2018; Vaughan & Madigan, 2021) and their negative association with collaboration (e.g., in the workplace; O’Boyle et al., 2012). Interestingly, results from both studies showed that when associations between collaboration and narcissism were found, they were *positive*, meaning that

participants felt more collaborative which in turn made them feel more narcissistic. This result was unexpected, as narcissism has been negatively associated with collaboration (e.g., O'Reilly et al., 2021). Nevertheless, this positive association could reflect a tendency towards self-serving bias observed in narcissism (Eddy, 2023) for which collaboration could be beneficial.

The results from our studies also showed that gender differences were present, but inconsistently so (i.e., 11 significant effects out of 30 in Study 1, and 9 significant effects out of 30 in Study 2). Across both studies, no gender differences in Machiavellianism were found. Significant gender differences (with men scoring higher) in narcissism were identified 70% of the time in Study 1, but no gender differences were identified in Study 2. For psychopathy, gender differences (with men scoring higher than women) were identified 40–90% of the time across both studies. Hence, our hypothesis H4 was partially supported, with *some* but *inconsistent* indication that men exhibited higher DT levels than women over 10 days. When gender differences were observed, they were aligned with the extensive evidence that men score reliably higher than women on all DT traits (Muris et al., 2017; Paulhus & Williams, 2002).

Finally, a consistent and unexpected result was the systematic nonconvergence of our TSO models when introducing SDO as a predictor of daily personality in all (except Psychopathy) models in Study 2. These results are surprising considering the established positive associations between DT traits and socially dominant attitudes (Jonason et al., 2020; Jones & Figueredo, 2013; Lee et al., 2013). One possible explanation for this result is that, as with competition and collaboration, personality better predict attitudes than be predicted by them. Another possible cause is that our measure of SDO lost validity due to sampling only two items from the original scale, causing convergence problems. Indeed, the selected items (compared to other potentially selected items) can have an important impact on the empirical meaning of the measured construct, which has ramifications on interpretation and generalizability of results (Avila et al., 2015). Nevertheless, is it most likely that adding SDO as a variable in the models tipped the ratio of unknown parameters (due to missing data) to become greater than the available information to identify the model, causing nonconvergence.

In sum, across both studies, our investigations of the sources of variability in the daily expression of DT were unexpected and only partially supported our hypotheses. Competition and collaboration had inconsistent influence on the occasion specific portion of daily DT states. SDO did not fit in our TSO model. We observed gender differences that demonstrated men scored higher than women, although those results were inconsistent across traits and studies. Similar to what we observed with longitudinal MI testing, the addition of predictors in the models might have increased their complexity and, as such, diminished their predictive power, leading to inconsistent results. Furthermore, our findings may simply reflect a natural consequence of the low variability observed in our main TSO analyses. That is, given that occasion-specific fluctuations accounted for only 11–20% of the total variance — compared to the 80–88% attributed to stable trait components — there may be insufficient variability in the daily DT state to reliably determine its underlying potential causes.

Limitations and Future Direction

Our studies have limitations. First, our small sample sizes reduced predictive power, which did not allow us to confirm longitudinal MI and negatively impacted models fit to the data in TSO analyses of conditional models (i.e., predictor models). When developing the TSO model, Cole and colleagues (2005) demonstrated that this model could perform well with a $n = 200$ sample size and four waves of data collection, and even better when sample size grew ($n = 500 - 1000$) or waves of data collection increased (e.g., 8–12 waves). Given our sample sizes of $n = 107$ and $n = 196$, and given our 10 waves of data collection, the TSO analyses could, in theory, perform well. We indeed observed this from our baseline models, which had excellent fit to the data. Nevertheless, most research studies that applied TSO modeling collected larger sample sizes (e.g., $n = 600$ or more). For example, Kline (2023) highlights that most SEM-published studies had sample sizes between $n = 260 - 375$ and that this still might not be sufficient to support conclusions due to the complexity of our longitudinal SEM models. Because we could not confirm measurement invariance, we could not confirm that our latent constructs were being measured consistently across time points. This can limit the inferences made about

results (e.g., it is more difficult to ascertain that observed variability is due to actual change versus differences in measurement). Consequently, interpretations of results from the TSO analyses must be considered cautiously. However, to address this issue, we have shifted to a partially latent TSO model in our main analyses, such that the State component of the model (see Figure 2) was defined as the average score for the given construct on that day (e.g., State Machiavellianism on occasion measurement 3 was set to be equal to the average Machiavellianism score on that day, instead of being a latent construct estimated from manifest variables/ items). Moreover, our Omegas (see Table 2 in Appendix C and Table 9 in Appendix G) suggest acceptable internal consistency. We believe this adjustment mitigated the possible issues from a lack of short-term longitudinal MI.

Another limitation of our studies concerns the limitations of TSO analysis itself. TSO models investigate how stable the rank-order consistency of a construct is over time (Soland et al., 2019). We know rank-order consistency increases as the time between time points decreases (Fraley & Roberts, 2005). Given that the time between timepoints in our research design was short (i.e., hours), it might have contributed to the high rank-order consistency observed in our results. Moreover, although rank-order consistency is important, it is only a portion of the relative stability of personality. Rank-order consistency measures how much change people experience relative to one another. Although important, it does not inform on how much or in what direction a sample increases or decreases on a given construct (i.e., mean-level change) and does not address how much change happens at the intra-individual level (i.e., how much people change relative to themselves). To better include within-person change, future research could build on our design by applying a multilevel TSO model (Castro-Alvarez, Tendeiro, Meijer, & Bringmann, 2022), which models within (Level 1) and between (Level 2) levels. Another limitation of the TSO model is that it does not indicate what situations cause changes in the construct of interest (in our studies, the DT traits and agreeableness). Although we attempted to capture this by integrating predictors in the model, a future application of our research question could use a mixed-effects TSO model (Castro-Alvarez, Tendeiro, de Jonge,

et al., 2022), which models person-situation interaction effects. This would also allow to expand the possible predictors of variability in DT traits by investigating a broader array of social situations (e.g., job interviews, interpersonal conflict, collaborative activities).

Conclusion

Our studies contribute to fundamental research on the DT by examining its relative stability through short time periods, such as days. It presented a robust and thorough analysis strategy across two studies. Our studies offered an in-depth examination of the relative stability of the DT by including longitudinal analyses that attempted to uniquely and innovatively capture factors that could predict fluctuations in daily DT states. Our studies also deepened our understanding of the DT by comparing its patterns of relative stability to that of its Big Five agreeableness antithesis.

Our main results highlight that, in our samples, there was a strong influence of stable traits on the consistency of personality expression over short periods rather than the influence of changing situations or previous situations. Nevertheless, there was nonnegligible variance in rank-order due to the changes in situational characteristics, which underscores the potential for change. Results from our studies also demonstrate the similarities of this pattern between DT traits and their Big Five agreeableness counterpart, which could suggest that the DT traits operate similarly to other normative traits. Finally, our sample size potentially did not have sufficient power to demonstrate a consistent influence of social attitudes on the expression of daily personality, or consistently replicate gender differences.

In sum, our studies presented a sophisticated research design (i.e., short-term intensive longitudinal design with multiple waves of data collection) with robust analyses that provide some insight on the DT traits' patterns of relative stability, its conceptualization in the person-situation debate, and its legitimacy as a normative personality model.

CHAPTER 3: Assessing the Relative Stability of DT Traits Across Situations**Abstract**

The relevance of the influence of situational factors on personality-relevant behaviour has long been debated in personality and social psychology. Today, the general research consensus supports an interactionist perspective that recognizes how both personality pre-dispositions and situational characteristics influence the development and expression of personality. Although this interaction of personality and situation has been widely studied in the Big Five or Five Factor Model, it remains understudied in the Dark Triad (DT) personality model. Hence, this study examined the relative stability of DT traits across situations by directly testing if certain social situations could lead to observable differences in DT states. Specifically, we used an online experimental design to determine whether three different putative social situations (collaborative, competitive, and neutral/control) could explain changes in DT states. Participants ($n = 276$) self-reported their general DT traits. Then, in a double-blind process, participants were randomly assigned to one of the social conditions to participate in an online activity. Finally, their self-reported DT states were collected immediately after their participation in the experimental condition. Three separate Analysis of Covariance (ANCOVA) were conducted to assess whether gender or exposure to different social situations could explain mean-level differences between groups, while controlling for their baseline DT. Results underscored that baseline DT traits predicted DT states after participating in experimental conditions, while no influence of social situations (i.e., experimental conditions), gender differences, or interaction effect were supported.

Keywords: Dark Triad, personality traits vs. states, experimental design, Machiavellianism, psychopathy, relative stability, person-situation debate.

The longstanding person-situation debate in psychology has opposed two fundamental ways of explaining human behaviour. The trait position, held by personality psychologists, claims that behaviour is largely stable and determined by personality disposition (Costa & McCrae, 1998; Wright & Jackson, 2023). The contextualist position, held by social psychologists, posits that behaviour is a situational reaction to context and that, as such, situational cues are largely responsible for our behaviours (Mischel, 1973; Roberts & Davis, 2016). Hence, trait theorists assert that personality traits make behaviour consistent across situations, whereas social psychologists assert that personality states and related behaviours tend to change according to situations. Today, research recognizes that an integration of both positions better represents how dispositions and environment cues interact to predict behaviour (Fleeson, 2004; Funder, 2006), at least for normative models such as the Big Five (Goldberg, 1990, 1992) and Five Factor Model (FFM; McCrae & Costa, 1987). Indeed, trait-relevant behaviours can be generally consistent due to overarching personality traits, yet we recognize that we can adapt our behaviours to fit situations (Epstein & O'Brien, 1985). *Traits*, by definition, represent stable and generally enduring dispositions towards thoughts, feelings, and behaviours (Costa Jr. & McCrae, 2006). At the same time, personality can vary according to the environment, such that one may not think, feel, or act the same in different situations. This momentary expression of personality at a given time or situation represents *state* personality (Eysenck, 1994). As such, a core postulate of personality trait theories is that traits are both stable and changing across situations, which is known as the *relative stability* of personality traits (Morizot & Miranda, 2007).

In recent years, a new model of personality, namely the Dark Triad (DT; Paulhus & Williams, 2002), has gained interest due to its malevolent and harmful interpersonal style. However, the study of the relative stability of DT traits, and especially the examination of factors that could influence changes in DT states and traits, has been neglected. This is problematic because relative stability of traits is a fundamental element to understand. The current research aims to fill this research gap by examining the relative stability of DT traits across different social situations through an experimental design. This introduction will first discuss the DT personality

model and its associations with pertinent social correlates. Then, we will discuss broadly how social situations influence state personality and personality change, as well as more specifically how this applies to the DT traits. Finally, a summary of the research objectives, plan of analysis, and hypotheses will be provided.

The Dark Triad of Personality

The DT has gained significant popularity in research over the past 25 years (Paulhus & Williams, 2002). The DT is a personality profile consisting of three interrelated, socially aversive but subclinical personality trait: Psychopathy, narcissism, and Machiavellianism. Psychopathy describes a tendency towards the disregard of others, low empathy, and low anxiety. Narcissism describes a tendency towards entitlement, grandiosity, and dominance. Machiavellianism describes a tendency towards manipulation, cynicism, and emotional coldness.

The underlying premise of this model is that, although these traits may be abrasive, they exist within the spectrum of normal personality, meaning that everyone exhibits these traits to some degree in everyday life, without necessarily being a diagnosable psychopathology (Paulhus & Williams, 2002). Indeed, DT traits have been consistently found in nonclinical populations, including university students (Krick et al., 2016; Paulhus & Williams, 2002). University students are usually in the developmental stage of Emerging Adulthood (EA; Arnett, 2014), in which individuals aged 18 to 25 years navigate new social roles as they transition from adolescence to adulthood. EA has been found to be a period of personality exploration (Arnett, 2014) and change (Roberts & Davis, 2016) that bring on personhood instability. This developmental instability can yield negative emotions and stress, which have been associated with the DT traits (Barlett & Barlett, 2015). Considering the pertinence of personality change and the DT traits in EA, our study will focus on a sample of emerging adult university students.

Consistently, gender differences have been found when examining DT traits, where men exhibit higher DT levels than women (Muris et al., 2017). Meta-analytical findings indicate, however, that effect sizes are in the small-to-medium range, with higher gender differences noted in psychopathy compared to Machiavellianism and narcissism (Muris et al., 2017). Considering

the established gender differences, we will consider gender in our analyses.

Social Competition, Collaboration, and The Dark Triad

The increased research attention received by the DT could be due to its potentially abrasive interpersonal repercussions. Indeed, the DT traits have been linked to a competitive, individualistic social style (Jonason, Li, & Teicher, 2010), hypercompetitiveness (Houston et al., 2015; Luchner et al., 2011), lying (Jonason, Lyons, Baughman, & Vernon, 2014), social dominance orientation (Jonason et al., 2020; Jones & Figueredo, 2013; Lee et al., 2013) and prejudice (Gluck et al., 2020; Jonason et al., 2020). Conversely, the DT traits have been negatively associated with collaboration (Bereczkei & Czibor, 2014; Paal & Bereczkei, 2007), even in settings where it is expected, such as at work (O’Boyle et al., 2012). These malevolent behaviours could be explained in part by recent findings showing that the DT is correlated with being sensitive to and motivated by rewards (Jonason & Jackson, 2016). Moreover, they support the idea that the DT is part of an evolved system of short-term self-rewarding active exploitation of one’s social environment, with social expectancy of returned favors and low genuine investment in relationships (Jonason, Duineveld, & Middleton, 2015). Together, these social attitudes especially underscore the DT traits’ orientation towards social competition rather than collaboration, which denotes a desire to outperform others to gain — potentially at their detriment — resources or status (West-Eberhard, 1983).

The Relative Stability of Traits in Social Situations

One way to understand how situations influence trait-relevant behaviour is through the Cognitive Social Learning (CSL) model proposed by Mischel (1973). The CSL suggests that behaviour is context-dependent, and that personality can only be understood by examining how behaviour unfolds within, and is shaped by, specific situational contexts. Hence, the CSL challenges the traditional trait-based approaches that often overlook environmental influences. In this view, personality and situations interact dynamically to produce situation-specific behaviours. Mischel (1973) explains that psychological situations can vary in terms of their “power.” Powerful situations are those that clearly define the expectations for appropriate behaviour,

leading to more predictable and uniform responses. When a situation is said to be powerful, behavioural responses are more likely to be explained by situational cues. In contrast, weak situations are those that create ambiguous expectations about the appropriate behaviour response, leading to behaviour responses that are more influenced by personality dispositions rather than situational cues. This suggests that certain situations are more likely to influence behavioural and attitudinal responses in individuals than others, in part due to the clarity of the expectations for said responses.

Building on the idea that behaviour is influenced by situational contexts, it is also important to explore how social situations can contribute to changes in personality. Situations can influence state personality (momentary changes in behaviour, thoughts, emotions, and attitudes), which, over time, may affect trait personality at a more general level. Stability and change of personality, otherwise known as *relative stability*, is measured through rank-order consistency and mean level change, which both measure interindividual group trends. Rank-order consistency refers to the relative position of individuals within a group (e.g., analogous to a percentile ranking) and assesses whether individuals change in the same direction over time (Ashton, 2017). Mean-level stability looks at whether a group increases or decreases in their mean levels on each trait dimension over time or across situations (Roberts & DelVecchio, 2000).

Social Situations and Personality Change

One way to observe the effect of the environment on personality is through observing people engaging with and in social situations. Indeed, a staple of social psychology has been the study of the impact of situations on social behaviour (like personality state) and attitudes. Social situations involve actions from individuals that are shaped by the external conditions at a given time, based on how participants subjectively assess the situation (such as their personal perspective or mood) and the objective features of the situation (like its physical or social aspects; Furnham & Argyle, 2013).

Social psychologists have long argued the importance of considering social environments and situations (e.g., life events, roles, experiences) in understanding behaviours (Mischel, 1973;

Roberts & Davis, 2016), which in turn helps us understand personality. There is evidence for such a claim in the literature. For instance, a study using multivariate latent change models found that students adults who live abroad experience an increase in Openness and a decrease in Neuroticism, with this change being fully mediated by the formation of international friendships (Zimmermann & Neyer, 2013). Another study using latent growth curve modeling suggests that Conscientiousness may increase due to taking on leadership roles at work, likely driven by increased responsibilities (W.-D. Li et al., 2021). Other studies have found that personality varies as a function of social roles and/or social status (Specht, 2017), social demands (Specht et al., 2011), cumulative adversity (Shiner et al., 2017), and life events (Bleidorn et al., 2018; Roberts & Mroczek, 2008). Together, these findings highlight how situations — particularly the interpersonal and social characteristics of situations — can drive adaptive changes in personality states and traits over time. One in-depth daily diary research project specifically examined what aspects of situations were associated with personality state change, and how did these changes manifest (Fleeson, 2007a). In a series of two experience sampling studies, participants reported Big Five related behaviours (e.g., quiet/energetic for extraversion, warm/polite for agreeableness), as well as situational characteristics (e.g., “How structured was the situation?”, “How much did you interact with others”). The results underscore three important elements. First, certain situational characteristics consistently affected trait-content manifestations. For instance, people were more extraverted and agreeable in friendlier situations, but more conscientious and slightly higher in neuroticism in task-oriented ones. Second, different traits were activated by different situational factors. Anonymity, for example, was linked to increased state conscientiousness, but had no effect on state neuroticism. Finally, the characteristics of the situation partially influenced behavioural changes. People adjusted their personality states (e.g., extraversion) in response to changing situational characteristics, such as task orientation or anonymity. Fleeson’s findings are especially pertinent for this research project because they suggest that situational characteristics can determine the direction and extent of personality-state change.

Competitive and Collaborative Social Situations. More structured research designs have also been interested in how social situations impact personality and relevant behaviours. These studies have taken many forms, like role-playing (e.g., the Stanford Prison experiment; Haney et al., 1973), and scenario-based (e.g., the Milgram experiment; Milgram, 1963) experiments and games. For example, several studies have explored the impact of playing competitive and collaborative games on behaviours and attitudes. Research has shown that playing a collaborative game in pairs leads to more collaboration with a partner than when competing against them (Ewoldsen et al., 2012) and fosters greater collaboration with others in general (Greitemeyer et al., 2012). Similarly, playing collaboratively with a partner to achieve a common goal has been found to increase participants' empathy — a concept negatively correlated with the DT traits — compared to those who played the same game individually (Greitemeyer, 2013). In contrast, with respect to competition, one longitudinal study showed that prolonged exposure to competitive video games predicted increased aggression in adolescents (Adachi & Willoughby, 2013). Furthermore, Schmierbach (2010) found that players exhibited higher levels of aggressive cognition when playing competitive video games, compared to when they played alone or in teams. Incidentally, research has established that aggression is closely linked to DT traits (Paulhus et al., 2018).

Taken together, the findings reviewed suggest that competitive social situations tend to increase competitive and aggressive attitudes and behaviours, whereas collaborative social situations tend to increase collaborative attitudes and behaviours. This flexibility in attitudes and behaviours reflects an adaptation to different social situations, which is what is captured by personality state change. The questions relevant to this study, then, are how these findings apply to DT traits and which situational characteristics might trigger changes in DT states.

The Relative Stability of Dark Triad Traits in Situations

To comment on the relative stability of DT traits across different situations, we need to review the limited extent of empirical research that has investigated DT traits as dependent variables.

In recent longitudinal daily diary studies, DT states have all been shown to present high within-person variability across a 5-to-10-day period (up to 70% variance, Hardin & Smith, 2022; Nübold et al., 2022), and to increase due to experiencing role conflict at work (Nübold et al., 2022). This tendency was also observed for narcissism specifically, which has also been shown to present high within-person variability in experience sampling studies (Giacomin & Jordan, 2016a). These results highlight the potential for change, especially at a within-person level, in DT traits. When measured in daily life over short periods, narcissism was found to increase due to experiencing role conflict at work (Nübold et al., 2022), and to experiencing increased positive agentic outcomes (e.g., feeling powerful, having control over others, or being assigned an important role in a group) in college students (Giacomin & Jordan, 2016b). Increase in psychopathy, across the lifespan, has been shown to be consistently predicted by having antisocial family and peers (Bergstrom et al., 2016). As for Machiavellianism, social experiments have shown Machiavellianism levels to be higher (although no baseline levels were assessed) after recalling or engaging in rivalry compared to neutral (e.g., recalling your commute) memories or engagements (Kilduff & Galinsky, 2017). Based on these results, it seems like certain social contexts, such as conflict, rivalry, and dominance, might especially lead to higher DT states.

Social Games as a Proxy for Social Situations

Social games, a specific type of social situations, has often been used in social psychology as a proxy to examine prosocial behaviours (Greitemeyer et al., 2010), intergroup attitudes (Greitemeyer, 2014), competitiveness (Baumert et al., 2014), and empathy (Greitemeyer, 2013). Social games can replicate real-life social situations because they mirror the social structures and tensions participants experience (e.g., gaining rewards, navigating interpersonal loyalties, and protecting self-esteem; Goffman, 1961). Research has mostly focused on how DT traits correlate or predict competitive and collaborative behaviours. Although it does not provide insight on the prediction of DT traits *from* these social situations, it is still noteworthy to discuss.

Psychopathic traits in community samples have been shown to predict uncooperative behaviours in social games (Johnston et al., 2014). Similarly, a study with 30 university students

found that individuals with low psychopathy scores were more likely to cooperate in a virtual game, while those with high psychopathy scores were less likely to cooperate and more likely to defect, showing a bias against collaboration (Rilling et al., 1969). These findings suggest that having higher psychopathy traits might lead to more competition than cooperation. However, no research has yet examined how psychopathic traits evolve in controlled experimental settings, which could provide insight into how these traits shift in real-time interactions.

Machiavellianism has received more attention in social games. Machiavellian traits are strongly negatively correlated with cooperation (Bereczkei & Cziror, 2014) and positively correlated with hypercompetitiveness (i.e., the motivation to win at all costs; Houston et al., 2015). In social games, participants with higher Machiavellianism scores tended to manipulate others more (Christie & Geis, 1970) and derive more pleasure from that manipulation (Geis et al., 1970). Higher Machiavellianism has also been found to adapt their interpersonal strategies in higher stakes situations (Christie et al., 1970). Newer research, however, has highlighted different findings, showing that higher Machiavellianism levels did not translate in more adaptation to the altruistic or competitive behaviour of others, suggesting resistance to environmental cues (Bereczkei & Cziror, 2014). This aligns with the view that individuals high in Machiavellianism often disregard social norms of cooperation (Bereczkei, 2018). Overall, results on Machiavellianism and social games are mixed, highlighting the need for more research.

In a study where participants played a resource allocation game in groups, higher narcissism was associated with harvesting more land, depleting resources faster (Campbell et al., 2005). In other words, higher narcissism was linked to more allocation of resources to oneself at the detriment of the group, suggesting a more competitive attitude that focuses on short-term gains rather than the common good. This aligns with other research showing associations between narcissism and (hyper)competitiveness (Luchner et al., 2011). It also aligns with findings showing that individuals with higher narcissism levels perform better in environments that serve their goals and offer high rewards (Nevicka et al., 2011). However, other research findings highlighted no association between narcissism and aggression in competitive settings (Hyatt et al., 2018). In this

study, narcissism didn't predict shock administration in a competitive context, suggesting that narcissism may not always be driven by competition. Overall, the relationship between narcissism, competition, and collaboration remains ambiguous and warrants further investigation.

Knowing that the DT traits are more inclined toward social competition and more averse to social collaboration, how might these social situations impact DT state changes? This question will be central to this research article.

The Present Research: The Relative Stability of Dark Triad Traits Across Situations

Modern personality theories acknowledge that both personality dispositions and situational factors influence behaviour. The CSL theory of personality (Mischel, 1973) emphasizes the importance of examining personality within specific situations to more accurately predict how people will behave in different contexts. Our tendency toward consistent patterns in thinking, feelings, and actions can be understood through the stability of personality traits, while our ability to adapt to specific situations is reflected in the momentary expression of personality states.

To date, research investigating how situations influence the DT traits is scarce. This is likely because the DT traits are often viewed as stable dispositions, rather than as outcomes that may change in response to situational factors. This gap in knowledge limits our understanding of one of the core ideas in personality theory: relative stability. In essence, relative stability refers to the notion that personality is both stable over time and flexible enough to adapt to different situations. This study directly addresses this gap by asking: Can various social situations lead to changes in DT states? In other words, are there situations that could trigger observable shifts in DT traits? One way to answer this question is to compare how DT traits shift across different social situations. Because of the associations between the DT traits, competition and collaboration, we specifically compared how DT traits changed across competitive and collaborative situations, while accounting for other factors such as gender and their baseline DT levels.

To this end, an online experimental design was employed in which participants were

randomly assigned to one of three conditions: Competitive, collaborative, or neutral. Their DT levels were assessed both before (pre-test) and after (post-test) their participation in the experimental conditions. For each trait, an Analysis of Covariance (ANCOVA) was used to examine whether participants in the different conditions showed significant changes in their DT states, while controlling for baseline DT scores and accounting for gender. In an ANCOVA, significant change translates in mean-level differences between groups.

Hypotheses

Our hypotheses are inspired by the SCL model (Mischel, 1973). If people's appraisal of situational cues helps them determine the appropriate response, we can expect that participants will adapt to the nature of the social situations they are in, which in turn should reflect personality state changes. Such state change would be observable through mean-level differences between participants from the different experimental conditions. As such, our two hypotheses are as follows:

- H1a: Those in the *competitive* condition will have higher levels of DT compared to those in either the collaborative or neutral conditions.
- H1b: Conversely, those in the *collaborative* condition will have lower levels of DT compared to those in either the competitive or neutral conditions.

Method

Sample Description

The sample consisted of 276 emerging adult students (i.e., between 18 and 25 years old) from the university of the authors. Participants were 76.8% women (23.2% men). The mean age of participants was 19 years-old ($SD = 1.22$). Fifty-six percent of participants (56.5%) identified English as their native language, whereas 20.3% identified French and 23.2% identified another language. Participants came from a variety of university programs (39.3% from Social Sciences, 23.6% from Sciences, 17.5% from Health Sciences, 11.6% from Arts, 3.6% from Engineering, 2.5% from Management, 1.1% from Medicine, and 0.7% from Law). Participants came from

diverse ethnic backgrounds: 48.2% identified as White (Caucasian or European), 10.9% as Black (Caribbean or African), 8.7% as East Asian, 8.3% as South Asian, 8.0% as Middle Eastern, 7.6% as multiethnic, 2.9% as Latino, 3.3% as North African, 1.1% as Aboriginal/Native, and 1.1% as identifying to another ethnic identity. Participants completed the study in exchange for course credits. After data cleaning, a total of 106¹⁶ participants were removed from the original sample (e.g., outside of age, unreliable participants, withdrawn participants, etc.). In total, 276 participants were included in the final analyses.

Measures

Demographics

Participants answered questions pertaining to demographic information, namely their (a) age, (b) gender identity, (c) native language, (d) cultural and ethnic identity, (e) student status (full or part time), (f) academic program, and (g) years in their program. See Appendix J for a copy of the demographic questions.

Dark Triad

The DT traits were measured at pre-test and post-test using the Short Dark Triad (SD3; Jones & Paulhus, 2014). Participant rated how much they agree with a series of statements related to the DT personality traits on a 5-point Likert-type scale (1 = *Disagree Strongly*; 5 = *Agree Strongly*). The SD3 is a 27-items self-report measure of the DT that comprises three subscales: Narcissism, Machiavellianism and psychopathy, each measured by nine items. Sample items include: “It’s wise to keep track of information that you can use against people later”, “I know that I am special because everyone keeps telling me so”, and “I like to get revenge on authorities.” One item from the SD3 psychopathy subscale that pertained to legal problems (i.e., “I have never gotten into trouble with the law”) was removed in the interest of mitigate participants’ emotional

¹⁶ For our main analyses, the use of gender variable is necessary. In our original final sample (i.e., after data cleaning), two participants identified as nonbinary. This number of participants is not sufficient to allow using the nonbinary category as a third level for the gender variable. As such, these two participants have been removed from the final sample and analyses.

discomfort¹⁷. To avoid response bias, items were presented randomly to participants.

The SD3 has been criticized regarding its discriminant validity between the Machiavellianism and psychopathy subscales (e.g., Knitter et al., 2025; O’Boyle et al., 2015; Persson et al., 2019) and its limitation in measuring grandiose narcissism (e.g., Maples et al., 2014). Nevertheless, the SD3 show acceptable internal consistency ($\alpha = 0.68 - 0.78$ Davis et al., 2019; Dragostinov & Möttus, 2023; Nnam et al., 2023) in young adult samples. In general adult samples, it shows good concurrent ($r = 0.82$; $r = 0.92$; $r = 0.87$; Jones & Paulhus, 2014) and convergent ($r = 0.74$; $r = 0.84$; $r = 0.43 - 0.72$; Maples et al., 2014) validity with standard measures (Mach-IV, SRP-III and NPI, respectively).

Attention Screeners. To compensate for the loss of environmental control in an online experimental design, attention screener items were added at pre-test and post-test to identify unreliable participants. Specifically, items were “If I am paying attention, I will select Disagree Strongly” and “For this question, please select Agree”. Participants who failed (i.e., did not select the prescribed answer) both screeners on the same questionnaire (e.g., both items at pre *or* post-test) were removed from the final analyses ($n = 8$).

Procedure

This experimental study was conducted online, through Qualtrics. Because of the Covid-19 pandemic, in-person recruitment and experimentation was impossible. Emerging adult participants were recruited through a research participation pool from the university of the authors during the Winter semester 2021. Participants between 18 and 25 years old from any major were eligible to participate. The focus on emerging adults aims to capture potential personality change during the period where they are more likely to occur (Roberts et al., 2006). Participants needed to be fluent in English, due to the self-report measures being in English. Students participated for points on their final mark in an introductory course. Participants were excluded from the final analyses for the following reasons: a) participants with unidentifiable IDs could not be

¹⁷ This decision was based on the original data collection method, which was in person. The aim was to minimize participants’ emotional discomfort, as well as the sensitivity of information if participants would have confided to researchers in person to have problems with the law.

uncompensated or participants who withdrawn prematurely, b) more than 5% missing value, c) unreliable, d) participants outside of inclusion criteria (e.g., participants older than 25 years-old), e) were duplicates (e.g., two submissions from the same participant). Participants who did not comply with the experimental task (e.g., produced tweets unrelated to the experimental tasks such as random numbers or random messages) were kept in the data for two reasons. First, participants were told in the study description that the content of their tweet would not be analyzed. Second, we did not want to disturb the random assignment of participants.

When participants opened the study link, they were firstly directed to an online consent form (See Appendix J) that briefed them on the purpose of the study by the researcher: They were deceived into thinking that researchers were interested in “how different people developed different ideas that they tweeted about on social media”. Once they agreed to participate in the study, they were directed to pre-test questionnaires (i.e., demographic questionnaires and the pre-test SD3[(Jones & Paulhus, 2014)]with two attention screener items). Then, they participated in the experimental task. Afterwards, they completed a distraction task (See Appendix I), and then answered the SD3 at post-test (with two added attention screener items). Finally, participants were presented a debrief form (See Appendix J) where they were informed of the true purpose of the study, given the opportunity to withdraw from the study, and given the researchers contact information should they have further questions.

For the experimental task, participants were assigned randomly to one of three conditions: Competitive, collaborative, or control. In all conditions, participants were presented a fictitious scenario in which the government of Canada is consulting students in the midst of “a national emergency following a catastrophic shortage in resources (e.g., money, food, healthcare, education) due to global warming, natural disasters, poverty, systemic discrimination, crime, and global pandemics” (see Appendix I for full scripts).

- In the **collaborative condition**, participants were told they were consulted to promote equal opportunities for all students by creating collaborative tweets, and that this team effort would help all students reach their full potential despite these difficult times.

- In the **competitive condition**, participants were told they were consulted to promote the protection of the interest of the best students by creating competitive tweets, and that this would ensure only the best performing students could reach their full potential given these difficult times.
- In the **control condition**, participants were told to discuss the impact of the recent catastrophic shortage in resources on students by creating tweets that reflect their perspective.

In each condition, participants had 15 minutes to create between 10 and 15 tweets. Participants could terminate the experimental task and move on the following steps of the study after submitting at least 10 tweets.

For the distraction task (see Appendix I), participants were presented a series of four exercises where they had to find target images amongst a group of images (e.g., find four-faced dice amongst five-faced dices, find trees with eight branches amongst trees with eleven branches, etc.) and identify how many target images were on the page as quickly and accurately as possible. The images used in the distraction task were original (i.e., drawn for this task specifically) and consisted of suns, dices, trees, and chocolate chip cookies. The drawings were neutral to ensure that no further priming effect occurred. The task was presented as an attention test to make sure that participants remained focused during their participation.

Participants who withdrew prematurely ($n = 47$) from the study (e.g., closed their webpage or lost Internet connection) received debriefing by email anonymously within 48 hours of their participation. In order to maintain their anonymity, their data was removed.

Analysis Strategy

This study examines the relative stability of the DT traits across different social contexts. An experimental design was used to determine whether certain social contexts (e.g., competitive versus collaborative vs. neutral) could cause changes in people's DT states. Gender differences were also examined. There are two independent variables. The first (IV_1) consists in social

situations and has three levels: Collaborative, competitive, and neutral social situations. The second (IV_2) consists in gender and has two levels: Male and female. The dependant variables consisted in the DT scores (i.e., Machiavellianism, narcissism and psychopathy) at post-test. However, to truly examine the effect of social situations and gender on DT states, one's baseline levels of DT must be taken into consideration.

Hence, an analysis of covariance (ANCOVA) was used because it allows to adjust the variance in the dependant variable by assuming that all scores on a designated covariate (i.e., in this study, individual differences — or DT scores at pre-test) are equal (Tabachnick & Fidell, 2019). In an ANCOVA, the comparisons of adjusted mean levels of the DV across the levels of the independent variable are carried only after controlling for a covariate with a preliminary regression (Tabachnick & Fidell, 2019). In other words, three two-way ANCOVAs (one for each DT trait) examined if DT states mean-levels at post-test were different across three social contexts (e.g., competitive, collaborative, or neutral) and gender (male and female) when holding pre-test scores of DT constant¹⁸.

Missing Values

The final data set comprised 0.47% of missing values. This low number of missing values is in part due to the thorough data cleaning in which unreliable and withdrawn participants were removed from the final analyses. Because of the low percentage of missing values and because the data collected was designed using a 5-point Likert-type scale, missing data was replaced by the item mode (across groups) rather than the mean.

Power Calculation

A priori power analysis was conducted through G*Power3.1 (Faul et al., 2009) to determine the suitable sample size for a 3x2 ANCOVA with an error probability of 0.05 and a power of 0.80. Results indicated that a total sample size of 251 participants would generate a

¹⁸ Although a multivariate analysis of covariance (MANCOVA) could have been used to answer the research question (where the dependant variables would have been the DT scores at post-test, the independent variables the social contexts, and the covariates the DT scores at pre-test), the moderate correlation between the dependant variables would have diminished the power of the MANCOVA (Tabachnick & Fidell, 2019). This is why three separate ANCOVAs were performed instead.

power of 0.95 (see Appendix K).

Results

Descriptive statistics can be found in Table 1, Appendix L. Three separate ANCOVAs were conducted to compare the impact of three different social contexts on Dark Triad traits. All analyses were performed using jamovi 1.6 (2021). The assumptions of normality of sampling distributions, homogeneity of variance, linearity, homogeneity of regression, and reliability of covariates were examined and satisfactory.

As shown in Tables 2, 3 and 4 (see Appendix L), for all DT scores at post-test, no statistically significant main effect of condition nor gender identity was found after controlling for DT scores at pre-test. There was also no interaction between condition and gender for either of the DT traits. DT scores at pre-test as a covariate, however, were significantly related to Dark Triad scores at post-test for all traits (Machiavellianism: $F(1, 269) = 1653.36$, $p < 0.001$, partial $\eta^2 = 0.860$; Narcissism: $F(1, 269) = 2298.232$, $p < 0.001$, partial $\eta^2 = 0.895$; Psychopathy: $F(1, 269) = 1301.413$, $p < 0.001$, partial $\eta^2 = 0.829$).

Discussion

The current experiment aimed to examine the relative stability of DT traits in social situations. Specifically, we experimentally tested whether socially competitive and collaborative social situations could motivate changes in DT states, compared to neutral ones, when controlling for baseline and accounting for gender. Our hypotheses predicted that participants assigned to the competitive condition would show higher DT mean-levels at post-test compared to the other conditions (H1a), whereas participants assigned to the collaborative condition would show lower DT mean-levels at post-test compared to the other conditions (H1b). The findings did not support our hypotheses. Indeed, no main effect of the experimental condition was found. Furthermore, no effect of gender was found, and no interaction effect was found (between the condition and gender). The only significant effect identified was the effect of baseline DT scores. This means that participants who were exposed to a competitive social situation did not differ in DT states at post-test from participants who were exposed to collaborative or neutral social situations, and that

men and women did not differ DT states at post-test. In fact, it is DT scores at baseline that significantly predicted DT states at post-test. Further, results indicated small partial eta squares (see Tables 2, 3 and 4 in Appendix L), suggesting that the experimental task had little impact on DT scores at post-test.

We consider two possible interpretations for our results. First, methodological and statistical reasons could explain the observed results. For example, it is possible that our online experimental task simply was not able to operationalize DT state change. Findings from research exploring differences in participants' behaviour in scenario versus real life situations indeed highlight that hypothetical probes might not capture the complex social and emotional motivational processes involved in decision-making. For example, FeldmanHall and colleagues (2012) tested behaviours in hypothetical compared to real life moral decisions through a series of incrementally detailed experiments and found that limited context in scenario-based experiments led to choices that do not align with traditional moral codes and that increased context helped align hypothetical decisions to mirror real moral decisions. This might be explained by the fact that scenario-based decision-making may not engage the same intensity or patterns of neural activations as real-life choices — which could mean that scenario-based studies do not capture completely the complexity of decision-making (Camerer & Mobbs, 2017). Additionally, participants might have presented a social desirability bias (King & Bruner, 2000), meaning that they might have wanted to present in a favourable light and thus appear more agreeable. Hypothetically, this could lead to lower engagement in the competitive condition task and underreporting of DT states, which could nullify the potential effect of the experimental tasks. With regards to our selected statistical analysis, the ANCOVA with pre-test DT scores as a covariate is very rigorous. Indeed, selecting an ANCOVA ensured that any differences observed at post-test could *only* be explained by the experimental task, which might have reduced the probability of observing change.

Another interpretation for our results is that they reflect the attributional nature of personality traits. Indeed, a core assumption of trait theory lies in the continuity of individual

attributes (i.e., traits) that can thus predict behaviour (McCrae & Costa, 1994; Roberts et al., 2006). As discussed earlier in this article, evidence supports that psychopathic traits predict uncooperative behaviours (Johnston et al., 2014) even when cooperation had already been initiated by others (Rilling et al., 1969). Research also showed that higher Machiavellianism is associated with more manipulation (Christie & Geis, 1970) and potentially less behavioural adaptation to context (Bereczkei & Czibor, 2014). Finally, narcissism traits have been associated with competitiveness (Luchner et al., 2011) and self-serving behaviours even in collaborative contexts (Campbell et al., 2005). Hence, it is possible that participants with higher DT traits might have maintained DT-related behaviours and attitudes, notwithstanding the experimental condition to which they were assigned, which would limit group differences observed at post-test. This alternative interpretation of the state continuity observed in our results might suggest more rigidity in DT traits in short measurements. This could imply that people might need longer exposure and engagement in situations to observe state and trait change. This view is consistent with findings from two research (Hudson & Fraley, 2015; Hudson et al., 2019) that showed that successful volitional personality change (e.g., in extraversion, agreeableness, emotional stability) over a 15-and-16-week period is possible through engaging in trait-relevant behaviours (e.g., being kind for agreeableness, being sociable for extraversion). Moreover, research on the effectiveness of psychotherapy to change normative and disordered personality traits showed that 4-to-8 weeks is necessary to observe meaningful personality trait change (Roberts et al., 2017). Hence, it is possible that just like with normative and disordered personality traits, a more intentional, intensive, and prolonged process is necessary to observe more meaningful DT state changes. The short-term nature of our experimental design thus might not have been able to capture such a process.

Limitations and Future Direction

The present study has limitations. First, because participants took part in the online study from home, the study was not representative of the traditional controlled laboratory setting of experimental designs. This diminishes researchers' control of the experimental

conditions (Hooley et al., 2012) and makes it difficult to establish how thoroughly students participated to the task, which potentially reduces internal validity. Indeed, participants could hypothetically complete the experimental task while watching a movie, during class, or in other distracting settings. Further, the fact that our design did not consider the content of the tweet made it possible for students to have participated poorly in the experimental task yet still be included in the analyses. This potentially allowed less involved participants to complete the study. This is in line with evidence that online participants have shown to be less accurate than lab-based participants (Dandurand et al., 2008). A second limitation is that, when answering the SD3, participants were not prompted with a time specifier (e.g., How much do you agree with each of the following statements *at the present time* vs. How much do you *generally* agree with each of the following statements). This might have contributed to the rigidity of states observed in the results, as participants might have answered post-test items in a more general manner, rather than in that specific moment. Finally, the manipulation of the experimental condition was not verified in our study, making it difficult to assess its validity. We attempted, as per Mischel (1973), to create so-called powerful social situation scenarios with clear expectations and context. However, the experimental tasks we designed might not have been sufficiently immersive (e.g., online, solitary, too brief), which could have limited its potential to prompt personality state change. Future research could further examine the relative stability of DT traits in other social contexts where participants interact with others (whether real people, confederates, or computer-generated interlocutors). A focus on more behaviour-based experiments where participants need to take action might provide a more accurate, engaging, and influential social situation.

Conclusion

Our online experimental design examined DT states as a *dependent* variable in an experimental context. Specifically, we assessed if exposure to competitive and collaborative social situations could prompt DT state changes when controlling for baseline DT and accounting for gender. Our results demonstrated that it was difficult to influence DT states from brief exposure to online social situations.

CHAPTER 4: General Discussion

This dissertation aimed to examine the patterns of relative stability of the DT traits over short time periods. Most empirical knowledge on the DT stems from cross-sectional or correlational methods, with limited evidence from longitudinal and experimental designs (Miller et al., 2019; Muris et al., 2017; Williams et al., 2022), especially in non-clinical populations. Additionally, researchers have emphasized the need to test whether DT traits are exclusively causal or if they can also be predicted (e.g., Muris et al., 2017). The lack of empirical evidence in these areas hinders a clear understanding of one of the core features of normative personality traits, such as the DT traits, namely their ability to exhibit both stability (i.e., dispositional coherence) and change (i.e., situational adaptability). Relative stability can be observed through time, for example, in how individuals change through developmental period, or in how stable they remain across days, months, or years. Relative stability can also be observed across situations. For example, in how do individuals change as a result of experiencing different situations, such as being immersed in specific environments (e.g., school, public spaces, work), participating in certain activities (e.g., competing in sports, taking a test), or acting within a particular role (e.g., being a teacher, being with friends). Understanding the relative stability of traits is essential to understanding their etiology, development, manifestations, and influence in one's life.

In light of the aforementioned research caveat in the DT literature, this thesis addressed the overarching research question of what are the patterns of relative stability of DT traits over short periods of time and across situations. We achieved this goal through two articles. The first article consisted of two independent studies that used a longitudinal design to examine the relative stability of DT traits through 10 days. The second article consisted in an experimental study that assessed the relative stability of DT traits across situations.

Summary and Contributions of the Articles

The Relative Stability of Dark Triad Traits Over Time

Summary of Article

Our first research project consisted in a short-term longitudinal design that observed the natural manifestation of the DT traits across ten days in two independent studies. More precisely, this research aimed to: a) explore the extent to which individuals' DT states varied or remained stable, b) partition the underlying sources of stability and variability, c) assess how the daily relative stability of DT traits compares with that of Big Five agreeableness, and d) identify potential factors that might predict shifts in daily DT states.

We presented three alternative hypotheses regarding the potential patterns of relative stability of the DT traits: A *Shared Trait-Situation* hypothesis (H1a) posited that DT states would remain generally equally stable and variable over ten days due to both personality traits and situation characteristics; a *Trait-Anchored* hypothesis (H1b) posited that DT states would remain mostly stable due to personality traits rather than variable due to situational characteristics; and a *Situation-Sensitive* hypothesis (H1c) posited that DT states would present significantly higher variability due to situational characteristics than stability due to personality traits. Furthermore, we hypothesized that DT states would be more stable over short time periods than agreeableness states (H2). As for predictors, we hypothesized that: a) higher competitive attitudes would predict higher DT states (H3a) while higher collaborative attitudes would predict lower DT states (H3b), b) that men would exhibit higher DT levels compared to women (H4), and c) in Study 2, we predicted that higher Social Dominance Orientation (SDO) would predict higher DT states (H5).

Key Findings

This project highlighted three main findings. First, aligned with our *Trait-Anchored relative stability* hypothesis (H1b), our results demonstrate DT states remained mostly stable over 10 days and that this stability is largely attributable (80–88%) to a latent personality *trait*. In fact, stable traits explained daily personality states approximately four times more, on average, than fluctuations in situations. This result was replicated across both studies. One way to interpret this

result is that the relative differences between people DT states stayed largely stable over ten days, which suggests that their personality was somewhat set during this period. Additionally, the residual experience of previous days only marginally explained (4 – 13%) variations in DT states the following day, suggesting that the impact of recent situations might be small or transient. This result is aligned with trait theories in personality and evidence supporting the dispositional and stable nature of personality traits (McCrae & Costa, 1994; Roberts et al., 2006; Tellegen, 1991). Nevertheless, our TSO analyses showed that in unconditional models, 11 – 20% of the variability in DT states was still attributable to situational changes. Given that rank-order consistency tends to increase as the time between measurements decreases (Fraley & Roberts, 2005), and considering that our assessments were only 24 hours apart, this level of variability is not trivial. As Fleeson (2001, 2007b) has shown, individuals display substantial within-person variability in Big Five state expressions — often spanning the full range of each trait dimension from low to high — which, over time, contributes to stable between-person differences. The rank-order variability observed in our results suggests that this partially changing nature of personality is detectable even over short periods, and may similarly shape between-person differences in traits like those of the DT.

Second, finding from our studies is that the patterns of relative stability of the DT traits closely resemble that of Big Five agreeableness, which is contrary to our (H2) hypothesis. What we observed in both studies that the DT traits and agreeableness had the same profile of relative stability over ten days, where people's relative interindividual personality differences (i.e., rank-order) remained overwhelmingly stable due to a latent trait, rather than changing because of fluctuating situations. Across both studies, the percentages of total variance explained by the DT traits and agreeableness were within a 2-to-8-percent difference. The evident similarity in the DT traits and agreeableness profiles of relative stability supports the claim that the DT traits operate similarly as other normative traits like the Big Five (Jakobwitz & Egan, 2006; O'Boyle et al., 2015; Paulhus & Williams, 2002; Vernon et al., 2008; Vize et al., 2020).

Finally, another main finding from our studies is that social attitudes and gender had some

but inconsistent effects on fluctuations in DT states. For example, higher competition predicted higher DT states on some but not all days, and differently across studies (e.g., 4 significant positive effects of competition on narcissism in Study 1, as opposed to none in Study 2). The inconsistent impact of social attitudes on fluctuation in DT states matches our first finding that personality traits mostly explained stability in daily DT states, rather than changes in situations. It could also be attributable to the decrease in power of the model that comes from adding more variables. Although we did not interpret the predictor models of agreeableness (as they were not part of our main research question), it is interesting to note that there were inconsistencies noted as well in the frequency of significant effects of competition and collaboration in DT states, again supporting that the DT traits operate comparably to other Big Five traits. Similar inconsistencies were noted for gender differences, where gender differences in narcissism were identified on more days in Study 1 than in Study 2, and less gender differences in psychopathy were identified in Study 1 compared to Study 2. Hence, our results only partially support hypotheses H3a, H3b, and H4. Nevertheless, when gender differences in DT states were identified, they were aligned with the empirical evidence that men score higher on DT traits than women.

Contributions

Our studies contribute to research on the DT in at least three ways. First, the use of a longitudinal design with TSO analyses is a distinct approach to the study the relative stability of DT traits, an important yet understudied area of study in DT research. Cross-sectional investigations can lead to observations in “situation vacuums” (Steyer et al., 2012) that do not provide sufficient contextual information to make accurate inferences. The use a short-term longitudinal design allowed us to observe people at different times and in different situations, which in turn allowed us to better understand them. Indeed, the TSO analyses partitioned the sources of personality expression attributable to stable traits versus changing situations, which empirically examined the position of the DT in the person-situation paradox. Furthermore, this research design was innovative in that it did not position the DT traits as predictor variables, but rather attempted to predict daily DT states from other variables. This allowed a more complete

examination of the relative stability of the DT, as it both looked at the predictive impact of stable DT traits, as well as the possibility of predicting changes in daily DT levels.

Secondly, our comparisons between DT traits and agreeableness reinforce that the DT personality model operates similarly with other empirically supported personality models such as the FFM. Despite its original conceptualization as a normative trait model (Paulhus & Williams, 2002), it is common in the literature (even from the authors of the seminal work on the DT) to use sensationalistic and objectifying terms to describe individuals higher on the DT, such as “psychopaths”, “Machiavellians”, and “narcissists” (see for example Holtzman, 2011; Jones & Paulhus, 2011; Rauthmann et al., 2014), “soldiers of misfortune” (Porter et al., 2014), “creatures of the night” (Jonason et al., 2013), or “the big bad wolf” (Black et al., 2014). Such appellations are misleading because they reinforce the vision of any individual scoring higher on the DT as uncannily evil or morally corrupt, which might not be representative of the actual observations from research findings. Rather, that high scorers on the DT traits might simply score *higher* (in relative rank-order), but not necessarily problematically *high* (in mean-level). Indeed, recent meta-analytic findings by Knitter and colleagues (2025) indicate that the average levels of Dark Triad traits in the general population are $M = 1.85$ for psychopathy, $M = 2.67$ for Machiavellianism, and $M = 2.74$ for narcissism. These averages may not particularly denote elevated levels in the populations. Moreover, these labels are also problematic in that they denote a categorical labeling like what is used to describe disordered (compared to healthy) personality. This is contradictory with the conceptualisation of the DT traits as a nonclinical profile of traits and with our findings. Our findings rather suggest that researchers should be more nuanced in their depiction of individuals higher on the DT, as they could still be within a relatively normal range for those traits. More research is needed to clarify this nuance, namely at which point are DT levels normal and at which point do they become excessive.

Finally, a notable strength of this article is the attempt at replication of results across two independent studies. Replication of findings is important to establish reliable, robust and unbiased results, and to encourage methodological rigor (Earp & Trafimow, 2015). Yet, attempts at

replications are rare (Earp & Trafimow, 2015), potentially due to a bias against publishing replications (Laws, 2016). In both studies, our findings showed that: a) DT and agreeableness states remained stable across ten days, b) DT traits and agreeableness showed very similar patterns of relative stability, and c) social attitudes and gender presented small and inconsistent influence of on daily DT and agreeableness states.

Conclusion

So, in daily life, do we change in our DT and agreeableness states? No... and yes! We *do* naturally show some relative changes — in our samples, participants showed approximately 11 – 20% change across 10 days. However, it seems we mostly naturally stay stable relative to others, at least in short periods of time.

The Relative Stability of Dark Triad Traits Across Situations

Summary of Article

Building on our first article, our second article consisted in an online experimental design to answer the question of whether we change, relative to others, across different social situations known to correlate with the DT traits. More precisely, this study aimed to test whether participation in competitive versus collaborative versus neutral social situations could prompt mean-level differences in DT states when controlling for gender and baseline differences. We hypothesized that participants exposed to a competitive social situation would show higher DT states than those exposed to collaborative or neutral social situations (H1a), and that participants exposed to a collaborative social situation would show lower DT states than those exposed to competitive or neutral social situations (H1b).

Key Findings

This study underscored two major findings. Our first finding is that competitive and collaborative situations — as operationalized in our study — did not increase or decrease mean levels of DT states. In other words, the DT mean-levels of participants at post-test did not differ according to the condition in which they were. Rather, their baseline DT traits were the sole

significant predictor or their DT states at post-test. This finding supports the idea that DT traits are dispositional attributes that explain personality manifestations (e.g., behaviours and attitudes) in certain situations, rather than the opposite. This finding is also aligned with the results from our first article.

Our second finding is that there were no gender differences in DT mean levels at post-test, and no interaction effect of the condition and gender — suggesting that men and women reacted similarly to the experimental conditions. As such, our hypotheses were not supported. Moreover, we were not able to replicate gender differences in DT traits observed in the empirical literature.

Contributions

Our second article adds to research on the DT in at least one way. This is one of the rare applications of experimental methods to study the DT traits: We believe this might be one of the first studies to apply an experimental research design to assess the DT as an outcome variable. The experimental design enabled us to address a critical research question with a method that has been rarely utilized up until now. Moreover, it allowed us to examine the Person (i.e., baseline) x Situations (i.e., conditions) interactions that are widely accepted as important to understand individual differences dynamics (Magnusson & Endler, 1977) and apply them to the DT traits. As discussed in this thesis, personality traits change to adapt to situations, and because of other factors such as maturation and life events. This study attempted to test if specific social situations could operationalize that change as a step towards understanding *what*, specifically, could increase or decrease abrasive traits such as the DT traits. We used an experimental design that incorporated one of the central social dynamics of the DT in research, namely competition (Lyons, 2019), alongside its antithetical counterpart, collaboration, as experimental conditions. Our decision to define pre-test scores as a covariate allowed for a true estimate of the effect of conditions on post-test score. Understanding which situations could — and possibly could not — lead to personality change in the short term is important, as the accumulation of momentary state changes may contribute to more enduring trait changes across human development (Roberts et al., 2017).

One silver lining from our results is that increases in DT states may not be easily triggered

by situational cues — at least not by the types of social situations we presented in this study. Given the abrasive and malevolent nature of DT traits and their potential to harm others, it would be concerning if mere exposure to competitive cues could elevate DT states enough to produce significant mean differences compared to collaborative or neutral cues. As such, our results might be reassuring.

Conclusion

So, do situations influence how we change? We could not confirm this in our study. According to our findings, baseline DT levels were the only predictor of DT states at post-test. From the results of our first article, it seems that we do express some daily relative change. It is possible that our experimental conditions were not able to operationalize that change experimentally, or that this change was not of sufficient magnitude to be significant. In sum, our results demonstrate that DT traits are not particularly susceptible to the written cues we presented as social situations.

Research and Theoretical Implications

The results from this thesis have demonstrated that DT traits are stable in emerging adults through short periods and across different social situations. In our first article, this was evidenced by replicated findings showing that the 10-day rank-order consistency remained highly stable (i.e., approximately four times more stable than variable) because of the influence of a latent personality trait. This was true for DT traits and agreeableness. Furthermore, the influence of other factors, such as competitiveness, collaborativeness, social dominance orientation, and gender, had small and inconsistent effects on variations in daily DT states. In our second article, the stability of DT traits was evidenced by findings showing that DT baseline levels were the only factor that predicted participants' DT levels after being immersed in one of three social situations; the social situation itself and gender had no bearing. The extent of the stability observed is somewhat surprising, as emerging adulthood has been identified as a period of high personality variability due to identity explorations (Roberts & Davis, 2016; Roberts et al., 2006), and to correlate with the DT (Barlett & Barlett, 2015). Additionally, in both articles, results show that

the influence of situation characteristics was minimal, suggesting potential resistance to situational influences. Finally, gender differences found in the empirical literature (e.g., Chiorri et al., 2019; Gluck et al., 2020; Muris et al., 2017; Paulhus & Williams, 2002) could not be conceptually replicated in our second article, and was only partially supported in our first article. In this section, we will discuss different implications of our findings with regards to relationships, psychopathology, personality change, and the person-situation debate.

Relationships

The findings that our personality traits tend to remain stable and largely shape our personality states over short periods and across different situations is potentially concerning. Indeed, given the socially abrasive nature of the DT traits, the concern is that individuals high on the DT traits could harm others and themselves consistently, across situations and time. This concern is valid, since meta-analytic findings emphasize that all DT traits are associated with interpersonal difficulties and antisocial tactics (Muris et al., 2017). Moreover, DT traits have been associated with more frequent conflicts and poor conflict resolution in romantic relationships (Horan et al., 2015), which may be due to their negative association with emotional intelligence (Walker et al., 2021). Although less attention has been given to other types of relationships, evidence suggests similar interpersonal challenges in friendships and work settings. In the workplace, the DT traits have been linked to counterproductive work behaviours (O'Boyle et al., 2012), and Machiavellianism and psychopathy traits in leaders has been associated with lower employees' career satisfaction (Volmer et al., 2016). In friendships, DT traits have been tied to strategic and utilitarian motivations for befriending (Jonason & Schmitt, 2012), which may lead to less genuine connections.

Detection of Dark Triad Personality

Considering the detrimental effects of DT traits on relationships, it is important to accurately detect these traits in others to protect oneself from potential relational stress. Individuals high in DT traits are more malevolent in relationships, as they often seek opportunities to exploit, manipulate, or deceive. So, how effective are we at identifying such

potentially problematic individuals? One meta-analysis on the correlation between self- and observer reports of DT traits, showed medium to high self-observer correlations for all DT traits ($r = 0.41 - 0.47$), indicating good agreement between self- and observer reports (Rico-Bordera et al., 2025). Moreover, the study found that proximity moderated the self-observer correlation for Machiavellianism and psychopathy, with stronger correlations when the observer knew the respondent better (Rico-Bordera et al., 2025). These findings align with another study finding that even unacquainted undergraduate students paired to play a collaborative game accurately assessed their collaborators who exhibited high DT traits (Rauthmann, 2012). Together, these results suggest that we can indeed detect when something is amiss, with friends or strangers.

These findings challenge the concept of the fundamental attribution error (FAE; Ross, 1977), which refers to our tendency to underestimate the impact of situational factors and overestimate the role of dispositional factors in human behaviour (Baumeister & Vohs, 2007). In our first article, we applied Trait-State-Occasion (TSO) models, grounded in LST, to mitigate the potential attribution error that are likely in cross-sectional designs. However, because our TSO analyses revealed that personality states are 80–90% stable over 10 days, which could mean that we are more likely than not to observe the average personality of people at any given time. As such, we may be able to detect “true” personality from single interactions, in part because stable dispositions tend to emerge in our behaviour. However, this leaves the possibility that this 10–20% variability in states might give sometimes the wrong impression about someone’s personality if one were to meet them only in those specific moments.

The Dark Triad and Psychopathology

Given the detrimental effects of DT traits on relationships, it is not surprising that they are also associated with negative psychopathological outcomes and adverse life circumstances. All DT traits have been linked to impairments in interpersonal functioning and aggression (Muris et al., 2017), as well as lower emotional intelligence and empathy, and higher levels of alexithymia (Schimmenti et al., 2019). In an Italian sample, indifference to others’ emotions and difficulty identifying one’s own feelings predicted global DT scores on the Dirty

Dozen (Schimmenti et al., 2019). These findings suggest that difficulty identifying emotions may especially contribute to emotional distress in individuals with higher DT traits. DT traits have also been linked to a weaker sense of self (Doerfler et al., 2021; Kaufman et al., 2019). Specifically, Machiavellianism and psychopathy were associated with more state-like (e.g., tired, stressed) than trait-like (e.g., kind, serious) self-concepts (Doerfler et al., 2021). Based on this result, we might have expected greater variability in our studies' DT states, though this was not observed.

If high-DT individuals struggle to identify emotions, it follows that they may also have difficulties with emotion regulation and strategy use. One study found that higher psychopathy scores predicted fewer adaptive strategies, lowering affective wellbeing (AWB) and, in turn, cognitive wellbeing (CWB; Gómez-Leal et al., 2023). Machiavellianism was associated with both adaptive and maladaptive strategies; while the former improved AWB and CWB, the latter had the opposite effect. Narcissism, in contrast, was linked to more adaptive strategy use and corresponding increases in AWB and CWB (Gómez-Leal et al., 2023). These findings are consistent with meta-analyses showing negative correlations between psychopathy, Machiavellianism, and both emotional wellbeing and psychological health (Blasco-Belled et al., 2024; Muris et al., 2017), and positive correlations with negative affect (Blasco-Belled et al., 2024). Vulnerable narcissism has been associated with negative affect and reduced psychological wellbeing (Blasco-Belled et al., 2024). In adolescents, both psychopathy and narcissism have even been linked to poorer physical health (Jonason, Baughman, et al., 2015).

DT traits have also been associated with depressive symptoms. In a Chinese sample, all DT traits correlated with symptoms such as suicidality, depressed mood, and worthlessness (J. Li et al., 2024). Among undergraduates, Machiavellianism and psychopathy were positively related to depression (Jonason, Baughman, et al., 2015), and meta-analyses confirm these links (Lyu et al., 2025). Narcissism shows a more mixed pattern, typically unrelated or negatively associated with depressive symptoms (Lyu et al., 2025; Wei et al., 2025), supporting the view that narcissism may serve a protective function, as discussed in the introduction. DT traits may also influence other psychopathologies. For instance, those who report more stressful life events and higher

Machiavellianism also score higher on psychosis scales (Lyons et al., 2019). Machiavellianism has been shown to negatively predict hope, self-esteem, and overall wellbeing in adolescents (Jonason, Baughman, et al., 2015).

Psychopathy appears to be the most harmful DT trait. Beyond its associations with poor interpersonal outcomes and emotion regulation, it has been negatively linked to social skills and physical health (Jonason, Baughman, et al., 2015), hope and wellbeing (Jonason, Baughman, et al., 2015), and occupational success, including salary, leadership, and career satisfaction (Spurk et al., 2016).

Hence, considering the detrimental associations of DT traits with psychological and physical health outcomes, their short-term stability may be cause for concern. Emotional deficits, poor emotion regulation, and maladaptive coping strategies could act as maintaining factors, reinforcing these traits over time and across situations. Identifying DT traits early (e.g., in adolescence) may help address the problematic attitudes and behaviours they support, and early interventions (e.g., psychotherapy, community resources) could be beneficial in mitigating long-term consequences.

Personality Change: Can it Happen?

Given the damaging correlates of DT traits, there is hope that these traits might change. This thesis directly addresses this question. In our first article, we explored the natural manifestations of daily DT states and identified the factors contributing to both stability and change. In our second article, we examined the potential causal effects of social situations that elicit concepts related to DT traits (i.e., social competition, collaboration, and dominance) onto DT states. Overall, our results show that DT state remain relatively stable in rank-order over short periods and stable in mean-levels across certain situations.

Volitional Personality Change

The findings of this thesis align with the Cognitive-Affective Processing System (CAPS; Mischel & Shoda, 1995). According to the CAPS model, people's characteristics organize into Cognitive-Affective Units (CAUs), which include affect, motivations (goals and values), the

ability to enact those motivations, expectations (about themselves and the world), and self-regulation strategies (Mischel & Shoda, 1995). The CAPS framework suggests that stable interindividual differences in CAUs influence how individuals process situational information, which ultimately guides their behaviour (Dingess & Wilt, 2020). Thus, even when considering the impact of environmental factors, as explored in this thesis, the interpretation of these factors still depends on the individual's predispositions towards affect, motivation, interpretation, and expectations. This might explain, at least in part, the stability we observed in our results.

If behaviour variability (and associated personality traits) is influenced by situational variability, and if our interpretation and selection of situations are governed by our personality systems, it is reasonable to conclude that personality change might need to focus primarily on trait-level interventions (e.g., gaining awareness of oneself) rather than exclusively on changing environmental factors. Research has explored whether a desire to change could lead to actual change. A study measuring personality traits between six and twelve months apart found that the simple desire for global and trait-specific personality change did not predict any change in traits (Baranski et al., 2020). A systematic review further confirmed that personality change without interventions yielded inconsistent results with small effect sizes (Haehner et al., 2024), supporting that personality change may not be easily achieved without targeted action.

Can simple interventions support volitional personality change? Evidence suggests they can. In a series of two studies, Hudson and Fraley (2015) demonstrated that over 16 weeks, simply (a) expressing a desire to increase specific personality traits, (b) identifying actionable ways to achieve this, and (c) reporting daily behaviours led to self-reported changes in the desired direction in both personality traits and behaviours. This suggests that simply monitoring personality and personality change could serve as an intervention in itself. Similarly, a recent study observed that participants using a digital personality change coach for three months demonstrated more personality change in the desired direction that maintained at least three months post-interventions, compared to those in the waitlist condition (Stieger et al., 2021). A systematic review similarly found that weekly interventions aimed at changing personality traits

(e.g., one-on-one coaching, online interventions, smartphone apps) generally facilitated desired personality changes, albeit with small effect sizes (Haehner et al., 2024). There is also evidence that maladaptive personality traits can be successfully changed. One study examined the links between the desire to change and actual change in five pathological personality traits (i.e., negative affectivity, disinhibition, detachment, antagonism, and psychoticism) over 16 weeks of weekly reports. Results showed that participants who wanted to decrease pathological traits reported changes in some traits (notably disinhibition and negative affectivity) compared to those who did not wish to change, which had positive repercussions on attachment anxiety, avoidance, and life functioning (Rufino et al., 2024). These findings are encouraging, demonstrating that even undesirable maladaptive traits, and thus potentially DT traits, can be changed through simple interventions like monitoring.

Research on psychotherapy interventions also supports such a hopeful outlook. Psychotherapy might help change personality states, which over time leads become internalized and automatized, leading to more lasting changes in personality traits. Nevertheless, meta-analytical findings showed that only 4-to-8 weeks of therapy interventions might be necessary to observe meaningful and lasting personality change (Roberts et al., 2017). When looking at randomized controlled trials of psychotherapy interventions to change Big Five traits, emotional stability showed the most meaningful change (adjusted $d = 0.57$), followed by extraversion ($d = 0.23$), conscientiousness ($d = 0.19$), agreeableness ($d = 0.15$), and openness to experience ($d = 0.15$; Roberts et al., 2017). As low agreeableness is particularly related to the DT traits (O'Boyle et al., 2015; Paulhus & Williams, 2002; Stead & Fekken, 2014), the finding that agreeableness is among the Big Five traits that might change the least through interventions brings some nuance to the expectations of potential changes in DT traits. Indeed, if the DT traits and agreeableness are negatively associated, it is reasonable to imagine that increasing agreeableness might lead to decreasing DT traits. Nevertheless, results on this front are mixed, as another study found that simple digital coaching targeting personality change showed strong effect sizes for increasing agreeableness ($d = 1.01$) over the course of three months (Stieger et al.,

2021). It is possible that the low effect sizes of agreeableness change found by Roberts and colleagues (2017) reflect the higher severity of dysfunction in individuals seeking therapy, compared to those seeking self-help through an online application. It is also possible, however, that changing agreeableness might prove especially difficult due to its interpersonal nature: compared to other Big Five traits, assessing and changing one's agreeableness necessarily involves one's relationships and social environments, which may be more difficult to target through therapy than other traits. For example, being *polite, courteous to others or helpful and unselfish with others* is intrinsically relational, compared to being *full of energy* (extraversion) or *staying optimistic after experiencing a setback* (negative emotionality). This might make targeted changes in agreeableness a particular challenge, and as such, also be a challenge for targeted changes in DT traits.

Nonetheless, meta-analyses show that even people with personality disorders (especially borderline personality disorder, but also at times, narcissistic personality disorder), have shown decreased symptoms through interventions (Katakis et al., 2023; Roberts et al., 2017; Szalay et al., 2024; Verheul & Herbrink, 2007) — although the enduring nature of these benefits over time is disputed, with only some studies showing that gains are maintained for 6 months to a year. Again, these results bring some reassurance that desire, dedication, and intervention to change even severe pathological personality is possible, shedding hope that this could be true of normative DT traits in general populations.

The Person-Situation Debate

The question of what shapes personality, particularly what drives its stability and change, remains central in personality and social psychology research. As discussed in this thesis, essentialist and contextualist perspectives on personality have historically been in conflict, giving rise to the person-situation debate. Although these perspectives may seem at odds, we now understand that neither fully defines or explains personality on its own; rather, they complement one another. Indeed, empirical evidence shows that situational characteristics and personality come together to influence relative stability of traits. Given this, several researchers have

advocated for moving beyond the person-situation debate, deeming it a false dichotomy (e.g., Fleeson, 2004; Funder, 2006; Kammrath et al., 2005; Kenrick & Funder, 1988; Mischel, 1979). Whether or not this stance is fully embraced, the core issue in personality psychology remains: what influences behaviours, thoughts, affects, and attitudes? It may indeed be time for researchers to move away from questioning whether these influences stem from personality predispositions *or* environmental factors and instead adopt a more open-ended inquiry into *how* personality traits *and* environmental characteristics interact to shape behaviours, thoughts, affects, and attitudes. This thesis contributes to answering only part of this question by providing insights into the previously understudied issue of the short-term interindividual relative stability of DT traits. Our results demonstrated that the rank-order of DT states generally remains stable over short periods, and that mean-levels remain stable across different situations. Further research could examine the mechanisms (e.g., cognitive filters, emotion regulation strategies) by which some traits might resist or adapt to changing situations over time as a way to target the interaction between personality and situations.

Limitations and Future Research

The Challenges of Conducting Complex Designs Online

The first limitation concerns the logistical and methodological challenges of conducting complex designs online. Longitudinal and experimental designs require adaptations for an online operationalization.

Controlled Environment. One of the challenges of conducting research online is the inability to control the environment in which participants complete questionnaires and participate in the experimental tasks. In traditional lab-based settings, researchers can ensure that participants are in a controlled, consistent environment, free from external distractions. This ensures that participants' responses are more likely to reflect their true feelings, thoughts, or behaviors. However, in online research, participants may complete questionnaires or participate in experiments from a variety of settings — private or public, alone or in company, at different time of day, etc. These variations in settings can introduce unforeseen noise in the data that could

decrease internal validity. We know that the environment that people find themselves in can influence how they think, feel, and act. For example, people tend to feel more positive and creative in natural environments (McCoy & Evans, 2002; McMahan & Estes, 2015; Schertz et al., 2022). Hence could being in different environments when participating in research influence participants' responses? It is reasonable to think that it could. This could be especially harmful for our experimental design. Some evidence showed that online experimental settings are methodologically sound and produce similar reaction times and accuracy performance compared to in-lab settings (e.g., Del Popolo Cristaldi et al., 2022). Nevertheless, it is possible that the lack of structure in the environments of participants when answering daily questionnaires or participating in the experimental task might have led them to be less attentive and careful when responding.

In our experimental study, we attempted to mitigate the issue of reliability of data in uncontrolled environments by including attention screeners. It would have been beneficial to also include such attention screeners in our longitudinal studies.

Attrition. One of the challenges for longitudinal designs, especially in experience sampling methods, concerns the attrition of participants. Compliance and retention rates are better with higher incentives, higher time intervals between measurements, and fewer evaluations per day (Vachon et al., 2019). In our studies, the median response rate was 7 and 8 (for Study 1 and Study 2, respectively) out of 10 possible reports. This compliance rate is similar to that of experience sampling method (ESM) studies (albeit, ESM have more intensive data collection procedures than our studies), which present a compliance rate of about 79% (Vachon et al., 2019). Nevertheless, this compliance rate means that for the majority of participants, 20 – 30% of their data had to be estimated. Although maximum likelihood estimation (MLE) is a robust and widely used method for handling missing data, it cannot fully substitute for the actual data, as it relies on assumptions about the data missingness mechanism and may still introduce biases if those assumptions are violated (Enders, 2022).

Sample

Samples Characteristics. Our first limitation consists in the characteristics of the samples in this thesis, which were made up mostly of white women who are university students. The disproportionate representation of such a demographic may challenge the generalizability of our findings. Future research could seek to replicate these results in different populations, such as those from various cultural backgrounds, nonstudent groups, or individuals at other developmental stages (e.g., adolescence or late adulthood). Additionally, future studies could benefit from targeted recruitment strategies to ensure they have samples that represent a more general profile of emerging adults.

Gender. The second limitation is in the methodological consideration of gender in this thesis. As discussed throughout this work, there is considerable empirical evidence showing gender differences in Dark Triad traits, with men typically scoring higher than women (Chiorri et al., 2019; Gluck et al., 2020; Muris et al., 2017; Paulhus & Williams, 2002). However, our studies yielded mixed results on this front, with Article 1 showing gender differences for some traits on some days without consistent replication across the two studies, and Article 2 finding no gender differences. One possible explanation for the lack of gender differences is the samples' composition, which included much more women than men. The small number of men in the sample may have reduced statistical power, making it harder to detect gender differences, even if they were present. Additionally, because women generally exhibit lower levels of DT traits than men, there might have been less variations of DT trait-levels, which might have made it more difficult to detect such gender differences. However, this explanation is speculative and might not have strong practical implications. For instance, in the development of the SD3 (Jones & Paulhus, 2014), although men and women showed statistically significant mean-differences across all three studies, the effect sizes were small-to-medium for narcissism and Machiavellianism ($d = 0.24 - 0.35$) and medium-to-large for psychopathy ($d = 0.52 - 0.65$). Therefore, while our speculation may be valid, it is also possible that the gender differences observed in the literature are not always as large as is often assumed.

Gender Diversity. A third limitation concerns the lack of gender diversity in our samples. Although there is a growing recognition of the importance of studying gender-diverse populations (such as people who identify as transgender, queer, nonbinary, or gender nonconforming), most research still focuses on binary gender categories. As an effort to be inclusive, individuals identifying to any gender were welcomed to participate, and participants could select from a spectrum of gender identities (e.g., nonbinary, trans man, trans woman). What we did not anticipate, however, was the low participation rate of gender-diverse emerging adults. In all our studies, the number of gender-diverse participants (i.e., less than 2 percent) was insufficient to conduct meaningful comparisons or ensure adequate statistical power for such analyses. Because gender-diverse participants made up a smaller proportion of our samples, we were limited in our ability to conduct gender comparisons with cisgender participants. As such, we had to exclude these participants from our final analyses.

Furthermore, the measures used in personality research have rarely been normed on gender-diverse populations, which increases difficulty in including gender-diverse individuals. This underrepresentation in research not only challenges the generalizability of findings but also risks further marginalizing these populations. To address this gap, it is opportune for researchers to improve the inclusivity of their studies. This could be helped by increasing the participation of gender-diverse individuals through targeted recruitment. For example, the research description could explicitly state that gender-diverse participants are welcomed and needed to better understand the DT in this population. Norming personality measures in gender-diverse populations would also improve inclusivity by improving our knowledge of the personality processes of gender-diverse individuals.

The Contributions of Inter-Individual Differences to our Understanding of Personality

The objective of this thesis was to investigate the relative stability of DT traits, which we examined both over short time periods and across different situations. This was operationalized by focusing on *interindividual* differences — i.e., the personality differences that distinguish individuals from one another. However, contemporary conceptualizations of personality

recognize that personality is relatively stable also because of the changes that occur within individuals. This concept, known as *intraindividual* differences, refers to the changes in personality relative to the individual's own tendencies. We know that between-person change is only a portion of relative stability. Consequently, one limitation is the inherent limitation of studying interindividual differences alone. Indeed, while interindividual differences remain generally stable across time, and especially across short periods (as demonstrated by the articles in this thesis, among others), intraindividual differences tend to simultaneously exhibit high levels of stability and variability (e.g., Fleeson, 2001, 2007a). As such, our exclusive focus on interindividual differences (or between-person change) may have limited our ability to capture the full extent of daily personality variability. For example, Roberts and Pomerantz (2004) argue that longitudinal and within participants designs demonstrate better that traits and situations are reciprocally related. This is in line with evidence demonstrating that real-time expression of behaviour and emotion (which are personality indicators) are predicted independently by both personality traits and situation characteristics (R. A. Sherman et al., 2015).

Future research could extend our work by simultaneously investigating the intra-and-inter-individual relative stability of DT traits, which could offer a more comprehensive understanding. For instance, applying multilevel (Castro-Alvarez, Tendeiro, Meijer, & Bringmann, 2022) or mixed-effects (Castro-Alvarez, Tendeiro, de Jonge, et al., 2022) TSO models could enable the examination of within-person longitudinal change. Additionally, a repeated measures ANCOVA design with both between-subjects and within-subjects factors could better examine within-person situational changes (Schneider et al., 2015).

Conclusion

Understanding personality traits' patterns of relative stability is fundamental to understanding their essence, such as their etiology, development, manifestation in daily life, and their influence on important life outcomes. As it has hopefully been made apparent in this thesis, there is a major research caveat in the study of the short-term relative stability of the DT traits. This thesis answers a call for the study of stability and change of DT traits in non-clinical

populations (Williams et al., 2022) by conducting pertinent and complex longitudinal and experimental designs that allow answering this fundamental question in personality research for the DT traits. The results from this thesis support, in large, that the DT traits remain stable over short time periods and across situations. This is aligned with trait theories, which posit that traits are stable dispositions that change just enough (on average minimally) to adapt to the specific demands of different situations (e.g., McCrae & Costa, 1994; Morizot & Miranda, 2007; Roberts et al., 2006).

References

- Adachi, P. J. C., & Willoughby, T. (2013). Demolishing the competition: The longitudinal link between competitive video games, competitive gambling, and aggression. *Journal of Youth and Adolescence*, 42(7), 1090–1104. <https://doi.org/10.1007/s10964-013-9952-2>
- Alavi, M., Visentin, D. C., Thapa, D. K., Hunt, G. E., Watson, R., & Cleary, M. (2020). Chi-square for model fit in confirmatory factor analysis. *Journal of Advanced Nursing*, 76(9), 2209–2211. <https://doi.org/10.1111/jan.14399>
- Allport, G. W. (1937). *Personality : A psychological interpretation*. H. Holt.
- American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders (5th ed., text rev.)* <https://doi.org/10.1176/appi.books.9780890425787>
- American Psychiatric Association & American Psychiatric Association. DSM-5 Task Force. (2013). *Diagnostic and statistical manual of mental disorders : DSM-5*. (Fifth edition).
- American Psychological Association. (2018). Personality. <https://dictionary.apa.org/personality>
- Arnett, J. J. (2014). *Emerging Adulthood: The winding road from the late teens through the twenties* (Second edition). Oxford University Press.
<https://doi.org/10.1093/acprof:oso/9780199929382.001.0001>
- Arterberry, B. J., Martens, M. P., Cadigan, J. M., & Roher, D. (2014). Application of generalizability theory to the Big Five Inventory. *Personality and Individual Differences*, 69, 98–103. <https://doi.org/10.1016/j.paid.2014.05.015>
- Ashton, M. C. (2017). *Individual differences and personality* (3rd). Academic Press.
- Ashton, M. C. (2022). *Individual differences and personality* (4th). Elsevier Science & Technology.
- Ashton, M. C., & Lee, K. (2005). Honesty-Humility, the Big Five, and the Five-Factor Model. *Journal of Personality*, 73(5), 1321–1354.
<https://doi.org/10.1111/j.1467-6494.2005.00351.x>
- Atherton, O. E., Sutin, A. R., Terracciano, A., & Robins, R. W. (2022). Stability and change in the Big Five personality traits: Findings from a longitudinal study of Mexican-origin adults.

- Journal of Personality and Social Psychology*, 122(2), 337–350.
<https://doi.org/10.1037/pspp0000385>
- Avila, M., Stinson, J., Kiss, A., Brandão, L. R., Uleryk, E., & Feldman, B. M. (2015). A critical review of scoring options for clinical measurement tools. *BMC Research Notes*, 8(1), 612.
<https://doi.org/10.1186/s13104-015-1561-6>
- Back, M. D., Küfner, A. C. P., Dufner, M., Gerlach, T. M., Rauthmann, J. F., & Denissen, J. J. A. (2013). Narcissistic admiration and rivalry: Disentangling the bright and dark sides of narcissism. *Journal of Personality and Social Psychology*, 105(6), 1013–1037.
<https://doi.org/doi:10.1037/a0034431>
- Back, M. D., Schmukle, S. C., & Egloff, B. (2009). Predicting actual behavior from the explicit and implicit self-concept of personality. *Journal of Personality and Social Psychology*, 97(3), 533–548. <https://doi.org/10.1037/a0016229>
- Baraldi, A. N., & Enders, C. K. (2010). An introduction to modern missing data analyses. *Journal of School Psychology*, 48(1), 5–37. <https://doi.org/10.1016/j.jsp.2009.10.001>
- Baranski, E., Gray, J., Morse, P., & Dunlop, W. (2020). From desire to development? A multi-sample, idiographic examination of volitional personality change. *Journal of Research in Personality*, 85(103910). <https://doi.org/10.1016/j.jrp.2019.103910>
- Barlett, C. P., & Barlett, N. D. (2015). The young and the restless: Examining the relationships between age, emerging adulthood variables, and the Dark Triad. *Personality and Individual Differences*, 86, 20–24. <https://doi.org/10.1016/j.paid.2015.05.024>
- Baughman, H. M., Dearing, S., Giammarco, E., & Vernon, P. A. (2012). Relationships between bullying behaviours and the Dark Triad: A study with adults. *Personality and Individual Differences*, 52(5), 571–575. <https://doi.org/10.1016/j.paid.2011.11.020>
- Baumeister, R. F., & Vohs, K. D. (2007). *Encyclopedia of social psychology*. Sage Publications.
- Baumert, A., Schlösser, T., & Schmitt, M. (2014). Economic games: A performance-based assessment of fairness and altruism. *European Journal of Psychological Assessment*, 30(3), 178–192. <https://doi.org/10.1027/1015-5759/a000183>

- Beck, E. D., & Jackson, J. J. (2022). A mega-analysis of personality prediction: Robustness and boundary conditions. *Journal of Personality and Social Psychology*, 122(3), 523–553. <https://doi.org/10.1037/pspp0000386>
- Bereczkei, T. (2017). *Machiavellianism: The Psychology of Manipulation* (1st ed.). Routledge. <https://doi.org/10.4324/9781315106922>
- Bereczkei, T. (2018). *Machiavellianism: The psychology of manipulation*. Routledge.
- Bereczkei, T., & Czibor, A. (2014). Personality and situational factors differently influence high Mach and low Mach persons' decisions in a social dilemma game. *Personality and Individual Differences*, 64, 168–173. <https://doi.org/10.1016/j.paid.2014.02.035>
- Bergstrom, H., Forth, A. E., & Farrington, D. P. (2016). The psychopathy: Continuity or change? Stability of psychopathic traits and predictors of stability. In A. Kapardis & D. P. Farrington (Eds.), *The psychology of Crime, Policing and Courts* (1st, pp. 94–115). Routledge. <https://doi.org/10.4324/9781315679860-8>
- Bertl, B., Pietschnig, J., Tran, U. S., Stieger, S., & Voracek, M. (2017). More or less than the sum of its parts? Mapping the Dark Triad of personality onto a single Dark Core. *Personality and Individual Differences*, 114, 140–144. <https://doi.org/10.1016/j.paid.2017.04.002>
- Birkás, B., Pátkai, G., & Csathó, Á. (2020). The mediating role of the Dark Triad between Life History Strategy and perceived stress factors. *Psychological Reports*, 123(2), 252–265. <https://doi.org/10.1177/0033294118818095>
- Black, P. J., Woodworth, M., & Porter, S. (2014). The Big Bad Wolf? The relation between the Dark Triad and the interpersonal assessment of vulnerability. *Personality and Individual Differences*, 67, 52–66. <https://doi.org/10.1016/j.paid.2013.10.026>
- Blair, R., Peschardt, K., Budhani, S., Mitchell, D., & Pine, D. (2006). The development of psychopathy. *Journal of Child Psychology and Psychiatry*, 47(3-4), 262–276. <https://doi.org/10.1111/j.1469-7610.2006.01596.x>

- Blais-Rochette, C., Miranda, D., & Kljajic, K. (2022). A meta-analysis on personality and cultural attitudes. *Canadian Psychology/Psychologie canadienne*, 63(1), 1–15.
<https://doi.org/10.1037/cap0000264>
- Blasco-Belled, A., Tejada-Gallardo, C., Alsinet, C., & Rogoza, R. (2024). The links of subjective and psychological well-being with the Dark Triad traits: A meta-analysis. *Journal of Personality*, 92, 584–600. <https://doi.org/10.1111/jopy.12853>
- Bleidorn, W., Hopwood, C. J., & Lucas, R. E. (2018). Life events and personality trait change. *Journal of Personality*, 86(1), 83–96. <https://doi.org/10.1111/jopy.12286>
- Bleidorn, W., Schwaba, T., Zheng, A., Hopwood, C. J., Sosa, S. S., Roberts, B. W., & Briley, D. A. (2022). Personality stability and change: A meta-analysis of longitudinal studies. *Psychological Bulletin*, 148(7-8), 588–619. <https://doi.org/10.1037/bul0000365>
- Bonfá-Araujo, B., Lima-Costa, A. R., Hauck-Filho, N., & Jonason, P. K. (2022). Considering sadism in the shadow of the Dark Triad traits: A meta-analytic review of the Dark Tetrad. *Personality and Individual Differences*, 197, 1–12.
<https://doi.org/10.1016/j.paid.2022.111767>
- Brewer, G., Bennett, C., Davidson, L., Ireen, A., Phipps, A.-J., Stewart-Wilkes, D., & Wilson, B. (2018). Dark triad traits and romantic relationship attachment, accommodation, and control. *Personality and Individual Differences*, 120, 202–208.
<https://doi.org/10.1016/j.paid.2017.09.008>
- Brown, T. A. (2006). *Confirmatory factor analysis for applied research* (1st). The Guilford Press.
- Brumbach, B. H., Figueredo, A. J., & Ellis, B. J. (2009). Effects of harsh and unpredictable environments in adolescence on development of life history strategies: A longitudinal test of an evolutionary model. *Human Nature*, 20, 25–51.
<https://doi.org/10.1007/s12110-009-9059-3>
- Cale, E. M., & Lilienfeld, S. O. (2002). Sex differences in psychopathy and antisocial personality disorder: A review and integration. *Clinical Psychology Review*, 22(8), 1179–1207.
[https://doi.org/10.1016/S0272-7358\(01\)00125-8](https://doi.org/10.1016/S0272-7358(01)00125-8)

- Camerer, C., & Mobbs, D. (2017). Differences in behavior and brain activity during hypothetical and real choices. *Trends in Cognitive Sciences*, 21(1), 46–56.
<https://doi.org/10.1016/j.tics.2016.11.001>
- Campbell, W. K., Bush, C. P., Brunell, A. B., & Shelton, J. (2005). Understanding the social costs of narcissism: The case of the tragedy of the commons. *Personality and Social Psychology Bulletin*, 31(10), 1358–1368. <https://doi.org/10.1177/0146167205274855>
- Caspi, A., & Roberts, B. W. (2001). Personality development across the life course: The argument for change and continuity. *Psychological Inquiry*, 12(2), 49–66.
https://doi.org/10.1207/S15327965PLI1202_01
- Caspi, A., Roberts, B. W., & Shiner, R. L. (2005). Personality development: Stability and change. *Annual Review of Psychology*, 56, 453–484.
<https://doi.org/10.1146/annurev.psych.55.090902.141913>
- Castro-Alvarez, S., Tendeiro, J. N., de Jonge, P., Meijer, R. R., & Bringmann, L. F. (2022). Mixed-effects trait-state-occasion model: Studying the psychometric properties and the person–situation interactions of psychological dynamics. *Structural Equation Modeling: A Multidisciplinary Journal*, 29(3), 438–451.
<https://doi.org/10.1080/10705511.2021.1961587>
- Castro-Alvarez, S., Tendeiro, J. N., Meijer, R. R., & Bringmann, L. F. (2022). Using structural equation modeling to study traits and states in intensive longitudinal data. *Psychological Methods*, 27(1), 17–43. <https://doi.org/10.1037/met0000393>
- Cattell, R. B., Eber, H. W., & Tatsuoka, M. M. (1970). *Handbook for the Sixteen Personality Factor Questionnaire (16PF)*. Institute for Personality; Ability Testing.
- Cavarra, M., Canegallo, V., Santoddi, E., Broccoli, E., & Fabio, R. (2021). Peace and personality: The relationship between the Five-Factor Model's personality traits and the Peace Attitude Scale. *Peace and Conflict: Journal of Peace Psychology*, 27(3), 508–511.
<https://doi.org/10.1037/pac0000484>

- Cervone, D., & Pervin, L. A. (2013). *Personality : Theory and research* (12th edition). John Wiley & Sons, Inc.
- Cervone, D., & Pervin, L. A. (2023). *Personality : Theory and research* (Fifteenth edition). John Wiley & Sons.
- Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling*, 14(2), 464–504.
<https://doi.org/10.1080/10705510701301834>
- Chiorri, C., Garofalo, C., & Velotti, P. (2019). Does the Dark Triad manifest similarly in men and women? Measurement invariance of the Dirty Dozen across sex. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues*, 38(3), 659–675.
<https://doi.org/10.1007/s12144-017-9641-5>
- Chmielewski, M., & Watson, D. (2009). What is being assessed and why it matters: The impact of transient error on trait research. *Journal of Personality and Social Psychology*, 97(1), 186–202. <https://doi.org/10.1037/a0015618>
- Christie, R., & Geis, F. L. (1970). *Studies in Machiavellianism* (L. Festinger & S. Schachter, Eds.). Academic Press.
- Christie, R., Gergen, K. J., & Marlowe, D. (1970). The penny-dollar caper. In R. Christie & F. L. Geis (Eds.). Academic Press.
- Clercq, B. D., Hofmans, J., Vergauwe, J., Fruyt, F. D., & Sharp, C. (2017). Developmental pathways of childhood dark traits. *Journal of Abnormal Psychology*, 126(7), 843–858.
<https://doi.org/10.1037/abn0000303>
- Cole, D. A., Martin, N. C., & Steiger, J. H. (2005). Empirical and conceptual problems with longitudinal Trait-State Models: Introducing a Trait-State-Occasion Model. *Psychological Methods*, 10(1), 3–20. <https://doi.org/10.1037/1082-989X.10.1.3>
- Cooke, D. J., & Michie, C. (2001). Refining the construct of psychopathy: Towards a hierarchical model. *Psychological Assessment*, 13(2), 171–188.
<https://doi.org/10.1037/1040-3590.13.2.171>

- Čopková, R., & Lörincová, E. (2021). The Dark Triad, love components, and attachment styles in romantic relationship experiencing during young adulthood. *Interpersona: An International Journal on Personal Relationships*, 15(2), 212–232.
<https://doi.org/10.5964/ijpr.4687>
- Corral, S., & Calvete, E. (2000). Machiavellianism: Dimensionality of the Mach IV and its relation to self-monitoring in a Spanish sample. *The Spanish Journal of Psychology*, 3(1), 3–13. <https://doi.org/10.1017/S1138741600005497>
- Corry, N., Merritt, R. D., Mrug, S., & Pamp, B. (2008). The factor structure of the Narcissistic Personality Inventory. *Journal of Personality Assessment*, 90(6), 593–600.
<https://doi.org/10.1080/00223890802388590>
- Cortina, J. M. (1993). What is coefficient alpha? An examination of theory and applications. *Journal of Applied Psychology*, 78(1), 98–104. <https://doi.org/10.1037/0021-9010.78.1.98>
- Costa, P. T., & McCrae, R. R. (1998). Trait theories of personality. In D. F. Barone, M. Hersen, & V. B. Van Hasselt (Eds.), *Advanced personality* (pp. 103–121). Springer US.
https://doi.org/10.1007/978-1-4419-8580-4_5
- Costa Jr., P. T., & McCrae, R. R. (2006). Trait and factor theories. In J. C. Thomas, D. L. Segal, & M. Hersen (Eds.), *Comprehensive Handbook of Personality and Psychopathology, Vol. 1. Personality and Everyday Functioning* (pp. 96–114). John Wiley & Sons, Inc.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297–334. <https://doi.org/doi:10.1007/BF02310555>
- Czibor, A., Szabo, Z. P., Jones, D. N., Zsido, A. N., Paal, T., Szijjarto, L., Carre, J. R., & Bereczkei, T. (2017). Male and female face of Machiavellianism: Opportunism or anxiety? *Personality and Individual Differences*, 117, 221–229.
<https://doi.org/10.1016/j.paid.2017.06.002>
- Dandurand, F., Shultz, T. R., & Onishi, K. H. (2008). Comparing online and lab methods in a problem-solving experiment. *Behavior Research Methods*, 40(2), 428–434.
<https://doi.org/10.3758/BRM.40.2.428>

- Davis, A. C., Visser, B. A., Volk, A. A., Vaillancourt, T., & Arnocky, S. (2019). The relations between life history strategy and dark personality traits among young adults. *Evolutionary Psychological Science*, 5(2), 166–177. <https://doi.org/10.1007/s40806-018-0175-3>
- Del Popolo Cristaldi, F., Granziol, U., Bariletti, I., & Mento, G. (2022). Doing experimental psychological research from remote: How alerting differently impacts online vs. lab setting. *Brain Sciences*, 12(8), 1061. <https://doi.org/10.3390/brainsci12081061>
- Delič, L., Novak, P., Kovačič, J., & Avsec, A. (2011). Self-reported emotional and social intelligence and empathy as distinctive predictors of narcissism. *Psychological Topics*, 20(3), 477–488. <https://doi.org/https://hrcak.srce.hr/78734>
- Dingess, A., & Wilt, J. (2020). Cognitive-affective processing system (caps). In B. J. Carducci, C. S. Nave, J. S. Mio, & R. E. Reggio (Eds.), *The Wiley encyclopedia of personality and individual differences. Volume I, Models and theories* (pp. 129–133, Vol. 1). Wiley-Blackwell. <https://doi.org/doi:10.1002/9781119547143.ch23>
- Doerfler, S. M., Tajmirriyahi, M., Ickes, W., & Jonason, P. K. (2021). The self-concepts of people with dark triad traits tend to be weaker, less clearly defined, and more state-related. *Personality and Individual Differences*, 180(110977). <https://doi.org/10.1016/j.paid.2021.110977>
- Doll, W. J., Xia, W., & Torkzadeh, G. (1994). A confirmatory factor analysis of the end-user computing satisfaction instrument. *MIS Quarterly*, 18(4), 453–461. <https://doi.org/10.2307/249524>
- Dragostinov, Y., & Möttus, R. (2023). Test-retest reliability and construct validity of the brief Dark Triad measurements. *Journal of Personality Assessment*, 105(2), 143–148. <https://doi.org/10.1080/00223891.2022.2052303>
- Duriez, B., & Van Hiel, A. (2002). The march of modern fascism. A comparison of Social Dominance Orientation and authoritarianism. *Personality and Individual Differences*, 32(7), 1199–1213. [https://doi.org/10.1016/S0191-8869\(01\)00086-1](https://doi.org/10.1016/S0191-8869(01)00086-1)

- Earp, B. D., & Trafimow, D. (2015). Replication, falsification, and the crisis of confidence in social psychology. *Frontiers in Psychology, 15*(621).
<https://doi.org/10.3389/fpsyg.2015.00621>
- Eddy, C. M. (2023). Self-serving social strategies: A systematic review of social cognition in narcissism. *Current Psychology, 42*(6), 4362–4380.
<https://doi.org/10.1007/s12144-021-01661-3>
- Edmonds, G. W., Goldberg, L. R., Hampson, S. E., & Barckley, M. (2013). Personality stability from childhood to midlife: Relating teachers' assessments in elementary school to observer- and self-ratings 40 years later. *Journal of Research in Personality, 47*(5), 505–513. <https://doi.org/10.1016/j.jrp.2013.05.003>
- Egan, V., Chan, S., & Shorter, G. W. (2014). The Dark Triad, happiness and subjective well-being. *Personality and Individual Differences, 67*, 17–22.
<https://doi.org/10.1016/j.paid.2014.01.004>
- Emmons, R. A. (1984). Factor analysis and construct validity of the Narcissistic Personality Inventory. *Journal of Personality Assessment, 48*(3), 291–300.
https://doi.org/10.1207/s15327752jpa4803_11
- Enders, C. K. (2022). *Applied missing data analysis* (2nd). Guilford Publications.
- Epstein, S., & O'Brien, E. J. (1985). The Person-Situation Debate in historical and current perspective. *Psychological Bulletin, 98*(3), 513–537.
<https://doi.org/10.1037/0033-2909.98.3.513>
- Ewoldsen, D. R., Eno, C. A., Okdie, B. M., Velez, J. A., Guadagno, R. E., & DeCoster, J. (2012). Effect of playing violent video games cooperatively or competitively on subsequent cooperative behavior. *Cyberpsychology, Behavior, and Social Networking, 15*(5), 277–280. <https://doi.org/10.1089/cyber.2011.0308>
- Eysenck, H. J. (1994). Trait Theories of Personality. In A. M. Coleman (Ed.), *Companion Encyclopedia of Psychology* (1st, pp. 622–640, Vol. 1). Routledge.
<https://doi.org/10.4324/9781315002897-36>

- Faul, F., Erdfelder, E., Buchner, A., & Lang, A. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41, 1149–1160.
- FeldmanHall, O., Mobbs, D., Evans, D., Hiscox, L. V., Navrady, L., & Dalgleish, T. (2012). What we say and what we do: The relationship between real and hypothetical moral choices. *Cognition*, 123(3), 434–441. <https://doi.org/10.1016/j.cognition.2012.02.001>
- Fernández del Río, E., Ramos-Villagrasa, P. J., Castro, Á., & Barrada, J. (2019). Sociosexuality and bright and dark personality: The prediction of behavior, attitude, and desire to engage in casual sex. *International Journal of Environmental Research and Public Health*, 16(15), 2731. <https://doi.org/10.3390/ijerph16152731>
- Fleeson, W. (2004). Moving personality beyond the person-situation debate: The challenge and the opportunity of within-person variability. *Current Directions in Psychological Science*, 13(2), 83–87. <https://doi.org/10.1111/j.0963-7214.2004.00280.x>
- Fleeson, W. (2001). Toward a structure- and process-integrated view of personality: Traits as density distributions of states. *Journal of Personality and Social Psychology*, 80(6), 1011–1027. <https://doi.org/10.1037/0022-3514.80.6.1011>
- Fleeson, W. (2007a). Situation-based contingencies underlying trait-content manifestation in behavior. *Journal of Personality*, 75(4), 825–861. <https://doi.org/10.1111/j.1467-6494.2007.00458.x>
- Fleeson, W. (2007b). Studying personality processes: Explaining change in between-persons longitudinal and within-person multilevel models. In R. W. Robins, R. C. Fraley, & R. F. Krueger (Eds.), *Handbook of research methods in personality psychology* (pp. 523–542). The Guilford Press.
- Foster, J. D., Campbell, W. K., & Twenge, J. M. (2003). Individual differences in narcissism: Inflated self-views across the lifespan and around the world. *Journal of Research in Personality*, 37(6), 469–486. [https://doi.org/10.1016/S0092-6566\(03\)00026-6](https://doi.org/10.1016/S0092-6566(03)00026-6)

- Fowles, D. C., & Dindo, L. (2009). Temperament and psychopathy: A dual-pathway model. *Current Directions in Psychological Science*, 18(3), 179–183.
<https://doi.org/10.1111/j.1467-8721.2009.01632.x>
- Fraley, R. C., & Roberts, B. W. (2005). Patterns of continuity: A dynamic model for conceptualizing the stability of individual differences in psychological constructs across the life course. *Psychological Review*, 112(1), 60–74.
<https://doi.org/10.1037/0033-295X.112.1.60>
- Frazier, A., A, P. F., & Gonzales, J. E. (2019). Born this way? a review of neurobiological and environmental evidence for the etiology of psychopathy. *Personality Neuroscience*, 2, e8.
<https://doi.org/10.1017/pen.2019.7>
- Funder, D. C. (2006). Towards a resolution of the personality triad: Persons, situations, and behaviors. *Journal of Research in Personality*, 40(1), 21–34.
<https://doi.org/10.1016/j.jrp.2005.08.003>
- Furnham, A., & Argyle, M. (2013). *The psychology of social situations: Selected readings* (Vol. 67). Elsevier.
- Furnham, A., Richards, S., Rangel, L., & Jones, D. N. (2014). Measuring malevolence: Quantitative issues surrounding the Dark Triad of personality. *Personality and Individual Differences*, 67, 114–121. <https://doi.org/10.1016/j.paid.2014.02.001>
- Furr, R. M., & Funder, D. C. (2021). Persons, situations, and person–situation interactions. In O. P. John & R. W. Robins (Eds.), *Handbook of personality: Theory and research* (4th, pp. 667–685). The Guilford Press.
- Gabriel, M. T., Critelli, J. W., & Ee, J. S. (1994). Narcissistic illusions in self-evaluations of intelligence and attractiveness. *Journal of Personality*, 62(1), 143–155.
<https://doi.org/10.1111/j.1467-6494.1994.tb00798.x>
- Geen, R. G. (1997). Chapter 16 - psychophysiological approaches to personality. In R. Hogan, J. Johnson, & S. Briggs (Eds.), *Handbook of personality psychology* (pp. 387–414). Academic Press. <https://doi.org/10.1016/B978-012134645-4/50017-2>

- Geis, F. L., Christie, R., & Nelson, C. (1970). In search of the machiavel. In R. Christie & F. L. Geis (Eds.). Academic Press.
- Giacomin, M., & Jordan, C. H. (2016a). Self-focused and feeling fine: Assessing state narcissism and its relation to well-being. *Journal of Research in Personality*, 63, 12–21.
<https://doi.org/10.1016/j.jrp.2016.04.009>
- Giacomin, M., & Jordan, C. H. (2016b). The wax and wane of narcissism: Grandiose narcissism as a process or state. *Journal of Personality*, 84(2), 154–164.
<https://doi.org/10.1111/jopy.12148>
- Gill, D. J., & Crino, R. D. (2012). The relationship between psychopathy and age in a non-clinical community convenience sample. *Psychiatry, Psychology and Law*, 19(4), 547–557.
<https://doi.org/10.1080/13218719.2011.615810>
- Gluck, M., Heesacker, M., & Choi, H. D. (2020). How much of the Dark Triad is accounted for by sexism? *Personality and Individual Differences*, 154(1), 109728.
<https://doi.org/10.1016/j.paid.2019.109728>
- Goffman, E. (1961). Fun in games. In R. McGinnis (Ed.), *Encounters: Two studies in the sociology of interaction* (pp. 17–84). Bobbs-Merrill.
<https://doi.org/10.1016/B978-0-12-804674-6.00021-1>
- Goldberg, L. R. (1990). An alternative “description of personality”: The big-five factor structure. *Journal of Personality and Social Psychology*, 59(6), 1216–1229.
<https://doi.org/10.1037//0022-3514.59.6.1216>
- Goldberg, L. R. (1992). The development of markers for the Big-Five factor structure. *Psychological Assessment*, 4(1), 26–42. <https://doi.org/10.1037/1040-3590.4.1.26>
- Gómez-Leal, R., Gutiérrez-Cobo, M. J., Megías-Robles, A., & Fernández-Berrocal, P. (2023). The dark triad and subjective well-being: The mediating role of cognitive-emotional regulation strategies. *Scandinavian Journal of Psychology*, 64(3), 368–375.
<https://doi.org/10.1111/sjop.12890>

- Goncalves, M. K., & Campbell, L. (2014). The Dark Triad and the derogation of mating competitors. *Personality and Individual Differences*, 67, 42–46.
<https://doi.org/10.1016/j.paid.2014.02.003>
- Gordts, S., Uzieblo, K., Neumann, C., den Bussche, E. V., & Rossi, G. (2017). Validity of the self-report psychopathy scales (SRP-III full and short versions) in a community sample. *Assessment (Odessa, Fla.)*, 24(3), 308–325. <https://doi.org/10.1177/1073191115606205>
- Götz, F. M., Bleidorn, W., & Rentfrow, P. J. (2020). Age differences in Machiavellianism across the life span: Evidence from a large-scale cross-sectional study. *Journal of Personality*, 88(5), 978–992. <https://doi.org/10.1111/jopy.12545>
- Goulet, J., & Morizot, J. (2023). Socio-educational environment questionnaire: Factor validity and measurement invariance in a longitudinal study of high school students. *Learning Environments Research*, 26, 445–467. <https://doi.org/10.1007/s10984-022-09441-x>
- Greitemeyer, T. (2013). Playing video games cooperatively increases empathic concern. *Social Psychology*, 44(6), 408–413. <https://doi.org/10.1027/1864-9335/a000154>
- Greitemeyer, T. (2014). Playing violent video games increases intergroup bias. *Personality and Social Psychology Bulletin*, 40(1), 70–78. <https://doi.org/10.1177/0146167213505872>
- Greitemeyer, T., Osswald, S., & Brauer, M. (2010). Playing prosocial video games increases empathy and decreases schadenfreude. *Emotion*, 10(6), 796–802.
<https://doi.org/10.1037/a0020194>
- Greitemeyer, T., Traut-Mattausch, E., & Osswald, S. (2012). How to ameliorate negative effects of violent video games on cooperation: Play it cooperatively in a team. *Computers in Human Behavior*, 28(4), 1465–1470. <https://doi.org/10.1016/j.chb.2012.03.009>
- Grijalva, E., Newman, D. A., Tay, L., Donnellan, M. B., Harms, P. D., Robins, R. W., & Yan, T. (2015). Gender differences in narcissism: A meta-analytic review. *Psychological Bulletin*, 141(2), 261–310. <https://doi.org/doi:10.1037/a0038231>

- Haehner, P., Wright, A. J., & Bleidorn, W. (2024). A systematic review of volitional personality change research. *Communications Psychology*, 2(115).
<https://doi.org/10.1038/s44271-024-00167-5>
- Hampson, S. E., & Goldberg, L. R. (2006). A first large cohort study of personality trait stability over the 40 years between elementary school and midlife. *Journal of Personality and Social Psychology*, 91(4), 763–779. <https://doi.org/doi:10.1037/0022-3514.91.4.763>
- Haney, C., Banks, C., & Zimbardo, P. (1973). Interpersonal dynamics in a simulated prison. *International Journal of Criminology and Penology*, 1, 69–97.
<https://doi.org/10.1111/jopy.12286>
- Hardin, B. S., & Smith, C. V. (2022). Darker by the day: Daily variability in dark personality traits. *Personality and Individual Differences*, 185, Article 111248.
<https://doi.org/10.1016/j.paid.2021.111248>
- Hare, R. D., Black, P. J., & Walsh, Z. (2013). The Psychopathy Checklist-Revised: Applications and limitations. In R. P. Archer & E. M. Wheeler (Eds.), *Forensic uses of clinical assessment instruments* (pp. 230–265). Routledge.
- Hassabis, D., Spreng, R. N., Rusu, A. A., Robbins, C. A., Mar, R. A., & Schacter, D. L. (2014). Imagine all the people: How the brain creates and uses personality models to predict behavior. *Cerebral cortex (New York, N.Y. 1991)*, 24(8), 1979–1987.
<https://doi.org/10.1093/cercor/bht042>
- Ho, A. K., Sidanius, J., Kteily, N., Sheehy-Skeffington, J., Pratto, F., Henkel, K. E., Foels, R., & Stewart, A. L. (2015). The nature of Social Dominance Orientation: Theorizing and measuring preferences for intergroup inequality using the new SDO₇ scale. *Journal of Personality and Social Psychology*, 109(6), 1003–1028.
<https://doi.org/10.1037/pspi0000033>
- Hodson, G., Hogg, S. M., & MacInnis, C. C. (2009). The role of “dark personalities” (narcissism, Machiavellianism, psychopathy), Big Five personality factors, and ideology in explaining

- prejudice. *Journal of Research in Personality*, 43(4), 686–690.
<https://doi.org/10.1016/j.jrp.2009.02.005>
- Holtzman, N. S. (2011). Facing a psychopath: Detecting the dark triad from emotionally-neutral faces, using prototypes from the Personality Faceaurus. *Journal of Research in Personality*, 45(6), 648–654. <https://doi.org/10.1016/j.jrp.2011.09.002>
- Hooley, J. M., Cole, S. H., & Gironde, S. (2012). Borderline personality disorder. In T. A. Widiger (Ed.), *The Oxford handbook of personality disorders* (pp. 165–195). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199735013.013.0020>
- Hopwood, C. J., Donnellan, M. B., Blonigen, D. M., Krueger, R. F., McGue, M., Iacono, W. G., & Burt, S. A. (2011). Genetic and environmental influences on personality trait stability and growth during the transition to adulthood: A three-wave longitudinal study. *Journal of Personality and Social Psychology*, 100(3), 545–556. <https://doi.org/10.1037/a0022409>
- Horan, S. M., Guinn, T. D., & Banghart, S. (2015). Understanding relationships among the Dark Triad personality profile and romantic partners' conflict communication. *Communication Quarterly*, 63(2), 156–170. <https://doi.org/10.1080/01463373.2015.1012220>
- Horstmann, K. T., Rauthmann, J. F., Sherman, R. A., & Ziegler, M. (2021). Unveiling an exclusive link: Predicting behavior with personality, situation perception, and affect in a preregistered experience sampling study. *Journal of Personality and Social Psychology*, 120(5), 1317–1343. <https://doi.org/10.1037/pspp0000357>
- Horstmann, K. T., & Ziegler, M. (2020). Assessing personality states: What to consider when constructing personality state measures. *European Journal of Personality*, 34(6), 1037–1059. <https://doi.org/10.1002/per.2266>
- Houston, J. M., Queen, J. S., Cruz, N., Vlahov, R., & Gosnell, M. (2015). Personality traits and winning: Competitiveness, hypercompetitiveness, and Machiavellianism. *North American Journal of Psychology*, 17(1), 105.
- Hudson, N. W., Briley, D. A., Chopik, W. J., & Derringer, J. (2019). You have to follow through: Attaining behavioral change goals predicts volitional personality change. *Journal of*

- Personality and Social Psychology*, 117(4), 839–857.
<https://doi.org/10.1037/pspp0000221>
- Hudson, N. W., & Fraley, R. C. (2015). Volitional personality trait change: Can people choose to change their personality traits? *Journal of Personality and Social Psychology*, 109(3), 490–507. <https://doi.org/10.1037/pspp0000021>
- Hudson, N. W., & Roberts, B. W. (2014). Goals to change personality traits: Concurrent links between personality traits, daily behavior, and goals to change oneself. *Journal of Research in Personality*, 53, 68–83. <https://doi.org/10.1016/j.jrp.2014.08.008>
- Hyatt, C. S., Weiss, B. M., Carter, N. T., Zeichner, A., & Miller, J. D. (2018). The relation between narcissism and laboratory aggression is not contingent on environmental cues of competition. *Personality Disorder*, 9(6), 543–552. <https://doi.org/10.1037/per0000284>
- Ickes, W., Snyder, M., & Garcia, S. (1997). Chapter 7 - personality influences on the choice of situations. In R. Hogan, J. Johnson, & S. Briggs (Eds.), *Handbook of personality psychology* (pp. 165–195). Academic Press.
<https://doi.org/10.1016/B978-012134645-4/50008-1>
- Jakobwitz, S., & Egan, V. (2006). The dark triad and normal personality traits. *Personality and Individual Differences*, 40(2), 331–339. <https://doi.org/10.1016/j.paid.2005.07.006>
- James, S., Kavanagh, P. S., Jonason, P. K., Chonody, J. M., & Scrutton, H. E. (2014). The Dark Triad, schadenfreude, and sensational interests: Dark personalities, dark emotions, and dark behaviors. *Personality and Individual Differences*, 68, 211–216.
<https://doi.org/10.1016/j.paid.2014.04.020>
- The jamovi project. (2021). jamovi (Version 1.6) [Computer Software]. <https://www.jamovi.org>
- John, O. P. (1989). Towards a taxonomy of personality descriptors. In D. M. Buss & N. Cantor (Eds.), *Personality psychology: Recent trends and emerging directions* (pp. 261–271). Springer US. https://doi.org/10.1007/978-1-4684-0634-4_20
- John, O. P., Donahue, E. M., & Kentle, R. L. (1991). Big Five Inventory (BFI). *APA PsycTests*.
<https://doi.org/10.1037/t07550-000>

- John, O. P., & Gosling, S. D. (2000). Personality traits. American Psychological Association.
<https://doi.org/10.1037/10521-044>
- John, O. P., Naumann, L. P., & Soto, C. J. (2008). Paradigm shift to the integrative big five trait taxonomy: History, measurement, and conceptual issues. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (3rd, pp. 114–158). The Guilford Press.
- Johnson, A. M., Vernon, P. A., & Feiler, A. R. (2008). Behavioral genetic studies of personality: An introduction and review of the results of 50+ years of research. In G. J. Boyle, G. Matthews, & D. H. Saklofske (Eds.), *The SAGE handbook of personality theory and assessment: Volume 1 — Personality theories and models* (pp. 145–173). Sage Publications. <https://doi.org/10.4135/9781849200462.n7>
- Johnson, J. A. (1999). Persons in situations: distinguishing new wine from old wine in new bottles. *European Journal of Personality*, 13(5), 443–453. [https://doi.org/10.1002/\(SICI\)1099-0984\(199909/10\)13:5<443::AID-PER358>3.0.CO;2-9](https://doi.org/10.1002/(SICI)1099-0984(199909/10)13:5<443::AID-PER358>3.0.CO;2-9)
- Johnston, L., Hawes, D. J., & Straiton, M. (2014). Psychopathic traits and social cooperation in the context of emotional feedback. *Psychiatry, Psychology and Law*, 21(5), 767–778. <https://doi.org/10.1080/13218719.2014.893550>
- Jonason, P. K., Baughman, H. M., Carter, G. L., & Parker, P. (2015). Dorian Gray without his portrait: Psychological, social, and physical health costs associated with the Dark Triad. *Personality and Individual Differences*, 78, 5–13. <https://doi.org/10.1016/j.paid.2015.01.008>
- Jonason, P. K., & Davis, M. D. (2018). A gender role view of the Dark Triad traits. *Personality and Individual Differences*, 125, 102–105. <https://doi.org/10.1016/j.paid.2018.01.004>
- Jonason, P. K., Duineveld, J. J., & Middleton, J. P. (2015). Pathology, pseudopathology, and the Dark Triad of personality. *Personality and Individual Differences*, 78, 43–47. <https://doi.org/10.1016/j.paid.2015.01.028>

- Jonason, P. K., Foster, J. D., Egorova, M. S., Parshikova, O., Csathó, Á., Oshio, A., & Gouveia, V. V. (2017). The Dark Triad traits from a life history perspective in six countries. *Frontiers in Psychology, Volume 8*. <https://doi.org/10.3389/fpsyg.2017.01476>
- Jonason, P. K., Icho, A., & Ireland, K. (2016). Resources, harshness, and unpredictability: The socioeconomic conditions associated with the Dark Triad traits. *Evolutionary Psychology, 14*(1), 1–11. <https://doi.org/10.1177/1474704915623699>
- Jonason, P. K., & Jackson, C. J. (2016). The Dark Triad traits through the lens of Reinforcement Sensitivity Theory. *Personality and Individual Differences, 90*, 273–277. <https://doi.org/10.1016/j.paid.2015.11.023>
- Jonason, P. K., Jones, A., & Lyons, M. (2013). Creatures of the night: Chronotypes and the Dark Triad traits. *Personality and Individual Differences, 55*(5), 538–541. <https://doi.org/10.1016/j.paid.2013.05.001>
- Jonason, P. K., & Kavanagh, P. (2010). The dark side of love: Love styles and the Dark Triad. *Personality and Individual Differences, 49*(6), 606–610. <https://doi.org/10.1016/j.paid.2010.05.030>
- Jonason, P. K., Koenig, B. L., & Tost, J. (2010). Living a fast life: The Dark Triad and Life History Theory. *Human Nature, 21*(4), 428–442. <https://doi.org/10.1007/s12110-010-9102-4>
- Jonason, P. K., & Krause, L. (2013). The emotional deficits associated with the Dark Triad traits: Cognitive empathy, affective empathy, and alexithymia. *Personality and Individual Differences, 55*(5), 532–537. <https://doi.org/10.1016/j.paid.2013.04.027>
- Jonason, P. K., & Lavertu, A. N. (2017). The reproductive costs and benefits associated with the Dark Triad traits in women. *Personality and Individual Differences, 110*, 38–40. <https://doi.org/10.1016/j.paid.2017.01.024>
- Jonason, P. K., Li, N. P., & Buss, D. M. (2010). The costs and benefits of the Dark Triad: Implications for mate poaching and mate retention tactics. *Personality and Individual Differences, 48*(4), 373–378. <https://doi.org/10.1016/j.paid.2009.11.003>

- Jonason, P. K., Li, N. P., & Teicher, E. A. (2010). Who is James Bond?: The Dark Triad as an agentic social style. *Individual Differences Research*, 8(2), 111–120.
- Jonason, P. K., Li, N. P., Webster, G. D., & Schmitt, D. P. (2009). The Dark Triad: Facilitating a short-term mating strategy in men. *European Journal of Personality*, 23(1), 5–18.
<https://doi.org/10.1002/per.698>
- Jonason, P. K., Lyons, M., Baughman, H. M., & Vernon, P. A. (2014). What a tangled web we weave: The Dark Triad traits and deception. *Personality and Individual Differences*, 70, 117–119. <https://doi.org/10.1016/j.paid.2014.06.038>
- Jonason, P. K., Lyons, M., & Bethell, E. (2014). The making of Darth Vader: Parent–child care and the Dark Triad. *Personality and Individual Differences*, 67, 30–34.
<https://doi.org/10.1016/j.paid.2013.10.006>
- Jonason, P. K., & Schmitt, D. P. (2012). What have you done for me lately? Friendship-selection in the shadow of the Dark Triad traits. *Evolutionary Psychology*, 10(3), 400–421.
<https://doi.org/10.1177/147470491201000303>
- Jonason, P. K., & Sherman, R. A. (2020). Personality and the perception of situations: The Big Five and Dark Triad traits. *Personality and Individual Differences*, 163, 110081.
<https://doi.org/10.1016/j.paid.2020.110081>
- Jonason, P. K., Underhill, D., & Navarrate, C. D. (2020). Understanding prejudice in terms of approach tendencies: The Dark Triad traits, sex differences, and political personality traits. *Personality and Individual Differences*, 153, 109617.
<https://doi.org/10.1016/j.paid.2019.109617>
- Jonason, P. K., & Webster, G. D. (2010). The Dirty Dozen: A concise measure of the Dark Triad. *Psychological Assessment*, 22(2), 420–432. <https://doi.org/10.1037/a0019265>
- Jonason, P. K., & Webster, G. D. (2012). A protean approach to social influence: Dark Triad personalities and social influence tactics. *Personality and Individual Differences*, 52(4), 521–526. <https://doi.org/10.1016/j.paid.2011.11.023>

- Jones, D. N., & Paulhus, D. L. (2009). Machiavellianism. In M. R. Leary & H. R. Hoyle (Eds.), *Handbook of Individual Differences in Social Behavior* (pp. 93–108). The Guilford Press.
- Jones, D. N., & Paulhus, D. L. (2011). The role of impulsivity in the Dark Triad of personality. *Personality and Individual Differences*, 51(5), 679–682.
<https://doi.org/10.1016/j.paid.2011.04.011>
- Jones, D. N., & Paulhus, D. L. (2014). Introducing the Short Dark Triad (SD3): A brief measure of dark personality traits. *Assessment*, 21(1), 28–41.
<https://doi.org/10.1177/1073191113514105>
- Jones, D. N., & Figueredo, A. J. (2013). The core of darkness: Uncovering the heart of the Dark Triad. *European Journal of Personality*, 27(6), 521–531. <https://doi.org/10.1002/per.1893>
- Kajonius, P. J., Persson, B. N., Rosenberg, P., & Garcia, D. (2016). The (mis)measurement of the Dark Triad Dirty Dozen: Exploitation at the core of the scale. *PeerJ*, 4, e1748.
<https://doi.org/10.7717/peerj.1748>
- Kammrath, L. K., Mendoza-Denton, R., & Mischel, W. (2005). Incorporating if...then...personality signatures in person perception: Beyond the person-situation dichotomy. *Journal of Personality and Social Psychology*, 88(4), 605–618.
<https://doi.org/10.1037/0022-3514.88.4.605>
- Katakis, P., Schlieff, M., Barnett, P., Rains, L. S., Rowe, S., Pilling, S., & Johnson, S. (2023). Effectiveness of outpatient and community treatments for people with a diagnosis of ‘personality disorder’: Systematic review and meta-analysis. *BMC Psychiatry*, 23(1), 57.
<https://doi.org/10.1186/s12888-022-04483-0>
- Kaufman, S. B., Yaden, D. B., Hyde, E., & Tsukayama, E. (2019). The Light vs. Dark Triad of Personality: Contrasting two very different profiles of human nature. *Frontiers in Psychology*, 10, 467. <https://doi.org/10.3389/fpsyg.2019.00467>
- Kendler, K. S., & Baker, J. H. (2007). Genetic influences on measures of the environment: A systematic review. *Psychological Medicine*, 37(5), 615–626.
<https://doi.org/10.1017/S0033291706009524>

- Kendler, K. S., & Eaves, L. J. (1986). Models for the joint effect of genotype and environment on liability to psychiatric illness. *American Journal of Psychiatry*, 143(3), 279–289.
<https://doi.org/10.1176/ajp.143.3.279>
- Kenrick, D. T., & Funder, D. C. (1988). Profiting from controversy: Lessons from the person-situation debate. *American Psychologist*, 43(1), 23–34.
<https://doi.org/10.1037/0003-066X.43.1.23>
- Kilduff, G. J., & Galinsky, A. D. (2017). The spark that ignites: Mere exposure to rivals increases Machiavellianism and unethical behavior. *Journal of Experimental Social Psychology*, 69, 156–162. <https://doi.org/10.1016/j.jesp.2016.10.007>
- King, M. F., & Bruner, G. C. (2000). Social desirability bias: A neglected aspect of validity testing. *Psychology & Marketing*, 17(2), 79–103.
[https://doi.org/10.1002/\(SICI\)1520-6793\(200002\)17:2<79::AID-MAR2>3.0.CO;2-0](https://doi.org/10.1002/(SICI)1520-6793(200002)17:2<79::AID-MAR2>3.0.CO;2-0)
- Klimstra, T. A., Jeronimus, B. F., Sijtsma, J. J., & Denissen, J. J. A. (2020). The unfolding dark side: Age trends in dark personality features. *Journal of Research in Personality*, 85, 103915. <https://doi.org/10.1016/j.jrp.2020.103915>
- Klimstra, T. A., Sijtsma, J. J., Henrichs, J., & Cima, M. (2014). The Dark Triad of personality in adolescence: Psychometric properties of a concise measure and associations with adolescent adjustment from a multi-informant perspective. *Journal of Research in Personality*, 53, 84–92. <https://doi.org/10.1016/j.jrp.2014.09.001>
- Kline, R. B. (2023). *Principles and practice of structural equation modeling* (5th). Guilford Press.
- Knitter, L. A., Hoffmann, J., Eid, M., & Koch, T. (2025). Measuring the dark triad: A meta-analytical SEM study of two prominent short scales. *Frontiers in Psychology*, 15, 1469970. <https://doi.org/10.3389/fpsyg.2024.1469970>
- Kohn, A. (1992). *No contest: The case against competition* (Revised edition). Houghton Mifflin Company.
- Krick, A., Tresp, S., Vatter, M., Ludwig, A., Wihlenda, M., & Rettenberger, M. (2016). The relationships between the Dark Triad, the moral judgment level, and the students'

- disciplinary choice: Self-selection, indoctrination, or both? *Journal of Individual Differences*, 37(1), 24–30. <https://doi.org/10.1027/1614-0001/a000184>
- Krizan, Z., & Johar, O. (2012). Envy divides the two faces of narcissism. *Journal of Personality*, 80(5), 1415–1451. <https://doi.org/10.1111/j.1467-6494.2012.00767.x>
- Kubarych, T. S., Deary, I. J., & Austin, E. J. (2004). The Narcissistic Personality Inventory: Factor structure in a non-clinical sample. *Personality and Individual Differences*, 36(4), 857–872. [https://doi.org/10.1016/S0191-8869\(03\)00158-2](https://doi.org/10.1016/S0191-8869(03)00158-2)
- Lalumière, M. L., Harris, G. T., & Rice, M. E. (2001). Psychopathy and developmental instability. *Evolution and Human Behavior*, 22(2), 75–92.
- Laws, K. R. (2016). Psychology, replication & beyond. *BMC Psychology*, 4(30). <https://doi.org/10.1186/s40359-016-0135-2>
- Lee, K., & Ashton, M. C. (2004). Psychometric properties of the HEXACO Personality Inventory. *Multivariate Behavioral Research*, 39(2), 329–358. https://doi.org/10.1207/s15327906mbr3902_8
- Lee, K., & Ashton, M. C. (2005). Psychopathy, Machiavellianism, and Narcissism in the Five-Factor Model and the HEXACO model of personality structure. *Personality and Individual Differences*, 38(7), 1571–1582. <https://doi.org/10.1016/j.paid.2004.09.016>
- Lee, K., Ashton, M. C., Wiltshire, J., Bourdage, J. S., Visser, B. A., & Gallucci, A. (2013). Sex, Power, and Money: Prediction from the Dark Triad and Honesty–Humility. *European Journal of Personality*, 27(2), 169–184. <https://doi.org/10.1002/per.1860>
- Li, J., Liu, C., Albertella, L., Rotaru, K., Li, K., Zhou, Y., Wei, X., Yuan, S., Liu, X., & Ren, L. (2024). Network analysis of the association between Dark Triad traits and depression symptoms in university students. *Personality and Individual Differences*, 218(112495), 1–18. <https://doi.org/10.1016/j.paid.2023.112495>
- Li, W.-D., Li, S., Feng, J. J., Wang, M., Zhang, H., Frese, M., & Wu, C.-H. (2021). Can becoming a leader change your personality? An investigation with two longitudinal studies from a

- role-based perspective. *Journal of Applied Psychology*, 106(6), 882–901.
<https://doi.org/10.1037/apl0000808>
- Lucas, R. E., & Donnellan, B. M. (2011). Personality development across the life span: Longitudinal analyses with a national sample from Germany. *Journal of Personality and Social Psychology*, 101(4), 847–861. <https://doi.org/10.1037/a0024298>
- Luchner, A. F., Houston, J. M., Walker, C., & Alex Houston, M. (2011). Exploring the relationship between two forms of narcissism and competitiveness. *Personality and Individual Differences*, 51(6), 779–782. <https://doi.org/10.1016/j.paid.2011.06.033>
- Luyckx, K., Goossens, L., & Soenens, B. (2006). A developmental contextual perspective on identity construction in Emerging Adulthood: Change dynamics in commitment formation and commitment evaluation. *Developmental Psychology*, 42(2), 366–380.
<https://doi.org/10.1037/0012-1649.42.2.366>
- Lyons, M. (2019). *The Dark Triad of Personality: Narcissism, Machiavellianism, and Psychopathy in Everyday Life*. Academic Press.
- Lyons, M., Evans, K., & Helle, S. (2019). Do “Dark” personality features buffer against adversity? The associations between cumulative life stress, the Dark Triad, and mental distress. *SAGE Open*, 9(1). <https://doi.org/10.1177/2158244018822383>
- Lyu, C., Xu, D., & Chen, G. (2025). Dark and Blue: A meta-analysis of the relationship between Dark Triad and depressive symptoms. *Journal of Research in Personality*, 114, 104553.
<https://doi.org/10.1016/j.jrp.2024.104553>
- MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods*, 1(2), 130–149.
<https://doi.org/10.1037/1082-989X.1.2.130>
- MacNeill, L. A., & Pérez-Edgar, K. (2020). Temperament and emotion. In *The encyclopedia of child and adolescent development* (pp. 1–12). John Wiley & Sons, Ltd.
<https://doi.org/10.1002/9781119171492.wecad180>

- Magnusson, D., & Endler, N. S. (1977). *Personality at the crossroads: Current issues in interactional psychology*. Lawrence Erlbaum Associates.
- Malesza, M., Ostaszewski, P., Büchner, S., & Kaczmarek, M. C. (2017). The adaptation of the short Dark Triad personality measure — Psychometric properties of a German sample. *Current Psychology*, 38, 855–864. <https://doi.org/10.1007/s12144-017-9662-0>
- Maples, J. L., Lamkin, J., & Miller, J. D. (2014). A test of two brief measures of the Dark Triad: The dirty dozen and short dark triad. *Psychological Assessment*, 26(1), 326–331. <https://doi.org/10.1037/a0035084>
- McCabe, K. O., Mack, L., & Fleenor, W. (2012). A guide for data cleaning in experience sampling studies. In M. R. Mehl & T. S. Conner (Eds.), *Handbook of research methods for studying daily life* (pp. 321–338). The Guilford Press.
- McClowry, S. G. (1992). Temperament theory and research. *Image: the Journal of Nursing Scholarship*, 24(4), 319–325. <https://doi.org/10.1111/j.1547-5069.1992.tb00740.x>
- McCoy, J. M., & Evans, G. W. (2002). The potential role of the physical environment in fostering creativity. *Creativity Research Journal*, 14(3-4), 409–426. https://doi.org/10.1207/S15326934CRJ1434_11
- McCrae, R. R., & Costa, P. T. (1987). Validation of the five-factor model of personality across instruments and observers. *Journal of Personality and Social Psychology*, 52(1), 81–90. <https://doi.org/10.1037/0022-3514.52.1.81>
- McCrae, R. R., & Costa, P. T. (1994). The stability of personality: Observation and evaluations. *Current Directions in Psychological Science*, 3(6), 173–175. <https://doi.org/10.1111/1467-8721.ep10770693>
- McCrae, R. R., & Costa Jr., P. T. (2008). The five-factor theory of personality. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.). The Guilford Press.
- McCrae, R. R., Costa Jr., P. T., Ostendorf, F., Angleitner, A., Hrebícková, M., Avia, M. D., Sanz, J., Sánchez-Bernardos, M. L., Kusdil, M. E., Woodfield, R., Saunders, P. R., & Smith, P. B. (2000). Nature over nurture: Temperament, personality, and life span

- development. *Journal of Personality and Social Psychology*, 78(1), 173–186.
<https://doi.org/10.1037//0022-3514.78.1.173>
- McCrae, R. R., & John, O. P. (1992). An introduction to the five-factor model and its applications. *Journal of Personality*, 60(2), 175–215.
<https://doi.org/10.1111/j.1467-6494.1992.tb00970.x>
- McCrae, R. R., Kurtz, J. E., Yamagata, S., & Terracciano, A. (2011). Internal consistency, retest reliability, and their implications for personality scale validity. *Personality and Social Psychology Review*, 15(1), 28–50. <https://doi.org/10.1177/1088868310366253>
- McDonald, M. M., Donnellan, M. B., & Navarrete, C. D. (2012). A life history approach to understanding the Dark Triad. *Personality and Individual Differences*, 52(5), 601–605.
<https://doi.org/10.1016/j.paid.2011.12.003>
- McIlwain, D. (2011). Young Machiavellians and the traces of shame: Coping with vulnerability to a toxic affect. In C. T. Barry, P. K. Kerig, T. D. Barry, & K. K. Stellwagen (Eds.), *Narcissism and Machiavellianism in youth: Implications for the development of adaptive and maladaptive behavior* (1st, pp. 213–231). American Psychological Association.
<https://doi.org/doi:10.1037/12352-012>
- McLarnon, M. J. (2022). Into the heart of darkness: A person-centered exploration of the Dark Triad. *Personality and Individual Differences*, 186, 111354.
<https://doi.org/10.1016/j.paid.2021.111354>
- McMahan, E. A., & Estes, D. (2015). The effect of contact with natural environments on positive and negative affect: A meta-analysis. *The Journal of Positive Psychology*, 10(6), 507–519.
<https://doi.org/10.1080/17439760.2014.994224>
- McNeish, D. (2018). Thanks coefficient alpha, we'll take it from here. *Psychological Methods*, 23(3), 412–433. <https://doi.org/10.1037/met0000144>
- Milgram, S. (1963). Behavioral study of obedience. *Journal of abnormal and social psychology*, 67(4), 371–378. <https://doi.org/10.1037/h0040525>

- Miller, J. D., & Maples, J. (2011). Trait personality models of narcissistic personality disorder, grandiose narcissism, and vulnerable narcissism. In W. K. Campbell & J. D. Miller (Eds.), *The handbook of narcissism and narcissistic personality disorder* (pp. 71–88). John Wiley & Sons, Inc. <https://doi.org/10.1002/9781118093108.ch7>.
- Miller, J. D., Vize, C., Crowe, M. L., & Lynam, D. R. (2019). A critical appraisal of the Dark-Triad literature and suggestions for moving forward. *Current Directions in Psychological Science*, 28(4), 353–360. <https://doi.org/10.1177/0963721419838233>
- Mischel, W. (1968). *Personality and assessment* (First edition). Psychology Press. <https://doi.org/10.4324/9780203763643>
- Mischel, W. (1973). Toward a cognitive social learning reconceptualization of personality. *Psychological Review*, 80(4), 252–283. <https://doi.org/10.1037/h0035002>
- Mischel, W. (1979). On the interface of cognition and personality: Beyond the person–situation debate. *American Psychologist*, 34(9), 740–754. <https://doi.org/10.1037/0003-066X.34.9.740>
- Mischel, W., & Shoda, Y. (1995). A cognitive-affective system theory of personality: Reconceptualizing situations, dispositions, dynamics, and invariance in personality structure. *Psychological Review*, 102(2), 246–268. <https://doi.org/10.1037/0033-295X.102.2.246>
- Morizot, J., & Miranda, D. (2007). Approche des traits de personnalité : Postulats, controverses et progrès récents. *Revue de Psychoéducation*, 36(2), 363–419. <https://doi.org/10.7202/1097129ar>
- Morris, L., & Mansell, W. (2018). A systematic review of the relationship between rigidity/flexibility and transdiagnostic cognitive and behavioral processes that maintain psychopathology. *Journal of Experimental Psychopathology*, 9(3), Article 2043808718779431. <https://doi.org/10.1177/2043808718779431>
- Moshagen, M., Hilbig, B. E., & Zettler, I. (2018). The dark core of personality. *Psychological Review*, 125(5), 656–688. <https://doi.org/10.1037/rev0000111>

- Moshagen, M. (2012). The model size effect in SEM: Inflated goodness-of-fit statistics are due to the size of the covariance matrix. *Structural Equation Modeling*, 19(1), 86–98.
<https://doi.org/10.1080/10705511.2012.634724>
- Mudrack, P. E. (1989). Age-related differences in Machiavellianism in an adult sample. *Psychological Reports*, 64(3, Pt 2), 1047–1050.
<https://doi.org/10.2466/pr0.1989.64.3c.1047>
- Mudrack, P. E. (1992). Additional evidence on age-related differences in Machiavellianism in an adult sample. *Psychological Reports*, 70(4), 1210–. <https://doi.org/10.2466/PR0.70.4.1210-1210>
- Muris, P., Merckelbach, H., Otgaar, H., & Meijer, E. (2017). The malevolent side of human nature: A meta-analysis and critical review of the literature on the dark triad (narcissism, Machiavellianism, and psychopathy). *Perspectives on Psychological Science*, 12(2), 183–204. <https://doi.org/10.1177/17456916166666070>
- Muris, P., Meesters, C., & Timmermans, A. (2013). Some youths have a gloomy side: Correlates of the Dark Triad personality traits in non-clinical adolescents. *Child Psychiatry and Human Development*, 44(5), 658–665. <https://doi.org/10.1007/s10578-013-0359-9>
- Muthén, L. K., & Muthén, B. O. (2017). *Mplus user's guide* (8th). Muthén & Muthén.
- Myung, I. J. (2003). Tutorial on maximum likelihood estimation. *Journal of Mathematical Psychology*, 47(1), 90–100. [https://doi.org/10.1016/S0022-2496\(02\)00028-7](https://doi.org/10.1016/S0022-2496(02)00028-7)
- Nevicka, B., De Hoogh, A. H. B., Van Vianen, A. E. M., Beersma, B., & McIlwain, D. (2011). All I need is a stage to shine: Narcissists' leader emergence and performance. *The Leadership Quarterly*, 22(5), 910–925. <https://doi.org/10.1016/j.leaqua.2011.07.011>
- Nnam, M. U., Effiong, J. E., Iloma, D. O., Terfa, I. M., & Ajah, B. O. (2023). Hazardous drinking and the Dark Triad: An antidote for manipulative behaviour among students. *Current psychology (New Brunswick, N.J.)*, 42(5), 4286–4292.
<https://doi.org/10.1007/s12144-021-01680-0>

- Nübold, A., van Gils, S., & Zacher, H. (2022). Daily work role stressors and dark triad states: Results of two diary studies. *Zeitschrift für Psychologie*, 230(4), 311–320.
<https://doi.org/10.1027/2151-2604/a000505>
- O’Boyle, E. H., Forsyth, D. R., Banks, G. C., & McDaniel, M. A. (2012). A meta-analysis of the Dark Triad and work behavior: A social exchange perspective. *Journal of Applied Psychology*, 97(3), 557–579. <https://doi.org/10.1037/a0025679>
- O’Boyle, E. H., Forsyth, D. R., Banks, G. C., Story, P. A., & White, C. D. (2015). A meta-analytic test of redundancy and relative importance of the Dark Triad and Five-Factor Model of personality. *Journal of Personality*, 83(6), 644–664. <https://doi.org/10.1111/jopy.12126>
- O’Reilly, C. A., Chatman, J. A., & Doerr, B. (2021). When “me” trumps “we”: Narcissistic leaders and the cultures they create. *Academy of Management Discoveries*, 7(3), 419–450.
<https://doi.org/10.5465/amd.2019.0163>
- Paal, T., & Bereczkei, T. (2007). Adult theory of mind, cooperation, Machiavellianism: The effect of mindreading on social relations. *Personality and Individual Differences*, 43(3), 541–551. <https://doi.org/10.1016/j.paid.2006.12.021>
- Parma, D. R. (2024). *Age related changes in the Dark Triad and subjective well-being in adults* (Publication No. 31327922) [Doctoral dissertation, The California School of Professional Psychology].
<https://login.proxy.bib.uottawa.ca/login?url=https://www.proquest.com/dissertations-theses/age-related-changes-dark-triad-subjective-well/docview/3066239416/se-2>
- Paulhus, D. L., & Williams, K. M. (2002). The dark triad of personality: Narcissism, Machiavellianism and psychopathy. *Journal of Research in Personality*, 36(6), 556–563.
[https://doi.org/10.1016/S0092-6566\(02\)00505-6](https://doi.org/10.1016/S0092-6566(02)00505-6)
- Paulhus, D. L. (2014). Toward a taxonomy of dark personalities. *Current Directions in Psychological Science*, 23(6), 421–426. <https://doi.org/10.1177/0963721414547737>

- Paulhus, D. L., Curtis, S. R., & Jones, D. N. (2018). Aggression as a trait: The Dark Tetrad alternative. *Current Opinion in Psychology*, 19, 88–92.
<https://doi.org/10.1016/j.copsyc.2017.04.007>
- Perry, R., & Sibley, C. G. (2012). Big-Five personality prospectively predicts Social Dominance Orientation and Right-Wing Authoritarianism. *Personality and Individual Differences*, 52(1), 3–8. <https://doi.org/10.1016/j.paid.2011.08.009>
- Perry, R., Sibley, C. G., & Duckitt, J. (2013). Dangerous and competitive worldviews: A meta-analysis of their associations with Social Dominance Orientation and Right-Wing Authoritarianism. *Journal of Research in Personality*, 47(1), 116–127.
<https://doi.org/10.1016/j.jrp.2012.10.004>
- Persson, B. N., Kajonius, P. J., & Garcia, D. (2019). Revisiting the structure of the Short Dark Triad. *Assessment (Odessa, Fla.)*, 26(1), 3–16.
<https://doi.org/10.1177/1073191117701192>
- Porter, S., Bhanwer, A., Woodforth, M., & Black, P. J. (2014). Soldiers of misfortune: An examination of the Dark Triad and the experience of schadenfreude. *Personality and Individual Differences*, 67, 64–68. <https://doi.org/10.1016/j.paid.2013.11.014>
- Pratto, F., Sidanius, J., Stallworth, L. M., & Malle, B. F. (1994). Social Dominance Orientation: A personality variable predicting social and political attitudes. *Journal of Personality and Social Psychology*, 67(4), 741–763. <https://doi.org/10.1037/0022-3514.67.4.741>
- Prenoveau, J. M. (2016). Specifying and interpreting Latent State–Trait Models with autoregression: An illustration. *Structural Equation Modeling: A Multidisciplinary Journal*, 23(5), 731–749. <https://doi.org/10.1080/10705511.2016.1186550>
- Putnick, D. L., & Bornstein, M. H. (2016). Measurement invariance conventions and reporting: The state of the art and future directions for psychological research. *Developmental Review*, 41(1), 71–90. <https://doi.org/10.1016/j.dr.2016.06.004>

- Rammstedt, B., & John, O. P. (2007). Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *Journal of Research in Personality*, 41(1), 203–212. <https://doi.org/10.1016/j.jrp.2006.02.001>
- Raskin, R., & Terry, H. (1988). A principal-components analysis of the Narcissistic Personality Inventory and further evidence of its construct validity. *Journal of personality and social psychology*, 54(5), 890–902. <https://doi.org/10.1037/0022-3514.54.5.890>
- Rauthmann, J. F. (2012). The Dark Triad and interpersonal perception: Similarities and differences in the social consequences of narcissism, Machiavellianism, and psychopathy. *Social Psychological and Personality Science*, 3(4), 487–496. <https://doi.org/10.1177/1948550611427608>
- Rauthmann, J. F., Kappes, M., & Lanzinger, J. (2014). Shrouded in the Veil of Darkness: Machiavellians but not narcissists and psychopaths profit from darker weather in courtship. *Personality and Individual Differences*, 67, 57–63. <https://doi.org/10.1016/j.paid.2014.01.020>
- Rauthmann, J. F., & Kolar, G. P. (2013). The perceived attractiveness and traits of the Dark Triad: Narcissists are perceived as hot, Machiavellians and psychopaths not. *Personality and Individual Differences*, 54(5), 582–586. <https://doi.org/10.1016/j.paid.2012.11.005>
- Rauthmann, J. F., & Will, T. (2011). Proposing a multidimensional Machiavellianism conceptualization. *Social Behavior and Personality*, 39(3), 391–403. <https://doi.org/10.2224/sbp.2011.39.3.391>
- Rico-Bordera, P., Pineda, D., Galán, M., & Piqueras, J. A. (2025). Assessing the dark personality traits with observer reports: A meta-analysis of inter-rater agreement on the Dark Triad and Dark Tetrad traits. *Personality and Mental Health*, 19. <https://doi.org/10.1002/pmh.1639>
- Rilling, J. K., Glenn, A. L., Jairam, M. R., Pagnoni, G., Goldsmith, D. R., Hanie A, E., & Lilienfeld, S. O. (1969). Neural correlates of social cooperation and non-cooperation as a

- function of psychopathy. *Biological Psychiatry*, 61(11), 135–160.
<https://doi.org/10.1016/j.biopsych.2006.07.021>
- Roberts, B. W., & Davis, J. P. (2016). Young adulthood is the crucible of personality development. *Emerging Adulthood*, 4(5), 318–326. <https://doi.org/10.1177/2167696816653052>
- Roberts, B. W., & DelVecchio, W. F. (2000). The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychological Bulletin*, 126(1), 3–25. <https://doi.org/10.1037/0033-2909.126.1.3>
- Roberts, B. W., Edmonds, G., & Grijalva, E. (2010). It is developmental me, not generation me: Developmental changes are more important than generational changes in narcissism—Commentary on Trzesniewski & Donnellan (2010). *Perspectives on Psychological Science*, 5(1), 97–102. <https://doi.org/10.1177/1745691609357019>
- Roberts, B. W., Luo, J., Briley, D. A., Chow, P. I., Su, R., & Hill, P. L. (2017). A systematic review of personality trait change through intervention. *Psychological Bulletin*, 143(2), 117–141. <https://doi.org/10.1037/bul0000088>
- Roberts, B. W., & Mroczek, D. (2008). Personality trait change in adulthood. *Current Directions in Psychological Science*, 17(1), 31–35.
<https://doi.org/10.1111/j.1467-8721.2008.00543.x>
- Roberts, B. W., & Nickel, L. B. (2021). Personality development across the life course: A neo-socioanalytic perspective. In O. P. John & R. W. Robins (Eds.), *Handbook of personality: Theory and research* (4th, pp. 259–283). The Guilford Press.
- Roberts, B. W., O'Donnell, M., & Robins, R. W. (2004). Goal and personality trait development in emerging adulthood. *Journal of Personality and Social Psychology*, 87(4), 541–550.
<https://doi.org/10.1037/0022-3514.87.4.541>
- Roberts, B. W., & Pomerantz, E. M. (2004). On traits, situations, and their integration: A developmental perspective. *Personality and Social Psychology Review*, 8(4), 402–416.
https://doi.org/10.1207/s15327957pspr0804_5

- Roberts, B. W., Walton, K. E., & Viechtbauer, W. (2006). Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies. *Psychological Bulletin*, 132(1), 1–25. <https://doi.org/10.1037/0033-2909.132.1.1>
- Robinson, O. C. (2009). On the social malleability of traits: Variability and consistency in Big 5 trait expression across three interpersonal contexts. *Journal of Individual Differences*, 30(4), 201–208. <https://doi.org/10.1027/1614-0001.30.4.201>
- Robinson, O. C., Nofhle, E. E., Guo, J., Asadi, S., & Zhang, X. (2015). Goals and plans for Big Five personality trait change in young adults. *Journal of Research in Personality*, 59, 31–43. <https://doi.org/10.1016/j.jrp.2015.08.002>
- Rogoza, R., & Cieciuch, J. (2020). Dark Triad traits and their structure: An empirical approach. *Current Psychology*, 34(4), 1287–1302. <https://doi.org/10.1007/s12144-018-9834-6>
- Rose, L., Sleep, C. E., Lynam, D. R., & Miller, J. D. (2023). Welcome to the Jungle: Comparing the empirical profiles of the “Dark” Factor and Antagonism. *Assessment (Odessa, Fla.)*, 30(8), 2626–2643. <https://doi.org/10.1177/10731911221124847>
- Ross, L. (1977). The intuitive psychologist and his shortcomings: Distortions in the attribution process. *Advances in Experimental Social Psychology*, 10, 173–220. [https://doi.org/10.1016/S0065-2601\(08\)60357-3](https://doi.org/10.1016/S0065-2601(08)60357-3)
- Rothbart, M. K., Ahadi, S. A., & Evans, D. E. (2000). Temperament and Personality: Origins and Outcomes. *Journal of Personality and Social Psychology*, 78(1), 122–135. <https://doi.org/10.1037/0022-3514.78.1.122>
- Roulin, N., & Krings, F. (2016). When winning is everything: The relationship between competitive worldviews and job applicant faking. *Applied Psychology*, 65(4), 643–670. <https://doi.org/10.1111/apps.12072>
- Rufino, S. M., Hudson, N. W., & Briskin, J. L. (2024). Volitional change in pathological traits: Can people change their maladaptive traits? *Personality and Social Psychology Bulletin*, 1461672241235737. Advance online publication. <https://doi.org/10.1177/01461672241235737>

- Sachs, J. L., Mueller, U. G., Wilcox, T. P., & Bull, J. J. (2004). The evolution of cooperation. *The Quarterly Review of Biology*, 79(2), 135–160. <https://doi.org/10.1086/383541>
- Savalei, V., & Reise, S. P. (2019). Don't forget the model in your model-based reliability coefficients: A reply to mcneish (2018). *Collabra: Psychology*, 5(1), 36. <https://doi.org/10.1525/collabra.247>
- Schertz, K. E., Bowman, J. E., Kotabe, H. P., Layden, E. A., Zhen, J., Lakhtakia, T., Lyu, M., Paraschos, O. A., Van Hedger, S. C., Rim, N. W., Vohs, K. D., & Berman, M. G. (2022). Environmental influences on affect and cognition: A study of natural and commercial semi-public spaces. *Journal of Environmental Psychology*, 83(101852), 1–13. <https://doi.org/10.1016/j.jenvp.2022.101852>
- Schimmenti, A., Jonason, P. K., Passanisi, A., Marca, L. L., Di Dio, N., & Gervasi, A. M. (2019). Exploring the dark side of personality: Emotional awareness, empathy, and the Dark Triad traits in an Italian sample. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues*, 38(1), 100–109. <https://doi.org/10.1007/s12144-017-9588-6>
- Schmierbach, M. (2010). “killing spree”: Exploring the connection between competitive game play and aggressive cognition. *Communication Research*, 37(2), 256–274. <https://doi.org/10.1177/0093650209356394>
- Schneider, B. A., Avivi-Reich, M., & Mozuraitis, M. (2015). A cautionary note on the use of the Analysis of Covariance (ANCOVA) in classification designs with and without within-subject factors. *Frontiers in Psychology*, 6(474). <https://doi.org/10.3389/fpsyg.2015.00474>
- Schwaba, T., Bleidorn, W., Hopwood, C. J., Manuck, S. B., & Wright, A. G. C. (2022). Refining the maturity principle of personality development by examining facets, close others, and comaturation. *Journal of Personality and Social Psychology*, 122(5), 948–958. <https://doi.org/doi:10.1037/pspp0000400>

- Seifert, I. S., Rohrer, J. M., Egloff, B., & Schmukle, S. C. (2022). The development of the rank-order stability of the Big Five across the life span. *Journal of Personality and Social Psychology, 122*(5), 920–941. <https://doi.org/10.1037/pspp0000398>
- Seybert, J., & Becker, D. (2019). Examination of the test–retest reliability of a forced-choice personality measure. *ETS Research Report Series, 1*, 1–17. <https://doi.org/10.1002/ets2.12273>
- Sherman, R. A., Nave, C. S., & Funder, D. C. (2010). Situational similarity and personality predict behavioral consistency. *Journal of Personality and Social Psychology, 99*(2), 330–343. <https://doi.org/10.1037/a0019796>
- Sherman, R. A., Rauthmann, J. F., Brown, N. A., Serfass, D. G., & Jones, A. B. (2015). The independent effects of personality and situations on real-time expressions of behavior and emotion. *Journal of Personality and Social Psychology, 109*(5), 872–888. <https://doi.org/10.1037/pspp0000036>
- Sherman, S. J., & Fazio, R. H. (1983). Parallels between attitudes and traits as predictors of behavior. *Journal of Personality, 51*(3), 308–345. <https://doi.org/10.1111/j.1467-6494.1983.tb00336.x>
- Shiner, R. L., Allen, T. A., & Masten, A. S. (2017). Adversity in adolescence predicts personality trait change from childhood to adulthood. *Journal of Research in Personality, 67*, 171–182. <https://doi.org/10.1016/j.jrp.2016.10.002>
- Shiner, R. L., DeYoung, C. G., & Zelazo, P. D. (2013). The structure of temperament and personality traits: A developmental perspective. In *The oxford handbook of developmental psychology* (Vol. 2). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199958474.013.0006>
- Soland, J., Kuhfeld, M., Wolk, E., & Bi, S. (2019). Examining the state-trait composition of social-emotional learning constructs: Implications for practice, policy, and evaluation. *Journal of Research on Educational Effectiveness, 12*(3), 550–577. <https://doi.org/10.1080/19345747.2019.1615158>

- Soto, C. J., & John, O. P. (2017a). The next Big Five Inventory (BFI-2): Developing and assessing a hierarchical model with 15 facets to enhance bandwidth, fidelity, and predictive power. *Journal of Personality and Social Psychology, 113*(1), 117–143.
<https://doi.org/10.1037/pspp0000096>
- Soto, C. J., & John, O. P. (2017b). Short and extra-short forms of the Big Five inventory–2: The BFI-2-S and BFI-2-XS. *Journal of Research in Personality, 68*, 69–81.
<https://doi.org/10.1016/j.jrp.2017.02.004>
- Soto, C. J., John, O. P., Gosling, S. D., & Potter, J. (2008). The developmental psychometrics of Big Five self-reports: Acquiescence, factor structure, coherence, and differentiation from ages 10 to 20. *Journal of Personality and Social Psychology, 94*(4), 718–737.
<https://doi.org/10.1037/0022-3514.94.4.718>
- Specht, J. (2017). Personality development in reaction to major life events. In J. Specht (Ed.), *Personality development across the lifespan* (pp. 341–356). Elsevier Academic Press.
<https://doi.org/10.1016/B978-0-12-804674-6.00021-1>
- Specht, J., Egloff, B., & Schmukle, S. C. (2011). Stability and change of personality across the life course: The impact of age and major life events on mean-level and rank-order stability of the Big Five. *Journal of Personality and Social Psychology, 101*(4), 862–882.
<https://doi.org/10.1037/a0024950>
- Spurk, D., & Hirschi, A. (2018). The Dark Triad and competitive psychological climate at work: A model of reciprocal relationships in dependence of age and organization change. *European Journal of Work and Organizational Psychology, 27*(6), 736–751.
<https://doi.org/10.1080/1359432X.2018.1515200>
- Spurk, D., Keller, A. C., & Hirschi, A. (2016). Do bad guys get ahead or fall behind? Relationships of the Dark Triad of personality with objective and subjective career success. *Social Psychological and Personality Science, 7*(2), 113–121.
<https://doi.org/10.1177/1948550615609735>

- Stead, R., & Fekken, G. C. (2014). Agreeableness at the core of the dark triad of personality. *Individual Differences Research*, 12(4-A), 131–141.
- Stead, R., Fekken, G. C., Kay, A., & McDermott, K. (2012). Conceptualizing the Dark Triad of personality: Links to social symptomatology. *Personality and Individual Differences*, 53(8), 1023–1028. <https://doi.org/10.1016/j.paid.2012.07.021>
- Stearns, S. C. (2000). Life history evolution: Successes, limitations, and prospects. *Naturwissenschaften*, 87, 476–486. <https://doi.org/10.1007/s001140050763>
- Stewart, A. L., & Pratto, F. (2015). Social dominance orientation. In J. D. Wright (Ed.), *International encyclopedia of the social & behavioral sciences* (Second Edition, pp. 250–253). Elsevier. <https://doi.org/10.1016/B978-0-08-097086-8.24093-2>
- Steyer, R., Geiser, C., & Fiege, C. (2012). Latent state-trait models. In H. Cooper, P. M. Camic, D. L. Long, A. T. Panter, D. Rindskopf, & K. J. Sher (Eds.), *APA handbook of research methods in psychology, Vol. 3. Data analysis and research publication* (pp. 291–308, Vol. 3). American Psychological Association. <https://doi.org/10.1037/13621-014>
- Stieger, M., Flückiger, C., Rügger, D., Kowatsch, T., Roberts, B. W., & Allemand, M. (2021). Changing personality traits with the help of a digital personality change intervention. *Proceedings of the National Academy of Sciences of the United States of America*, 118(8), e2017548118. <https://doi.org/10.1073/pnas.2017548118>
- Szalay, Z., Hardaker, M., & Tsakanikos, E. (2024). Narcissistic personality disorder: An opinionated review of the efficacy of psychotherapy. *Academia Mental Health and Well-Being*, 1(1). <https://doi.org/10.20935/MHealthWellB6239>
- Tabachnick, B. G., & Fidell, L. S. (2019). *Using multivariate statistics* (Seventh edition.). Pearson.
- Tajmirriyahi, M., Doerfler, S. M., Najafi, M., Hamidizadeh, K., & Ickes, W. (2021). Dark Triad traits, recalled and current quality of the parent-child relationship: A non-western replication and extension. *Personality and Individual Differences*, 180, 110949. <https://doi.org/10.1016/j.paid.2021.110949>

- Teicholz, J. G. (1978). A selective review of the psychoanalytic literature on theoretical conceptualizations of narcissism. *Journal of the American Psychoanalytic Association*, 26(4), 831–861. <https://doi.org/10.1177/000306517802600407>
- Tellegen, A. (1991). Personality traits: Issues of definition, evidence, and assessment. In D. Cicchetti & W. M. Grove (Eds.), *Thinking clearly about psychology: Essays in honor of Paul Everett Meehl, Vol. 1. Matters of public interest; Vol. 2. Personality and psychopathology* (pp. 10–35). University of Minnesota Press.
- Terraciano, A., McCrae, R. R., & Costa, P. T. (2010). Intra-individual change in personality stability and age. *Journal of Research in Personality*, 44(1), 31–37. <https://doi.org/10.1016/j.jrp.2009.09.006>
- Vachon, H., Viechtbauer, W., Rintala, A., & Myin-Germeys, I. (2019). Compliance and retention with the experience sampling method over the continuum of severe mental disorders: Meta-analysis and recommendations. *Journal of Medical Internet Research*, 21(12), e14475. <https://doi.org/10.2196/14475>
- Vaughan, R. S., & Madigan, D. J. (2021). The winner takes it all: The mediating role of competitive orientations in the Dark Triad and sport task performance relationship. *European Journal of Sport Science*, 21(8), 1183–1192. <https://doi.org/10.1080/17461391.2020.1825822>
- Verheul, R., & Herbrink, M. (2007). The efficacy of various modalities of psychotherapy for personality disorders: A systematic review of the evidence and clinical recommendations. *International Review of Psychiatry*, 19(1), 25–38. <https://doi.org/10.1080/09540260601095399>
- Vernon, P. A., Villani, V. C., Vickers, L. C., & Harris, J. A. (2008). A behavioral genetic investigation of the Dark Triad and the Big 5. *Personality and Individual Differences*, 44(2), 445–452. <https://doi.org/10.1016/j.paid.2007.09.007>

- Vize, C. E., Collinson, K. L., Miller, J. D., & Lynam, D. R. (2020). The “core” of the dark triad: A test of competing hypotheses. *Personality Disorders: Theory, Research, and Treatment*, 11(2), 91–99. <https://doi.org/10.1037/per0000386>
- Vize, C. E., Lynam, D. R., Collinson, K. L., & Miller, J. D. (2018). Differences among dark triad components: A meta-analytic investigation. *Personality Disorders: Theory, Research, and Treatment*, 9(2), 101–111. <https://doi.org/10.1037/per0000222>
- Volmer, J., Koch, I. K., & Göritz, A. S. (2016). The bright and dark sides of leaders’ dark triad traits: Effects on subordinates’ career success and well-being. *Personality and Individual Differences*, 101, 413–418. <https://doi.org/10.1016/j.paid.2016.06.046>
- Vukasović, T., & Bratko, D. (2015). Heritability of personality: A meta-analysis of behavior genetic studies. *Psychological Bulletin*, 141(4), 769–785. <https://doi.org/10.1037/bul0000017>
- Walker, S. A., Double, K. S., & Birney, D. P. (2021). Complicated relationship between the dark triad and emotional intelligence: A systematic review. *Emotion Review*, 13(3), 257–274. <https://doi.org/10.1177/17540739211014585>
- Wei, M., Li, J., Wang, X., Su, Z., & Luo, Y. L. L. (2025). Will the Dark Triad engender psychopathological symptoms or vice versa? A three-wave random intercept cross-lagged panel analysis. *Journal of Personality*, 767–780. <https://doi.org/10.1111/jopy.12974>
- West, S. A., Griffin, A. S., & Gardner, A. (2007). Social semantics: Altruism, cooperation, mutualism, strong reciprocity and group selection. *Journal of Evolutionary Biology*, 20(2), 415–432. <https://doi.org/10.1111/j.1420-9101.2006.01258.x>
- West-Eberhard, M. J. (1983). Sexual selection, social competition, and speciation. *The Quarterly Review of Biology*, 58(2), 155–183. <https://doi.org/10.1086/413215>
- Wiggins, J. S. (1997). Chapter 4 - in defense of traits. In R. Hogan, J. Johnson, & S. Briggs (Eds.), *Handbook of personality psychology* (pp. 95–115). Academic Press. <https://doi.org/10.1016/B978-012134645-4/50005-6>

- Williams, K. M., Martín-Raugh, M. P., & Lentini, J. E. (2022). Longitudinal stability and change of the Dark Triad: A call for research in postsecondary, occupational, and community settings. *ETS Research Report Series, 1*. <https://doi.org/10.1002/ets2.12362>
- Williams, K. M., Paulhus, D. L., & Hare, R. D. (2007). Capturing the four-factor structure of psychopathy in college students via self-report. *Journal of Personality Assessment, 88*(2), 205–219. <https://doi.org/10.1080/00223890701268074>
- Wilson, R. E., Thompson, R. J., & Vazire, S. (2017). Are fluctuations in personality states more than fluctuations in affect? *Journal of Research in Personality, 69*, 110–123. <https://doi.org/10.1016/j.jrp.2016.06.006>
- Wilt, J., & Revelle, W. (2015). Affect, behaviour, cognition and desire in the big five: An analysis of item content and structure. *European Journal of Personality, 29*(4), 478–497. <https://doi.org/10.1002/per.2002>
- Wolff, C., & Wetzels, E. (2023). The development of Machiavellianism, psychopathy, and narcissism in young adulthood. *Collabra: Psychology, 9*(1), 77870. <https://doi.org/10.1525/collabra.77870>
- Wood, D., & Roberts, B. W. (2006). The effect of age and role information on expectations for Big Five personality traits. *Personality & Social Psychology Bulletin, 32*(11), 1482–1496. <https://doi.org/10.1177/0146167206291008>
- Wright, A. J., & Jackson, J. J. (2023). Do changes in personality predict life outcomes? *Journal of Personality and Social Psychology, 125*(6), 1495–1518. <https://doi.org/10.1037/pspp0000472>
- Wrzus, C., Wagner, G. G., & Riediger, M. (2016). Personality-situation transactions from adolescence to old age. *Journal of Personality and Social Psychology, 110*(5), 782–799. <https://doi.org/10.1037/pspp0000054>
- Wu, P.-C. (2021). Is personality stable in adolescence? Disentangling time-invariant and time-varying factors of personality in a trait–state–occasion model. *International Journal of Psychology, 56*(3), 425–434. <https://doi.org/10.1002/ijop.12723>

- Zettler, I., Moshagen, M., & Hilbig, B. E. (2021). Stability and change: The Dark Factor of Personality shapes dark traits. *Psychological and Personality Science*, 12(6), 974–983. <https://doi.org/10.1177/1948550620953288>
- Zhang, W., Zou, H., Wang, M., & Finy, M. S. (2015). The role of the Dark Triad traits and two constructs of emotional intelligence on loneliness in adolescents. *Personality and Individual Differences*, 75, 74–79. <https://doi.org/10.1016/j.paid.2014.10.025>
- Zimmermann, J., & Neyer, F. J. (2013). Do we become a different person when hitting the road? Personality development of sojourners. *Journal of Personality and Social Psychology*, 105(3), 515–530. <https://doi.org/10.1037/a0033019>

Appendix A

Study Materials (Chapter 2 — Study 1)

Study Description

Study Name: **How Dark can you get? Stability and change of the Dark Triad personality traits through time.**

Study Type: This is an online survey study.

Abstract: A doctoral thesis study is now being conducted by Audrey Renaud-da Costa, a doctoral student at the LPSP-Laboratory of Personality and Social Psychology (under the supervision of Dr. Dave Miranda). This is a brief ONLINE follow-up study that is interested in the patterns of change and stability of the Dark Triad of personality, their relationship with collaborative and competitive states of mind, and how they compare to other personality traits over a period of 10 days.

Description: This is a brief **ONLINE** follow-up study that is interested in the patterns of change and stability of the Dark Triad of personality, their relationship with collaborative and competitive states of mind, and how they compare to other personality traits over a period of 10 days. Should you decide to participate, in a few days, you will be invited by email to participate in a 10-day daily survey from **September 18 to September 27**. You have to wait a few days to start so that we can recruit enough people in our study before it begins. This survey is voluntary. Once you've started, you will receive a reminder email once a day for 10 consecutive days to complete our survey between 6pm and 11:59pm. Each completion will take about 10 minutes. You will receive 2 ISPR points for your participation; **in other words, you will be granted 2 points for 100 minutes of participation!** Your ISPR points will be granted 2 days after the 10 consecutive days of survey. This is necessary to see how many surveys you actually filled-out in total. This is an online study with no "on campus" meeting.

Your collaboration will greatly improve the scientific quality of this research project by enabling us to have findings across several days, a first in this specific domain! All of these questionnaires are online and can be completed from any computer or hand-held device in a quiet place.

Eligibility Requirements: Please note that our questionnaire is only available in English. English-speaking and French-speaking bilingual participants are welcome to participate in this study.

You must be aged between 17 and 25 years to participate.

Duration: 10 minutes each day for 10 consecutive days (total 1h40 minutes).

- Points:**
- Answering between 1 and 3 surveys (≤ 30 minutes): 0.5 point
 - Answering between 4 and 6 surveys (≤ 1 hour): 0.5 point (cumulated total: 1 point)
 - Answering between 7 and 9 surveys (≤ 1.5 hours): 0.5 (cumulated total: 1.5 points)
 - For full commitment of answering all 10 surveys: 0.5 point (cumulated total: 2 points)

In other words, you get 2 points for 100 minutes of participation!

Researchers: Audrey Renaud-da Costa, Doctoral Student, Email: {redacted}
Dr. Dave Miranda, Associate Professor, Email: {redacted}

Study Status: Not visible to participants – [[Send a Request](#)]

**REB
Approval
Code:**

Online Consent Forms

Stability and change of the Dark Triad personality traits through time.

Consent form: Fall 2019

Audrey Renaud-da Costa (doctoral student in psychology)
LPSP- Laboratory of Personality and Social Psychology
{redacted address}
Phone: {redacted}
Email: {redacted}

Dr. Dave Miranda (Associate Professor)
LPSP- Laboratory of Personality and Social Psychology
{redacted address}
Phone: {redacted}
Email: {redacted}

Task to be Performed:

A doctoral thesis study is now being conducted by Audrey Renaud-da Costa, a doctoral student at the LPSP-Laboratory of Personality and Social Psychology (under the supervision of Dr. Dave Miranda). This is a brief follow-up study that is interested in the patterns of change and stability of the Dark Triad of personality (i.e. subclinical psychopathy, narcissism and Machiavellianism), their relationship with collaborative and competitive states of mind, and how they compare to other personality traits (i.e. Openness, Conscientiousness, Extraversion, Agreeableness and Negative emotionality) over the period of 10 days. Participation in this project is completely voluntary.

This follow-up research will consist of answering a brief questionnaire once a day for 10 consecutive days. You had to wait a few days to start so that we could recruit enough people in our study before it began. Should you decide to participate, you will be invited to participate to the 10-day daily questionnaires from [date] to [date]. The completion of any survey is completely voluntary and will each take 10 minutes to complete, anytime between 6pm and 11:59pm. You will receive one email reminder every day. All questionnaires are online and can be completed from any computer or hand-held device at a quiet time.

Anonymity and Confidentiality:

You have received a 6-digit ID code for the Integrated System for Participation in Research of the School of Psychology (ISPR). Please write your 6-digit ID on the appropriate space at the beginning of the questionnaire. To ensure that your answers remain entirely confidential and anonymous, please do not write your name on the questionnaire. Be assured that neither the University of Ottawa nor your professors will be informed of your answers. Only Audrey Renaud-da Costa and Dr. Dave Miranda will have access to the data. A copy of the database from this study will be kept for at least 30 years on the researchers' password protected computers. Data from this study will be analyzed and interpreted in a global manner.

For your information, please note that your data will be collected through a safe and well-known service for research online called Qualtrics, which is widely used by major universities to conduct surveys for psychological research.

In order to minimize the risk of security breaches and to help ensure your confidentiality we recommend that you use standard safety measures such as signing out of your account, closing your browser and locking your screen or device when you are no longer using them / when you have completed the study.

Rights and Responsibilities:

Should you decide to participate to our study, you will be directed to a secure web page, in which you will be asked to complete an online questionnaire at the time of your convenience. You will be invited to answer this same survey once a day for 10 consecutive days, anytime between 6pm and 11:59pm, from [date] to [date]. You will receive an email reminder everyday to complete the questionnaires. Each questionnaire takes approximately 10 minutes to complete. It is important to understand that questionnaires should be completed alone and at a quiet time.

You are not obligated to respond to any question that you may feel uncomfortable answering. However, your honesty in responding would certainly be appreciated. You are also free to refuse to participate and to withdraw from the study at any time. You will be compensated the amount of point corresponding with the amount of questionnaires filled. Please note that if you choose to withdraw from the study, we will still use the data for which you have provided answers. If you wish to withdraw from the entire study and that we remove all of your answers; then click on the link “I want to withdraw from the entire study and remove all my answers” that we provide to you at the end of the online survey.

Potential Inconveniences and Resources:

This questionnaire will contain questions about subclinical psychopathy, narcissism and Machiavellianism, as well as collaborative and competitive states of mind, and also Openness, Conscientiousness, Extraversion, Agreeableness and Negative emotionality. Reporting personal information might cause emotional inconveniences. We wish to remind you that resources are offered to students through the Student Academic Success Service (613-562-5101; sass@uottawa.ca).

On campus, you can contact the *Counselling and Coaching Service* (613-562-5800) and the *Health Services Clinic* (613-564-3950). Off campus, you can contact the *Crisis Line* (24/7), within Ottawa (613-722-6914) or outside Ottawa (1-866-996-0991).

Compensation:

To thank you for your time and effort, you will receive ISPR points which will be converted into an equivalent percentage of your overall grade in the course during the semester in which you are participating, up to a maximum of 2 points (i.e., 2 percent).

As per ISPR principles, you will be compensated proportionally to your participation. More specifically, we will give you 0.5 point for every 30 minutes of participation, and 0.5 additional point for full commitment of answering all surveys. The points are attributed as follows:

- If you answer between 1 and 3 surveys (≤ 30 minutes): 0.5 point
- If you answer between 4 and 6 surveys (≤ 1 hour): 0.5 point (cumulated total: 1 point)
- If you answer between 7 and 9 surveys (≤ 1.5 hours): 0.5 (cumulated total: 1.5 points)
- For full commitment of answering all 10 surveys: 0.5 point (cumulated total: 2 points)

In other words, you can obtain up to 2 points (or 2 percent of your grade) for answering all 10 surveys. The points are attributed regardless of the specific days that you answered the questionnaires (e.g., you could answer questionnaires on day 1, 4, 5, 6, 7 and 10 for a total of six filled surveys, or 1 point). It is important that all participants answer a minimal amount of questionnaires because missing questionnaires risk invalidating the results of the longitudinal results. Your points will be granted two days after the 10-days study. This is necessary to see how many surveys you actually filled-out in total. If you decide to withdraw from the study, you will be compensated up to the amount you answered. You will be eligible for compensation even if you decide to click on the link “I want to withdraw from the entire study and remove all my answers”.

Data Utilization and Storage:

Data from this study will be used for the purpose of this research project, will be used in presentations at scientific conferences, and will be published in scientific journals. Your data will be stored in password protected computers. Results of this project will be analyzed, interpreted, and published in a global manner. Participants will not be identified in publications. A copy of the database from this study will be kept for at least 30 years after data collection. Audrey Renaud-da Costa and Dr. Dave Miranda will be the only persons to have access to the data.

Questions and Request for Information:

Any questions about your rights as a research participant may be addressed to the Office of Research Ethics and Integrity, {redacted localisation}. Any questions about this research can be addressed to Audrey Renaud-da Costa ({redacted email}) or Dr. Dave Miranda ({redacted email}). Please print a copy of this page for your own records.

Informed Consent:

If you understand the statements above and freely consent to participate in this study, please choose the following option: I agree to participate. You will be directed to a separate secure web page where the online survey is located.

Be sure to write your ISPR code correctly at the beginning of the survey in order to obtain your points from the ISPR of the School of Psychology.

If you have any questions before deciding to participate or not please feel free to email Audrey Renaud-da Costa or Dr. Dave Miranda. We invite you to print this form for your file.

If you understand the statements above and do not want to participate in the study, close this web page.

Stabilité et changements des traits de personnalité de la Triade Malveillante à travers le temps.

Formulaire de consentement: automne 2019

Audrey Renaud-da Costa (étudiante au doctorat en psychologie)

LPSP- Laboratoire de Psychologie Sociale et de la Personnalité

{adresse expurgée}

Téléphone: {expurgé}

Courriel: {expurgé}

Dr. Dave Miranda (professeur agrégé)

LPSP- Laboratoire de Psychologie Sociale et de la Personnalité

{adresse expurgée}

Téléphone: {expurgé}

Courriel: {expurgé}

Tâches à effectuer:

Une étude de thèse de doctorat est présentement menée par Audrey Renaud-da Costa, une étudiante au doctorat au LPSP - Laboratoire de Psychologie Sociale et de la Personnalité (sous la supervision du Dr. Dave Miranda) à L'École de psychologie de l'Université d'Ottawa. Cette étude longitudinale vise à mieux comprendre les patrons de stabilité et changements de la Triade Malveillante (c.à.d. niveaux sous-cliniques de psychopathie, narcissisme et machiavélisme), leur relation avec des états d'esprit compétitifs et collaboratifs, et leur comparaison avec d'autres traits de personnalité (c.à.d. l'Ouverture d'esprit, l'esprit Conscientieux, l'Extraversion, l'Amabilité, et les émotions Négatives). La participation à ce projet est entièrement volontaire.

Cette étude longitudinale consistera à remplir un bref questionnaire quotidiennement pendant 10 jours consécutifs. Vous avez dû attendre quelques jours avant de commencer pour nous donner la chance de recruter le plus de participants possible avant le début de l'étude. Si vous décidez de participer, vous serez invité à participer à l'étude de questionnaires quotidiens pendant 10 jours du [date] au [date]. La complétion des questionnaires est entièrement volontaire et prendra chaque fois 10 minutes, à n'importe quel moment entre 18:00 et 23:59. Vous recevrez un courriel de rappel à chaque jour. Tous les questionnaires sont en ligne et peuvent être complétés seuls à partir de n'importe quel ordinateur ou appareil électronique portable à un moment calme.

Anonymat et confidentialité:

Vous avez reçu un code d'identification à six chiffres du Système intégré de participation à la recherche de l'école de psychologie (SIPR). Vous êtes priés d'écrire votre code d'identification à six chiffres dans l'espace approprié au début du questionnaire. Afin d'assurer que vos réponses demeurent entièrement confidentielles et anonymes, vous êtes priés de ne pas écrire votre nom sur le questionnaire. Soyez assurés que ni l'Université d'Ottawa, ni vos professeurs ne seront informés de vos réponses. Seuls Audrey Renaud-da Costa (étudiante au doctorat) et Dr. Dave Miranda auront accès aux données. Une copie de la base de données de cette étude sera conservée pendant au moins 30 ans sur les ordinateurs protégés par mot de passe des chercheurs. Les données provenant de cette étude seront analysées et interprétées de manière globale.

Pour votre information, s.v.p. notez que vos données seront recueillies à travers un service de la recherche en ligne sécuritaire et réputé nommé Qualtrics, lequel est largement utilisé par de grandes universités afin de mener des sondages pour la recherche en psychologie.

Afin de minimiser les risques d'atteinte à votre sécurité et pour assurer votre confidentialité, nous vous recommandons d'utiliser des mesures de sécurité standard, telles que mettre fin à la session, fermer votre navigateur Internet et verrouiller votre écran ou appareil lorsque vous ne les utilisez plus / lorsque vous avez terminé l'étude.

Droits et responsabilités:

Si vous décidez de participer à notre étude, vous serez dirigés sur une page web sécurisée à partir de laquelle on vous demandera de compléter le questionnaire en ligne au moment de votre choix. Vous serez ensuite invité à compléter ce même questionnaire quotidiennement pendant 10 jours consécutifs, entre 18:00 et 23:59, du [date] au [date]. Vous recevrez un courriel tous les jours en rappel de compléter les questionnaires. Chaque questionnaire quotidien prendra environ 10 minutes à compléter. Il est important de comprendre que les questionnaires devraient être complétés seuls et à un moment calme.

Vous n'êtes pas tenus de répondre à aucune question pouvant vous mettre mal à l'aise. Cependant, l'honnêteté de vos réponses sera certainement appréciée. Vous êtes également libre de refuser de participer et de vous retirer de l'étude à tout moment. La compensation qui vous sera attribuée correspondra à la quantité de questionnaires que vous complétez. S.v.p. notez que si vous choisissez de vous retirer de cette étude, nous allons tout de même utiliser les données pour lesquelles vous avez fournies des réponses. Si vous souhaitez vous retirer de l'étude au complet et que nous retirions toutes vos réponses; alors cliquez sur le lien « Je veux me retirer de l'étude au complet et enlever toutes mes réponses » que nous vous fournissons à la fin du questionnaire en ligne.

Inconvénients potentiels et ressources:

Ce questionnaire contient des questions portant sur des niveaux sous-cliniques de psychopathie, narcissisme et machiavélisme, l'état d'esprit compétitif et collaboratif, ainsi que sur l'Ouverture d'esprit, l'esprit Conscientieux l'Extraversion, l'Amabilité et les émotions Négatives. Fournir des informations personnelles pourrait occasionner des désagréments émotionnels. Nous désirons vous rappeler que des ressources sont offertes aux étudiant(e)s à travers le Service d'appui au succès scolaire (613-562-5101; sass@uottawa.ca).

Sur le campus, vous pouvez contacter le *Service de counselling et de coaching* (613-562-5200) et le *Service de santé* (613-564-3950). Hors campus, vous pouvez contacter la *Ligne d'écoute téléphonique* (24/7) à Ottawa (613-772-6914) ou à l'extérieur d'Ottawa (1-866-996-0991).

Compensation:

Pour vous remercier de votre temps et de vos efforts, vous obtiendrez des points SIPR qui seront convertis en un pourcentage équivalent de votre note finale du cours auquel vous participez ce semestre, pour un maximum de 2 points (c.à.d. 2 pourcents). En accord avec les principes du SIPR, vous recevrez une compensation proportionnelle à votre participation. Plus précisément, nous vous attribuerons 0.5 point pour chaque 30 minutes de participation, et 0.5 point additionnel

pour l'engagement maximal d'avoir répondu à tous les 10 questionnaires. Les points sont attribués comme suit:

- Si vous répondez entre 1 et 3 questionnaires (≤ 30 minutes): 0.5 point
- Si vous répondez entre 4 et 6 questionnaires (≤ 1 heure): 0.5 point (total cumulé: 1 point)
- Si vous répondez entre 7 et 9 questionnaires (≤ 1.5 heures): 0.5 point (total cumulé: 1.5 points)
- Pour l'engagement maximal d'avoir répondu aux 10 questionnaires: 0.5 point (total cumulé: 2 points)

En d'autres mots, vous pouvez obtenir jusqu'à 2 points (ou 2 pourcent de votre note finale) pour répondre à tous les 10 questionnaires. Les points sont attribués peu importe les jours spécifiques auxquels vous avez répondu aux questionnaires (p. ex. vous pourriez répondre aux questionnaires les jours 1, 4, 5, 6, 7 et 10 pour un total de 6 questionnaires équivalents à 1 point). Il est important que les participants répondent à un nombre minimal de questionnaires puisque les données manquantes risquent d'invalider les résultats de l'étude longitudinale. Vos points vous seront attribués deux jours après la fin de l'étude de 10 jours. Ceci est nécessaire pour constater à combien de questionnaires vous avez répondu. Si vous décidez de vous retirer de l'étude, vous serez compensés selon le nombre de questionnaires remplis. Vous serez éligibles pour une compensation même si vous cliquez sur le lien "Je veux me retirer de l'étude en entier et retirer toutes mes réponses".

Utilisation et conservation des données:

Les données de cette étude seront utilisées dans le cadre de ce projet de recherche et seront utilisées dans des présentations à des conférences scientifiques et seront publiées dans des revues scientifiques. Vos données seront conservées sur des ordinateurs qui sont protégés par mot de passe. Les résultats de ce projet seront analysés, interprétés et publiés de manière globale. Les participants ne seront pas identifiés dans les publications. Une copie de la base de données provenant de cette étude sera conservée pendant au moins 30 ans après la collecte de données. Audrey Renaud-da Costa et Dr. Dave Miranda seront les seules personnes ayant accès aux données.

Questions et requête d'information:

Toute question concernant vos droits en tant que participant à la recherche peut être adressée au Bureau d'éthique et d'intégrité de la recherche, {adresse expurgée}. Toute question à propos de cette recherche peut être adressée à Audrey Renaud-da Costa ({courriel expurgé}) ou au Dr. Dave Miranda ({courriel expurgé}). Veuillez s.v.p. imprimer cette page pour vos propres archives.

Consentement libre et éclairé:

Si vous comprenez les énoncés ci-dessus et consentez librement à participer à cette étude, veuillez choisir l'option suivante : J'accepte de participer. Vous serez redirigé vers une page web sécurisée sur laquelle se retrouve le questionnaire.

Assurez-vous d'écrire votre code correctement au début du questionnaire afin d'obtenir vos points du SIPR de l'École de Psychologie.

Si vous avez des questions avant de décider de participer ou non, sentez-vous libre d'envoyer un courriel à Audrey Renaud-da Costa ({courriel expurgé}), ou au Dr. Dave Miranda ({courriel expurgé}).

Nous vous invitons à imprimer ce formulaire et à le conserver dans vos archives.

Si vous comprenez les énoncés ci-dessus et ne désirez pas participer à cette étude, veuillez fermer cette page web.

☐ **J'accepte de participer.**

Reminder Email

Thank you for your participation in our study titled “Stability and change of the Dark Triad personality traits through time” that is being currently conducted.

This is a friendly reminder that if you still want to participate in our daily questionnaire, the end date for today’s questionnaire is tonight by 11:59pm. This survey is completely voluntary and will take 10 minutes to complete. Your collaboration will greatly improve the scientific quality of this research project by enabling us to have longitudinal findings across several days, a first in this specific research domain!

Remember that your ISPR point(s) will be granted at the end of this 10-day study!

Please use the link below to access the survey. Make sure to include your 6-digit ISPR code, that can be found at the bottom of this email.

[\[Link\]](#).

Your help is greatly appreciated.

Thank you,

Audrey Renaud-da Costa (doctoral student in psychology)
LPSP- Laboratory of Personality and Social Psychology
{redacted address}
Phone: {redacted}
Email: {redacted}

Appendix B**Demographic Questionnaire (Chapter 2 — Study 1 and 2)**

1. What best describes your gender? : Man ____ Woman ____ Transgender Man ____ Transgender Woman ____ Non-binary ____ You don't have an option that applies to me. I identify as (please specify) ____ Prefer not to answer ____
2. What is your native language: English ____ French ____ Other (please specify): ____
3. What is your age? _____
4. What is the level of your academic training?
 - ☐ Freshman (1st year)
 - ☐ Junior (2nd year)
 - ☐ Sophomore (3rd year)
 - ☐ Senior (4th year)
 - ☐ Graduate (please specify if you are a Master ____ or PhD ____ student)
5. Are you a full time or a part-time student? Full ____ Part-time ____
6. In what academic program are you mainly enrolled? _____
7. How do you describe yourself in terms of your ethnic group? (Please check “✓” all that apply)
 - ☐ Aboriginal/Native
 - ☐ White / Caucasian or European
 - ☐ Black / Caribbean or African
 - ☐ East Asian
 - ☐ South Asian
 - ☐ Middle Easterner (Arab)
 - ☐ Latino
 - ☐ North African (Arab)
 - ☐ Other ethnic or cultural group(s), please specify: _____

Appendix C

Tables (Chapter 2 — Study 1)

Table 1

Longitudinal Measurement Invariance Models with Fit Indices and Fit Indices Change

Invariance Model	Model Fit Indicators			Model Fit Change	
	CFI	RMSEA	[90%CI]	ΔCFI	ΔRMSEA
<i>Agreeableness</i>					
Model A1.0: Configural t1-t3	0.906	0.085	[0.071-0.099]	-	-
Model A1.1: Metric t1-t3	0.907	0.081	[0.068-0.095]	0.001	-0.004
Model A1.2: Scalar t1-t3	0.875	0.085	[0.073-0.097]	-0.032	0.004
Model A1.3: Uniqueness t1-t3	0.871	0.083	[0.072-0.095]	-0.004	-0.002
Model A2.0: Configural t1-t7	0.886	0.084	[0.079-0.089]	0.015	0.001
Model A2.1: Metric t1-t7	0.887	0.082	[0.077-0.087]	0.001	-0.002
Model A2.2: Scalar t1-t7	0.880	0.080	[0.075-0.085]	-0.007	-0.002
Model A2.3: Uniqueness t1-t7	0.88	0.078	[0.074-0.083]	0.000	-0.002
Model A3.0: Configural t1-t10		M.N.C		-	-
<i>Machiavellianism</i>					
Model M1.0: Configural t1-t3	0.888	0.075	[0.066-0.084]	-	-
Model M1.1: Metric t1-t3	0.892	0.072	[0.063-0.081]	0.004	-0.003
Model M1.2: Scalar t1-t3	0.893	0.066	[0.058-0.075]	0.001	-0.006
Model M1.3: Uniqueness t1-t3	0.899	0.063	[0.055-0.072]	0.006	-0.003
Model M2.0: Configural t1-t7		M.N.C		-	-
<i>Narcissism</i>					
Model N1.0: Configural t1-t3	0.859	0.088	[0.080-0.097]	-	-
Model N1.1: Metric t1-t3	0.859	0.086	[0.078-0.095]	0	-0.002
Model N1.2: Scalar t1-t3	0.862	0.079	[0.071-0.087]	0.003	-0.007
Model N1.3: Uniqueness t1-t3	0.866	0.076	[0.068-0.084]	0.004	-0.003
Model N2.0: Configural t1-t7	0.796	0.096	[0.092-0.099]	-0.07	0.02
Model N2.1: Metric t1-t7	0.795	0.094	[0.091-0.097]	-0.001	-0.002
Model N2.2: Scalar t1-t7	0.794	0.091	[0.088-0.094]	-0.001	-0.003
Model N2.3: Uniqueness t1-t7	0.798	0.089	[0.086-0.092]	0.004	-0.002
Model N3.0: Configural t1-t10		M.N.C		-	-
<i>Psychopathy</i>					
Model P1.0: Configural t1-t3	0.883	0.067	[0.058-0.076]	-	-
Model P1.1: Metric t1-t3	0.884	0.065	[0.056-0.074]	0.001	-0.002
Model P1.2: Scalar t1-t3	0.883	0.061	[0.052-0.069]	-0.001	-0.004
Model P1.3: Uniqueness t1-t3	0.884	0.059	[0.050-0.068]	0.001	-0.002
Model P2.0: Configural t1-t7		M.N.C		-	-

Note. Longitudinal measurement invariance testing where models increase gradually in complexity (i.e., starting with less time measurements and increasing) and restrictions (i.e., from configural to uniqueness measurement invariance testing). CFI = comparative fit index; RMSEA = root mean square error of approximation; 90% CI = 90% confidence interval; M.N.C = model non convergence (to simplify the table, once a model has not converged, no subsequent models are presented in this table).

Table 2*Omega Values of Internal Consistency*

Occ. Meas.	Omega Value			
	Agreeableness	Machiavellianism	Narcissism	Psychopathy
1	0.754	0.860	0.815	0.875
2	0.784	0.893	0.824	0.770
3	0.813	0.910	0.837	0.850
4	0.786	0.915	0.830	0.843
5	0.802	0.852	0.792	0.796
6	0.835	0.937	0.863	0.878
7	0.862	0.941	0.887	0.876
8	0.850	0.952	0.855	0.869
9	0.802	0.944	0.849	0.874
10	0.851	0.871	0.806	0.801

Table 3
Descriptive Statistics

Day	Agree (Mean ± StD)	Mach (Mean ± StD)	Narc (Mean ± StD)	Psych (Mean ± StD)	Comp (Mean ± StD)	Collab (Mean ± StD)
Day 1	3.65 (0.65)	3.24 (0.64)	2.88 (0.62)	2.27 (0.65)	2.68 (1.33)	3.62 (1.16)
Day 2	3.50 (0.75)	3.26 (0.71)	2.85 (0.63)	2.29 (0.54)	2.68 (1.33)	3.68 (1.15)
Day 3	3.70 (0.72)	3.10 (0.75)	2.83 (0.63)	2.20 (0.57)	2.49 (1.28)	3.65 (1.11)
Day 4	3.62 (0.71)	3.19 (0.78)	2.84 (0.62)	2.23 (0.60)	2.56 (1.22)	3.54 (1.12)
Day 5	3.53 (0.72)	3.12 (0.76)	2.81 (0.64)	2.27 (0.64)	2.66 (1.24)	3.47 (1.17)
Day 6	3.61 (0.74)	3.15 (0.83)	2.80 (0.65)	2.24 (0.66)	2.49 (1.24)	3.54 (1.09)
Day 7	3.62 (0.78)	3.09 (0.85)	2.82 (0.68)	2.22 (0.62)	2.41 (1.14)	3.62 (1.16)
Day 8	3.62 (0.75)	3.12 (0.86)	2.74 (0.62)	2.16 (0.57)	2.48 (1.09)	3.71 (0.99)
Day 9	3.69 (0.69)	3.14 (0.83)	2.83 (0.63)	2.18 (0.61)	2.58 (1.20)	3.68 (0.98)
Day 10	3.60 (0.76)	3.09 (0.82)	2.76 (0.66)	2.26 (0.63)	2.46 (1.11)	3.58 (1.07)
Total	3.61	3.15	2.82	2.23	2.55	3.61

Note. Agree = agreeableness; Mach = Machiavellianism; Narc = narcissism; Psych = psychopathy; Comp = competitive attitude; Collab = collaborative attitude; *Mean* = mean; *StD* = Standard Deviation; Total = average of means over the ten-day period.

Table 4

Standardized Factor Loadings and Regression Coefficients for Trait, Occasion Specific, and Autoregressions Factors for Unconditional Baseline Models

Agreeableness (1.0)			Machiavellianism (2.0)			Narcissism (3.0)			Psychopathy (4.0)			
Estimates	S. E	two-tailed p	Estimates	S. E	two-tailed p	Estimates	S. E	two-tailed p	Estimates	S. E	two-tailed p	
- Trait factor BY -												
Day 1	0.844	0.032	0.000	0.836	0.032	0.000	0.859	0.028	0.000	0.798	0.039	0.000
Day 2	0.886	0.024	0.000	0.919	0.019	0.000	0.837	0.032	0.000	0.821	0.034	0.000
Day 3	0.876	0.024	0.000	0.918	0.015	0.000	0.937	0.013	0.000	0.895	0.02	0.000
Day 4	0.912	0.018	0.000	0.924	0.013	0.000	0.948	0.012	0.000	0.883	0.022	0.000
Day 5	0.867	0.024	0.000	0.93	0.014	0.000	0.923	0.016	0.000	0.927	0.015	0.000
Day 6	0.886	0.022	0.000	0.939	0.012	0.000	0.934	0.015	0.000	0.894	0.021	0.000
Day 7	0.931	0.016	0.000	0.961	0.008	0.000	0.934	0.015	0.000	0.926	0.016	0.000
Day 8	0.929	0.015	0.000	0.96	0.01	0.000	0.94	0.012	0.000	0.928	0.015	0.000
Day 9	0.857	0.026	0.000	0.964	0.008	0.000	0.903	0.019	0.000	0.898	0.021	0.000
Day 10	0.929	0.015	0.000	0.968	0.007	0.000	0.955	0.01	0.000	0.949	0.013	0.000
- Occasion specific factor BY -												
Day 1	0.536	0.051	0.000	0.548	0.048	0.000	0.513	0.047	0.000	0.603	0.052	0.000
Day 2	0.464	0.046	0.000	0.394	0.045	0.000	0.547	0.048	0.000	0.571	0.049	0.000
Day 3	0.482	0.043	0.000	0.397	0.035	0.000	0.348	0.036	0.000	0.445	0.04	0.000
Day 4	0.409	0.039	0.000	0.383	0.032	0.000	0.319	0.037	0.000	0.469	0.041	0.000
Day 5	0.499	0.042	0.000	0.368	0.034	0.000	0.384	0.038	0.000	0.374	0.038	0.000
Day 6	0.464	0.042	0.000	0.344	0.032	0.000	0.357	0.039	0.000	0.448	0.042	0.000
Day 7	0.365	0.04	0.000	0.275	0.03	0.000	0.358	0.04	0.000	0.378	0.039	0.000
Day 8	0.369	0.037	0.000	0.28	0.033	0.000	0.345	0.034	0.000	0.372	0.037	0.000
Day 9	0.515	0.044	0.000	0.265	0.03	0.000	0.429	0.038	0.000	0.439	0.042	0.000
Day 10	0.370	0.038	0.000	0.252	0.027	0.000	0.297	0.031	0.000	0.315	0.039	0.000
- Autoregression of day k-1 ON -												
Day 1	-	-	-	-	-	-	-	-	-	-	-	-
Day 2	0.448	0.101	0.000	0.360	0.108	0.001	0.406	0.105	0.000	0.137	0.131	0.296
Day 3	0.174	0.131	0.185	0.199	0.134	0.137	0.065	0.146	0.658	0.178	0.124	0.150
Day 4	0.043	0.138	0.756	0.259	0.113	0.022	-0.048	0.23	0.834	0.195	0.130	0.134
Day 5	-0.11	0.123	0.372	0.178	0.106	0.093	-0.11	0.14	0.432	0.08	0.123	0.514
Day 6	0.247	0.124	0.046	0.219	0.13	0.093	0.3	0.139	0.031	0.416	0.115	0.000
Day 7	-0.197	0.17	0.247	0.025	0.181	0.891	0.441	0.124	0.000	0.044	0.157	0.778
Day 8	0.135	0.146	0.356	-0.051	0.189	0.788	-0.002	0.177	0.991	0.099	0.143	0.491
Day 9	0.409	0.094	0.000	-0.148	0.177	0.404	0.144	0.124	0.244	0.311	0.109	0.004
Day 10	0.337	0.114	0.003	0.463	0.112	0.000	0.178	0.126	0.158	-0.157	0.168	0.349

Table 5*Trait-State-Occasion Fit Indices for Unconditional and Conditional Models*

Model	X ²	df	p	CFI	RMSEA	90% CI
Agreeableness						
Model 1.0 : Agreeableness	45.872	26	0.0094	0.986	0.062	0.031 - 0.092
Model 1.1 : Social attitudes and Agreeableness	1867.938	396	0.0000	0.262	0.138	0.131 - 0.144
Model 1.2 : Full TSO with social attitudes & gender	1936.247	416	0.0000	0.248	0.137	0.130 - 0.143
Machiavellianism						
Model 2.0 : Machiavellianism	44.724	26	0.0126	0.991	0.061	0.028 - 0.090
Model 2.1 : Social attitudes and Machiavellianism	1951.085	396	0.0000	0.401	0.142	0.135 - 0.148
Model 2.2 : Full TSO with social attitudes & gender	1963.833	416	0.0000	0.396	0.138	0.132 - 0.144
Narcissism						
Model 3.0: Narcissism	46.653	26	0.0077	0.988	0.064	0.032 - 0.093
Model 3.1: Social attitudes and Narcissism	1786.738	396	0.0000	0.368	0.134	0.128 - 0.140
Model 3.2 : Full TSO with social attitudes & gender	2040.587	416	0.0000	0.326	0.141	0.135 - 0.147
Psychopathy						
Model 4.0: Psychopathy	56.503	26	0.0005	0.979	0.077	0.050 - 0.105
Model 4.1: Social attitudes and Psychopathy	1770.211	396	0.0000	0.277	0.133	0.127 - 0.139
Model 4.2 : Full TSO with social attitudes & gender	1859.336	416	0.0000	0.259	0.133	0.127 - 0.139

Note. Trait-State-Occasion models in incremental complexity (from baseline models to full TSO models with all predictors) with fit indices. X² = chi-square; df = degrees of freedom; p = p value; CFI = comparative fit index; RMSEA = root mean square error of approximation; 90% CI = 90% confidence intervals.

Table 6*Partition of Trait vs. Occasion Specific Variance Across a 10-day Period for Baseline Unconditional TSO Models*

	Total (%)	Time 1	Time 2	Time 3	Time 4	Time 5	Time 6	Time 7	Time 8	Time 9	Time 10
Agreeableness (model 1.0)											
Explained trait variance of total variance	79.60	71.23	78.50	76.74	83.17	75.17	78.50	86.68	86.30	73.44	86.30
Explained occasion variance of total variance	20.38	28.73	21.53	23.23	16.73	24.90	21.53	13.32	13.62	26.52	13.69
Carry-over effect of occasion variance	6.44	-	20.070	3.028	0.185	1.210	6.101	3.881	1.823	16.728	11.357
Occasion specific carry-over effects of total variance	1.31	-	4.32	0.70	0.03	0.30	1.31	0.52	0.25	4.44	1.55
Machiavellianism (model 2.0)											
Explained trait variance of total variance	86.98	69.89	84.46	84.27	85.38	86.49	88.17	92.35	92.16	92.93	93.70
Explained occasion variance of total variance	13.01	30.03	15.52	15.76	14.67	13.54	11.83	7.56	7.84	7.02	6.35
Carry-over effect of occasion variance	5.55	-	12.96	3.96	6.71	3.17	4.80	0.06	0.26	2.19	21.44
Occasion specific carry-over effects of total variance	0.72	-	2.01	0.62	0.98	0.43	0.57	0.005	0.02	0.15	1.36
Narcissism (model 3.0)											
Explained trait variance of total variance	84.23	73.79	70.06	87.80	89.87	85.19	87.24	87.24	88.36	81.54	91.20
Explained occasion variance of total variance	15.80	26.32	29.92	12.11	10.18	14.75	12.74	12.82	11.90	18.40	8.82
Carry-over effect of occasion variance	5.20	-	16.48	0.42	0.23	1.21	9.00	19.45	0.0004	2.07	3.17
Occasion specific carry-over effects of total variance	0.82	-	4.93	0.05	0.02	0.18	1.15	2.49	0.00005	0.38	0.28
Psychopathy (model 4.0)											
Explained trait variance of total variance	79.76	63.68	67.40	80.10	77.97	85.93	79.92	85.75	86.12	80.64	90.06
Explained occasion variance of total variance	20.21	36.36	32.60	19.80	22.00	13.99	20.07	14.29	13.84	19.27	9.92
Carry-over effect of occasion variance	4.01	-	1.88	3.17	3.80	0.64	17.31	0.19	0.98	9.67	2.46
Occasion specific carry-over effects of total variance	0.81	-	0.61	0.63	0.84	0.09	3.47	0.03	0.14	1.86	0.24

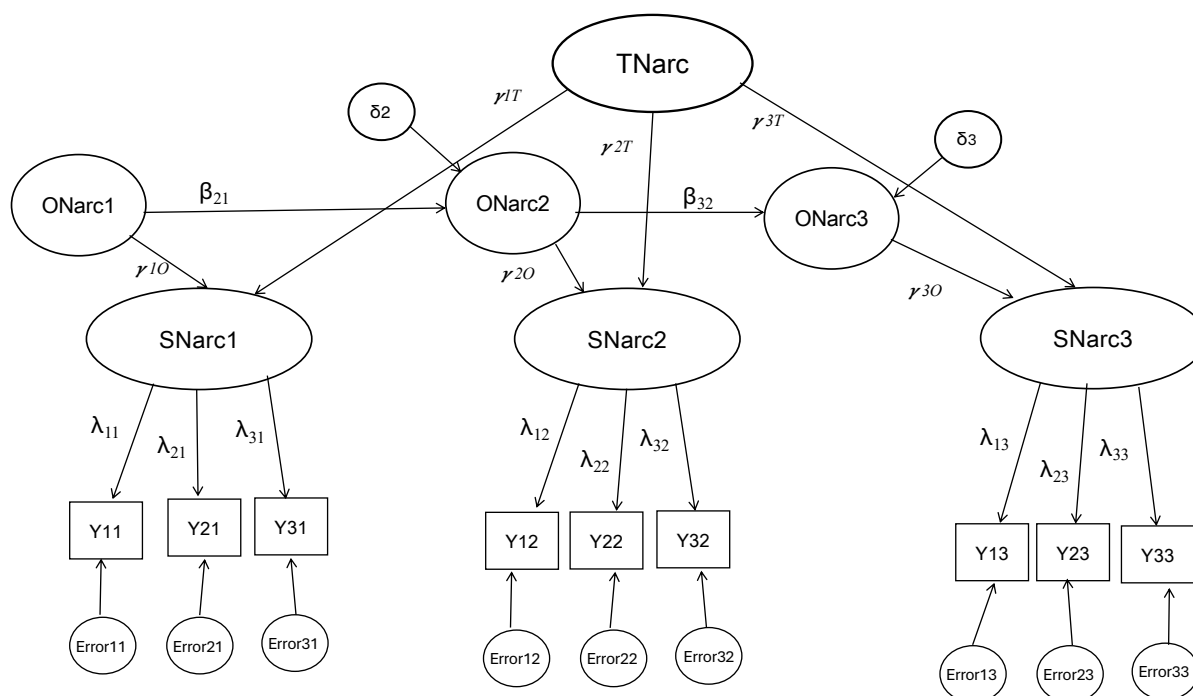
Note. Partitioning of trait vs. occasion specific variance across a 10-day period for the unconditional models. The percentage of carry-over effect of occasion variance is a percentage of the percentage from the explained occasion variance from the total variance (e.g., in Model 1.0, 6.44% of 20.38%). The occasion specific carry-over effects of total variance represents the equivalent percentage from the total variance (e.g., in Model 1.0, 6.44% of 20.38% is equivalent to 1.31% of total variance).

Table 7*Standardized Regression Coefficients for Conditional TSO Models*

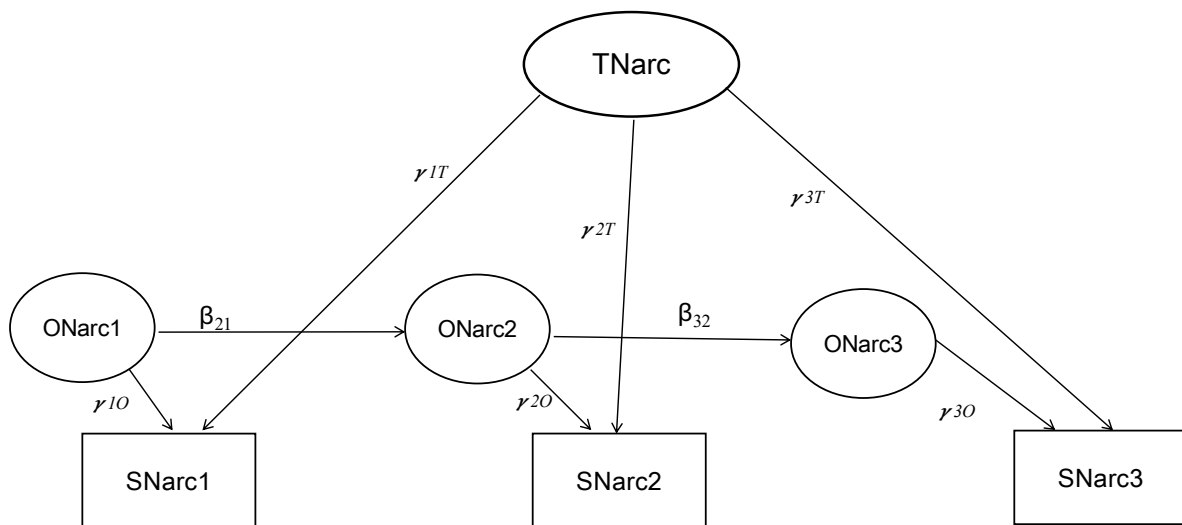
Estimates					S. E	two-tailed p		Estimates					S. E	two-tailed p		Estimates					S. E	two-tailed p	
Competition					Collaboration					Gender													
Occasion specific Agreeableness (1.2)	Day 1	-0.128	0.126	0.311		-0.048	0.118	0.682		0.136	0.154	0.374											
	Day 2	-0.066	0.108	0.54		0.016	0.112	0.889		0.144	0.138	0.294											
	Day 3	-0.211	0.098	0.032		0.179	0.095	0.060		-0.023	0.150	0.876											
	Day 4	-0.257	0.09	0.004		0.355	0.08	0.000		0.163	0.166	0.328											
	Day 5	-0.414	0.076	0.000		0.268	0.087	0.002		-0.063	0.149	0.673											
	Day 6	-0.081	0.099	0.414		0.155	0.091	0.087		0.001	0.133	0.991											
	Day 7	-0.071	0.101	0.483		0.462	0.086	0.000		0.015	0.191	0.939											
	Day 8	-0.19	0.093	0.039		0.108	0.1	0.279		0.048	0.153	0.752											
	Day 9	-0.125	0.087	0.153		0.2	0.081	0.013		0.179	0.087	0.039											
	Day 10	-0.03	0.104	0.769		0.185	0.102	0.070		-0.174	0.162	0.282											
Competition					Collaboration					Gender													
Occasion specific Machiavellianism (2.2)	Day 1	0.001	0.117	0.996		-0.115	0.108	0.288		-0.243	0.141	0.085											
	Day 2	0.241	0.114	0.034		-0.156	0.102	0.128		-0.151	0.147	0.303											
	Day 3	0.180	0.098	0.068		-0.092	0.095	0.337		-0.113	0.165	0.493											
	Day 4	0.309	0.092	0.001		-0.057	0.083	0.489		-0.003	0.151	0.986											
	Day 5	0.226	0.093	0.015		-0.207	0.090	0.021		-0.118	0.166	0.475											
	Day 6	0.116	0.104	0.265		0.040	0.093	0.669		-0.225	0.169	0.182											
	Day 7	0.130	0.116	0.260		-0.128	0.108	0.234		-0.031	0.249	0.901											
	Day 8	-0.028	0.110	0.796		0.068	0.103	0.505		-0.231	0.238	0.332											
	Day 9	0.151	0.128	0.238		-0.169	0.117	0.146		-0.079	0.330	0.810											
	Day 10	-0.071	0.110	0.519		0.009	0.104	0.928		0.025	0.207	0.904											
Competition					Collaboration					Gender													
Occasion specific Narcissism (3.2)	Day 1	0.146	0.110	0.187		0.105	0.102	0.306		-0.417	0.122	0.001											
	Day 2	0.116	0.102	0.255		0.100	0.092	0.281		-0.164	0.166	0.156											
	Day 3	0.254	0.091	0.005		0.100	0.087	0.250		-0.386	0.146	0.008											
	Day 4	0.220	0.092	0.017		0.185	0.080	0.021		-0.492	0.169	0.004											
	Day 5	0.228	0.090	0.011		0.186	0.089	0.038		-0.432	0.180	0.010											
	Day 6	0.031	0.091	0.735		0.226	0.090	0.012		-0.362	0.159	0.023											
	Day 7	0.221	0.088	0.012		-0.024	0.088	0.773		-0.181	0.147	0.217											
	Day 8	0.140	0.099	0.159		0.079	0.099	0.386		-0.505	0.181	0.005											
	Day 9	0.020	0.098	0.835		0.297	0.098	0.001		-0.255	0.155	0.098											
	Day 10	0.104	0.090	0.249		0.098	0.090	0.289		-0.479	0.139	0.001											
Competition					Collaboration					Gender													
Occasion specific Psychopathy (4.2)	Day 1	0.079	0.116	0.496		0.055	0.107	0.610		-0.361	0.117	0.002											
	Day 2	0.245	0.105	0.019		-0.041	0.104	0.694		-0.123	0.138	0.372											
	Day 3	0.059	0.099	0.548		-0.057	0.095	0.551		-0.272	0.145	0.061											
	Day 4	0.261	0.089	0.004		0.007	0.084	0.937		-0.161	0.140	0.250											
	Day 5	0.288	0.091	0.002		-0.013	0.090	0.888		-0.324	0.149	0.029											
	Day 6	0.447	0.083	0.000		-0.064	0.075	0.398		-0.091	0.108	0.402											
	Day 7	0.329	0.102	0.001		-0.086	0.098	0.381		-0.255	0.184	0.165											
	Day 8	0.118	0.107	0.269		-0.054	0.102	0.595		-0.273	0.194	0.160											
	Day 9	0.164	0.094	0.080		-0.093	0.084	0.268		-0.271	0.108	0.012											
	Day 10	0.231	0.107	0.031		-0.002	0.101	0.985		-0.540	0.178	0.002											

Appendix D

Figures of Trait-State-Occasion Models (Chapter 2 — Study 1 and 2)

Figure 1*Theoretical Trait-State-Occasion Model (Simplified Example)*

Note. Trait-State-Occasion (TSO) model with autoregressions. Simplified example of a three-time-measurement model using a three-item measure for narcissism. k = time point (1, 2, and 3); TNarc = latent trait narcissism at time point k ; SNarck = latent state narcissism at time point k ; ONarck = latent occasion narcissism at time point k ; γ = regression coefficients for pathways from TNarc to SNarck (γ_{kT}), and ONarck to SNarck (γ_{kO}) at time point k ; $\beta_{k, k-1}$ = autoregressive coefficient for the regression of ONarck on ONarck - 1; δk = disturbance term for ONarck; Y_{jk} = the j th manifest variable (i.e., questionnaire item) at time point k ; λ_{jk} = factor loading for the j th manifest variable on SNarck at time point k ; Error $_{jk}$ = error factor for the j th manifest variable at time point k .

Figure 2*Applied TSO Model (Simplified Example)*

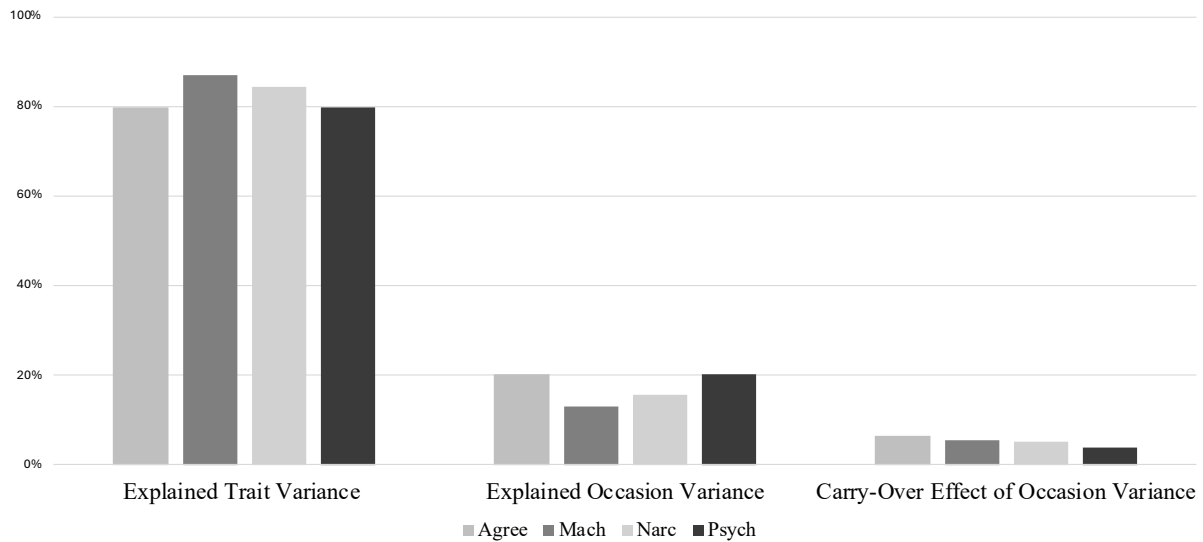
Note. Applied Trait-State-Occasion (TSO) model with autoregressions. Simplified example of a three-time-measurement model. k = time point (1, 2, and 3); TNarc = latent trait narcissism at time point k ; SNarck = state narcissism defined as composite mean narcissism score at time point k ; ONarck = latent occasion narcissism at time point k ; γ = regression coefficients for pathways from TNarc to SNarck (γ_{kT}), and ONarck to SNarck (γ_{kO}) at time point k ; $\beta_{k,k-1}$ = autoregressive coefficient for the regression of ONarck on ONarck - 1.

Appendix E

Bar Graph of Partition of Variance (Chapter 2 — Study 1)

Figure 3

Partition of Trait vs. Occasion Specific Variance Across a 10-day Period for Unconditional Baseline Models



Appendix F

Study Materials (Chapter 2 — Study 2)

Study Description

Study Name: **How Dark can you get? Stability and change of the Dark Triad personality traits through time.**

Study Type: This is an ONLINE survey study.

Abstract: This is a brief ONLINE follow-up study that is interested in the patterns of change and stability of personality traits over a period of 10 days.

Description: A doctoral thesis study is now being conducted by Audrey Renaud-da Costa, a doctoral student at the LPSP-Laboratory of Personality and Social Psychology (under the supervision of Dr. Dave Miranda).

WHAT:

This is a brief ONLINE follow-up study that is interested in the patterns of change and stability of the Dark Triad of personality, their relationship with collaborative and competitive states of mind, elements of social dominance and egalitarianism, and how they compare to other personality traits over a period of 10 days. Should you decide to participate, in a few days, you will be invited by email to participate in a 10-day daily survey from [date to date]. This survey is voluntary. Each completion will take about 10 minutes. This is an online study with no “on campus” meeting.

WHEN:

You will receive a reminder for the study 24 hours before the beginning of the study via email, sent through ISPR. On [the 1st day of the timeslot], you will receive the link to the study around 3:00pm via email. You will be able to answer the questionnaire from 6:00 – 11:59pm.

HOW:

Once you’ve started, you will receive a reminder email containing the link to the study once a day for 10 consecutive days. The survey will be active daily between 6pm and 11:59pm, which means that you can answer the questionnaire daily between 6pm and 11:59pm.

POINTS:

You will receive up to 2 ISPR points for your participation; in other words, you will be granted 2 points for 100 minutes of participation! Your ISPR points will be granted 2 days after the 10 consecutive days of survey. This is necessary to see how many surveys you actually filled-out in total. Points are distributed as follows:

- Answering between 1 and 3 surveys (≤ 30 minutes): 0.5 point
- Answering between 4 and 6 surveys ($\leq$ hour): 0.5 point (cumulated total: 1 point)
- Answering between 7 and 9 surveys (≤ 1.5 hours): 0.5 (cumulated total: 1.5 points)
- For full commitment of answering all 10 surveys: 0.5 point (cumulated total: 2 points)

Your collaboration will greatly improve the scientific quality of this research project by enabling us to have findings across several days, a first in this specific domain! All of these questionnaires are online and can be completed from any computer or hand-held device in a quiet place.

Eligibility Requirements: Please note that our questionnaire is only available in English. English-speaking and French-speaking bilingual participants are welcome to participate in this study.

You must be aged between 17 and 25 years to participate.

Duration: 10 minutes each day for 10 consecutive days (total 1h40 minutes).

- Points:**
- Answering between 1 and 3 surveys (≤ 30 minutes): 0.5 point
 - Answering between 4 and 6 surveys (≤ 1 hour): 0.5 point (cumulated total: 1 point)
 - Answering between 7 and 9 surveys (≤ 1.5 hours): 0.5 (cumulated total: 1.5 points)
 - For full commitment of answering all 10 surveys: 0.5 point (cumulated total: 2 points)

In other words, you get 2 points for 100 minutes of participation!

Researchers: Audrey Renaud-da Costa, Doctoral candidate in clinical psychology, Email: N/A (removed).

Online Consent Forms

Stability and change of the Dark Triad personality traits through time.

Online Consent Form: Winter 2020

Audrey Renaud-da Costa (doctoral student in psychology)
LPSP- Laboratory of Personality and Social Psychology
{redacted address}
Phone:{redacted}
Email:{redacted}

Dr. Dave Miranda (Associate Professor)
LPSP- Laboratory of Personality and Social Psychology
{redacted address}
Phone:{redacted}
Email:{redacted}

Tasks to be Performed:

A doctoral thesis study is now being conducted by Audrey Renaud-da Costa, a doctoral student at the LPSP-Laboratory of Personality and Social Psychology (under the supervision of Dr. Dave Miranda). This is a brief follow-up study that is interested in the patterns of change and stability of the Dark Triad of personality (i.e. subclinical psychopathy, narcissism and Machiavellianism), their relationship with collaborative and competitive states of mind, elements of social dominance and egalitarianism, and how they compare to other personality traits (i.e. Openness, Conscientiousness, Extraversion, Agreeableness and Negative emotionality) over the period of 10 days. Participation in this project is completely voluntary.

This follow-up research will consist of answering a brief questionnaire once a day for 10 consecutive days. You selected the day at which you desired to begin your participation in the study, and will be invited to participate to the 10-day daily questionnaires from [date to date]. The completion of any survey is completely voluntary and will each take 10 minutes to complete. You will receive one email reminder every day around 3:00pm. All questionnaires are online and can be completed from any computer or hand-held device at a quiet time, **anytime between 6pm and 11:59pm.**

Anonymity and Confidentiality:

You have received a 6-digit ID code for the Integrated System for Participation in Research of the School of Psychology (ISPR). Please write your 6-digit ID on the appropriate space at the beginning of the questionnaire. To ensure that your answers remain entirely confidential and anonymous, please do not write your name on the questionnaire. Be assured that neither the University of Ottawa nor your professors will be informed of your answers. Only Audrey Renaud-da Costa and Dr. Dave Miranda will have access to the data. A copy of the database from this study will be kept for at least 30 years on the researchers' password protected computers. Data from this study will be analyzed and interpreted in a global manner.

For your information, please note that your data will be collected through a safe and well-known service for research online called Qualtrics, which is widely used by major universities to conduct surveys for psychological research.

In order to minimize the risk of security breaches and to help ensure your confidentiality we recommend that you use standard safety measures such as signing out of your account, closing your browser and locking your screen or device when you are no longer using them / when you have completed the study.

Rights and Responsibilities:

Should you decide to participate to our study, you will be directed to a secure web page, in which you will be asked to complete an online questionnaire at the time of your convenience between 6pm and 11:59pm. You will be invited to answer this same survey once a day for 10 consecutive days, anytime between 6pm and 11:59pm, from [date to date]. You will receive an email reminder everyday to complete the questionnaires. Each questionnaire takes approximately 10 minutes to complete. It is important to understand that questionnaires should be completed alone and at a quiet time.

You are not obligated to respond to any question that you may feel uncomfortable answering. However, your honesty in responding would certainly be appreciated. You are also free to refuse to participate and to withdraw from the study at any time. You will be compensated the amount of point corresponding with the amount of questionnaires filled. Please note that if you choose to withdraw from the study, we will still use the data for which you have provided answers. If you wish to withdraw from the entire study and that we remove all of your answers; then click on the link “I want to withdraw from the entire study and remove all my answers” that we provide to you at the end of the online survey.

Potential Inconveniences and Resources:

This questionnaire will contain questions about subclinical psychopathy, narcissism and Machiavellianism, as well as collaborative and competitive states of mind, elements of social dominance and egalitarianism, and also Openness, Conscientiousness, Extraversion, Agreeableness and Negative emotionality. Reporting personal information might cause emotional inconveniences. We wish to remind you that resources are offered to students through the Student Academic Success Service (613-562-5101; sass@uottawa.ca).

On campus, you can contact the *Counselling and Coaching Service* (613-562-5800) and the *Health Services Clinic* (613-564-3950). Off campus, you can contact the Crisis Line (24/7), within Ottawa (613-722-6914) or outside Ottawa (1-866-996-0991).

Compensation:

To thank you for your time and effort, you will receive ISPR points, which will be converted into an equivalent percentage of your overall grade in the course during the semester in which you are participating, up to a maximum of 2 points (i.e., 2 percent).

As per ISPR principles, you will be compensated proportionally to your participation. More specifically, we will give you 0.5 point for every 30 minutes of participation, and 0.5 additional

point for full commitment of answering all surveys. The points are attributed as follows:

- If you answer between 1 and 3 surveys (≤ 30 minutes): 0.5 point
- If you answer between 4 and 6 surveys ($\leq$ hour): 0.5 point (cumulated total: 1 point)
- If you answer between 7 and 9 surveys (≤ 1.5 hours): 0.5 point (cumulated total: 1.5 points)
- For full commitment of answering all 10 surveys: 0.5 point (cumulated total: 2 points)

In other words, you can obtain up to 2 points (or 2 percent of your grade) for answering all 10 surveys (i.e., 100 minutes of participation). The points are attributed regardless of the specific days that you answered the questionnaires (e.g., you could answer questionnaires on day 1, 4, 5, 6, 7 and 10 for a total of six filled surveys, or 1 point). It is important that all participants answer a minimal amount of questionnaires because missing questionnaires risk invalidating the results of the longitudinal results. Your points will be granted two days after the 10-day study. This is necessary to see how many surveys you actually filled-out in total. If you decide to withdraw from the study, you will be compensated up to the amount you answered. You will be eligible for compensation even if you decide to click on the link “I want to withdraw from the entire study and remove all my answers”.

Be sure to write your ISPR code correctly at the beginning of the survey in order to obtain your points from the ISPR of the School of Psychology.

Data Utilization and Storage:

Data from this study will be used for the purpose of this research project, will be used in presentations at scientific conferences, and will be published in scientific journals. Your data will be stored in password protected computers. Results of this project will be analyzed, interpreted, and published in a global manner. Participants will not be identified in publications. A copy of the database from this study will be kept for at least 30 years after data collection. Audrey Renaud-da Costa and Dr. Dave Miranda will be the only persons to have access to the data.

Questions and Request for Information:

Any questions about your rights as a research participant may be addressed to the Office of Research Ethics and Integrity, {redacted localisation}. Any questions about this research can be addressed to Audrey Renaud-da Costa, the principal investigator in this project. Please print a copy of this page for your own records.

Informed Consent:

If you understand the statements above and freely consent to participate in this study, please choose the following option: “I agree to participate”. You will be directed to a separate secure web page where the online survey is located.

If you understand the statements above and do not want to participate in the study, close this web page.

Stabilité et changement des traits de personnalité de la Triade Malveillante à travers le temps.

Formulaire de consentement : Hiver 2020

Audrey Renaud-da Costa (étudiante au doctorat en psychologie)

LPSP- Laboratoire de Psychologie Sociale et de la Personnalité

{adresse expurgée}

Téléphone: {expurgé}

Courriel: {expurgé}

Dr. Dave Miranda (professeur agrégé)

LPSP- Laboratoire de Psychologie Sociale et de la Personnalité

{adresse expurgée}

Téléphone: {expurgé}

Courriel: {expurgé}

Tâches à effectuer:

Une étude de thèse de doctorat est présentement menée par Audrey Renaud-da Costa, une étudiante au doctorat au LPSP - Laboratoire de Psychologie Sociale et de la Personnalité (sous la supervision du Dr. Dave Miranda) à L'École de psychologie de l'Université d'Ottawa. Cette étude longitudinale vise à mieux comprendre les patrons de stabilité et changements de la Triade Malveillante (c.à.d. niveaux sous-cliniques de psychopathie, narcissisme et machiavélisme), leur relation avec des états d'esprit compétitifs et collaboratifs, des éléments de dominance sociale et d'égalitarisme, et leur comparaison avec d'autres traits de personnalité (c.à.d. l'Ouverture d'esprit, l'esprit Conscientieux, l'Extraversion, l'Amabilité, et les émotions Négatives). La participation à ce projet est entièrement volontaire.

Cette étude longitudinale consistera à remplir un bref questionnaire quotidiennement pendant 10 jours consécutifs. Vous avez sélectionné la date à laquelle vous désiriez commencer votre participation à l'étude, et serez invité à participer à l'étude de questionnaires quotidiens pendant 10 jours du [date à date]. La complétion des questionnaires est entièrement volontaire et prendra chaque fois 10 minutes. Vous recevrez un courriel de rappel à chaque jour vers 3:00pm. Tous les questionnaires sont en ligne et peuvent être complétés seuls à partir de n'importe quel ordinateur ou appareil électronique portable à un moment calme, à n'importe quel moment **entre 18:00 et 23:59**.

Anonymat et confidentialité:

Vous avez reçu un code d'identification à six chiffres du Système intégré de participation à la recherche de l'école de psychologie (SIPR). Vous êtes priés d'écrire votre code d'identification à six chiffres dans l'espace approprié au début du questionnaire. Afin d'assurer que vos réponses demeurent entièrement confidentielles et anonymes, vous êtes priés de ne pas écrire votre nom sur le questionnaire. Soyez assurés que ni l'Université d'Ottawa, ni vos professeurs ne seront informés de vos réponses. Seuls Audrey Renaud-da Costa (étudiante au doctorat) et Dr. Dave Miranda auront accès aux données. Une copie de la base de données de cette étude sera conservée pendant au moins 30 ans sur les ordinateurs protégés par mot de passe des chercheurs. Les données provenant de cette étude seront analysées et interprétées de manière globale.

Pour votre information, s.v.p. notez que vos données seront recueillies à travers un service de la recherche en ligne sécuritaire et réputé nommé Qualtrics, lequel est largement utilisé par de grandes universités afin de mener des sondages pour la recherche en psychologie.

Afin de minimiser les risques d'atteinte à votre sécurité et pour assurer votre confidentialité, nous vous recommandons d'utiliser des mesures de sécurité standard, telles que mettre fin à la session, fermer votre navigateur Internet et verrouiller votre écran ou appareil lorsque vous ne les utilisez plus / lorsque vous avez terminé l'étude.

Droits et responsabilités:

Si vous décidez de participer à notre étude, vous serez dirigés sur une page web sécurisée à partir de laquelle on vous demandera de compléter le questionnaire en ligne au moment de votre choix. Vous serez ensuite invité à compléter ce même questionnaire quotidiennement pendant 10 jours consécutifs, entre 18:00 et 23:59, du [date à date]. Vous recevrez un courriel tous les jours en rappel de compléter les questionnaires. Chaque questionnaire quotidien prendra environ 10 minutes à compléter. Tous les questionnaires sont en ligne et peuvent être complétés seuls à partir de n'importe quel ordinateur ou appareil électronique portable à un moment calme.

Vous n'êtes pas tenus de répondre à aucune question pouvant vous mettre mal à l'aise. Cependant, l'honnêteté de vos réponses sera certainement appréciée. Vous êtes également libre de refuser de participer et de vous retirer de l'étude à tout moment. La compensation qui vous sera attribuée correspondra à la quantité de questionnaires que vous complétés. S.v.p. notez que si vous choisissez de vous retirer de cette étude, nous allons tout de même utiliser les données pour lesquelles vous avez fournies des réponses. Si vous souhaitez vous retirer de l'étude au complet et que nous retirions toutes vos réponses; alors cliquez sur le lien « Je veux me retirer de l'étude en entier et retirer toutes mes réponses » que nous vous fournissons à la fin du questionnaire en ligne.

Inconvénients potentiels et ressources:

Ce questionnaire contient des questions portant sur des niveaux sous-cliniques de psychopathie, narcissisme et machiavélisme, l'état d'esprit compétitif et collaboratif, des éléments de dominance sociale et d'égalitarisme, ainsi que sur l'Ouverture d'esprit, l'esprit Conscientieux l'Extraversion, l'Amabilité et les émotions Négatives. Fournir des informations personnelles pourrait occasionner des désagréments émotionnels. Nous désirons vous rappeler que des ressources sont offertes aux étudiant(e)s à travers le Service d'appui au succès scolaire (613-562-5101; sass@uottawa.ca).

Sur le campus, vous pouvez contacter le Service de counseling et de coaching (613-562-5200) et le Service de santé (613-564-3950). Hors campus, vous pouvez contacter la Ligne d'écoute téléphonique (24/7) à Ottawa (613-772-6914) ou à l'extérieur d'Ottawa (1-866-996-0991).

Compensation:

Pour vous remercier de votre temps et de vos efforts, vous obtiendrez des points SIPR qui seront convertis en un pourcentage équivalent de votre note finale du cours auquel vous participez ce semestre, pour un maximum de 2 points (c.à.d. 2 pourcents). En accord avec les principes du SIPR, vous recevrez une compensation proportionnelle à votre participation. Plus précisément, nous vous attribuerons 0.5 point pour chaque 30 minutes de participation, et 0.5 point additionnel

pour l'engagement maximal d'avoir répondu à tous les 10 questionnaires. Les points sont attribués comme suit:

- Si vous répondez entre 1 et 3 questionnaires (≤ 30 minutes): 0.5 point
- Si vous répondez entre 4 et 6 questionnaires (≤ 1 heure): 0.5 point (total cumulé: 1 point)
- Si vous répondez entre 7 et 9 questionnaires (≤ 1.5 heures): 0.5 point (total cumulé: 1.5 points)
- Pour l'engagement maximal d'avoir répondu aux 10 questionnaires: 0.5 point (total cumulé: 2 points)

En d'autres mots, vous pouvez obtenir jusqu'à 2 points (ou 2 pourcents de votre note finale) pour répondre à tous les 10 questionnaires (c.à.d. pour 100 minutes de participation). Les points sont attribués peu importe les jours spécifiques auxquels vous avez répondu aux questionnaires (p. ex. vous pourriez répondre aux questionnaires les jours 1, 4, 5, 6, 7 et 10 pour un total de 6 questionnaires équivalents à 1 point). Il est important que les participants répondent à un nombre minimal de questionnaires puisque les données manquantes risquent d'invalider les résultats de l'étude longitudinale. Vos points vous seront attribués deux jours après la fin de l'étude de 10 jours. Ceci est nécessaire pour constater à combien de questionnaires vous avez répondu. Si vous décidez de vous retirer de l'étude, vous serez compensés selon le nombre de questionnaires remplis. Vous serez éligibles pour une compensation même si vous cliquez sur le lien "Je veux me retirer de l'étude en entier et retirer toutes mes réponses".

Assurez-vous d'écrire votre code d'identification SIPR correctement au début du questionnaire afin d'obtenir vos points du SIPR de l'École de Psychologie.

Utilisation et conservation des données:

Les données de cette étude seront utilisées dans le cadre de ce projet de recherche et seront utilisées dans des présentations à des conférences scientifiques et seront publiées dans des revues scientifiques. Vos données seront conservées sur des ordinateurs qui sont protégés par mot de passe. Les résultats de ce projet seront analysés, interprétés et publiés de manière globale. Les participants ne seront pas identifiés dans les publications. Une copie de la base de données provenant de cette étude sera conservée pendant au moins 30 ans après la collecte de données. Audrey Renaud-da Costa et Dr. Dave Miranda seront les seules personnes ayant accès aux données.

Questions et requête d'information:

Toute question concernant vos droits en tant que participant à la recherche peut être adressée au Bureau d'éthique et d'intégrité de la recherche, {adresse expurgée}. Toute question à propos de cette recherche peut être adressée à Audrey Renaud-da Costa, la chercheuse principale de ce projet de recherche.

Veuillez s.v.p. imprimer cette page pour vos propres archives.

Consentement libre et éclairé:

Si vous comprenez les énoncés ci-dessus et consentez librement à participer à cette étude, veuillez choisir l'option suivante : « J'accepte de participer ». Vous serez redirigé vers une

page web sécurisée sur laquelle se retrouve le questionnaire.

Si vous comprenez les énoncés ci-dessus et ne désirez pas participer à cette étude, veuillez fermer cette page web.

Email Reminder

Thank you for your participation in our study titled “Stability and change of the Dark Triad personality traits through time” that is being currently conducted.

This is a friendly reminder that if you still want to participate in our daily questionnaire, you can do so **between 6:00pm and 11:59pm tonight** (as per ISPR study information). This survey is completely voluntary and will take 10 minutes to complete. Your collaboration will greatly improve the scientific quality of this research project by enabling us to have longitudinal findings across several days, a first in this specific research domain!

Remember that your ISPR point(s) will be granted at the end of this 10-day study!

Please use the link below to access the survey. Make sure to include your 6-digit ISPR code, that can be found at the bottom of this email.

Your help is greatly appreciated.

Thank you,

Audrey Renaud-da Costa (doctoral student in psychology)
LPSP- Laboratory of Personality and Social Psychology
{redacted address}

Appendix G

Tables (Chapter 2 — Study 2)

Table 8

Longitudinal Measurement Invariance Models with Fit Indices and Fit Indices Change

Invariance Model	Model Fit Indicator			Model Fit Change	
	CFI	RMSEA	[90%CI]	ΔCFI	ΔRMSEA
<i>Agreeableness</i>					
Model A1.0: Configural t1-t3	0.951	0.103	[0.086-0.120]	-	-
Model A1.1: Metric t1-t3	0.954	0.096	[0.079-0.113]	0.003	-0.007
Model A1.2: Scalar t1-t3	0.942	0.097	[0.081-0.112]	-0.012	0.001
Model A1.3: Uniqueness t1-t3	0.949	0.088	[0.072-0.103]	0.007	-0.009
Model A2.0: Configural t1-t7		M.N.C		-	-
<i>Machiavellianism</i>					
Model M1.0: Configural t1-t3		M.N.C		-	-
<i>Narcissism</i>					
Model N1.0: Configural t1-t3	0.878	0.107	[0.096-0.117]	-	-
Model N1.1: Metric t1-t3	0.877	0.104	[0.094- 0.115]	-0.001	-0.003
Model N1.2: Scalar t1-t3	0.869	0.100	[0.090-0.110]	-0.008	-0.004
Model N1.3: Uniqueness t1-t3	0.870	0.097	[0.081-0.112]	0.001	-0.003
Model N2.0: Configural t1-t7		M.N.C		-	-
<i>Psychopathy</i>					
Model P1.0: Configural t1-t3	0.894	0.119	[0.109-0.130]	-	-
Model P1.1: Metric t1-t3	0.894	0.116	[0.106-0.127]	0	-0.003
Model P1.2: Scalar t1-t3	0.891	0.110	[0.100-0.119]	-0.003	-0.006
Model P1.3: Uniqueness t1-t3	0.893	0.106	[0.096-0.115]	0.002	-0.004
Model P2.0: Configural t1-t7	0.844	0.104	[0.100-0.109]	-0.049	-0.002
Model P2.1: Metric t1-t7	0.843	0.103	[0.099-0.108]	-0.001	-0.001
Model P2.2: Scalar t1-t7	0.843	0.990	[0.095-0.103]	0	0.887
Model P2.3: Uniqueness t1-t7	0.843	0.098	[0.094-0.102]	0	-0.892
Model P3.0: Configural t1-t10		M.N.C		-	-

Note. Longitudinal measurement invariance testing where models increase gradually in complexity (i.e., starting with less time measurements and increasing) and restrictions (i.e., from configural to uniqueness measurement invariance testing). CFI = comparative fit index; RMSEA = root mean square error of approximation; 90% CI = 90% confidence interval; M.N.C = model non convergence (to simplify the table, once a model has not converged, no subsequent models are presented in this table).

Table 9*Omega Values of Internal Consistency*

Occ. Meas.	Omega Value			
	Agreeableness	Machiavellianism	Narcissism	Psychopathy
1	0.863	0.870	0.866	0.876
2	0.878	0.877	0.846	0.868
3	0.838	0.925	0.836	0.892
4	0.896	0.925	0.857	0.910
5	0.836	0.864	0.748	0.831
6	0.819	0.934	0.814	0.896
7	0.833	0.947	0.827	0.905
8	0.851	0.942	0.834	0.908
9	0.874	0.935	0.894	0.903
10	0.823	0.883	0.810	0.845

Table 10
Descriptive Statistics

Day	Agree (Mean ± StD)	Mach (Mean ± StD)	Narc (Mean ± StD)	Psych (Mean ± StD)	Comp (Mean ± StD)	Collab (Mean ± StD)	SDO (Mean ± StD)
Day 1	3.57 (0.78)	3.19 (0.62)	2.85 (0.62)	2.19 (0.61)	2.57 (1.13)	3.63 (0.84)	2.23 (0.82)
Day 2	3.65 (0.81)	3.16 (0.68)	2.90 (0.63)	2.16 (0.63)	2.41 (1.19)	3.60 (1.03)	2.15 (0.94)
Day 3	3.63 (0.76)	3.21 (0.75)	2.90 (0.62)	2.24 (0.68)	2.29 (1.03)	3.64 (0.95)	2.31 (1.00)
Day 4	3.65 (0.80)	3.14 (0.75)	2.98 (0.64)	2.17 (0.69)	2.39 (1.06)	3.52 (1.13)	2.32 (0.91)
Day 5	3.74 (0.72)	3.15 (0.78)	2.94 (0.61)	2.25 (0.70)	2.33 (1.09)	3.54 (1.04)	2.21 (0.90)
Day 6	3.62 (0.70)	3.18 (0.79)	2.87 (0.59)	2.19 (0.69)	2.38 (1.13)	3.56 (1.01)	2.28 (0.89)
Day 7	3.57 (0.75)	3.19 (0.83)	2.91 (0.63)	2.23 (0.71)	2.47 (1.18)	3.43 (1.08)	2.31 (0.97)
Day 8	3.60 (0.70)	3.13 (0.80)	2.92 (0.61)	2.18 (0.68)	2.39 (1.18)	3.50 (0.99)	2.30 (0.92)
Day 9	3.57 (0.74)	3.15 (0.79)	2.96 (0.67)	2.13 (0.70)	2.51 (1.08)	3.48 (1.07)	2.33 (0.95)
Day 10	3.68 (0.67)	3.08 (0.86)	2.95 (0.66)	2.19 (0.69)	2.50 (1.14)	3.58 (1.07)	2.33 (0.94)
Total	3.63	3.16	2.92	2.19	2.42	3.55	2.28

Note. Agree = agreeableness; Mach = Machiavellianism; Narc = narcissism; Psych = psychopathy; Comp = competitive attitude; Collab = collaborative attitude; *Mean* = mean; *StD* = Standard Deviation; Total = average of means over the ten-day period.

Table 11

Standardized Factor Loadings and Regression Coefficients for Trait, Occasion Specific, and Autoregressions Factors for Unconditional Baseline Models

	Agreeableness (1.0)			Machiavellianism (2.0)			Narcissism (3.0)			Psychopathy (4.0)		
	Estimates	S.E	two-tailed p	Estimates	S.E	two-tailed p	Estimates	S.E	two-tailed p	Estimates	S.E	two-tailed p
- Trait factor BY -												
Day 1	0.838	0.033	0.000	0.798	0.041	0.000	0.915	0.018	0.000	0.870	0.027	0.000
Day 2	0.87	0.028	0.000	0.877	0.025	0.000	0.936	0.014	0.000	0.913	0.019	0.000
Day 3	0.91	0.021	0.000	0.864	0.029	0.000	0.942	0.013	0.000	0.907	0.02	0.000
Day 4	0.976	0.014	0.000	0.928	0.016	0.000	0.959	0.011	0.000	0.949	0.012	0.000
Day 5	0.936	0.017	0.000	0.95	0.013	0.000	0.958	0.01	0.000	0.870	0.028	0.000
Day 6	0.937	0.019	0.000	0.961	0.014	0.000	0.945	0.014	0.000	0.938	0.015	0.000
Day 7	0.902	0.024	0.000	0.959	0.014	0.000	0.937	0.15	0.000	0.964	0.011	0.000
Day 8	0.905	0.024	0.000	0.926	0.019	0.000	0.931	0.016	0.000	0.953	0.014	0.000
Day 9	0.882	0.028	0.000	0.937	0.016	0.000	0.928	0.017	0.000	0.944	0.014	0.000
Day 10	0.913	0.021	0.000	0.936	0.017	0.000	0.949	0.013	0.000	0.957	0.011	0.000
- Occasion specific factor BY -												
Day 1	0.545	0.051	0.000	0.602	0.054	0.000	0.402	0.041	0.000	0.494	0.047	0.000
Day 2	0.493	0.049	0.000	0.48	0.047	0.000	0.351	0.038	0.000	0.408	0.043	0.000
Day 3	0.414	0.045	0.000	0.504	0.05	0.000	0.334	0.037	0.000	0.421	0.044	0.000
Day 4	0.216	0.064	0.001	0.372	0.041	0.000	0.282	0.037	0.000	0.315	0.037	0.000
Day 5	0.353	0.044	0.000	0.312	0.038	0.000	0.286	0.035	0.000	0.493	0.049	0.000
Day 6	0.349	0.05	0.000	0.275	0.05	0.000	0.327	0.039	0.000	0.347	0.041	0.000
Day 7	0.432	0.037	0.000	0.282	0.047	0.000	0.35	0.039	0.000	0.265	0.042	0.000
Day 8	0.426	0.051	0.000	0.377	0.048	0.000	0.364	0.041	0.000	0.304	0.045	0.000
Day 9	0.471	0.052	0.000	0.35	0.042	0.000	0.373	0.043	0.000	0.330	0.04	0.000
Day 10	0.408	0.048	0.000	0.352	0.046	0.000	0.315	0.038	0.000	0.292	0.037	0.000
- Autoregression of day k-1 ON -												
Day 1	-	-	-	-	-	-	-	-	-	-	-	-
Day 2	0.193	0.116	0.095	0.531	0.086	0.000	0.216	0.124	0.081	0.450	0.099	0.000
Day 3	0.245	0.123	0.047	0.534	0.084	0.000	0.117	0.134	0.38	0.421	0.105	0.000
Day 4	-0.372	0.296	0.209	0.438	0.105	0.000	0.125	0.153	0.414	0.514	0.102	0.000
Day 5	-0.28	0.269	0.298	0.396	0.112	0.000	-0.109	0.18	0.546	0.330	0.114	0.004
Day 6	-0.087	0.187	0.643	0.07	0.208	0.737	0.22	0.14	0.118	0.077	0.136	0.574
Day 7	0.191	0.18	0.288	-0.489	0.275	0.076	-0.044	0.190	0.815	-0.039	0.213	0.854
Day 8	0.436	0.115	0.000	-0.321	0.197	0.104	0.198	0.13	0.128	-0.554	0.183	0.002
Day 9	0.547	0.099	0.000	0.214	0.156	0.17	-0.043	0.149	0.772	0.235	0.156	0.132
Day 10	0.486	0.11	0.000	0.214	0.168	0.201	-0.185	0.158	0.242	-0.110	0.186	0.557

Table 12*Trait-State-Occasion Fit Indices for Unconditional and Conditional Models*

Model	X2	df	p	CFI	RMSEA	90% CI
Agreeableness						
Model 1.0 : Agreeableness	47.255	26	0.0066	0.980	0.087	0.046 - 0.127
Model 1.1 : Social attitudes and Agreeableness	1284.325	396	0.0000	0.295	0.145	0.136 - 0.154
Model 1.2 : Social attitudes, SDO and Agreeableness	3982.028	731	0.0000	N/A	0.204	0.198 - 0.210
Model 1.3 : Full TSO with social attitudes, SDO & gender	4029.339	761	0.0000	N/A	0.200	0.194 - 0.206
Model 1.4 : Full TSO model without SDO	1324.232	416	0.0000	0.289	0.143	0.134 - 0.152
Machiavellianism						
Model 2.0 : Machiavellianism	58.769	26	0.0002	0.973	0.109	0.072 - 0.146
Model 2.1 : Social attitudes and Machiavellianism	1270.755	396	0.0000	0.358	0.144	0.135 - 0.153
Model 2.2 : Social attitudes and SDO and Machiavellianism	4105.695	731	0.0000	N/A	0.208	0.202 - 0.214
Model 2.3 : Full TSO with social attitudes, SDO & gender	4136.255	761	0.0000	N/A	0.204	0.198 - 0.210
Model 2.4: Full TSO model without SDO	1300.145	416	0.0000	0.354	0.141	0.132 - 0.150
Narcissism						
Model 3.0: Narcissism	36.707	26	0.0794	0.992	0.062	0.000 - 0.105
Model 3.1: Social attitudes and Narcissism	1266.783	396	0.0000	0.423	0.14	0.131 - 0.149
Model 3.2: Social attitudes and SDO Narcissism	3962.06	731	0.0000	N/A	0.203	0.197 - 0.209
Model 3.3: Full TSO with social attitudes, SDO & gender	4057.755	761	0.0000	N/A	0.201	0.195 - 0.207
Model 3.4: Full TSO model without SDO	1255.667	416	0.0000	0.424	0.137	0.129 - 0.146
Psychopathy						
Model 4.0: Psychopathy	42.788	26	0.0203	0.986	0.078	0.031 - 0.118
Model 4.1: Social attitudes and Psychopathy	N/A	396	N/A	N/A	N/A	N/A
Model 4.2: Social attitudes, SDO and Psychopathy	3812.24	731	0.0000	N/A	0.198	0.192 - 0.205
Model 4.3: Full TSO with social attitudes, SDO & gender	4323.761	761	0.0000	N/A	0.209	0.203 - 0.215
Model 4.4: Full TSO model without SDO	1380.041	416	0.0000	0.357	0.147	0.139 - 0.156

Note. Trait-State-Occasion models in incremental complexity (from baseline models to full TSO models with all predictors) with fit indices. X2 = chi-square; df = degrees of freedom; p = p value; CFI = comparative fit index; RMSEA = root mean square error of approximation; 90% CI = 90% confidence intervals.

Table 13

Partition of Trait vs. Occasion Specific Variance Across a 10-day Period for Baseline Unconditional TSO Models

	Total (%)	Time 1	Time 2	Time 3	Time 4	Time 5	Time 6	Time 7	Time 8	Time 9	Time 10
Agreeableness (model 1.0)											
Explained trait variance of total variance	82.38	70.22	75.69	82.81	95.26	87.61	87.80	81.36	81.90	77.79	83.36
Explained occasion variance of total variance	17.61	29.70	24.30	17.14	4.67	12.46	12.18	18.66	18.15	22.18	16.65
Carry-over effect of occasion variance	10.88	-	3.72	6.00	13.84	7.84	0.76	3.65	19.01	29.92	23.62
Occasion specific carry-over effects of total variance	1.92	-	0.91	1.03	0.65	0.98	0.09	0.68	3.45	6.64	3.93
Machiavellianism (model 2.0)											
Explained trait variance of total variance	83.71	63.680	76.913	74.650	86.118	90.250	92.352	91.968	85.748	87.797	87.610
Explained occasion variance of total variance	16.26	36.240	23.040	25.402	13.838	9.734	7.563	7.952	14.213	12.250	12.390
Carry-over effect of occasion variance	13.54	-	28.196	28.516	19.184	15.682	0.490	23.912	10.304	4.580	4.580
Occasion specific carry-over effects of total variance	2.20	-	6.50	7.24	2.65	1.53	0.04	1.90	1.46	0.56	0.57
Narcissism (model 3.0)											
Explained trait variance of total variance	88.38	83.72	87.61	88.74	91.97	91.78	89.30	87.80	86.68	86.12	90.06
Explained occasion variance of total variance	11.58	16.160	12.320	11.156	7.952	8.180	10.693	12.250	13.250	13.913	9.923
Carry-over effect of occasion variance	2.13	-	4.666	1.369	1.563	1.188	4.840	0.194	3.920	0.185	3.423
Occasion specific carry-over effects of total variance	0.25	-	0.57	0.15	0.12	0.10	0.52	0.02	0.52	0.03	0.34
Psychopathy (model 4.0)											
Explained trait variance of total variance	85.95	75.690	83.357	82.265	90.060	75.690	87.984	92.930	90.821	89.114	91.585
Explained occasion variance of total variance	14.07	24.404	16.646	17.724	9.923	24.305	12.041	7.023	9.242	10.890	8.526
Carry-over effect of occasion variance	11.35	-	20.250	17.724	26.420	10.890	0.593	0.152	30.692	5.523	1.210
Occasion specific carry-over effects of total variance	1.60	-	3.37	3.14	2.62	2.65	0.07	0.01	2.84	0.60	0.10

Note. Partitioning of trait vs. occasion specific variance across a 10-day period for the unconditional models. The percentage of carry-over effect of occasion variance is a percentage of the percentage from the explained occasion variance from the total variance (e.g., in Model 1.0, 6.44% of 20.38%). The occasion specific carry-over effects of total variance represents the equivalent percentage from the total variance (e.g., in Model 1.0, 6.44% of 20.38% is equivalent to 1.31% of total variance).

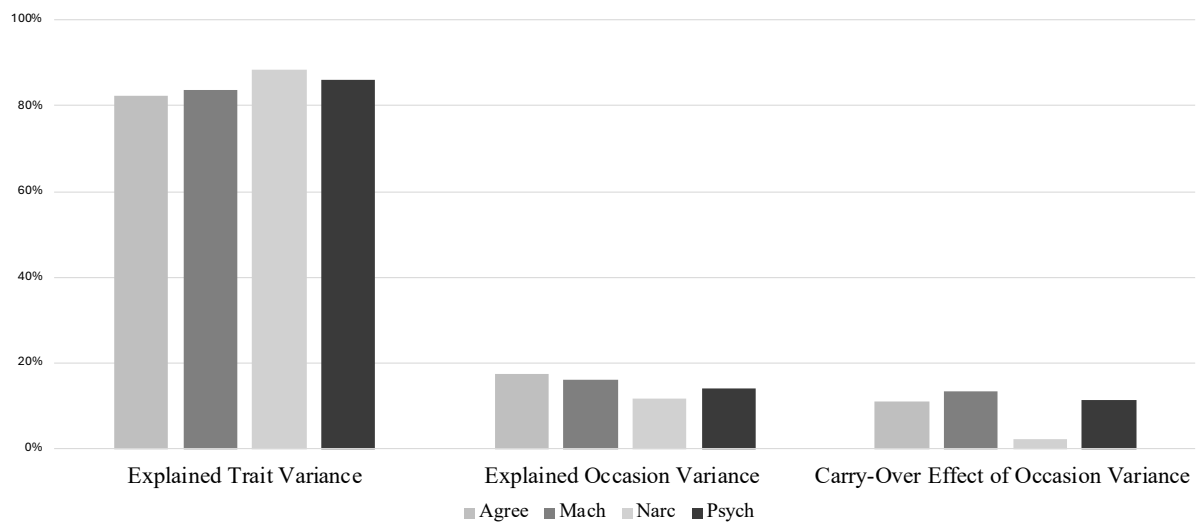
Table 14

Standardized Regression Coefficients for DT Traits Onto Predictors Across a 10-Day Period for Full Conditional TSO Models

		Estimates	S. E	two-tailed p	Estimates	S. E	two-tailed p	Estimates	S. E	two-tailed p
		Competition			Collaboration			Gender		
Occasion specific Agreeableness (1.4)	Day 1	-0.045	0.111	0.687	0.101	0.11	0.358	0.100	0.178	0.576
	Day 2	-0.142	0.104	0.171	0.488	0.091	0.000	0.092	0.172	0.593
	Day 3	-0.14	0.124	0.260	0.054	0.118	0.646	0.018	0.198	0.928
	Day 4	-0.361	0.173	0.037	0.103	0.143	0.473	0.539	0.401	0.179
	Day 5	-0.24	0.125	0.056	0.034	0.127	0.790	0.372	0.391	0.341
	Day 6	-0.104	0.136	0.447	0.347	0.116	0.003	0.147	0.246	0.550
	Day 7	-0.022	0.128	0.867	0.155	0.119	0.193	0.166	0.159	0.294
	Day 8	-0.155	0.109	0.155	0.011	0.104	0.913	0.180	0.129	0.162
	Day 9	-0.104	0.115	0.365	0.029	0.11	0.796	0.030	0.131	0.821
	Day 10	-0.039	0.11	0.723	0.392	0.109	0.000	0.021	0.159	0.894
		Competition			Collaboration			Gender		
Occasion specific Machiavellianism (2.4)	Day 1	0.16	0.108	0.14	0.009	0.108	0.933	-0.060	0.155	0.700
	Day 2	0.153	0.106	0.148	0.033	0.099	0.742	-0.008	0.141	0.956
	Day 3	0.184	0.101	0.069	-0.079	0.094	0.397	0.023	0.105	0.824
	Day 4	0.133	0.114	0.241	-0.140	0.101	0.167	-0.159	0.166	0.338
	Day 5	0.383	0.11	0.000	-0.038	0.097	0.693	0.096	0.188	0.608
	Day 6	0.026	0.171	0.877	0.083	0.125	0.509	0.055	0.252	0.828
	Day 7	0.347	0.142	0.015	-0.001	0.143	0.996	-0.023	0.451	0.959
	Day 8	0.250	0.148	0.091	0.056	0.143	0.696	-0.100	0.462	0.829
	Day 9	0.143	0.137	0.296	-0.155	0.128	0.225	-0.071	0.217	0.745
	Day 10	0.112	0.161	0.487	0.002	0.137	0.990	0.141	0.240	0.558
		Competition			Collaboration			Gender		
Occasion specific Narcissism (3.4)	Day 1	-0.051	0.119	0.516	0.013	0.127	0.051	0.129	0.236	0.585
	Day 2	0.077	0.119	0.232	0.03	0.116	0.793	-0.048	0.246	0.847
	Day 3	0.147	0.123	0.351	-0.012	0.118	0.919	0.085	0.253	0.735
	Day 4	-0.103	0.111	0.903	0.422	0.108	0.000	0.364	0.239	0.128
	Day 5	0.017	0.139	0.678	0.017	0.126	0.89	-0.034	0.384	0.930
	Day 6	0.053	0.128	0.173	0.208	0.116	0.073	0.141	0.216	0.514
	Day 7	0.175	0.129	0.125	0.028	0.123	0.819	0.078	0.278	0.778
	Day 8	0.183	0.119	0.767	0.296	0.12	0.014	0.023	0.239	0.924
	Day 9	-0.045	0.151	0.821	0.048	0.137	0.726	0.217	0.274	0.429
	Day 10	0.032	0.143	0.669	0.248	0.127	0.051	0.409	0.293	0.163
		Competition			Collaboration			Gender		
Occasion specific Psychopathy (4.4)	Day 1	0.086	0.103	0.408	0.07	0.099	0.482	-0.495	0.135	0.000
	Day 2	0.147	0.093	0.113	0.086	0.097	0.379	-0.285	0.142	0.044
	Day 3	0.055	0.098	0.843	0.018	0.089	0.843	-0.313	0.123	0.011
	Day 4	0.044	0.096	0.647	-0.31	0.089	0.726	-0.322	0.147	0.028
	Day 5	0.276	0.103	0.007	-0.163	0.093	0.08	-0.074	0.131	0.571
	Day 6	0.18	0.123	0.144	-0.117	0.108	0.279	-0.522	0.169	0.002
	Day 7	0.232	0.119	0.051	-0.079	0.106	0.477	-0.595	0.214	0.005
	Day 8	0.175	0.122	0.152	-0.025	0.113	0.824	-0.845	0.229	0.000
	Day 9	0.257	0.114	0.024	-0.189	0.101	0.062	-0.358	0.171	0.036
	Day 10	0.283	0.138	0.04	0.062	0.126	0.621	-0.651	0.236	0.006

Appendix H

Bar Graph of Partition of Variance (Chapter 2 — Study 2)

Figure 4*Partition of Trait vs. Occasion Specific Variance for Unconditional Baseline Models*

Appendix I

Experimental Tasks Materials (Chapter 3)

Experimental Scripts

Hypercompetitive Condition Script

Imagine that there is a national emergency and that you are being consulted to protect the interests of only the best students in Canada on social media. The government needs a genius mind like yours to prioritize the needs of the best performing students only, following a catastrophic shortage in resources (e.g., money, food, healthcare, education) due to global warming, natural disasters, poverty, systemic discrimination, crime, and global pandemics. The government needs aggressive, successful, and powerful students to guide us out of these difficult times. Specifically, you are being asked to lead the online promotion of this movement by creating tweets that encourage competition between students so that only the best can reach their full potential, given these difficult times.

Goal of the task: Your task is now to create simulated tweets that encourage competition between students to surpass these difficult times. Hence, you now have to simulate between 10 and 15 tweets on our online survey. Do not open your Twitter account if you have one, this simulation requires that you stay on our webpage.

Our laboratory will analyze and evaluate the content of your tweets with a computerized social cognitive analysis based on artificial intelligence (AI). The AI will be able to find the participant with the best ideas and designate them as the most original tweeter ever!

You have 15 minutes to write your simulated tweets on our online survey. After the time is up, or when you finished the 15 tweets, the page will ask you to confirm and will then close automatically. You will receive further instructions at that moment.

Collaborative Condition Script

Imagine that there is a national emergency and that you are being consulted to promote equal opportunities for all students in Canada on social media. The government needs a massive team effort to help instill mutual support between all students in the face of a catastrophic shortage in resources (e.g., money, food, healthcare, education) due to global warming, natural disasters, poverty, systemic discrimination, crime, and global pandemics. The government needs dependable, trustworthy, and helping students to lead us out of these difficult times. Specifically, you are being asked to contribute to the online promotion of this movement by creating tweets that encourage collaboration between students so that all of them can help each other reach their full potential despite these difficult times.

Goal of the task: Your task is now to create simulated tweets that encourage collaboration between students under these difficult times. Hence, you now have to simulate between 10 and 15

tweets on our online survey. Do not open your Twitter account if you have one, this simulation requires that you stay on our webpage.

Our laboratory will analyze and evaluate the content of your tweets with a computerized social cognitive analysis based on artificial intelligence (AI). The AI will be able to combine the best ideas from each participant to create the most original team tweet ever!

You have 15 minutes to write your simulated tweets on our online survey. After the time is up, or when you finished the 15 tweets, the page will ask you to confirm and will then close automatically. You will receive further instructions at that moment.

Control Condition Script

Imagine there is a national emergency and that you are being consulted to discuss the impact of the recent catastrophic shortage in resources (e.g., global warming, natural disasters, poverty, systemic discrimination, crime, and global pandemics) through social media. The government wants you to share your perspective on how these various crises will impact students. Specifically, you are being asked to participate in the online discussion of this reflection by creating tweets that will reflect your perspective.

Goal of the task: Your task is now to create simulated tweets that reflect your perspective of the impact on students under these difficult times. Hence, you now have to simulate between 10 and 15 tweets on our online survey. Do not open your Twitter account if you have one, this simulation requires that you stay on our webpage.

You have 15 minutes to write your simulated tweets on our online survey. After the time is up, or when you finished the 15 tweets, the page will ask you to confirm and will then close automatically. You will receive further instructions at that moment.

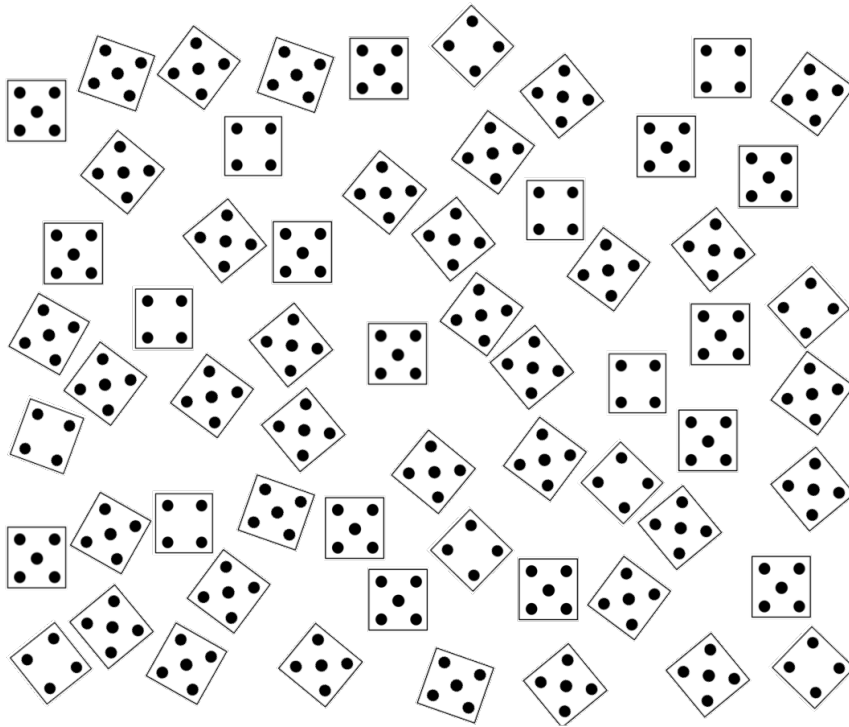
Distraction Task

Thank you for your efforts and for your enlightening tweets. Now that you have completed this part of the study, we would like to test your attention and alertness. This will allow us to ensure that all participants in the study are paying attention to what is asked of them.

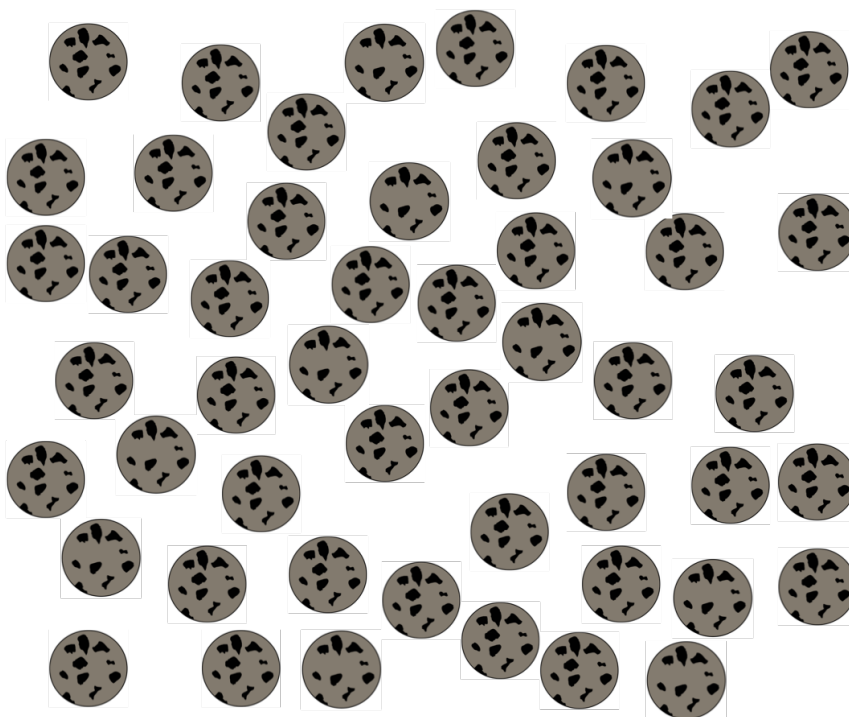
When you press next, you will see a group of images. Your task is to find target images amongst the rest and identify how much of these are on the page as quickly and accurately as possible. You are timed.

Click next when you are ready to begin.

Here is a page full of five- and four-faced dice. Please identify how many four-faced dice are in this page. Work as quickly as you can without making mistakes. You are timed. Enter your answer in the space below.

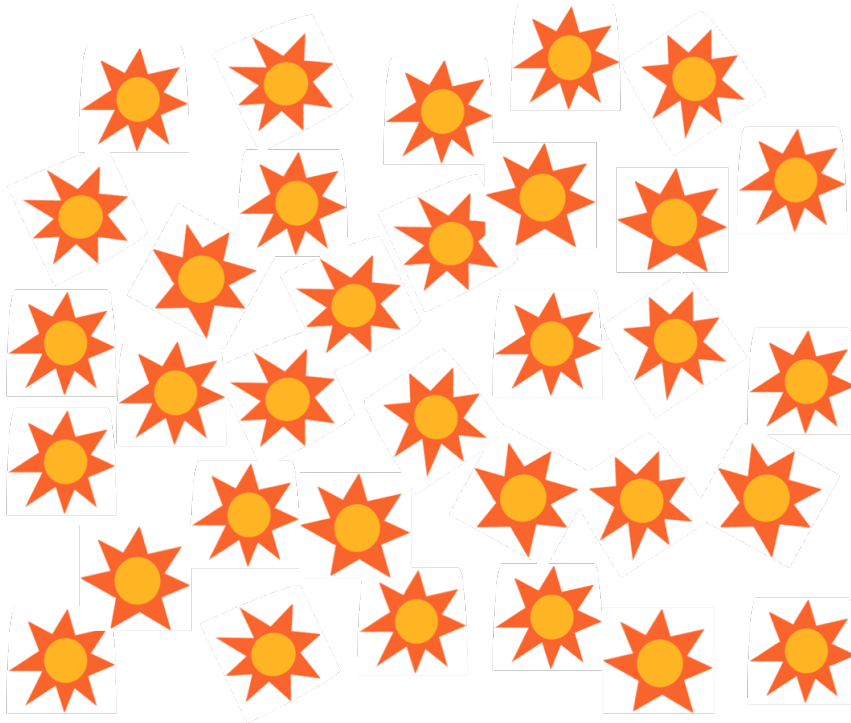


Here is a page full of cookies. Some have 10 chocolate chips, some have 9 chocolate chips. Please identify how many cookies with 9 chocolate chips are on this page. Work as quickly as you can without making mistakes. You are timed. Enter your answer in the space below.

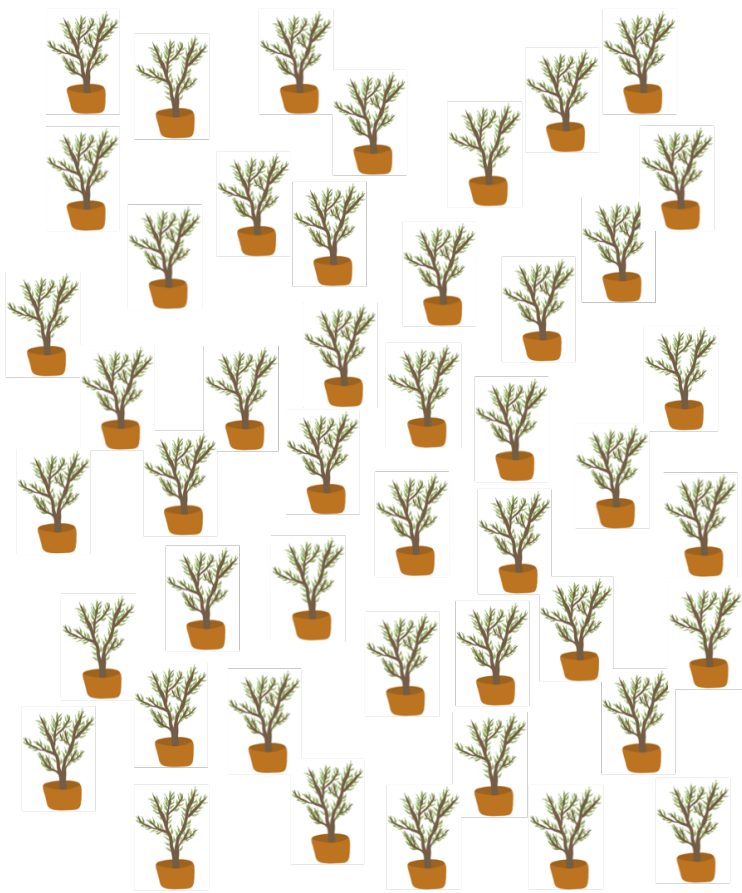


Here is a page full of suns. Some have 7 spikes, and some have 8 spikes. Please indicate how

many 7-spiked suns are in this page. Work as quickly as you can without making mistakes. You are timed. Enter your answer in the space below.



Here is a page full of small trees. Some have 11 branches, some have 8 branches. Please identify how many 8-branched trees are in this page. Work as quickly as you can without making mistakes. You are timed. Enter your answer in the space below.



Appendix J

Study Material (Chapter 3)

Study Description

Study Name: Fifty shades of tweets: students in the context of tweets on social media

Study Type: Online study.

Abstract: This online study is interested in understanding how different students develop different ideas that they tweet about on social media. To do that, you will answer questionnaires, and participate in an activity where you will simulate tweets about a fictional situation that impacts students at the university of Ottawa.

Description: A doctoral thesis study is now being conducted by Audrey Renaud-da Costa, a doctoral student at the LPSP-Laboratory of Personality and Social Psychology (under the supervision of Dr. Dave Miranda). This online study is interested in understanding how different students develop different ideas that they tweet about on social media. To do so, we will ask you to simulate tweets about a timely subject: the experience of university students during emergency crises situations.

During this online study, you will go through 6 steps: (1) read and fill out an online consent form; (2) answer questionnaires; (3) write simulated tweets (in our survey and not into a real account) related to the experience of university students in emergency situations; (4) participate in an attention and observation game, (5) answer another questionnaire; and (6) receive a debriefing explaining the study. The questionnaires and tweets are online and can be completed **alone** and in a quiet place on any computer or hand-held device.

Your participation in the tweeting task will require the following: create as many simulated tweets as possible in fifteen minutes that promote different aspects related to the experience of university students. Your complete participation should last less than an hour.

Should you be interested to participate, you will be able to click on the survey link. Once you click on the link, you will be directed to an online consent form.

Your participation in this study is voluntary. You will receive one point that will be converted into one percent of your final grade in the course under which you are registered with ISPR.

Your collaboration will help us better understand students in the context of social media!

- Eligibility** Please note that our questionnaire is only available in English.
- Requirements:** French-speaking bilingual participants are welcome to participate in this study if they can fluently read English.

You must be aged between 18 and 25 years to participate.

Please note that you cannot participate in the present study if you already participated in the ISPR study “Can we all be dark at times? The relative stability of the Dark Triad traits of personality through time”.

Duration: 1 hour (online)

Points: 1 point.

Researchers: Audrey Renaud-da Costa, Doctoral Candidate
Dr. Dave Miranda, Associate Professor

Consent Forms**Fifty shades of tweets: Students in the context of tweets on social media***Online Consent Form – Winter 2021*

Audrey Renaud-da Costa (doctoral student in psychology)
LPSP- Laboratory of Personality and Social Psychology
{redacted address}
Phone: {redacted}
Email: {redacted}

Dr. Dave Miranda (Associate Professor)
LPSP- Laboratory of Personality and Social Psychology
{redacted address}
Phone: {redacted}
Email: {redacted}

Task to be Performed:

A doctoral thesis study is now being conducted by Audrey Renaud-da Costa, a doctoral student at the LPSP-Laboratory of Personality and Social Psychology (under the supervision of Dr. Dave Miranda). This online study is interested in understanding how different students develop different ideas that they tweet about on social media. Participation in this project is completely voluntary. This online study consists of six steps: (1) read and fill-out an online consent form; (2) answer questionnaires; (3) write simulated tweets (in our survey and not into a real account); (4) participate in an attention and observation game; (5) answer another questionnaire; and (6) receive a debriefing explaining the study.

Your participation in the study activities will require the following: (1) create up to 15 simulated tweets in 15 minutes, which will be related to different fictitious aspects of university students' life in crises situations; and (2) identify specific details in a series of images.

The quality of your tweets will be analyzed and evaluated with a computerized social cognitive analysis based on artificial intelligence (AI). The online questionnaires and the production of tweets have to be completed alone from any computer or hand-held device, **in a quiet place**. Your entire participation in this study should take less than an hour.

Anonymity and Confidentiality:

You have received a 6-digit ID code for the Integrated System for Participation in Research of the School of Psychology (ISPR). This number is not the same as your student number. Please write your 6-digit ISPR ID in the appropriate space. To ensure that your answers remain entirely confidential and anonymous, please do not write your name or student number. Be assured that neither the University of Ottawa nor your professors will be informed of your answers, which will only be identified with your ISPR number. Only Audrey Renaud-da Costa and Dr. Dave Miranda will have access to the data. A copy of the database from this study will be kept for at least 30 years on the researchers' password protected computers. Data from this study will be analyzed

and interpreted in a global manner. For your information, please note that your data will be collected through a safe and well-known service for research online called Qualtrics, which is widely used by major universities to conduct surveys for psychological research.

Rights and Responsibilities:

If you decide to participate in our study, you will fill questionnaires and participate in different tasks (see task to be performed). You are not obligated to respond to any question that you may feel uncomfortable answering. However, your honesty in responding would certainly be appreciated. You are also free to refuse to participate in the task, and to withdraw from the study at any time. You will be compensated one ISPR point even if you withdraw from the study. If you wish to withdraw from the study and/or that we remove all of your answers, you can indicate at the end of the survey that you want to withdraw your answers. If you exit from the study before the end of the study (e.g., by closing or changing the webpage) or if your participation is interrupted (e.g., internet shortage, distraction), we will consider that you have withdrawn from the study and will not use your data. In that case, you will receive debriefing within 48hr anonymously by email through ISPR. You will still receive the compensation even if you withdraw from the study.

Potential Inconveniences and Resources:

The questionnaires will contain questions about personal traits. Reporting personal information might cause emotional inconveniences for some participants. We wish to remind you that resources are offered to students through the Student Academic Success Service (613-562-5101; sass@uottawa.ca). Students who need emotional help and support can contact the Counselling and Coaching Service (613-562-5200). Or, you can contact the Crisis line (24/7), within Ottawa (613-722-6914) or outside Ottawa (1-866-996-0991). The University of Ottawa has also prepared a list of resources that can give you emotional and psychological support, which you can find on these two websites: COVID-19: How to access mental health support from the comfort of your home: <https://www.uottawa.ca/wellness/covid-19/support-from-home> Mental health and wellness resources: <https://www.uottawa.ca/wellness/>

Compensation:

To thank you for participating in our study, you will receive one ISPR point which will be converted into one percent of your overall grade in the course during the semester in which you are participating. Your ISPR point will be automatically granted after your participation in this online study.

Data Utilization and Storage:

Data from this study will be used for the purpose of this research project, will be used in presentations at scientific conferences, and will be published in scientific journals. Your data will be stored in password-protected computers. Results of this project will be analyzed, interpreted, and published in a global manner. Participants will not be identified in publications. A copy of the database from this study will be kept for at least 30 years after data collection. Audrey Renaud-da Costa and Dr. Dave Miranda will be the only persons to have access to the data. As part of efforts to improve research in psychology in general, it is recommended to render resources more open and transparent to the scientific community. Hence, other researchers could ask to access the data

(e.g., to conduct secondary analyses for a new project, for results replication purposes, etc.). In such instances, they will have to send us a written request and sign a confidentiality agreement.

Questions and Request for Information:

Any questions about your rights as a research participant may be addressed to the Office of Research Ethics and Integrity, {redacted localisation}. Any questions about this research can be addressed to Audrey Renaud-da Costa or Dr. Dave Miranda.

Informed Consent:

If you understand the statements above and freely consent to participate in this study, enter your ISPR 6-digit code, and please choose the following option: I agree to participate. You will then be directed to the online survey. Be sure to write your ISPR code correctly at the beginning of the survey in order to obtain your points from the ISPR of the School of Psychology, not your student number. If you have any questions before deciding to participate or not please feel free to ask Audrey Renaud-da Costa by email, who is the main investigator for this project. If you understand the statements above and do not want to participate in the study, please close this webpage.

Participants should save or print a copy of this form to keep for their personal records.

☐ I agree to participate.

Cinquante nuances de tweet: les étudiants dans le contexte de tweets sur les réseaux sociaux
Formulaire de consentement - Hiver 2021

Audrey Renaud-da Costa (étudiante au doctorat en psychologie)
LPSP- Laboratoire de Psychologie Sociale et de la Personnalité
{adresse expurgée}
Téléphone: {expurgé}
Courriel: {expurgé}

Dr. Dave Miranda (professeur agrégé)
LPSP- Laboratoire de Psychologie Sociale et de la Personnalité
{adresse expurgée}
Téléphone: {expurgé}
Courriel: {expurgé}

Tâches à effectuer:

Une étude de thèse de doctorat est présentement menée par Audrey Renaud-da Costa, une étudiante au doctorat au LPSP - Laboratoire de Psychologie Sociale et de la Personnalité (sous la supervision du Dr. Dave Miranda) à L'École de psychologie de l'Université d'Ottawa. Cette étude en ligne s'intéresse à comprendre comment différents étudiants développent différentes idées qu'ils tweetent sur les réseaux sociaux. Votre participation à cette étude est entièrement volontaire.

Cette étude en ligne consiste en six étapes: (1) lire et remplir un formulaire de consentement en ligne; (2) répondre à des questionnaires; (3) participer à un exercice où vous simulerez des tweets (dans notre questionnaire, sans besoin de se connecter à un compte); (4) participer à une activité d'attention et observation de détails (5) répondre à d'autres questionnaires; et (6) recevoir un compte rendu qui explique l'étude.

Votre participation aux activités de l'étude vous demandera de: (1) simuler jusqu'à 15 tweets en 15 minutes qui auront trait à différents enjeux fictifs des étudiants universitaires en situations de crises; et (2) identifier des détails précis sur une série d'images.

La qualité de vos tweets sera analysée et évaluée par un logiciel d'analyse sociocognitive informatisé basé sur les technologies de l'intelligence artificielle. Les questionnaires en ligne et la rédaction de tweets devraient être effectués seuls à partir de n'importe quel ordinateur ou appareil électronique portable à un endroit calme. Votre participation à l'entièreté de l'étude devrait prendre moins d'une heure à compléter.

Anonymat et confidentialité:

Vous avez reçu un code d'identification à six chiffres du Système intégré de participation à la recherche de l'école de psychologie (SIPR). Cet identifiant n'est pas le même que votre numéro étudiant. Vous êtes priés d'écrire votre code d'identification à six chiffres dans l'espace approprié au début du questionnaire. Afin d'assurer que vos réponses demeurent entièrement confidentielles et anonymes, vous êtes priés de ne pas écrire votre nom ou numéro étudiant. Soyez assurés que ni

l'Université d'Ottawa, ni vos professeurs ne seront informés de vos réponses. Seuls Audrey Renaud-da Costa (étudiante au doctorat) et Dr. Dave Miranda auront accès aux données. Une copie de la base de données de cette étude sera conservée pendant au moins 30 ans sur les ordinateurs protégés par mot de passe des chercheurs. Les données provenant de cette étude seront analysées et interprétées de manière globale. Pour votre information, s.v.p. notez que vos données seront recueillies à travers un service de la recherche en ligne sécuritaire et réputé nommé Qualtrics, lequel est largement utilisé par de grandes universités afin de mener des sondages pour la recherche en psychologie.

Droits et responsabilités:

Si vous décidez de participer à notre étude, vous répondrez à des questionnaires et participerez à différentes tâches (voir tâches à effectuer). Vous n'êtes pas tenus de répondre à aucune question pouvant vous mettre mal à l'aise. Cependant, l'honnêteté de vos réponses sera certainement appréciée. Vous êtes également libre de refuser de participer à la tâche et de vous retirer de l'étude à tout moment. Vous serez compensé même si vous vous retirez de l'étude. Si vous souhaitez vous retirer de l'étude au complet et/ou que nous retirions toutes vos réponses, indiquez que vous voulez retirer vos données de l'étude à la fin des questionnaires. Si vous vous retirez de l'étude prématurément (p. ex. que vous fermez ou changez votre fenêtre internet) ou que votre participation est interrompue (p. ex. perte de connexion, distraction), nous considérerons que vous vous retirez de l'étude et n'utiliserons pas vos données pour l'étude. Dans cette situation, vous recevrez d'ici 48h le compte rendu anonymement par courriel via SIPR. Vous recevrez votre compensation même si vous vous retirez de l'étude.

Inconforts potentiels et ressources:

Ce questionnaire contient des questions portant sur les traits personnels. Fournir des informations personnelles pourrait occasionner un inconfort émotionnel pour certains. Nous désirons également vous rappeler que des ressources sont offertes aux étudiant(e)s à travers le Service d'appui au succès scolaire (613-562-5101; sass@uottawa.ca). Les étudiant(e)s ayant besoin d'aide et de soutien émotionnel peuvent contacter le Service de counselling et de coaching (613-562-5200). Ou encore, vous pouvez contacter la Ligne d'écoute téléphonique (24/7) à Ottawa (613-722-6914) ou à l'extérieur d'Ottawa (1-866-996-0991). L'Université d'Ottawa a également préparé une liste de ressources pouvant vous donner du soutien émotionnel et psychologique, lesquels vous pouvez trouver dans ces deux sites web: COVID-19 : obtenir du soutien psychologique depuis chez soi :

<https://www.uottawa.ca/mieuxetre/covid-19/soutien-depuis-chez-soi> Les ressources en santé mentale et mieux-être: <https://www.uottawa.ca/mieuxetre/>

Compensation:

Pour vous remercier de votre participation à notre étude, vous obtiendrez un point SIPR qui sera converti en un pourcentage équivalent de votre note finale du cours auquel vous participez ce semestre. Votre point SIPR vous sera automatiquement attribué suite votre participation à l'étude en ligne.

Utilisation et conservation des données:

Les données de cette étude seront utilisées dans le cadre de ce projet de recherche et seront

utilisées dans des présentations à des conférences scientifiques et seront publiées dans des revues scientifiques. Vos données seront conservées sur des ordinateurs qui sont protégés par mot de passe. Les résultats de ce projet seront analysés, interprétés et publiés de manière globale. Les participants ne seront pas identifiés dans les publications. Une copie de la base de données provenant de cette étude sera conservée pendant au moins 30 ans après la collecte de données. Audrey Renaud-da Costa et Dr. Dave Miranda seront les seules personnes ayant accès aux données. Dans le cadre d'efforts visant à améliorer la recherche en psychologie en général, il est recommandé de rendre les ressources plus accessibles et transparentes pour la communauté scientifique. Donc, d'autres chercheurs pourraient demander d'avoir accès aux données (par ex., pour mener des analyses secondaires pour un nouveau projet, pour des raisons de réplication des résultats, etc.). Dans de telles circonstances, ils devront nous faire une demande par écrit et signer une entente de confidentialité.

Questions et requête d'information:

Toute question concernant vos droits en tant que participant à la recherche peut être adressée au Bureau d'éthique et d'intégrité de la recherche, {adresse expurgée}. Toute question à propos de cette recherche peut être adressée à Audrey Renaud-da Costa ou au Dr. Dave Miranda.

Consentement libre et éclairé:

Si vous comprenez les énoncés ci-dessus et consentez librement à participer à cette étude, veuillez entrer votre code SIPR à six chiffres et choisir l'option suivante : J'accepte de participer. Vous serez redirigé vers une page web sécurisée sur laquelle se retrouve le questionnaire. Assurez-vous d'écrire votre code correctement au début du questionnaire afin d'obtenir vos points du SIPR de l'École de Psychologie, et non pas votre numéro étudiant. Si vous avez des questions avant de décider de participer ou non, sentez-vous libre de les demander à Audrey Renaud-da Costa par courriel, la chercheuse principale pour ce projet. Si vous comprenez les énoncés ci-dessus et ne désirez pas participer à cette étude, fermez cette page web.

Les participants sont avisés de sauvegarder une copie électronique ou imprimer une copie papier de ce formulaire de consentement pour leurs archives personnelles.

☐ J'accepte de participer.

Debrief Forms

Fifty shades of tweets: Students in the context of tweets on social media

Debrief Form – Winter 2021

Thank you for your participation in our research study Fifty shades of tweets: Students in the context of tweets on social media. I would like to discuss with you in greater details the study you just participated in and to explain exactly what we were trying to study. As you may know, scientific methods sometimes require that participants in research studies not be given complete information about the research until after the study is completed. Although we cannot always tell you everything before you begin your participation, we do want to tell you at the very least everything when the study is completed.

For this study, it was important that we did not share all the information about the research question or goal of the study. Now that your participation is completed, I will describe the withheld information to you, why it was important to withhold it, and provide you with the opportunity to make a decision on whether you would still like to have your data included in this study.

What you should know about this study

You were informed that this study was interested in understanding how different students develop different ideas that they tweet about on social media. However, the actual research question is not this. In fact, the study is interested in seeing if collaborative/equalitarian and competitive/hierarchical social mindsets and contexts can respectively decrease or increase the Dark Triad personality traits temporarily (i.e., Machiavellianism and subclinical levels of psychopathy and narcissism), compared to neutral social mindsets and contexts. Each participant was randomly assigned to one of three experimental conditions: (i) collaborative/equalitarian task; (ii) competitive/hierarchical task; or (iii) neutral/control task. In order to immerse you in either a collaborative/equalitarian, competitive/hierarchical, or neutral mindset, we had to use deception. This is why you were made to believe that we were interested in how and what you would tweet on social media about the situation of university students in emergency crises. However, in reality, we will not use the content of your tweets in our analysis (all tweets will be deleted), as this task was only meant to further prime collaboration or competition against neutral contexts. In fact, our laboratory does not even have a way to do computerized social cognitive analysis based on artificial intelligence (AI). The reason we told you this cover story is to make the experimental task seem more realistic. Finally, the reason you participated in an attention and observation game was to distract your mind after participating in the task before answering the personality traits questionnaire for the second time.

We could not tell you the exact research question at the beginning of the study because it may have caused a risk of biasing your answers to fit our research question. Now, thanks to your participation, we will be able to see if Dark Triad personality traits can temporarily change, and in what direction, as a result of being in a socially neutral, collaborative/equalitarian, or competitive/hierarchical social mindsets.

If other people knew the true purpose of the study, it might affect how they behave/answer questions in our study. For this reason, we ask to not disclose our research procedures and purpose to anyone who might participate in this study in the future as this could affect the results of the study.

Emotional discomfort

If you experience emotional discomfort after having completed the study, we wish to remind you that resources are offered to students through the Student Academic Success Service (613-562-5101; sass@uottawa.ca). Students who need emotional help and support can contact the Counselling and Coaching Service (613-562-5200). Or, you can contact the Crisis line (24/7), within Ottawa (613-722-6914) or outside Ottawa (1-866-996-0991). The University of Ottawa has also prepared a list of resources that can give you emotional and psychological support, which you can find on these two websites:

COVID-19: How to access mental health support from the comfort of your home: <https://www.uottawa.ca/wellness/covid-19/support-from-home>
Mental health and wellness resources: <https://www.uottawa.ca/wellness/>

Questions and inquiries

The main researcher conducting this study is Audrey Renaud-da Costa, a doctoral candidate in clinical psychology at the University of Ottawa, School of Psychology. If you have questions, you may contact Audrey (principal investigator), or professor Dave Miranda (supervisor).

Any questions about your rights as a research participant may be addressed to the Office of Research Ethics and Integrity, {redacted localisation}. Right to withdraw data Now that the full nature of our study has been explained, you may choose to withdraw from the study and ask us to delete your data. Whether you agree or do not agree to have your data used for this study, you will still receive your ISPR point for your participation. Please select the appropriate box below to confirm if you do, or do not, give permission to have your data included in the study.

Participants should save or print a copy of this form to keep for their personal records.

☐ I have been made aware of all the details of the study and I give permission for my data to be included in the study.

☐ I have been made aware of all the details of the study and I do not give permission for my data to be included in the study.

Cinquante nuances de tweet: les étudiants dans le contexte de tweets sur les réseaux sociaux
Compte rendu – Hiver 2021

Merci de votre participation à notre étude: Cinquante nuances de tweet: les étudiants dans le contexte de tweets sur les réseaux sociaux. J'aimerais discuter plus en détails avec vous de l'étude à laquelle vous venez de participer pour vous expliquer exactement ce que nous tentions d'étudier. Comme vous le savez peut-être, la méthode scientifique requiert parfois que les participants soient informés sur tous les aspects de l'étude uniquement après leur participation. Même si nous ne pouvons pas toujours vous dire tous les détails avant votre participation, nous voulons certainement vous les dire une fois que votre participation est complétée.

Pour cette étude, il était important que nous ne partagions pas avec vous les buts et questions de recherches précises de l'étude en cours. Maintenant que vous avez terminé votre participation, je vous décrirai l'information qui n'a pas été originalement partagée, pourquoi c'était important de le faire, et vous donner l'opportunité de décider si vous voulez toujours que vos données soient incluses dans l'étude.

Ce que vous devriez savoir sur cette étude

Vous avez été informés que cette étude s'intéressait à comprendre comment différents étudiants développent différentes idées qu'ils tweetent sur les réseaux sociaux. Cependant, la réelle question de recherche n'est pas celle-ci. En fait, l'étude est intéressée à tester si les états d'esprits et contextes sociaux collaboratifs/égalitaires et compétitifs/hierarchiques peuvent respectivement diminuer ou augmenter temporairement les traits de personnalité de la Triade Malveillante (Dark Triad; machiavélisme et niveaux sous-cliniques de psychopathie et narcissisme), comparativement à des états d'esprits et contextes sociaux neutres. Tous les participants ont été aléatoirement assignés à une de trois conditions expérimentales: (i) tâche collaborative/égalitaire; (ii) tâche compétitive/hierarchique; ou (iii) tâche neutre/contrôle. Pour que nous puissions vous induire dans ces états d'esprit, nous devons utiliser la duperie. C'est pourquoi on vous a indiqué que nous étions intéressés à ce que vous tweeteriez sur les réseaux sociaux à propos de la condition des étudiants universitaires en temps de crises. En réalité cependant, nous n'utiliserons pas le contenu de vos tweets pour des analyses ultérieures (tous vos tweets seront supprimés), puisque cette activité avait pour but d'ancrer les concepts de collaboration et compétition en comparaison à des contextes neutres. En fait, notre laboratoire n'a pas les ressources pour faire une analyse sociocognitive par un logiciel informatisé basé sur les technologies de l'intelligence artificielle. La raison pour laquelle nous vous avons indiqué ceci était pour faire paraître la tâche expérimentale plus réaliste. Finalement, votre participation à une tâche d'attention et d'observation était pour vous distraire de la tâche complétée avant de remplir pour une deuxième fois le questionnaire sur les traits de personnalité.

Nous ne pouvions pas vous partager la réelle question de recherche dès le départ puisque cela aurait pu risquer de biaiser vos réponses pour adhérer à la question de recherche. Maintenant, grâce à votre participation, nous pourrions observer si les traits de personnalité de la Triade Malveillante peuvent changer, et dans quelle direction, par le fait d'être dans des états d'esprits et contextes sociaux neutres, collaboratifs/égalitaires, ou compétitifs/hierarchiques.

Si d'autres personnes savaient le but réel de notre étude, cela pourrait influencer la façon dont ils agissent et répondent à nos questions. Pour cette raison, nous vous demandons de ne pas divulguer les procédures de recherche ou but réel de l'étude à quiconque pourrait participer à l'étude dans le futur, puisque cela pourrait affecter les résultats de l'étude.

Inconfort émotionnel

Si vous éprouvez un inconfort émotionnel après avoir complété cette étude, nous désirons également vous rappeler que des ressources sont offertes aux étudiant(e)s à travers le Service d'appui au succès scolaire (613-562-5101; sass@uottawa.ca). Les étudiant(e)s ayant besoin d'aide et de soutien émotionnel peuvent contacter le Service de counselling et de coaching (613-562-5200). Ou encore, vous pouvez contacter la Ligne d'écoute téléphonique (24/7) à Ottawa (613-722-6914) ou à l'extérieur d'Ottawa (1-866-996-0991). L'Université d'Ottawa a également préparé une liste de ressources pouvant vous donner du soutien émotionnel et psychologique, lesquels vous pouvez trouver dans ces deux sites web:

COVID-19 : obtenir du soutien psychologique depuis chez soi :

<https://www.uottawa.ca/mieuxetre/covid-19/soutien-depuis-chez-soi>

Les ressources en santé mentale et mieux-être: <https://www.uottawa.ca/mieuxetre/>

Questions et requête d'information

La chercheuse principale en charge de cette étude est Audrey Renaud-da Costa, une candidate au doctorat en psychologie clinique de l'Université d'Ottawa. Si vous avez des questions, vous pouvez contacter Audrey Renaud-da Costa (chercheuse principale), ou professeur Dave Miranda (superviseur).

Toute question concernant vos droits en tant que participant à la recherche peut être adressée au Bureau d'éthique et d'intégrité de la recherche, {adresse expurgée}. Droit de retirer vos données Maintenant que la nature entière et complète de l'étude vous a été expliquée, vous pouvez décider de vous retirer de l'étude et de supprimer vos données. Peu importe votre décision, vous recevrez votre point SIPR pour votre participation. SVP cochez la case appropriée pour indiquer si vous voulez, ou ne voulez pas, donner votre permission d'inclure vos données dans l'étude.

Les participants sont avisés de sauvegarder une copie électronique ou imprimer une copie papier de ce formulaire pour leurs archives personnelles.

☐ J'ai été informé.e des détails de l'étude et je donne ma permission pour que les données collectées à mon sujet soient incluses dans cette étude.

☐ J'ai été informé.e des détails de l'étude et je ne donne pas ma permission pour que les données collectées à mon sujet soient incluses dans cette étude.

Demographic Questionnaire

1. What best describes your gender? : Man ___ Woman ___ Transgender Man ___ Transgender Woman ___ Non-binary ___ You don't have an option that applies to me. I identify as (please specify) ___ Prefer not to answer ___
2. What is your native language: English ___ French ___ Other (please specify): ___
3. What is your age? _____
4. What is the level of your academic training?
 - ☐ 1st year
 - ☐ 2nd year
 - ☐ 3rd year
 - ☐ 4th year
5. Are you a full time or a part-time student? Full ___ Part-time ___
6. In what academic program are you mainly enrolled?
 - ☐ Arts
 - ☐ Management
 - ☐ Social Sciences
 - ☐ Science
 - ☐ Health Sciences
 - ☐ Engineering
 - ☐ Law
 - ☐ Education
 - ☐ Medicine
 - ☐ Other (please specify) _____
7. How do you describe yourself in terms of your ethnic group? (Please select all that apply)
 - ☐ Aboriginal/Native
 - ☐ White / Caucasian or European
 - ☐ Black / Caribbean or African
 - ☐ East Asian
 - ☐ South Asian
 - ☐ Middle Easterner (Arab)
 - ☐ Latino
 - ☐ North African (Arab)
 - ☐ Other ethnic or cultural group(s), please specify: _____

Appendix K

G*Power3.1 Analysis for 3x2 ANCOVA (Chapter 3)

[1] -- Thursday, September 27, 2018 -- 17:18:26

F tests - ANCOVA: Fixed effects, main effects and interactions

Analysis:	A priori: Compute required sample size	
Input:	Effect size f	= 0.25
	α err prob	= 0.05
	Power (1- β err prob)	= 0.95
	Numerator df	= 2
	Number of groups	= 6
	Number of covariates	= 1
Output:	Noncentrality parameter λ	= 15.6875000
	Critical F	= 3.0328156
	Denominator df	= 244
	Total sample size	= 251
	Actual power	= 0.9506646

Appendix L
Tables (Chapter 3)

Table 1
Descriptive Statistics

		<i>Mean (StD)</i>					
Condition	Gender	Machiavellianism		Narcissism		Psychopathy	
		<u>Baseline</u>	<u>Post-Test</u>	<u>Baseline</u>	<u>Post-Test</u>	<u>Baseline</u>	<u>Post-Test</u>
Comp	Man	3.22 (0.46)	3.28 (0.59)	2.85 (0.58)	2.79 (0.57)	2.47 (0.42)	2.5 (0.41)
	Woman	3.07 (0.59)	3.03 (0.65)	2.83 (0.50)	2.85 (0.56)	2.26 (0.50)	2.23 (0.55)
Collab	Man	3.48 (0.57)	3.38 (0.74)	2.84 (0.52)	2.91 (0.64)	2.39 (0.50)	2.33 (0.56)
	Woman	3.06 (0.62)	3.04 (0.70)	3.04 (0.55)	3.04 (0.59)	2.28 (0.55)	2.27 (0.56)
Control	Man	3.1 (0.66)	3.03 (0.75)	2.85 (0.68)	2.89 (0.74)	2.22 (0.67)	2.17 (0.62)
	Woman	3.18 (0.55)	3.1 (0.60)	2.97 (0.48)	2.98 (0.50)	2.37 (0.58)	2.35 (0.62)

Note. Comp = competitive; Collab = collaborative; *StD* = Standard Deviation

Table 2
Analysis of Covariance — Machiavellianism

	Sum of Squares	df	Mean Square	F	p	η^2p
Machiavellianism Baseline	101.26422	1	101.26422	1653.3596	<.001	0.860
Condition	0.30028	2	0.15014	2.4513	0.088	0.018
Gender Identity	0.00542	1	0.00542	0.0885	0.766	0.000
Condition* Gender Identity	0.28066	2	0.14033	2.2912	0.103	0.017
Residuals	16.47559	269	0.06125			

Table 3*Analysis of Covariance — Narcissism*

	Sum of Squares	df	Mean Square	F	p	η^2p
Narcissism Baseline	80.08935	1	80.08935	2298.232	< .001	0.895
Condition	0.09827	2	0.04913	1.410	0.246	0.010
Gender Identity	0.00920	1	0.00920	0.264	0.608	0.001
Condition* Gender Identity	0.18236	2	0.14033	2.617	0.075	0.019
Residuals	9.37418	269	0.09118			

Table 4*Analysis of Covariance — Psychopathy*

	Sum of Squares	df	Mean Square	F	p	η^2p
Psychopathy Baseline	70.89194	1	70.89194	1301.4128	< .001	0.829
Condition	0.06405	2	0.03202	0.5879	0.556	0.004
Gender Identity	0.00111	1	0.00111	0.0205	0.886	0.000
Condition* Gender Identity	0.11195	2	0.05597	1.0275	0.359	0.008
Residuals	14.65325	269	0.05447			