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The Interaction of Adaptive and Maladaptive Narcissism, and its Relevance to Performance Under Pressure and Quality of Training

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The Interaction of Adaptive and Maladaptive Narcissism, and its Relevance to Performance Under Pressure and Quality of Training

By Shuge Zhang

Thesis submitted to Bangor University in fulfilment of the requirements for the Degree of Doctor of Philosophy at the School of Sport, Health, and Exercise Sciences, Bangor University.

April 2019

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LIST OF PEER-REVIEWED PUBLICATIONS DURING THIS PHD

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Zhang, S., Roberts, R., Pitkethly, A., & English, C. (Manuscript in preparation). Maladaptive narcissism and performance strategies protect against the potential adverse influences of adaptive narcissism on athlete training. *Psychology of Sport & Exercise*.

Zhang, S., Beattie, S., Pitkethly, A., & Dempsey, C. (2019). Lead me to train better: Transformational leadership moderates the negative relationship between athlete personality and training behaviours. *The Sport Psychologist*. https://doi.org/10.1123/tsp.2018-0055

Zhang, S., Woodman, T., & Roberts, R. (2018). Anxiety and fear in sport and performance. In *Oxford Research Encyclopedia of Psychology*. Oxford University Press. https://doi.org/10.1093/acrefore/9780190236557.013.162

Wang, J., Baranowski, T., Lau, P. W. C., Chen, T., & **Zhang, S.** (2016). Psychological correlates of self-reported and objectively measured physical activity among Chinese children - psychological correlates of PA. *International Journal of Environmental Research and Public Health*, *13*, 1006-1017. https://doi.org/10.3390/ijerph13101006

LIST OF CONFERENCE ORAL PRESENTATIONS DURING THIS PHD

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Zhang, S., Roberts, R., & Woodman, T. (2018, April). When adaptive and maladaptive narcissism meet: The precise combination matters in stressful cognitive performance. Oral presentation at the *2018 International Conferences for Self-enhancement*, Warsaw, Poland.

Zhang, S., Roberts, R., Cooke, A., & Woodman, T. (2017, November). I am great and I want to dominate: Narcissism and performance under stress. Oral presentation at the annual conference of the British Association of Sport and Exercise Sciences, Nottingham, UK.

Zhang, S., Roberts, R., Woodman, T., & Hardy, L. (2016, July). Narcissism and performance under pressure: Every piece of narcissism matters. Oral presentation at the *2016 Congress of the European College of Sport Sciences* (ECSS), Vienna, Austria.

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THESIS ABSTRACT

Research has demonstrated that the performance of narcissists rises and falls with the opportunity for self-enhancement and the emergence of ego threats. As such, it has been suggested that narcissists are more capable of performing in a competition, where self-enhancement and ego threats are present, rather than in a training environment, where such opportunities are lacking. However, the narcissism-performance literature has focused on narcissism in its grandiose form but has not considered the so-called *adaptive* and *maladaptive* components of narcissism. Indeed, adaptive narcissism, reflecting high levels of confidence and assertiveness, is different to maladaptive narcissism, reflecting a strong willingness to dominate and control over situations. Since narcissism can reflect either high levels of adaptive or maladaptive narcissism, or certainly both, it is essential to consider adaptive and maladaptive narcissism interact in order to gain a full picture of how narcissism plays a role in performance settings. Therefore, the overarching aim of the thesis was to examine the interaction between adaptive and maladaptive narcissism in two different performance contexts, namely high-pressure performance environments and athletic training environments. Furthermore, the thesis also explored mechanisms underlying the narcissism-performance relationship in order to explain why the adaptive × maladaptive narcissism interaction would contribute to high performance under high pressure. Finally, the thesis examined practical strategies to protect against the potential adverse effects of narcissism on athlete training; providing the first evidence that goal-setting and imagery use during training help narcissists (especially those high in adaptive narcissism) train better.

The thesis consists of a general introduction (Chapter 1), four empirical studies (Chapters 2 and 3), and a general discussion (Chapter 4). More specifically, Chapter 2 presents a collection of three experimental studies, examining the interactive effects of adaptive and maladaptive narcissism on performance under pressure as well as testing the

mechanisms underlying the performance effects. Experiment 1 used a basketball free throw task to assess the adaptive × maladaptive narcissism interaction on performance under high pressure. Experiment 2 used a golf-putting task to test the hypothesized performance effects. Further, Experiment 2 employed self-report and behavioural measures to explore the mechanisms underlying any performance effects. To test the replicability and generalizability of Experiments 1 and 2, Experiment 3 used a letter transformation task and a colour-word Stroop task to test the adaptive × maladaptive narcissism interaction, along with self-report and psychophysiological measures to examine mechanisms. Across each study results consistently demonstrated that adaptive narcissism predicted performance under high pressure only when maladaptive narcissism was high. Also, at high levels of maladaptive narcissism, adaptive narcissism predicted decreased pre-putt time in the golf-putting task (Experiment 2) and an adaptive psychophysiological response in the letter transformation task (Experiment 3), reflecting better processing efficiency. Findings suggest that individuals high in both adaptive and maladaptive narcissism perform better under pressure because of superior processing efficiency during task performance.

Chapter 3 (Study 4) presents an applied study examining a three-way interaction between adaptive and maladaptive narcissism and performance strategies (specifically goal-setting and imagery), on athlete quality of training. Using a sample of athletes from different backgrounds (i.e., sporting levels and sport types) with multiple-source data provided (i.e., self-report and informant rating), Study 4 demonstrated consistent three-way interactions between narcissism components and each performance strategy. Specifically, when athlete use of goal-setting was low, adaptive narcissism contributed to increased distractibility and poorer quality of preparation when maladaptive narcissism was low but not high. However, when athlete use of goal-setting was high, adaptive narcissism was not associated with training behaviours regardless of the level of maladaptive narcissism. Identical interactions

also emerged for imagery use. The findings suggest that maladaptive narcissism and the performance strategies of goal-setting and imagery protect against the potential adverse effects of adaptive narcissism on athlete training.

Based on the findings of the empirical work presented in Chapter 2 and 3, Chapter 4 of this thesis provides implications at a broad theoretical and applied level. Strengths, limitations, and directions for future research are also discussed.

CHAPTER 1: GENERAL INTRODUCTION

The Greek myth

The term “narcissism” was derived from a Greek myth – the story of *Narcissus*. The young Narcissus was famous for his beauty; he wanted to find a mate but was not satisfied with anyone. One day, the nymph Echo saw Narcissus and fell madly in love with him. Echo followed Narcissus for a walk, repeated everything he said, and tried to embrace him but failed – Narcissus rejected the romantic advances, leaving Echo heartbroken. However, when Narcissus arrived at a pool and saw his reflection in the water, he fell in love with his image, immersed himself in his beauty, and eventually perished by the waterside.

The story of Narcissus reflects some of the modern views on narcissism. From an interpersonal perspective, one could interpret the myth in the way that Narcissus was unable to love and connect with others, and therefore Echo suffered due to Narcissus’s love of his self-image. Such an interpretation is relevant to current narcissism research in the social and interpersonal domains (Campbell & Green, 2007). From an alternative perspective however, one could interpret the myth in the way that Narcissus rejected the beautiful Echo but fell in love with his reflection because he "outperformed" Echo in his beauty. The latter interpretation is relevant to the central theme of the present thesis – the role of narcissism in the performance contexts.

Distinguishing normal narcissism from a personality disorder

While narcissism as a sub-clinical personality construct has been conceptualized since Freud’s time (see Freud, 1914/1957, 1931/1950), the more extreme form, *Narcissistic Personality Disorder* (NPD), was first introduced by Kohut (1968). To distinguish normal narcissism from NPD, Miller and Campbell (2008) suggested that NPD is an extreme form of narcissism and reflects some sort of pathology and vulnerability. For example, although both

sub-clinical narcissism and NPD share the need for admiration and entitlement, individuals with sub-clinical narcissism do not "require" such admiration and are not "pre-occupied" with these fantasies to the same extent as those with the NPD (Campbell, 1999; Raskin & Novacek, 1991). In addition, sub-clinical narcissism is assessed using continuous scales such as the Narcissistic Personality Inventory (NPI; Raskin & Hall, 1979), rather than in a diagnostic manner as is for the NPD (see American Psychiatric Association, 2013).

Scope, definition, and terminology

This present thesis aimed to examine the role of narcissism in performance contexts to advance the current narcissism-performance literature (see below). In this thesis, narcissism is considered as a non-clinical personality trait that can be assessed on a continuous scale and is defined as a self-centred, self-aggrandizing, entitled, dominant, and manipulative interpersonal orientation (Morf, Horvath, & Torchetti, 2011). Such a conceptualization focuses on grandiose narcissism as opposed to vulnerable narcissism (Miller et al., 2011). Further, the focus is on narcissistic grandiosity within the agentic domain, as opposed to the more recently conceptualized communal form of narcissism (Gebauer, Sedikides, Verplanken, & Maio, 2012). Adopting the aforementioned conceptualizations of narcissism in its grandiose form, in the present thesis, the term "narcissist" is used to refer to individuals who are high in grandiose narcissism or NPI scores, as opposed to those diagnosed as the NPD.

To further clarify, research reviewed, discussed, and presented throughout this thesis largely relies on NPI-based measures of normal narcissism. Indeed, the NPI is the most widely used measure of narcissism within the personality literature. The scale has been subject to criticism, such as a sole focus on grandiosity and an unreliable factor structure (Cain, Pincus, & Ansell, 2008; Watson & Biderman, 1993), but recent tests have shown the NPI to capture many of the central narcissistic traits such as dominance, immodesty,

noncompliance, and manipulativeness more fully than other measures of narcissism (see Miller et al., 2012). As such, these researchers argued that whatever criticisms that may be levelled at the NPI, the NPI remains an appropriate measure of narcissism, especially in relation to its grandiose component.

According to the research into NPI-based narcissism, narcissists are attention seeking (Buss & Chiodo, 1991) and socially extraverted (Brunell et al., 2008). Also, they are impulsive (Vazire & Funder, 2006) and high in approach rather than avoidance motivation (Foster & Trimm, 2008). In addition, they react (overly) defensively in response to negative feedback (F Rhodewalt & Morf, 1998) and can be (over)confident despite failure (Campbell, Goodie, & Foster, 2004). These research findings support the view that narcissists attempt to construct and maintain a positive self-concept (Campbell, Brunell, & Finkel, 2006; Morf & Rhodewalt, 2001; Raskin, Novacek, & Hogan, 1991). This chapter turns next to focus on elaborating why narcissists may have advantages in the performance contexts.

The early view on narcissism and performance

Research has suggested that narcissism encompasses essential traits for performance success. Specifically, narcissists have high levels of confidence even when facing failures (Campbell et al., 2004), hold optimistic expectations and depend on their ability for success (Farwell & Wohlwend-Lloyd, 1998), and have strong a willingness to dominate any situation (Morf & Rhodewalt, 2001). Indeed, support for the facilitative roles of confidence (e.g., Hardy, Woodman, & Carrington, 2004; Woodman & Hardy, 2003), optimism (e.g., Gaudreau & Blondin, 2004; Nicholls, Polman, Levy, & Backhouse, 2008), and the desire for dominance (e.g., Hardy et al., 2017; Nevicka, Baas, & Ten Velden, 2016) in performance settings has emerged across the psychology literature. With these findings in mind therefore, one might expect that, all things being equal, narcissists would outperform their non-narcissistic counterparts.

However, early research typically demonstrated a mismatch between narcissists' grandiose beliefs about performance and their objective performance results. For example, narcissists believed they were superior to others in their intelligence but did not perform any better in an intelligence test compared to their counterparts (Gabriel, Critelli, & Ee, 1994). Narcissistic individuals were also exceptionally optimistic towards their course grades but were unable to fulfil their expectations (Farwell & Wohlwend-Lloyd, 1998). They thought they could read one's minds but failed to do so in mind-reading tasks (Ames & Kammrath, 2004). Additionally, they viewed their job performance as typically satisfactory, but such a positive self-evaluation was not supported by the informant ratings of their supervisors (Judge, LePine, & Rich, 2006). These conflicting results suggest that narcissists have significant self-evaluation bias and seem unable to demonstrate superior performance compared to non-narcissists.

While early research suggested that narcissism does not predict performance, such a view is overly simplistic and fails to consider the potential modulating influence of different performance contexts. Indeed, personal and environmental factors interactively determine one's behaviours (Bandura, 1989, 2004; Tett & Burnett, 2003; Tett & Guterman, 2000). Regarding the narcissism-performance relationship, it is likely that this relationship is moderated by environmental factors such as the features or nature of the performance context. Research since 2000 has typically supported this theoretical proposition; the relationship between narcissism and performance is indeed dependent on the presence or absence of specific factors in the environment.

The rises and falls of narcissists' performance

Although early research suggests that the performance of narcissists is not generally laudable, more recent research has demonstrated that at least two context-specific factors can influence narcissists' performance. One crucial factor that influences the performance of

narcissists is the opportunity for self-enhancement afforded by the performance environment. In particular, narcissists continuously seek out opportunities for self-enhancement (Campbell, Rudich, & Sedikides, 2002; Morf, Weir, & Davidov, 2000). As such, narcissists should be acutely aware of the potential glory, if there is any, offered by different situations. Indeed, Wallace and Baumeister (2002) suggested that, because of their zealous pursuit of self-enhancement, narcissists should perform very well in situations that offer the opportunity for personal glory but perform poorly when such opportunity is absent. Across four experimental studies, Wallace and Baumeister convincingly demonstrated that narcissists, compared to their counterparts, performed better when the prospect for self-enhancement was high (e.g., when performing challenging tasks, performing tasks for rewards and/or public recognition) but performed poorer when it was low (e.g., lack of challenges or rewards, and no public recognition). This seminal work suggests that the performance of narcissists rises and falls with the opportunity for self-enhancement.

Support for Wallace and Baumeister's work has emerged within the sport and performance domain. For example, Geukes, Mesagno, Hanrahan, & Kellmann (2012) demonstrated that handball players with high levels of narcissism performed similar to their counterparts in penalty throwing when there were no spectators, but performed particularly well when there were spectators present. Similarly, Roberts, Woodman, Hardy, Davis, and Wallace (2013) demonstrated that figure skaters high in narcissism[1] outperformed their counterparts in a stressful national event but not when performing the a competition routine in training. In laboratory settings, Woodman, Roberts, Hardy, Callow, and Rogers (2011)

[1] High in narcissism, and similar descriptions relevant to the levels of narcissism (or its components) throughout this thesis, point to relative as opposed to absolute levels of certain narcissistic traits. For example, when referring to individuals high in narcissism, the thesis meant to refer to those who scored relatively higher than average people in the NPI within a target sample/population (rather than referring to anyone whose NPI score exceeds a specific absolute level). Such a practice is consistent with the recommendation from literature (Meisel, Ning, Campbell, & Goodie, 2016).

found that narcissistic individuals cycled further in the same given time when performing in individual competition (individual performance identifiable) rather than in a group competition (individual performance unidentifiable). According to these consistent findings, it is clear that self-enhancement opportunities motivate narcissists to strive for excellent performance.

Another context-specific factor influencing the narcissism-performance relationship is ego threat. Indeed, narcissists continuously strive to gain others' recognition of their high agency, and thus they are typically sensitive to ego threats that question their positive self-image (vanDellen, Campbell, Hoyle, & Bradfield, 2011). When facing ego threats (e.g., negative feedback, failure, rejection), narcissists are highly alert and strive to eliminate the sources of threats and to re-establish dominance, which contributes to their increased risks of aggressive behaviours and violence (Baumeister et al., 1996; Bushman & Baumeister, 1998). Different to social and interpersonal contexts, performance contexts provide an alternative way for narcissists to deal with any ego threats – narcissists can eliminate the threats and re-establish dominance via beating the competition and being the exceptional performer. Consequently, one would expect narcissists to strive for exceptional performance when they face ego threats. Support for such a theoretical position has emerged. Across a series of experiments, Nevicka et al., (2016) consistently demonstrated that individuals with higher levels of narcissism were more willing to perform a challenging task and indeed performed better in creative tasks following ego threats (e.g., recall and describe one's negative past events, give negative feedbacks, challenge one's uniqueness). The findings suggest that the presence of ego threats “push” narcissists to perform well.

Narcissists under high performance pressure

While it is commonly agreed that the opportunity for glory and the emergency of ego threats facilitate the performance of narcissists, pressurized performance environments unite

the features of self-enhancement and ego threats. Typically, pressurized performance environments not only challenge one's positive self-image but also offer an extraordinary opportunity to gain benefits for being exceptional. Since narcissists in performance settings seek out opportunities for self-enhancement (Wallace & Baumeister, 2002) and are motivated to strive for exceptional performance to eliminate any ego threat, narcissists may well stand out in the high-pressure performance environments that offer both glory (e.g., performing well when others fail) and ego threats (e.g., risks of failure). Consequently, one would expect narcissists to strive under high pressure as they compete to seek out glory and to eliminate ego threats. To date, three studies have examined the performance of narcissists under low and high pressure. Specifically, Wallace and Baumeister (2002) used monetary reward to manipulate the levels of pressure and found that only individuals high in narcissism improved dart-throwing performance under pressure (Experiment 3). Geukes et al. (2012) found that handball players performed better in handball penalty throwing in front of over 1,000 spectators (high pressure) compared to in a training session with no audience at present (low pressure). Roberts et al. (2013) demonstrated that high-level figure skaters improved performance from a training session preparing for competition routines (low pressure) to an important national event (high pressure). These findings are in line with the proposition that narcissists are capable of performing well under pressure.

Nevertheless, while our knowledge of the role of narcissism in pressurized performance has been growing, at least two issues warrant further research attention. One issue points to the overly simplistic conceptualization of narcissism in high-pressure performance contexts. Typically, research has focused on narcissism in its grandiose form but at a global level only, without the recourse to consider the multidimensional nature of narcissism (Emmons, 1984; Raskin & Terry, 1988) and thus ignores the distinctive effects of the so-called *adaptive* and *maladaptive* components of narcissism on performance under

pressure (Roberts, Woodman, et al., 2018). Certainly, narcissism (or high NPI scores) can reflect either high levels of its adaptive or maladaptive components or indeed a combination of both. Therefore, embracing an interactive approach involving the adaptive and maladaptive components is essential to better understand the role of narcissism in pressurized performance. Besides a lack of research examining different components of narcissism in high-pressure performance settings, another underexplored field in narcissism-performnace research is related to the mechanism(s) explaining why narcissists perform as they do under pressure (Roberts, Cooke, et al., 2018; Roberts, Woodman, & Sedikides, 2018). More specifically, while researchers have agreed narcissists are capable of performing under pressure, our knowledge in why narcissists excel in pressurized situations is incomplete. Consequently, this chapter turns next to discuss the interaction of adaptive and maladaptive narcissism in relation to pressurized performance, as well as the possible mechanisms underlying the relationship between narcissism and performance under pressure.

The role of adaptive/maladaptive narcissism in pressurized performance

As has been discussed in the previous section, our current knowledge of narcissism in the performance domain is incomplete. One major limitation is that, to date, the narcissism-performance literature has focused solely on grandiose narcissism at a global level, without recourse to consider its multidimensional nature (e.g., Emmons, 1984; Raskin & Terry, 1988; see also Roberts et al., 2018). In its original development, the NPI narcissism contained seven factors, namely authority, self-sufficiency, exhibitionism, entitlement, exploitativeness, superiority, and vanity (Raskin & Hall, 1979). This seven-factor structure, however, has been found difficult to replicate (Emmons, 1984; Watson & Biderman, 1993). Indeed, researchers have proposed various alternative factor structures (see Corry, Merritt, Mrug, & Pamp, 2008). However, one particular perspective on the NPI structure that is gaining increased support is the distinction made between the so-called *adaptive* and *maladaptive* components of

narcissism. Specifically, “adaptive” narcissism, reflected by the sense of authority and self-sufficiency in the NPI, is associated with more desirable qualities such as confidence and self-awareness (Emmons, 1984; Raskin & Terry, 1988). On the contrary, “maladaptive” narcissism, reflected by exhibitionism, entitlement and exploitativeness in the NPI, is associated with less desirable qualities such as a dominating orientation and attention seeking (Raskin & Terry, 1988; Washburn, McMahon, King, Reinecke, & Silver, 2004).

Evidence from literature supports the adaptive/maladaptive model of narcissism. Specifically, maladaptive narcissism is associated with increased neuroticism, low empathy, and self-esteem, whereas adaptive narcissism is not (Cai & Luo, 2018). In social and interpersonal contexts, it is maladaptive narcissism, rather than adaptive narcissism, that predicts increased conduct problems (Barry, Frick, & Killian, 2003), prolonged delinquency (Barry, Frick, Adler, & Grafeman, 2007), as well as internalizing symptoms and severe peer problems (Barry & Malkin, 2010). Also, maladaptive narcissism is related to increased actual-ideal discrepancies (Rhodewalt & Morf, 1995), higher levels of mood variability and emotional intensity (Emmons, 1984), lower levels of self-esteem (Brown, Budzek, & Tamborski, 2009), increased violence and aggressions (Washburn et al., 2004), and lower empathy (Watson & Morris, 1991). In contrast, adaptive narcissism does not demonstrate any of these unhealthy effects. Overall, research suggest that adaptive narcissism is a more desirable aspect of the trait than maladaptive narcissism, with acceptable levels of internal consistency, test-retest reliability, as well as good predictive and construct validity[2] (Ackerman et al., 2011; Barry et al., 2007, 2003; Barry & Malkin, 2010; Hepper, Hart, & Sedikides, 2014; Hepper, Sedikides, & Cai, 2013).

[2] Available evidence on the adaptive/maladaptive model of narcissism is exclusively based on Raskin and Terry’s original NPI-40 rather than its short form, i.e., the Ames et al.’s NPI-16. Since all items of the NPI-16 are from the NPI-40, the reliability and validity of the adaptive and maladaptive components of narcissism generated using NPI-16 should be similar to that of the NPI-40.

While support for the distinction between adaptive and maladaptive narcissism has emerged in social and interpersonal research, such a distinction has yet to be examined in performance-focused narcissism research. Adaptive narcissism reflects high levels of confidence (Emmons, 1984; Raskin & Terry, 1988), and confidence is commonly linked to improved performance in pressured situations (Woodman & Hardy, 2003). However, confidence can also be detrimental to performance, especially when individuals fail to allocate appropriate resources to facilitate performance and "coast" toward performance outcomes as a result of being overly confident (Beattie, Dempsey, Roberts, Woodman, & Cooke, 2017; Beattie, Fakehy, & Woodman, 2014; Beattie, Woodman, Fakehy, & Dempsey, 2015; Vancouver & Kendall, 2006; Vancouver, Thompson, Tischner, & Putka, 2002; Woodman, Akehurst, Hardy, & Beattie, 2010). Given the association between adaptive narcissism and overconfidence and self-assuredness, the mismatch between narcissists' inflated performance self-views and their objective performance (e.g., Ames & Kammrath, 2004) is most likely to be evident in relation to adaptive narcissism as opposed to maladaptive narcissism. Considering the diverging perspective that adaptive narcissism may benefit and harm performance, it is unrealistic to propose a simple relation between adaptive narcissism and performance under pressure.

Maladaptive narcissism reflects a strong sense of personal control and a willingness to dominate (Raskin & Terry, 1988; Washburn et al., 2004), which serves an important motivational function that makes one strive for exceptional performance (Hardy et al., 2017; Nevicka et al., 2016). However, maladaptive narcissism is also linked to internalizing symptoms such as anxiety (Cai & Luo, 2018; Washburn et al., 2004) that is typically detrimental to performance under pressure (see Woodman & Hardy, 2001; Zhang et al., 2018). These differing viewpoints also make the existence of a simple relationship between maladaptive narcissism and performance under pressure highly unlikely.

Instead of looking into the effects of adaptive and maladaptive narcissism on performance separately, I propose a more nuanced position in this thesis. More specifically, my position is that the influence of adaptive narcissism on pressurized performance depends on the presence or absence of maladaptive narcissism. Indeed, the willingness to dominate that stems from maladaptive narcissism likely dovetails with the high levels of confidence that derives from adaptive narcissism, driving narcissists to strive for their desired high-performance reality. Also, the confidence and assertiveness reflected by adaptive narcissism likely buffers any potential adverse effects of the internalizing symptoms associated with maladaptive narcissism. As such, adaptive and maladaptive narcissism may well interact with each other and thus contribute to the attainment of the highest possible performance. Resting on such an interactionist perspective, one would not expect adaptive narcissism, reflecting (over)confidence and (over)assertiveness, to predict performance under pressure especially when maladaptive narcissism is low. However, when maladaptive narcissism is high, reflecting a strong willingness to dominate and have control over situations, one would expect adaptive narcissism to predict improved performance under pressure because of the precise combination of confidence and willingness to dominate. Despite the appeal of this theoretical rationale, it has received no empirical attention. Therefore, the present thesis tested this interaction perspective on performance under pressure in a variety of settings, of which the full details are presented in Chapter 2 (Experiments 1-3), as well as in low pressure training environments with details presented in Chapter 3 (Study 4).

Mechanisms underlying narcissism and performance under pressure

Aside from a failure to consider the role of adaptive and maladaptive narcissism, another important issue in the narcissism-performance literature is that our understanding of the mechanisms underlying the narcissism-performance relationship is limited. Nonetheless, recent research has offered two accounts regarding why narcissists perform better in some

situations than in others (see Roberts, Woodman, et al., 2018); one where narcissists improve performance as a result of increasing effort under conditions of self-enhancement (hereafter "*trying harder*"; see also Wallace & Baumeister, 2002) and one where narcissists improve as a result of a more efficient allocation of resources (hereafter "*trying smarter*"). These conceptualizations are particularly relevant to the distraction theories of anxiety and performance such as the *Processing Efficiency Theory* (Eysenck & Calvo, 1992) and the *Attentional Control Theory* (Eysenck, Derakshan, Santos, & Calvo, 2007). Consequently, both the theories are briefly discussed before expanding on the details regarding mechanisms underlying narcissism and performance under pressure.

Processing Efficiency Theory

One's desire to perform well typically evokes performance anxiety that often harms performance. According to the Processing Efficiency Theory (Eysenck & Calvo, 1992), performance anxiety appears in the form of worry and serves two principal functions. On the one hand, anxiety distracts cognitive processing by pre-empting working memory, which shifts attention to task-irrelevant thoughts (e.g., worry) and thus is detrimental to performance. On the other hand, anxiety also serves a motivational function. Typically, worrying about performing poorly may lead to the re-allocation of additional resources for task processing (i.e., trying harder), which could compensate for any adverse effects of anxiety on the effectiveness of performance.

According to the motivational role of performance anxiety as proposed in Processing Efficiency Theory, performers could "*try harder*" or allocate more processing resources to protect against the adverse effects of anxiety on performance (see Woodman & Hardy, 2001; Zhang, Woodman, & Roberts, 2018). For example, high compared to low trait-anxiety performers suffer more from performance anxiety, but these anxious performers maintain their performance level under pressure when they exert greater mental effort (e.g., Smith,

Bellamy, Collins, & Newell, 2001; Wilson & Smith, 2007). Also, the investment of additional resources or effort that compensates performance can appear in alternative forms such as taking longer time in task processing (e.g., Murray & Janelle, 2003; Wilson, Smith, & Holmes, 2007) and applying more visual searches (e.g., Nieuwenhuys, Pijpers, Oudejans, & Bakker, 2008; Williams, Vickers, & Rodriguez, 2002). These findings support that performers can perform well under pressure via *trying harder*.

Attentional Control Theory

Based on the Processing Efficiency Theory (Eysenck & Calvo, 1992), Eysenck et al., (2007) proposed the Attentional Control Theory to precisely capture why performance anxiety impairs cognitive processes and thus exerts adverse effects on performance. Specifically, Attentional Control Theory suggests that when performing under pressure, performers will allocate resources to detect the source of related threats, which in turn diverts resources from a goal-directed (top-down) attentional system to a stimulus-driven (bottom-up) attentional system thus disrupting autonomous task regulatory processes and increasing task-irrelevant thoughts. Furthermore, Attentional Control Theory suggests that performance anxiety creates a high cognitive load that impairs the "inhibition" function of working memory (i.e., resisting disruption or interference from task-irrelevant stimuli), making the performer less resistant to threats and worry. Simultaneously, performance anxiety also impairs the "shifting" function of working memory (i.e., reallocating attention to task-relevant stimuli), preventing the performer from directing attention to the task performance. The impaired inhibition and shifting functions thus disrupt efficient task processing and harm performance.

Support for Attentional Control Theory has emerged in sport and performance settings (see Zhang et al., 2018). For example, when performing free throws under pressure, basketball players significantly reduced eye gaze duration on the “hoop” (reflecting impaired

goal-directed system and shifting function) but increased eye gaze on various targets (reflecting overly activated stimulus-driven system and impaired inhibition function), which accompanied reductions in performance (Wilson, Vine, & Wood, 2009). Similarly, football players fixated longer on the goalkeeper (the "threats" rather the "goal") when performing penalty kicks under pressure, which impaired performance (Wilson, Wood, & Vine, 2009).

Resting on tenets of the Attentional Control Theory, performers are likely to perform well under pressure via *trying smarter* or by utilising superior management and regulation of task processing. For example, Vine and Wilson (2011) demonstrated improvements in goal directed attention and performance on a pressurized aiming task following quiet eye training focusing on strengthening the goal-directed attentional system and the shifting function of working memory. In another study, Ducrocq, Wilson, Vine, & Derakshan (2016) showed improvements to tennis players' resistance to task-irrelevant stimuli and serve return performance, following inhibition training aimed at resisting the stimulus-driven attentional system and activating the inhibition function of working memory. These findings support the position that performers can perform well under pressure via *trying smarter*.

Narcissists under performance pressure: Trying harder or smarter?

Regarding narcissism and performance under pressure, both the *trying harder* and the *trying smarter* hypotheses appear relevant (Roberts, Cooke, et al., 2018; Roberts, Woodman, et al., 2018). Indeed, while narcissists are good at applying self-regulatory strategies to maintain and construct a positive self-concept (Baumeister & Vohs, 2001; Campbell, 1999; Campbell et al., 2006; Miller et al., 2007; Morf & Rhodewalt, 2001; Raskin et al., 1991), these regulations require effort (Zimmerman, 2008). Embracing the *trying harder* hypothesis, Wallace and Baumeister (2002) argued that the rising opportunity for glory drives narcissists to invest extra effort to achieve desired performance states. Providing evidence for Wallace and Baumeister's (2002) position, Woodman et al. (2011) showed that individuals high in

narcissism increased effort and cycled further in a ten-minute cycle ergometer test, especially in an individual competition setting. More recently, Roberts, Cooke, et al. (2018) demonstrated that the influence of narcissism on the performance of a dart-throwing task and a muscular endurance task under self-enhancement conditions (i.e., competition, opportunity for rewards) works through effort quantity during task performance. These findings indicate that narcissists perform better because they try harder.

However, while the *trying harder* hypothesis has received some attention; the *trying smarter* hypothesis has yet to receive empirical support. Nevertheless, the *trying smarter hypothesis* seems promising because narcissism's greater focus on success and little conscious avoidance or worry of failure (Elliot & Thrash, 2001) likely protects against the adverse effects of performance anxiety. Eysenck et al. (2007) suggest that performance anxiety impairs the goal-directed system and overly activates the stimulus-driven system, thus disrupts task processing and harms performance. However, thanks to their strong desire to construct and maintain a positive self, narcissists may focus particularly well on goals, inhibiting task-irrelevant stimuli and shifting attention to assist task processing. Therefore, compared to their counterparts, narcissists are likely more capable of regulating resources for task processing. Such a superior task processing within the capacity-limited working memory system enables narcissists to perform well under pressure.

While both the *trying harder* and the *trying smarter* hypotheses are viable, the conceptualizations of these two positions in relation to narcissism may be too simplistic because they fail to consider the adaptive × maladaptive narcissism interaction. Indeed, considering the adaptive × maladaptive narcissism interaction in relation to these two hypotheses may provide insights into a more precise and complete understanding of why narcissists likely perform well under pressure. From the perspective of *trying harder*, although narcissism is thought to contribute to performance via increased effort (Wallace &

Baumeister, 2002), adaptive narcissism, reflecting an (overly) inflated self, may be unlikely to predict increased effort especially when maladaptive narcissism is at low levels (reflecting a lack of willingness to dominate). Nevertheless, high levels of maladaptive narcissism, reflecting a strong willingness to dominate and control, may drive the inflated self to strive for desirable states. Therefore, based on the *trying harder* position, adaptive narcissism would predict increased effort during task processing only when maladaptive narcissism is high.

From the perspective of *trying smarter*, certainly, individuals high in narcissism focus heavily on success as opposed to failure (Elliot & Thrash, 2001) and thus likely prevent attention from being shifted to task-irrelevant thoughts (e.g., worry) during pressurized task performance. Such a superior attentional control benefits task processing (Eysenck et al., 2007). However, when maladaptive narcissism is low, reflecting a lack of willingness to achieve exceptional performance, adaptive narcissism on its own (reflecting an inflated self) may not predict optimal task processing. Nonetheless, when maladaptive narcissism is high, the link between adaptive narcissism and processing efficiency might be strengthened due to the precise combination of the strong willingness to dominate and the high-level confidence. As such, based on the *trying smarter* position, narcissism would predict better efficiency during task processing only when maladaptive narcissism is high. This thesis examined both the trying harder and the trying smarter hypotheses in relating to the adaptive × maladaptive narcissism interaction in Chapter 2 (Experiments 2-3).

Narcissists in training environments

In addition to the pressurized performance arena, training environments reflect another type of performance context. Different from high-pressure performance settings, which contain great opportunities to lionise the self, training environments are relatively lacking in such possibility (Roberts & Woodman, 2015; Roberts, Woodman, et al., 2018).

Taking athletic training as an example, often thousands of hours of deliberate practice is required to build up expertise, but such tough experience does not guarantee sporting success (Rees et al., 2016). Considering the lack of self-enhancement opportunity in training, one would expect that narcissists may not strive in training because they can hardly foresee any glory afforded by the training environments. Thus, it seems reasonable to predict a negative relation between narcissism and training quality.

Although the potential negative relation between narcissism and effective training appears reasonable from a theoretical perspective, it is likely an overly simplistic position. Indeed, the current conception of the narcissism-training relationship only considers narcissism globally, without consideration of the adaptive and maladaptive aspects of the trait. Such a distinction between the different components of narcissism is essential, as they may play different roles in training.

To expand, adaptive narcissism is likely debilitative for training quality. All things being equal, individuals with high levels of adaptive narcissism might not be fully engaged in training because they are overconfident regarding their abilities, and thus feel no need for hard work. In other words, these individuals may be particularly keen on self-dreaming – fantasising without the need for behavioural reality. Different from adaptive narcissism, maladaptive narcissism reflects a willingness to dominate and a desire for personal control (Raskin & Terry, 1988; Washburn et al., 2004). These aspects of narcissism may be beneficial to training. Specifically, athletes with high levels of maladaptive narcissism might engage better in training because they want to dominate others during competition and realize that training is a means to aid this likely increased dominance and control.

Although examining the unique effects of adaptive and maladaptive narcissism on training may be of interest, similar to the high-pressure domain a more meaningful approach is to embrace the interaction between these components of narcissism. As mentioned, high

levels of narcissism can reflect either high levels of adaptive or maladaptive narcissism or indeed both. Consequently, it is important to take an interactionist perspective to understand the full picture of how narcissism exerts influences on athlete training. Specifically, although adaptive narcissism may have negative influences in training, maladaptive narcissism may well moderate such adverse effects. In particular, an increase in adaptive narcissism might be related to the impaired quality of training when maladaptive narcissism is low. However, the relationship between adaptive narcissism and quality of training might become neutral or even positive when maladaptive narcissism is high. Such an interaction perspective suggests that maladaptive narcissism may protect against the potentially harmful influence of adaptive narcissism in training.

Enhancing narcissists' training

In addition to the need to consider the adaptive × maladaptive narcissism interaction when examining the influence of narcissism on training, another important issue is relevant. If narcissists, or individuals with high levels of adaptive narcissism, are indeed poor in training environments, what can be done about this to alleviate any negative effects on athlete training? Although maladaptive narcissism seems to appear beneficial to training (at least theoretically) for those with high levels of adaptive narcissism, athlete personality is difficult to change thus it is not practical, or indeed ethical, to manipulate athlete personality for the sake of optimizing athlete training. Also, considering narcissists' performance potential in high-pressure environments, one would expect narcissists to make better use of their performance potential if they can fully commit to and get the best out their training. Consequently, it is essential to explore practical means to help narcissists train better. In the applied context, one relevant theoretical framework is the Pyramid Model of Peak Performance (Hardy, Jones, & Gould, 1996).

The Pyramid Model of Peak Performance

Hardy et al.'s (1996) pyramid model suggests that any performance state is a result of the interaction between the performer's personality and any performance strategies or coping skills used. In its conceptualization, the model places personality at the base of the pyramid, revealing that personality has a fundamental impact on the preparation for peak performance states. However, the model also suggests that the influences of personality on performance states are modifiable. Specifically, performance strategies or coping skills could strengthen any positive effects or mitigate any negative effects of personality on performance states. Such a theoretical approach provides important practical value and has received support (Roberts, Callow, Hardy, Woodman, & Thomas, 2010; Roberts et al., 2013; Woodman et al., 2011; Zhang, Beattie, Pitkethly, & Dempsey, 2019).

Considering the potential negative influences of narcissistic qualities in training, Hardy et al.'s (1996) pyramid model provides a foundational framework with which to explore practical means to help narcissists train better. Since the performance of narcissists is dependent on self-enhancement, and training environments typically lacking such opportunities, performance strategies that help narcissists to foresee the opportunity for self-enhancement afforded by the training environments may drive them to train better. Two performance strategies may be particularly helpful in this regard as they have been previously linked to self-enhancement, namely imagery (see Martin, Moritz, & Hall, 1999) and goal-setting (see Burton, Naylor, & Holliday, 2001).

The use of performance strategies for self-enhancement

Literature has supported imagery as a self-enhancement strategy. Imagery involves a voluntary top-down process that allows performers to 'experience' themselves performing any tasks as they want via a number of sensory modalities (Holmes & Calmels, 2008). In a

dart throwing and a golf task, Roberts et al. (2010) found that narcissists improved performance only when they imaged themselves performing successfully before performing the tasks. These researchers argued that imagining one's successful performance activates narcissists' self-enhancement motives as the individual is able to imagine themselves being successful. As such, imagery use may be particularly beneficial to narcissistic athletes in training. To expand, imagery allows for the creation of images showing the individual being exceptional; thus, if used in the training environment, it may increase athlete perception of self-enhancement opportunities afforded by training environments. Considering that narcissists excel when the opportunity for self-enhancement is present (Wallace & Baumeister, 2002), one would expect athletes high in narcissism train better especially when they increase imagery use in training.

Goal-setting may also provide similar opportunities for self-enhancement. Smith, Arthur, Hardy, Callow, and Williams (2013) suggested that setting goals creates an inspiring vision of the future to engage athletes to fully commit to their training. More importantly, in the context of self-enhancement, the inspiring vision of future can help athletes to foresee the opportunity for glory afforded by training environments. Since the opportunity for glory makes narcissists strive (Wallace & Baumeister, 2002), athletes high in narcissism may be more motivated when using goal-setting in training. Consequently, goal-setting likely interacts with narcissistic qualities and exert positive effects on training.

Since imagery and goal-setting increase the levels of perceived glory or self-enhancement, it is likely that these strategies would help narcissists train better. More specifically, the earlier interactionist position, that adaptive and maladaptive narcissism interactively influence athlete training can be extended to a three-way interaction between adaptive narcissism, maladaptive narcissism, and performance strategies (especially imagery and goal-setting). Specifically, when performance strategy use is low, adaptive narcissism

should have adverse effects on athlete training behaviours when maladaptive narcissism is low but not high. However, when goal-setting or imagery use is high, the potential negative influences of adaptive narcissism on athlete training would be mitigated regardless of the levels of maladaptive narcissism. Such a novel position is examined in this thesis in Chapter 3 (Study 4).

Overview of thesis chapters

In sum, this introductory chapter has identified the role of sub-clinical narcissism (especially in its grandiose form) in pressurized performance settings and training environments. The influence of narcissism in these performance contexts, however, likely depends on the interplay between the so-called adaptive and maladaptive components of narcissism. Consequently, the overarching aim of this thesis is to examine the interaction effect of adaptive and maladaptive narcissism on pressurized performance (Chapter 2) and athlete training behaviours (Chapter 3). In addition to this primary purpose, I also examined the underexplored mechanisms underlying the performance effects of the proposed adaptive × maladaptive narcissism interaction (Chapter 2) and explored the neglected area of using performance strategies (i.e., goal-setting/imagery use) to help narcissistic athlete train better (Chapter 3). At a broader level, the present thesis calls attention to embracing the distinction between adaptive and maladaptive narcissism when considering the influences of narcissism in the performance arena.

Chapter 2 of this thesis reports three experiments examining the adaptive × maladaptive narcissism interaction in a basketball throwing task (Experiment 1), a golf-putting task (Experiment 2), and a letter transformation and a colour-word Stroop task (Experiment 3), under high performance pressure. Experiments 2-3 further tested the *trying harder* and the *trying smarter* hypotheses in relation to the adaptive × maladaptive narcissism interaction. Experiment 2 adopted a self-report measure of effort and a behavioural measure

of processing efficiency during the performance of golf-putting. Meanwhile, Experiment 3 employed both self-report measure and a physiological measure of effort and made use of psychophysiological measure to assess mental efficiency during the task performance.

Chapter 3 of this thesis reports an applied study (Study 4) examining the potential three-way interaction (adaptive × maladaptive narcissism × goal-setting/imagery) in athlete training. Athletes from different levels and sport types completed questionnaires assessing their narcissism personality and the use of performance strategies during training. Coaches of participating athletes rated each athlete regarding his or her training behaviours.

Chapter 4 summarizes the research findings and discusses the strengths and limitations of the research from Chapters 2-3. The theoretical and applied implications, as well as the future directions for research, are also discussed. On a relevant note, although chapters of this thesis are independent to each other, and the two empirical chapters have been written as standalone research papers, these chapters are linked to each other especially regarding the theoretical conceptualization of hypothesized effects and the interpretation of implications at broader levels. Therefore, at times there is necessary overlap between chapters. This approach is in accordance with the policy of the School of Sport, Health, and Exercise Sciences.

CHAPTER 2: I AM GREAT, BUT ONLY WHEN I ALSO WANT TO DOMINATE: ADAPTIVE AND MALADAPTIVE NARCISSISM INTERACTIVELY PREDICT PERFORMANCE UNDER PRESSURE

Abstract

Objective. The narcissism-performance literature has focused on grandiose narcissism but has not examined the *adaptive* and *maladaptive* components of narcissism. We examined the interaction between adaptive narcissism, reflecting over-confidence, and maladaptive narcissism, reflecting a willingness to dominate, on performance in high-pressure environments.

Method. In Experiment 1, basketball players (n = 80) performed basketball free throws in a low-pressure individual session followed by a high-pressure competition. In Experiment 2, experienced golfers (n = 64) completed a golf-putting task under practice, low pressure, and high pressure. In Experiment 3, University students (n = 117) performed a letter transformation task and a Stroop task under practice, low pressure, and high pressure.

Results. Across the three experiments, adaptive narcissism predicted performance under pressure only when maladaptive narcissism was high. Also, at high levels of maladaptive narcissism, adaptive narcissism predicted decreased pre-putt time in the golf-putting task (Experiment 2) and an adaptive psychophysiological response to anxiety in the letter transformation task (Experiment 3), reflecting better processing efficiency. All effects were independent of age, expertise, and NPI scores.

Conclusion. Individuals high in both adaptive and maladaptive narcissism perform better under pressure because of superior processing efficiency during task performance.

I am great, but only when I also want to dominate: Adaptive and maladaptive narcissism interactively predict performance under pressure

Performing to a high standard is important in many facets of life (DeCaro, Thomas, Albert, & Beilock, 2011). Whether an athlete performing in an Olympic final, a high school student taking college entry exams, a surgeon performing a crucial operation, or in any other high-stakes situation, one's desire to perform well under pressurized conditions typically evokes performance anxiety that often harms performance (Hardy, Jones, & Gould, 1996; Woodman & Hardy, 2001). Conversely, while performance pressure may be detrimental to those who are worried about the uncertainty of success (Eysenck, Derakshan, Santos, & Calvo, 2007), it may be beneficial for individuals who seek glory and pursue admiration from performance success. In this context, one relevant personality trait is narcissism, especially in its grandiose form[3] (see Roberts & Woodman, 2015, 2016, 2017; Roberts, Woodman, & Sedikides, 2018).

Individuals high in narcissism are thought to have the ability to perform well because they possess essential traits for performance success such as high levels of confidence (Campbell, Goodie, & Foster, 2004), optimistic expectations (Farwell & Wohlwend-Lloyd, 1998), and a strong desire for dominance (Morf & Rhodewalt, 2001). Indeed, narcissists believe they are superior to others and consider themselves as exceptional performers (Gabriel et al., 1994). This grandiose belief is, however, inflated and fails to match objective performance levels; that is, narcissists perform no better than others (Ames & Kammrath, 2004; Judge, LePine, & Rich, 2006; Robins & John, 1997).

[3] The current research conceptualizes narcissism as a non-clinical personality trait that can be assessed on a continuous scale and adopts the definition of narcissism as a self-centred, self-aggrandizing, entitled, dominant, and manipulative interpersonal orientation (Morf, Horvath, & Torchetti, 2011). Such a conceptualization points to the grandiose narcissism at an agentic level but not vulnerable narcissism (Miller et al., 2011) or communal narcissism (Gebauer et al., 2012).

One important factor that likely strengthens the narcissism-performance relationship is the level of self-enhancement opportunity afforded by the particular performance setting. Individuals high in narcissism are highly motivated by self-enhancement and so are keenly aware that different situational contexts vary in the opportunity for them to gain glory (Alicke & Sedikides, 2009). Wallace and Baumeister (2002) suggested that individuals high in narcissism should excel in situations when there is an opportunity for self-enhancement, and they should underperform when these opportunities are absent. In a series of studies, these researchers demonstrated that individuals high in narcissism improved more in performance than those low in narcissism when the prospect for self-enhancement was high; they improved less when such opportunity was low. Support for this initial work is consistent in field studies (e.g., Geukes, Mesagno, Hanrahan, & Kellmann, 2012; Roberts, Woodman, Hardy, Davis, & Wallace, 2013) and in laboratory settings (e.g., Roberts, Callow, Hardy, Woodman, & Thomas, 2010; Woodman, Roberts, Hardy, Callow, & Rogers, 2011).

Another context-specific factor modulating the influence of narcissism on performance is ego threat. As individuals high in narcissism continuously strive to gain others' recognition of their capacities, they are particularly sensitive to ego threats that question their positive self-image (vanDellen et al., 2011). As such, following negative feedback, failure, or rejection, they react aggressively toward others (Bushman & Baumeister, 1998; Morf & Rhodewalt, 2001). While narcissists may try to eliminate the sources of threats and to re-establish dominance in the social or interpersonal contexts through violence and aggression (Baumeister, Smart, & Boden, 1996), they may adopt an alternative threat-elimination approach in the performance domain. Specifically, performance contexts provide narcissists an opportunity to eliminate threat and to re-establish dominance by beating the competition. As such, one would expect individuals high in narcissism to perform exceptionally well following ego threats. Supporting this position, Nevicka, Baas,

and Ten Velden (2016) provided evidence that narcissism predicted not only a greater willingness to perform challenging tasks but also greater cognitive performance when ego threats emerged.

Overall, the narcissism-performance literature converges on narcissists' performances being context-specific. While opportunities for glory and the emergence of ego threats are different context-specific factors, a pressurized performance context contains both these features. Typically, the high-pressure performance environment offers a greater risk of failure. Therefore, it challenges one's positive self-image but also offers an extraordinary opportunity to lionize the self by being exceptional. Consequently, individuals high in narcissism are likely to outperform their counterparts in high-pressure environments.

Our current knowledge of narcissism in the performance domain is, nonetheless, incomplete. One major limitation of this work is that, to date, the narcissism-performance literature has focused solely on grandiose narcissism at a global level, without recourse to consider its multidimensional nature (e.g., Emmons, 1984; Raskin & Terry, 1988; see also Roberts et al., 2018). For example, in its original development, the Narcissistic Personality Inventory (NPI) contained seven factors: authority, self-sufficiency, exhibitionism, entitlement, exploitativeness, superiority, and vanity (Raskin & Hall, 1979; Raskin & Terry, 1988). Although subsequent tests have failed to replicate this seven-factor structure (Emmons, 1984; Watson & Biderman, 1993), evidence supports the distinction between the so-called *adaptive* and *maladaptive* components of the NPI. In particular, adaptive narcissism, reflected by the sense of authority and self-sufficiency in the NPI, is associated with more desirable qualities such as confidence and self-awareness (Emmons, 1984; Raskin & Terry, 1988). On the contrary, maladaptive narcissism, reflected by exhibitionism, entitlement and exploitativeness in the NPI, is associated with less desirable qualities such as a dominating orientation and attention seeking (Raskin & Terry, 1988; Washburn, McMahon,

King, Reinecke, & Silver, 2004). Based on these differential patterns, more recent work by Barry and colleagues (Barry, Chaplin, & Grafeman, 2006; Barry et al., 2007, 2003; Barry & Malkin, 2010) has provided further support to the distinction between adaptive and maladaptive narcissism.

Researchers have yet to consider the adaptive/maladaptive distinction in the context of performance. However, examining the influence of these components in this domain is important to increase our understanding of narcissism's influence in performance settings (Roberts, Woodman, et al., 2018). Adaptive narcissism reflects high levels of confidence (Emmons, 1984; Raskin & Terry, 1988), and confidence is commonly linked to improved performance in pressured situations (Woodman & Hardy, 2003). Thus, all things being equal, one might expect adaptive narcissism to predict better performance. Nonetheless, adaptive narcissism in isolation may not lead to the highest levels of performance. Indeed, extremely high levels of confidence can sometimes be detrimental to performance, as individuals fail to allocate appropriate resources to facilitate performance (Beattie et al., 2017, 2014, 2015; Vancouver & Kendall, 2006; Vancouver et al., 2002; Woodman, Akehurst, et al., 2010). Further, literature has revealed the mismatch between narcissists' inflated performance self-views and their objective performance (e.g., Ames & Kammrath, 2004); such a discrepancy is most likely to be evident in relation to adaptive narcissism, given the confidence and self-assuredness associated with this component. These latter points call into question the universally positive influence that adaptive narcissism may have on performance, and performance under pressure in particular. Given these diverging perspectives, the simple relation between adaptive narcissism and performance seems unclear. We propose a more nuanced position, and suggest that the influence of adaptive narcissism on performance depends on the presence or absence of maladaptive narcissism.

Maladaptive narcissism reflects a strong sense of personal control and a willingness to dominate (Raskin & Terry, 1988; Washburn et al., 2004). In performance contexts, the sense of personal control and the willingness for dominance serves an important motivational function that makes one strive for exceptional performance (Nevicka et al., 2016). Indeed, studies of serial high achievers in the performance domain (e.g., Hardy et al., 2017) indicate the importance of such characteristics in attaining the highest levels of excellence. Thus, the willingness to dominate that stems from maladaptive narcissism likely dovetails with the high levels of confidence that derive from adaptive narcissism, driving narcissists to strive for their desired high-performance reality. This theoretical position intimates an interaction between adaptive and maladaptive narcissism on performance under pressure. Specifically, the maladaptive facet of narcissism is important in high-achievement domains and adaptive narcissism will be beneficial to performance under pressure only if maladaptive narcissism is high. This interactionist perspective is important, especially in the context of maladaptive narcissism. In isolation, maladaptive narcissism predicts internalizing symptoms such as anxiety (Washburn et al., 2004), and such symptoms are generally debilitative to performance under pressure (Woodman & Hardy, 2003; Zhang et al., 2018). Thus, on its own, maldaptive narcisissm might not be associated with optimal performance under pressure. However when it co-occurs with adaptive narcissism, it is likely to faciliate performance. Despite the appeal of this theoretical rationale, it has received no empirical attention. As such, the overarching aim of the present research was to test this interaction perspective on performance under pressure in a variety of settings.

Besides examining the hypothesized interaction between adaptive and maladaptive narcissism on pressurized performance, we also explored potential mechanisms underlying this performance effect. Recent research has offered two accounts regarding why narcissists perform better in some situations than in others (see Roberts, Woodman, et al., 2018); one

where narcissists improve performance as a result of increasing effort under conditions of self-enhancement (hereafter "*trying harder*") and one where narcissists improve as a result of a more efficient allocation of resources (hereafter "*trying smarter*"). The *trying harder* position rests on a prediction of Processing Efficiency Theory (Eysenck & Calvo, 1992) that performers can maintain or even improve performance under pressure if they invest substantial amounts of effort, with the increase in effort coming at a cost to processing efficiency. The *trying smarter* position is based on tenets of Attentional Control Theory (Eysenck et al., 2007), that performers can maintain or improve their performance under pressure via excellent management and regulation of processing resources within the capacity-limited working memory system, which in reality reflects improved processing efficiency as opposed to simply an increase in effort. In a dart throwing task and a muscular endurance task, Roberts, Cooke, et al. (2018) found that narcissists performed better following self-enhancement opportunity because they increased effort quantity, supporting the *trying harder* position.

In relation to the adaptive × maladaptive narcissism interaction on performance under pressure, both the *trying harder* and the *trying smarter* positions seem viable. For the *trying harder* position, individuals high in narcissism seem capable of investing extra effort to achieve desired performance states (Wallace & Baumeister, 2002; Woodman, Roberts, Hardy, Callow, & Rogers, 2011). Nonetheless, the overly inflated self of adaptive narcissism, in the absence of maladaptive narcissism, is unlikely to predict increased effort (cf. Woodman et al., 2011). However, because of the strong willingness to dominate, high levels of maladaptive narcissism may drive the inflated self to strive for desirable states. Therefore, based on the *trying harder* position, adaptive narcissism should predict increased effort during task processing when maladaptive narcissism is also high.

Different to the trying harder position, the *trying smarter* position focuses on how efficient processing and appropriate attentional control may facilitate performance. Individuals high in narcissism focus heavily on success as opposed to failure (Elliot & Thrash, 2001). This sensitivity to reward likely helps prevent their attention shifting to task-irrelevant thoughts (e.g., worry) during task performance under pressure. This better attentional control, in turn, benefits the task processing (Eysenck et al., 2007). Nonetheless, without the willingness to achieve exceptional performance, adaptive narcissism in the absence of maladaptive narcissism may not predict optimal task processing, because the narcissistic individual believes their task processing is already excellent. With high levels of maladaptive narcissism providing a strong willingness to dominate, however, the link between adaptive narcissism and processing efficiency might be strengthened. As such, the *trying smarter* position suggests that adaptive narcissism would predict better efficiency during task processing when maladaptive narcissism is high.

Importantly, our hypothesized interaction effects of adaptive and maladaptive narcissism should not be artifacts of high-levels grandiose narcissism or high NPI scores. High levels of grandiose narcissism or NPI scores may refer to high levels of either adaptive or maladaptive narcissism, or indeed both. Consequently, any effect that the interplay between adaptive and maladaptive narcissism may demonstrate is not equivalent to the effect of high-levels grandiose narcissism or NPI scores. As such, it is important to control for grandiose narcissism NPI scores, so we did.

In sum, theory suggests that the adaptive and maladaptive components of narcissism should interact to predict performance under pressure; an increase in effort and/or more effective processing resources may help to explain any performance benefits. In Experiment 1, we used a basketball free throw task to test the interplay between adaptive and maladaptive narcissism on pressurized performance. In Experiment 2, we used a golf-putting task to

examine the replicability of the Experiment 1 results. Further, we employed self-report and behavioural measures to test both the *trying harder* and the *trying smarter* positions. In Experiment 3, we used a letter-transformation and a Stroop task to test the generalizability of the Experiment 1 and 2 results. We also employed self-report and psychophysiological measures to test further the two mechanistic perspectives. Across all experiments, we used a wide range of stimuli to create pressurized experimental conditions.

Experiment 1

Method

Participants

Based on the effect sizes (ranging from .11 to .25) of Wallace and Baumeister's (2002) work on narcissism and performance, we needed a minimum sample of 74 participants to have adequate power (.80) to detect a small-to-medium effect, i.e., Cohen's f^2 = .11, at .05 alpha level (G*Power 3; Faul, Erdfelder, Lang, & Buchner, 2007). With institutional approval, we recruited 80 male recreational basketball players (*M* age = 22.29, *SD* = 2.37; *M* years of experience = 7.66; SD = 2.14). All participants provided written consent before participating.

Task

We employed a basketball free throw task (see Hardy & Parfitt, 1991). Participants completed the free throw task (see *Experimental conditions* section) using a regulation basketball (24.60cm in diameter) from the free throw line, 4.33m from the basket (45.00cm in diameter) at a regulation height of 3.05m. We assessed performance using Hardy and Parfitt's (1991) point system designed for the same task. A score of "5" stands for a "clean" basket shot, "4" for rim and in, "3" for backboard and in, "2" for rim and out, "1" for backboard and out, and "0" for a complete miss. We summed participants' scores in their testing throws.

Design

We used a within-group design to reduce sampling error and thus allow a better understanding of how performers respond to, and perform in, high-pressure environments. We assigned 10 participants to one of eight groups, with each group following the same experimental procedures. All participants completed experimental tasks under two

conditions: low pressure (i.e., individual session) and high pressure (i.e., competition in front of audience). The individual session took place seven days before the competition.

Experimental conditions

Low-pressure condition. Consistent with Hardy and Parfitt (1991), this condition consisted of twenty non-recorded warm-up throws and five recorded testing throws. Each participant attended an individual session in an indoor sports hall. We introduced the scoring system and instructed participants to perform at their normal pace.

High-pressure condition. This condition consisted of twenty non-recorded warm-up free throws followed by five recorded free throws performed in front of an audience as part of a competition. We informed participants that cash prizes equivalent to £30, £20, and £10 were available for the top three performers. We also informed participants that a congratulatory poster would be placed on the sports hall news wall, highlighting the winning participants. Furthermore, we asked participants to act as audiences when they were not performing the task. We asked our ‘audience' participants to stay in a pre-set audience zone that surrounded the free throw area and provided them with whistles and inflatable sticks to make similar noises to those during basketball matches. Before starting the free throws, we asked participants to perform the free throws at their normal pace.

Measures

Narcissism. We assessed narcissism using the Narcissistic Personality Inventory–16 (NPI-16; Ames, Rose, & Anderson, 2006). As a valid and reliable short form of the NPI-40 (Raskin & Hall, 1979), the NPI-16 consists of sixteen forced-choice items from the NPI-40 that asks participants to choose between one narcissistic and one non-narcissistic statement (e.g., "I will be a success" vs "I am not too concerned about success"). Following recommendations by Barry et al. (2013), we generated scores for *adaptive* narcissism (five

items; $M = 2.58$, $SD = 1.80$, $\alpha = .78$), *maladaptive* narcissism (eight items; $M = 4.80$, $SD = 2.39$, $\alpha = .77$), and *grandiose* narcissism (NPI total score; $M = 8.05$, $SD = 4.55$, $\alpha = .87$).

Cognitive anxiety. We used the cognitive anxiety subscale of the Revised Competitive State Anxiety Inventory–2 (CSAI-2R; Cox, Martens, & Russell, 2003) to assess cognitive anxiety before each condition. The cognitive anxiety subscale of the CSAI-2R contains five items (e.g., "I am concerned that I may not do as well in this competition as I could") on a 4-point Likert scale from 1 (*not at all*) to 4 (*very much so*). Cronbach's alpha achieved .89-.90 in the different experimental conditions.

Procedure

The experiment received institutional ethical approval. We recruited participants from a university basketball club. With the agreement from the club manager, study information sheets were provided to club members in a study briefing session after a weekly event of the basketball club. After the briefing session, club members who decided to participate provided consent, signed up for their sessions, and completed the NPI-16. On the day of the individual session, participants completed the CSAI-2R before starting their free throws. On completion of the throws we thanked participants and reminded them of the group competition a week later. On the competition day, following the instructions (see *High-pressure condition* section) participants drew lots to decide the order of performance. They completed the CSAI-2R immediately before their individual performance. After the competition, we thanked participants, fully debriefed them about the study, and awarded money to the prize-winners.

Results

Preliminary analyses

A paired *t* test revealed a significant increase in cognitive anxiety from low ($M = 8.93$, $SD = 3.13$) to high-pressure conditions ($M = 11.39$, $SD = 4.19$), $t\ (79) = 5.30$, $p = .001$, 95%

CI [1.54, 3.39], Cohen's d = .59. Descriptive statistics and correlations between study variables are shown in Table 2.1.1.

Main analyses

To create a performance variable for analysis, we regressed the high-pressure performance on the low-pressure performance, with higher residual scores reflecting better pressurized performance. The residualized approach (see Castro-Schilo & Grimm, 2018) allowed us to account for both participants' performance capacity in normal situations when considering their performance under pressure. Hereafter, we use the term "performance" to refer to residualized performance.

To test our hypothesis that adaptive and maladaptive would interactively predict performance, we performed moderated regressions with 5,000 bootstraps using PROCESS (Hayes, 2013). To ensure that any effects we obtained were independent of participants' age, expertise, and the artifacts of NPI total score, we controlled for these variables. Following Jaccard and Turrisi's (2003) recommendation, we standardized all testing variables using z-score transformation before conducting the moderated regression. We analyzed simple slopes at *Mean* ± *1SD.* Lower and upper bound 95% confidence intervals (CI) that do not encompass zero indicates significance at the .05 level.

Performance. The effects of the covariates and the main effects of adaptive and maladaptive narcissism were not statistically significant (see Table 2.1.2) for detailed regression statistics). The interaction between adaptive and maladaptive narcissism was significant, β = .38, ΔR^2 = .11, F (1, 73) = 14.02, p = .004, CI [.18, .58], Cohen's f^2 = .15. Simple slope analysis indicated that adaptive narcissism was significantly associated with better performance when maladaptive narcissism was high (β = .62, p = .007, CI [.18, 1.06]) but was not related to performance when maladaptive narcissism was low (β = -.14, p = .60, CI [-.67, .39]). Figure 2.1 (top) displays the nature of the interaction.

Discussion

In line with our hypothesis, Experiment 1 demonstrated that performance under pressure improved as adaptive narcissism increased, only when maladaptive narcissism was high. Individuals high in both adaptive and maladaptive narcissism seem to gain performance advantage in high-pressure environments. Such performance effects were independent of performers' age, experience, and NPI total score. This supports that the observed performance effect is not an artifact of high levels of grandiose narcissism and is likely to be generated to performers of different ages and levels of expertise. We examined the replicability of the Experiment 1 results using a golf putting task in Experiment 2. Furthermore, in Experiment 2, we tested both the *trying harder* and the *trying smarter* positions to explore why adaptive narcissism would benefit pressurized performance only in the presence of maladaptive narcissism.

Table 2.1.1

*Descriptive statistics and correlations between study variables in the basketball set shot (*n = *80)*

Measure	1	2	3	4	5	6	7	8	9
(1) Age	–	.49**	-.17	-.12	-.16	-.07	-.17	-.11	-.17
(2) Experience		–	-.01	-.14	.04	-.02	.02	.05	.01
(3) NPI-16			–	.85**	.92**	.29**	.24	.27*	.57**
(4) AN-5				–	.65**	.23*	.22	.07	.46**
(5) MN-8					–	.29*	.19	.27*	.51**
(6) Anxiety (LP)						–	.39**	.12	.31**
(7) Anxiety (HP)							–	.35**	.33**
(8) Performance (LP)								–	.65**
(9) Performance (HP)									–
Mean	22.41	7.61	8.05	2.58	4.80	8.93	11.40	16.16	16.58
SD	2.30	2.14	4.55	1.80	2.39	3.13	4.19	4.11	4.63

Note. Experience = Years of Experience; NPI-16 = 16-item Narcissistic Personality Inventory (range: 0-16); AN-5 = Adaptive Narcissism (range: 0-5); MN-8 = Maladaptive Narcissism (range: 0-8); LP = Low Pressure; HP = High Pressure; Range of Performance Scores: 0-25.

* $p < .05$; ** $p < .01$

Table 2.1.2

Regression statistics in the basketball free throw task in Experiment 1

Free throw scores *(n = 80)*					
	B	*SE*	*t*	*p*	95% CI
Constant	-.24	.11	-2.23	.029	[-.46, -.03]
AN-5	.24	.22	1.06	.290	[-.21, .68]
MN-8	-.02	.28	-.08	.934	[-.58, .54]
AN x MN	.38	.10	3.74	.001	[.18, .58]
Age	-.05	.11	-.48	.633	[-.26, .16]
Year of Experience	.07	.11	.61	.542	[-.15, .28]
NPI-16	.46	.42	1.10	.275	[-.38, 1.30]

Note. SE = Standard Errors; CI = Confidence Interval; AN-5 = 5-item Adaptive Narcissism; MN-8 = 8-item Maladaptive Narcissism; AN x MN = Interaction between adaptive and maladaptive narcissism; NPI-16 = 16-item Narcissistic Personality Inventory. Free throw scores were residuals regressing high-pressure condition on low-pressure condition. All variables were standardize

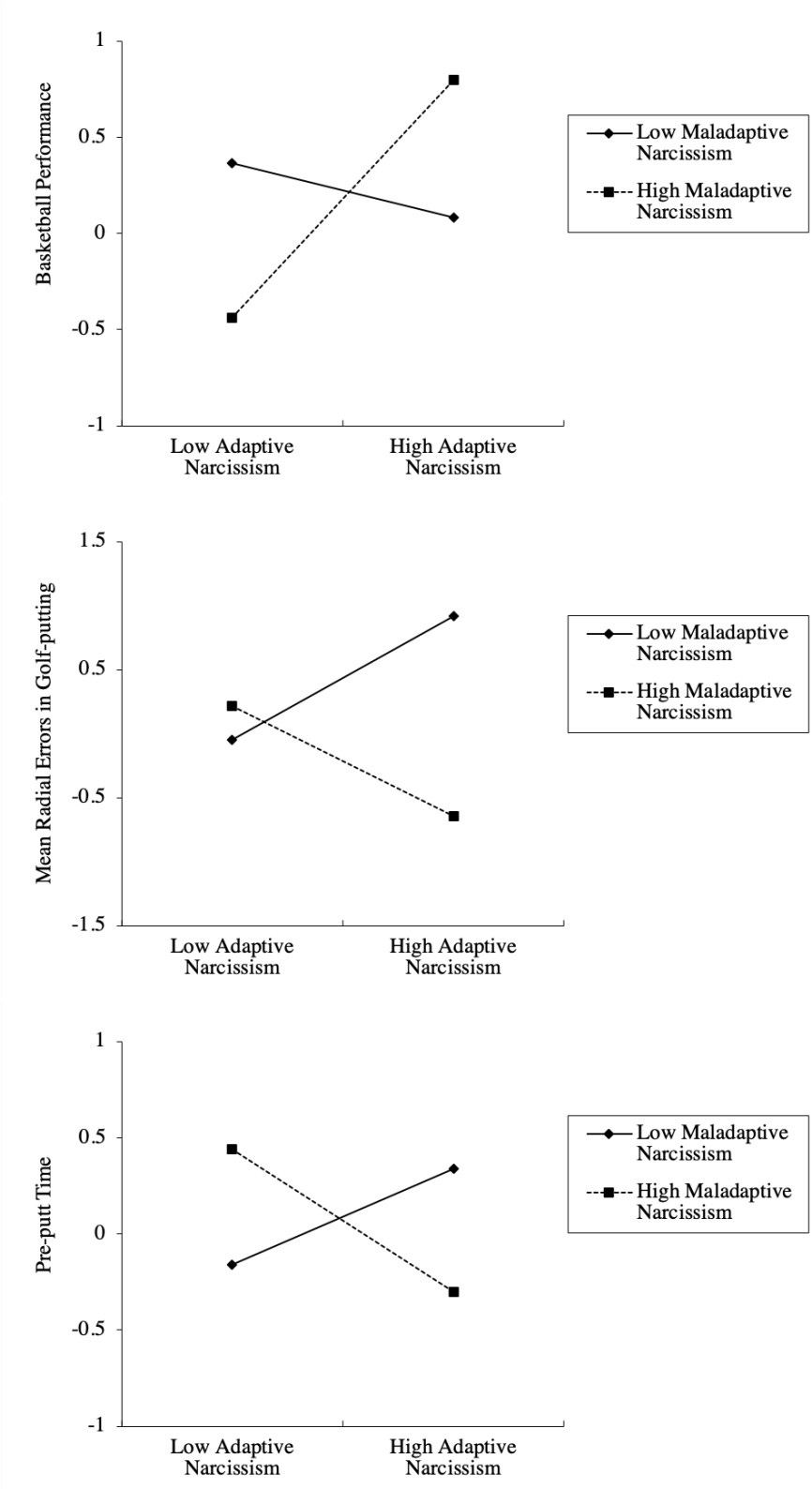

Figure 2.1. Interaction between adaptive and maladaptive narcissism on performance scores in basketball free throw (top) and mean radial errors (middle) and pre-putt time (bottom) in golf-putting. Regression slopes were derived from one standard deviation below the mean (low) or one standard deviation above the mean (high). Outcome variable was residuals regressing high pressure on low pressure conditions. All variables were standardized scores.

Experiment 2

Method

Participants

Based on the effect size in Experiment 1 (i.e., Cohen's $f^2 = .16$), power analysis indicated that we needed a minimum sample of 52 participants to have adequate power (.80) to detect our hypothesized performance effect at .05 alpha level. With institutional approval, we recruited 64 right-handed medium-handicap golfers (*M* age = 45.67, *SD* = 18.83; *M* handicap = 15.88; *SD* = 2.26; 48 males). We chose medium-handicap golfers because they are particularly sensitive to pressure manipulations (Mullen & Hardy, 2000). All participants claimed that they played competitively on a regular basis and had done so in the previous 12 months. Participants provided written consent prior to participation.

Task and Apparatus

Participants performed a putting task on a 4.5 × 1.6-metre indoor putting green. We provided a standard (90cm) steel-shafted blade style putter and competition white golf balls (4.27cm diameter). We used a half-size target hole (5.5cm diameter) to increase the accuracy demands (Cooke, Kavussanu, McIntyre, Boardley, & Ring, 2011). We disguised a digital camera with a 10mm diameter lens and a shutter speed of 1/2000 second, facing directly toward participants. We used the digital camera as an additional source of pressure (e.g., Beilock & Carr, 2001) and to measure pre-putt time (e.g., Wilson, Smith, et al., 2007).

Performance

We used an automated measuring system to measure putting performance, which we conceptualized as the distance between the centre of the golf ball and the centre of the hole. We took the mean distance of the balls from the target hole (in mm) to generate the mean

radial error (MRE), with lower MRE representing the higher accuracy and better performance. We recorded each successful holed putt as 0mm.

Design

Participants performed the task under practice, low pressure, and high pressure. Each participant attended an individual session to complete all experimental conditions.

Experimental conditions

Practice. This condition consisted of five blocks of nine putts (i.e., 45 putts in total) to familiarize participants with the task. Participants received standardized instruction that the objective of the experiment was to examine the effect of using different putting positions in golf putting skills training and thus they were randomly assigned to the group that would follow a specific putting sequence. In reality, all participants followed the same randomized sequence of the three starting points within each putting block – 1.6, 2.2, 2.8, 2.8, 2.2, 1.6, 1.6, 2.2, and 2.8m from the target. The purpose of this training-related instruction was to blind participants from the real objectives of this experiment and to help achieve experimental manipulations. Before each putting block, we instructed participants to "relax and take your time to perform the putt as you want; try to acclimatize yourself with the task and get the ball ideally holed or make it as close to the hole as possible."

Low-pressure condition. This condition consisted of a single block of nine putts, with the same putting sequence as in practice. To minimize pressure, we reminded our participants of the experimental purpose we provided at practice. Prior to putting, we asked participants to “relax and take your time to perform the putt as you want; try to get the ball ideally holed or make it as close to the hole as possible”.

High-pressure condition. This condition consisted of a final block of nine putts, using a putting sequence different from the previous blocks. To start, we informed participants that based on their putting performance in previous blocks they were to receive prize money of

£5. However, to secure the £5, participants needed to achieve a "reasonable level of performance", which in reality was participants' MRE in the low-pressure condition minus a half standard deviation. We informed participants that they would lose £5 if they failed to meet the basic standard. Moreover, we informed participants that they would get extra prize money of £15 if they achieved a "superior" performance standard that in reality was participants' MRE in the low-pressure condition minus one standard deviation[4].

Furthermore, we informed participants that they would compete against each other in the final block. We asked participants to draw one of twelve task cards from an envelope we prepared. We explained that different task cards provided different levels of task difficulty. For example, repeating nine putts from the same starting point represents an easy task; completing three mini-blocks of three putts whilst repeating the same starting point in each mini-block represents a medium-level task; putting from a randomized sequence of the three different starting points represents a difficult task. We reminded participants that regardless of the level of difficulty, the participant who improved most from the previous block to the final block would win £50 and be promoted in congratulatory posters posted on the news boards in the golf club of which they were members. Additionally, we informed participants that we would release the top-ten and the bottom-ten rankings based on their performance improvement from the previous to the final block to all participants through emails.

Despite instructing participants that different task cards provided different putting sequences, in reality, everyone completed the same task order: 2.2, 1.6, 2.8, 2.8, 2.2, 1.6, 2.2,

[4] The "basic" and "superior" performance standards were set to increase the level of challenge and task difficulty so as to create a more pressurized condition. The levels of standards (i.e., previous average MRE minus a half or one standard deviation) were cautiously designed to make the task feel challenging and stressed but still relatively realistic and achievable. Typically, previous average MRE minus a half or one standard deviation reflects a possibility of approximately 16% or 32% possibility to achieve, at least theoretically. We tested the use of these performance criterion among pilot participants to ensure its practicability and reliability.

2.8, and 1.6m. After drawing the task card, we checked a pre-printed document in front of participants to provide a fake historical record revealing the likelihood of obtaining a prize. We told participants that in the past about 50% people secured £5 and about 10% people got an extra prize £15 but nobody gained any prize when putting the same sequence as them.

Finally, we made participants aware of the video camera we disguised. We informed participants that the recorded video materials would be assessed by an external expert, and selected records would be edited and used for promotional and educational purposes. We further reminded participants that they were free to withdraw from completing the final block if they were unhappy with anything. After participants confirmed their willingness to participate, we instructed them to "take your time, concentrate on the task in hand, try to get the ball ideally holed or as close as possible to the target to win a prize."

Measures

Narcissism. While the NPI-16 used in the Experiment 1 is a valid, reliable, and convenient measure of narcissism, the NPI-16 removed 34 items from the NPI-40 (Raskin & Hall, 1979) and thus may lose some information in assessing narcissism. Indeed, researchers recommended that the NPI-16 is a good alternative for the NPI-40 when the use of the longer measure is impractical but should not substitute the use of the NPI-40 in all situations (e.g., Ames et al., 2006). As such, in Experiment 2, we used the NPI-40 to ensure a more complete assessment of narcissistic personality traits. The NPI-40 is a 40-item forced-choice inventory that asks participants to choose between one narcissistic and one non-narcissistic statement (e.g. "I will be a success" vs "I am not too concerned about success"). As with Experiment 1, we generated a score for adaptive narcissism (14-item; $M = 5.84$, $SD = 2.92$, $\alpha = .76$), maladaptive narcissism (18-item; $M = 5.12$, $SD = 3.85$, $\alpha = .75$), and grandiose narcissism (NPI total score; $M = 13.60$, $SD = 6.79$, $\alpha = .83$).

Cognitive anxiety. We used the Mental Readiness Form-L (MRF-L, Krane, 1994). The MRF-L is a shorter and more expedient alternative to the CSAI-2R than used in Experiment 1. Its cognitive anxiety item asks participants to determine to what extent their thoughts are worried on a bipolar 11-point Likert scale from 1 (*calm*) to 11 (*worried*). The single-item format is less intrusive and thus more convenient to measure anxiety as close as possible to both the manipulative instructions and the subsequent performance.

Mental effort. We used the Rating Scale for Mental Effort (RSME, Zijlstra, 1993) to examine the *trying harder* position. The RSME is a vertical axis scale that asks participants to rate their level of mental effort ranging from 0 to 150, with increments of 10 displayed on the left side of the scale and nine descriptive indicators from 3 (*no mental effort at all*) to 114 (*extreme mental effort*). The RSME is an effective measure of mental effort during the performance of various tasks, with a test-retest reliability achieved .78-.88 (Zijlstra, 1993).

Pre-putt time. We measured pre-putt time as a behavioural indicator of processing efficiency, in order to examine the *trying smarter* position. This approach was recommended by Eysenck and Calvo (1992) and has been adopted in performance-related research (see Wilson, 2008). Reduced pre-putt time indicates less time required for movement planning and motor response programming, likely due to efficient management of processing resources. As such, reduced pre-putt time reflects better efficiency (Lam, Masters, & Maxwell, 2010; Walters-Symons, Wilson, Klostermann, & Vine, 2018). We counted video frames (50Hz field rate) from the moment when participants prepared for the putting posture to the moment when participants initiated a "real" putt with the putter touching the golf ball (see also Wilson et al., 2007). We transferred the number of counted video frames to pre-putt-time (in seconds).

Procedure

The experiment took place in a quiet golf-putting laboratory. We promoted our study advertisement and recruited participants from local golf clubs. Those who decided to participate contacted us via email or phone to discuss any availability for testing. On the experiment day, we welcomed participants and asked them to complete the NPI-40. Participants then completed the experimental conditions of five blocks of practice, one block of low-pressure putts, and one final block of high-pressure putts. We asked participants to complete the MRF-L after our manipulations in the low and high-pressure conditions and the RSME on completion of the low and high-pressure conditions. At the end of the experimental session, we fully debriefed participants about the details of the experiment, thanked all participants, and paid their prize money (if applicable).

Results

Preliminary analyses

A paired *t* test revealed a significant increase in cognitive anxiety from the low (M = 3.30, SD = 1.97) to high anxiety condition (M = 4.61, SD = 2.53), t (63) = 7.96, $p < .001$, 95% CI [.98, 1.64], Cohen's d = .99. Descriptive statistics and correlations between study variables are shown in Table 2.2.1.

Main Analyses

As with Experiment 1, we generated the residualized scores for all of our outcome variables including MRE, mental effort, age-adjusted heart rate, and pre-putting time (hereafter we use the variable name to refer to the residualized scores, e.g., "MRE" refers to residualized MRE). We performed moderated regression analyses as in Experiment 1 and controlled for age, handicap, and NPI total score in all analyses. See Table 2.2.2 for full details of regression statistics.

Performance. None of the covariates were related to performance, although handicap approached significance (β = .22, p = .06, 95% CI [-.01, .45]). The main effects were non-

significant, but the interaction between adaptive and maladaptive narcissism was significant, β = -.44, ΔR^2 = .17, F (1, 57) = 13.47, p = .001, 95% CI [-.74, -.22], Cohen's f^2 = .24. Adaptive narcissism was associated with reduced MRE, reflecting better performance, when maladaptive narcissism was high (β = -.45, p = .113, 95% CI [-1.02, .11]) but was related to increased MRE reflecting reduced performance when maladaptive narcissism was low (β = .50, p = .092, 95% CI [-.08, 1.09])[5]. Figure 2.1 (middle) displays the nature of the interaction.

Effort. None of the effects of the covariates were significant. No main or interactive effect of adaptive and maladaptive narcissism were significant.

Pre-putt time. No covariates or main effects were significant. The interaction between adaptive and maladaptive narcissism was significant, β = -.31, ΔR^2 = .08, F (1, 57) = 4.79, p = .033, 95% CI [-.60, -.03], Cohen's f^2 = .11. Simple slopes showed that adaptive narcissism predicted reduced pre-putt time, reflecting better efficiency, when maladaptive narcissism was high (β = -.37, p = .232, 95% CI [-.99, .25]) but predicted increased pre-putt time, reflecting reduced efficiency, when maladaptive narcissism was low (β = .25, p = .436, 95% CI [-.39, .90]). Figure 2.1 (bottom) displays the nature of the interaction.

Discussion

Consistent with Experiment 1, Experiment 2 demonstrated that increased adaptive narcissism was related to better pressurized performance only when maladaptive narcissism

[5] It is noticeable that neither simple slope was significant. It warrants attention that the non-significant simple slope should not undermine the meaningfulness of a significant interaction effect because the test of simple slopes only compares the estimates of the slopes to zero rather than comparing these slopes to each other. As such, despite the non-significant simple slopes, the two slopes (i.e., the relationship between adaptive narcissism and performance when maladaptive narcissism was low and high) were indeed statistically different given the significant interaction. In the contexts here, the influence of adaptive narcissism on performance was different when maladaptive narcissism was low compared to it was high. Such an interpretation should be consistently applied to the later results sections in case of either simple slope was non-significant.

was high but not low. Importantly, this effect was again independent of age, task-related expertise, and NPI total score (all of which were non-significant).

The results of Experiment 2 do not support the *trying harder* hypothesis because adaptive narcissism failed to predict effort regardless of the levels of maladaptive narcissism. However, the results offer some support for the *trying smarter* hypothesis. When maladaptive narcissism was high, efficiency improved as adaptive narcissism increased, which was accompanied by the subsequent better performance. However, when maladaptive narcissism was low adaptive narcissism was associated with decreased efficiency and performance. In Experiment 3, we employed cognitive tasks and university students to examine the generalizability of the Experiment 1 and 2 findings.

Table 2.2.1

*Descriptive statistics and correlations between study variables in the golf-putting task (*n = *64)*

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13
(1) Age	_	.05	-.22	-.12	-.20	-.27*	-.29*	-.08	-.15	.09	-.01	.01	.03
(2) Handicap		_	.10	.09	.05	.04	.12	-.02	-.01	.01	.03	.41**	.46**
(3) NPI-40			_	.70**	.82**	-.04	-.04	-.08	-.02	-.02	.02	.34**	.11
(4) AN-14				_	.25*	.06	-.04	-.01	-.01	-.10	-.11	.26*	.15
(5) MN-18					_	-.05	.02	-.06	.04	.04	.11	.25*	-.01
(6) Anxiety (LP)						_	.86**	.12	.24	.02	-.02	-.03	-.04
(7) Anxiety (HP)							_	.12	.24	-.03	.01	.12	.06
(8) ME (LP)								_	.96**	.20	.23	-.01	-.12
(9) ME (HP)									_	.24	.31*	.02	-.13
(10) PrePT (LP)										_	.70**	-.02	-.10
(11) PrePT (HP)											_	.03	-.01
(12) MRE (LP)												_	.40**
(13) MRE (HP)													_
Mean	45.67	15.88	13.58	6.02	4.98	3.30	4.61	100.56	108.39	7.68	9.09	276.05	262.97
SD	18.82	4.25	7.08	3.24	3.74	1.97	2.53	34.95	35.58	3.04	4.37	73.45	75.69

Note. NPI-40 = 40-item Narcissistic Personality Inventory (range: 0-40); AN-14 = Adaptive Narcissism (range: 0-14); MN-18 = Maladaptive Narcissism (range: 0-18); LP = Low Pressure; HP = High Pressure; ME = Mental Effort; PrePT = Pre-putting Time (in second); MRE = Mean Radial Errors (in millimeter). * $p < .05$; ** $p < .01$

Table 2.2.2

Regression statistics in the golf-putting task in Experiment 2

Mean radial errors *(n = 64)*					
	B	*SE*	*t*	*p*	95% CI
Constant	.12	.12	1.00	.320	[-.12, .35]
AN-14	.02	.26	.09	.926	[-.49, .54]
MN-18	-.33	.33	-1.00	.320	[-.98, .33]
AN x MN	-.48	.13	-3.67	.001	[-.74, -.22]
Age	.12	.12	.99	.323	[-.12, .35]
Handicap	.22	.12	1.91	.061	[-.01, .45]
NPI-40	.07	.44	.15	.882	[-.81, .94]
Mental effort *(n = 64)*					
	B	*SE*	*t*	*p*	95% CI
Constant	-.02	.12	-.20	.841	[-.27, .22]
AN-14	-.05	.27	-.18	.858	[-.59, .49]
MN-18	.44	.34	1.30	.199	[-.23,1.13]
AN x MN	.10	.14	.74	.464	[-.17, .37]
Age	-.22	.12	-1.83	.073	[-.47, .02]
Handicap	.05	.12	.39	.698	[-.20, .29]
NPI-40	-.17	.46	-.37	.712	[-1.08, .74]
Pre-putt time *(n = 64)*					
	B	*SE*	*t*	*p*	95% CI
Constant	.08	.13	.60	.552	[-.18, .33]
AN-14	-.06	.28	-.22	.830	[-.62, .50]
MN-18	-.01	.36	-.01	.988	[-.72, .71]
AN x MN	-.31	.14	-2.19	.033	[-.60, -.03]
Age	-.03	.13	-.24	.806	[-.29, .23]
Handicap	.08	.13	.65	.520	[-.17, .34]
NPI-40	-.01	.48	-.04	.971	[-.97, .94]

Note. SE = Standard Errors; CI = Confidence Interval; AN-14 = 14-item Adaptive Narcissism; MN-18 = 18-item Maladaptive Narcissism; AN x MN = Adaptive ×maladaptive narcissism interaction; NPI-40 = 40-item Narcissistic Personality Inventory. Dependant variables were residuals regressing high on low-anxiety condition. Variables were standardized.

Experiment 3

Method

Participants

Based on the effect size (.08) pooled from Nevicka et al.'s (2016) studies (Study 2 & 3) on narcissism and cognitive performance following high or low levels of ego threats, we needed a minimum sample of 101 participants to have adequate power (.80) to detect our hypothesized performance effect at .05 alpha level. With institutional approval, we recruited 117 university students from a UK University (*M* age = 23.57, *SD* = 4.05; 46 males) to perform two cognitive tasks. All participants provided written consent prior to participation.

Tasks

We programmed and tested a letter transformation and a color-word Stroop task using PsychoPy (Peirce, 2007). We provided the task instructions, gave the manipulations, and assessed performance via the computerized testing system.

Letter transformation. The letter transformation task (Hamilton, Hockey, & Rejman, 1977) requires participants to transform a random letter string a given distance to obtain another letter string. For example, the instruction 'A + 3' requires participants to transform a single letter string 'A' by counting forward for three letters following the English alphabet, to get to an answer of 'D'. We used the single-string task where only one letter needed to be transformed in one trial at a distance ranging from 1 to 4 letters, with both forward (e.g., D + 4) and backward (e.g., Z - 4) transformations to make the task more difficult. Using the single-letter version of letter transformation helps to minimize the potential confound of movement processing (i.e., the time spent on pressing a responding button after working out the transformation) on cognitive processing (i.e., the time spent on transforming the given letter with a required distance).

Colour-word Stroop task. The colour-word Stroop task (Hochman, 1967) displays a series of colour-related words (i.e., red, green, blue) in either congruent colours (i.e., "red" displayed in red) or incongruent colours (i.e., "red" displayed in green or blue). This task requires participants to report the colour of the word regardless of its semantic definition.

Performance

A timer started each time when the testing system began to display a task trial and stopped when the participant pressed a responding key. We used the average time taken as the major performance outcome but controlled for accuracy in all analyses to remove any possible speed-accuracy trade-offs.

Design

Participants performed the letter transformation followed by the colour-word Stroop task under practice, low pressure, and high pressure. Each participant attended an individual session to complete all experimental conditions.

Experimental conditions

Prior to starting, we used standardized instructions to convince our participants that the experimental tasks were important and relevant to them. We also informed participants that we intended to pay them £5 for participation to thank for their time and commitment based on the successful completion of all experimental tasks.

Practice. We familiarized participants with our experimental tasks by providing detailed task instructions followed by free practicing trials. Participants had an opportunity to practice ten trials of letter transformation followed by ten trials of the Stroop task, which is consistent with studies using the same tasks (Hardy, Beattie, & Woodman, 2007; Pallak, Pittman, Heller, & Munson, 1975).

Low-pressure condition. On completion of the practice condition, the testing system instructed participants that they had a last opportunity to practice. The system further

displayed instructions to participants, encouraging them to practice the task for as many trials as they wanted. The system then instructed participants that during this last practice their average speed and accuracy would be automatically recorded and compared to a database that consisted of historical records of other participants' speed and accuracy doing the same tasks from our previous studies. Such fabricated instruction was necessary for manipulation purposes (see *High-pressure condition*). Before starting the final practice, the system instructed participants to complete each trial as fast as possible and to practice as many trials as they wanted in order to optimize their task preparation for the final test coming after.

High-pressure condition. On completion of the low-pressure condition, the testing system automatically displayed fake but precise feedback regarding participants' percentile positions of speed and accuracy in their last practice (i.e., "Your percentile ranking of speed in letter transformation – 10.9%"; "Your percentile ranking of accuracy in letter transformation – 78.6%"; "Your percentile ranking of speed in the Stroop task – 30.4%"; "Your percentile ranking of accuracy in the Stroop task – 76.3%"). We further interpreted the feedback to our participants:

> The feedback suggests that, compared to people participating in our previous studies performing the same tasks, your speed seems quite slow in the previous session – faster than only 10.9% people in letter transformation and 30.4% people in the Stroop task. Despite this, your accuracy in both tasks ranked higher than average people.

After giving negative feedback (see also Nevicka et al., 2016), the testing system instructed participants that they would be competing with over one hundred other participants in the final test. The system gave further instructions that participants' performances would be compared to the same historical records as in the last practice, and the improvement in their percentile rankings would determine their cognitive performance. To strengthen perceived task importance, the system provided further instructions that the more one improves from

the last practice to the final test, the more capable one will be in scenarios involving learning new skills, creating innovative ideas, and solving different problems in real life.

In addition, the system displayed pressurized instructions that, while the top three performers who improved the most would be awarded a monetary prize of £50, £25, and £10, respectively, those who failed to maintain their previous percentile rankings would not receive the £5 participation allowance. The system also informed participants that a full list of rank-ordered performance improvement would be sent to all participants on completing all experimental sessions, with a highlight to promote both the top-ten and the bottom-ten participants. In reality, all participants were paid £5 on top of any prize money, and the list of participants' rankings was not released. Following the aforementioned pressurized manipulations, we provided the following instructions:

> This is a serious test, but you are not forced to continue if you are unwilling to. Are you sure you want to continue to complete the test?

Participants entered the final test only if they agreed. Before starting the final test, the system displayed a final reminder:

> This is a difficult and demanding test, you need to complete one hundred trials of the letter transformation task followed by another hundred trials of the Stroop task. Try to complete the tests as quickly as possible.

Measures

Narcissism. We assessed narcissism using the NPI-40 as described in Experiment 2. We generated a score for adaptive narcissism (14-item; $M = 6.32$, $SD = 3.44$, $\alpha = .79$), maladaptive narcissism (18-item; $M = 5.97$, $SD = 3.91$, $\alpha = .79$), and grandiose narcissism (NPI total score; $M = 15.84$, $SD = 7.79$, $\alpha = .88$).

Cognitive anxiety. We assessed cognitive anxiety prior to each experimental condition using the MRF-L as described in Experiment 2.

Mental effort. We assessed mental effort after each experimental condition using the RSME as described in Experiment 2.

Cardiac activity. We measured cardiac activity using a Polar V800 heart rate monitor. The Polar V800 demonstrates excellent agreement with a 3-lead electrocardiograph (Giles, Draper, & Neil, 2016). We used the Kubios HRV Software (Tarvainen, Niskanen, Lipponen, Ranta-aho, & Karjalainen, 2014) to analyse recordings. We analysed artefact-free data only[6].

We assessed heart rate to provide physiological insights into effort in order to examine the *trying harder* position, with increased heart-rate reflecting higher levels of effort (e.g., Borg, Hassmén, & Lagerström, 1987; Mulder, 1992; Roberts, Cooke, et al., 2018). To reduce the likelihood of any confound on heart rate, we used age-adjusted heart rate, which was computed based on the percentage of the predicted maximum heart rate (220-age) for each participant (Astrand, Rodahl, Dahl, & Strømme, 2003).

In addition, we assessed the root mean square of successive normal to normal [R-R] intervals (r-MSSD), a time domain measures of heart rate variability, to provide insights into the efficiency of task processing in order to examine the *trying smarter* position. r-MSSD provides an index of cardiac vagal control (Achten & Jeukendrup, 2003), which is positively associated with affective regulation, attentional control, and goal-directed executive function (Thayer & Brosschot, 2005). It also reflects the activation of prefrontal cortex that is positively related to one's ability to self-regulate during task performance (Thayer, Hansen, Saus-Rose, & Johnsen, 2009). Typically, processing efficiency and r-MSSD reduce as anxiety increases (e.g., Eysenck & Calvo, 1992; Thayer et al., 2009). Therefore, if participants *try smarter*, one would expect them to be immune from this typical anxiety

[6] Recordings from six participants were influenced by artefacts. We excluded these participants to optimize the analyses of the HRVs (see Tarvainen et al., 2014).

response, and instead display maintained or increased r-MSSD to reflect relatively greater efficiency.

Number of trials practiced. The number of trials practiced indicated various potential confounds related to performance. For example, a participant with lower levels of capacity or confidence, higher levels of motivation or perceived task importance, may practice more trials to better prepare. In the low-pressure condition, we instructed participants to practice as many trials as they wanted to prepare for their final test and recorded the number of trials they practiced. We used this variable as a covariate in all analyses.

Procedure

With institutional approval, we promoted the study information via sending emails to university students and posting posters around the university campus. Those who decided to participate contacted us via email or phone to discuss their availability and confirm their testing sessions. The experiment took place in a quiet testing room. Participants received standard study information and provided consent. Next, we attached the Polar V800 to participants and asked them to sit still for two minutes to check if the heart rate monitor was working properly. After completing the NPI-40, participants performed the familiarization trials for the two tasks, followed by the low-pressure and high-pressure conditions. Participants completed the MRF-L immediately after the manipulations in the low and high-pressure conditions and the RMSE on completion of these conditions. We measured cardiac activity continuously during the task performance in both pressure conditions. On completion of all experimental tasks, we fully debriefed participants of the details in the experiment and the rationale behind the procedures. We also thanked all participants and paid them £5. At the end of all experimental sessions, we awarded prize money to the top three performers.

Results

Preliminary analyses

A paired *t* test revealed a significant increase in cognitive anxiety from low (M = 3.17, SD = 1.82) to high pressure condition (M = 5.09, SD = 2.33), t (116) = 9.78, $p < .001$, 95% CI [1.53, 2.21], Cohen's d = .91. Descriptive statistics and correlations between study variables are shown in Tables 2.3.1 – 2.3.4.

Main Analyses

As in Experiments 1 and 2, we generated the residualized scores for the time taken, accuracy[7], mental effort, age-adjusted heart rate, and r-MSSD (hereafter we use the variable name to refer to the residualized score). Among the residualized scores, we excluded extreme values that were three standard deviations from the variable mean because these high values of standardized residuals increase standard errors and reduce statistical power in regression analyses (Cohen, Cohen, West, & Aiken, 2003). The analytical sample in each of our analyses after excluding extreme scores met our required sample size. We controlled for age, numbers of trials practiced, NPI total score, and accuracy in all our analyses, and performed the same regression analyses described in Experiment 1 and 2. See Tables 2.3.5 – 2.3.6 for full details of regression statistics.

Performance. For the letter transformation task, none of the covariates were related to the time taken. While no main effect was significant, the interaction between adaptive and maladaptive narcissism was significant, β = -.20, ΔR^2 = .05, F (1, 109) = 5.88, p = .017, 95% CI [-.36, -.04], Cohen's f^2 = .04. Although simple slopes were non-significant, adaptive narcissism predicted reduced time taken, reflecting better performance, when maladaptive narcissism was high (β = -.34, p = .133, 95% CI [-79, .11]) rather than low (β = .06, p = .807, 95% CI [-.42, .54]). Figure 2.2 (top) displays the nature of the interaction.

[7] We standardized accuracy under high-stress condition in the Stroop task rather than residualized it because every participant achieved 100% accuracy when performing the Stroop task in the low-pressure condition. This reflects that the demand of the colour-word Stroop task may be relatively low to the experiment participants.

For the Stroop task, none of the effects of the covariates were significant. Despite non-significant main effects, the interaction between adaptive and maladaptive narcissism was evident, β = -.14, ΔR^2 = .04, F (1, 105) = 4.14, p = .044, 95% CI [-.28, -.01], Cohen's f^2 = .03. Simple slopes were again non-significant, yet adaptive narcissism was associated with reduced time taken when maladaptive narcissism was high (β = -.15, p = .426, 95% CI [-.53, .22]) but increased time taken when maladaptive narcissism was low (β = .13, p = .614, 95% CI [-.28, .53]). Figure 2.2 (middle) displays the nature of the interaction.

Effort. No main or interaction effect was significant for self-report mental effort. However, number of trials practiced was related to mental effort in the letter transformation (β = -.18, p = .072, 95% CI [-.38, .01]) and the Stroop task (β = -.22, p = .050, 95% CI [-.44, .00]). No covariates, main or interaction effects emerged when examining age-adjusted heart rate during the letter transformation and the Stroop task.

Efficiency. For the letter transformation, accuracy (β = .15, p = .060, 95% CI [-.01, .31]) and NPI total score (β = .72, p = .048, 95% CI [.01, 1.43]) were associated with r-MSSD. Of more interest, adaptive (β = -.46, p = .023, 95% CI [-.86, -.07]) and maladaptive narcissism (β = -.50, p = .055, 95% CI [-1.00, .01]) and their interaction, β = .20, ΔR^2 = .05, F (1, 99) = 5.25, p = .024, 95% CI [.02, .35], Cohen's f^2 = .04, were also related to r-MSSD. Adaptive narcissism was not associated with r-MSSD when maladaptive narcissism was high (β = -.29, p = .170, 95% CI [-.70, .12]) but predicted reduced r-MSSD, reflecting an anxiety-induced reduction in efficiency (i.e., the typical anxiety response) when maladaptive narcissism was low (β = -.65, p = .005, 95% CI [-1.09, -.20]). Figure 2.2 (bottom) displays the nature of the interaction.

For the Stroop task, NPI scores (β = .69, p = .08, 95% CI [-.07, 1.45]) and the interaction between adaptive and maladaptive narcissism approached significance, β = .14, ΔR^2 = .03, F (1, 98) = 2.89, p = .08, 95% CI [-.02, .29], Cohen's f^2 = .02. Adaptive narcissism

was related to reduced r-MSSD when maladaptive narcissism was low (β = -.46, p = .06, 95% CI [-.95, .02]) but not when it was high (β = -.20, p = .40, 95% CI [-.65, .26]).

Discussion

Consistent with Experiments 1 and 2, in Experiment 3 adaptive narcissism was only associated with improved performance under pressure when maladaptive narcissism was high. In accord with Experiment 2, the effort data failed to support the *trying harder* hypothesis. The r-MSSD data from the letter transformation task provide further support for the trying smarter hypothesis as adaptive narcissism protected processing efficiency and predicted improved performance only when maladaptive narcissism was high. Although the r-MSSD data from the Stroop task was non-significant, it was in the same pattern as demonstrated in the letter transformation task. The close-to-significant effect may be due to the short recording length during the Stroop task especially under the low-pressure condition (M second = 60.40, SD = 41.24), which reduces the reliability of the measure (Mulder, 1992). Overall, these results support the *trying smarter* position over the *trying harder* one.

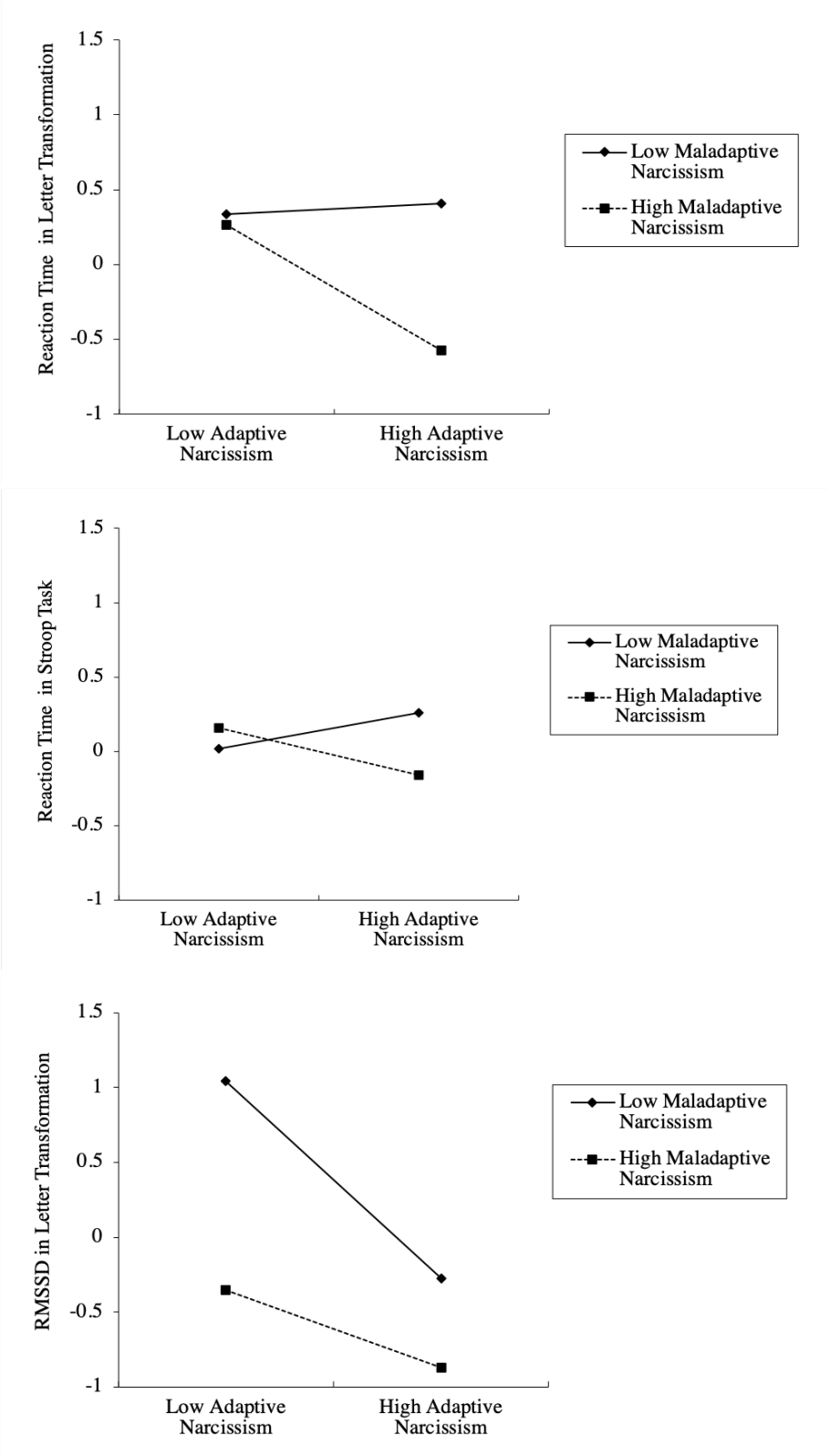

Figure 2.2. Interaction between adaptive and maladaptive narcissism on time taken in the letter transformation (top) and the Stroop task (middle) and the r-MSSD during the letter transformation (bottom). Regression slopes were derived from one standard deviation below the mean (low) or one standard deviation above the mean (high). Outcome variable was residuals regressing high pressure on low pressure conditions. All variables were standardized scores.

Table 2.3.1

*Descriptive statistics and correlations between study variables in the letter transformation task under low pressure condition (*n = *117)*

Measure	1	2	3	4	5	6	7	8	9	10	11
(1) Age	_	.01	.04	-.03	-.06	.09	-.05	-.16	.23*	.02	-.13
(2) NPI-40		_	.82**	.87**	-.16	.15	-.17	-.13	.26**	.09	-.18
(3) AN-14			_	.52**	-.17	.19*	-.13	-.16	.23*	.06	-.19
(4) MN-18				_	-.08	.08	-.08	-.09	.28**	.08	-.16
(5) Anxiety					_	.15	.07	-.02	-.04	.26	-.01
(6) Mental Effort						_	.11	-.10	.05	.03	.02
(7) AgHR (n =111)							_	-.52**	.03	.16	-.01
(8) r-MSSD (n=111)								_	-.01	.03	-.06
(9) TNTP									_	.25**	-.16
(10) Time Taken										_	-.38*
(11) Accuracy											_
Mean	23.57	15.84	6.32	5.97	3.17	116.01	39.22	43.04	32.91	7.13	.79
SD	4.04	7.79	3.44	3.91	1.81	26.31	5.61	19.57	24.41	3.06	.19

Note. NPI-40 = 40-item Narcissistic Personality Inventory (range: 0-40); AN-14 = Adaptive Narcissism (range: 0-14); MN-18 = Maladaptive Narcissism (range: 0-18); AgHR = Age-adjusted percentage of maximum heart rate (in %); r-MSSD = Root mean square of the successive differences of the normal to normal R-R intervals (in millisecond); TNTP = Total number of trials practiced.

* $p < .05$; ** $p < .01$

Table 2.3.2

*Descriptive statistics and correlations between study variables in the letter transformation task under high pressure condition (*n = *117)*

Measure	1	2	3	4	5	6	7	8	9	10
(1) Age	_	.01	.04	-.03	-.17	.06	.04	-.14	.01	-.14
(2) NPI-40		_	.82**	.87**	.12	.12	-.18	-.03	-.14	-.07
(3) AN-14			_	.52**	-.01	.13	-.12	-.11	-.13	-.09
(4) MN-18				_	.19*	.10	-.11	-.02	-.14	-.05
(5) Anxiety					_	.07	.04	-.04	.09	-.02
(6) Mental Effort						_	.05	-.07	-.01	.01
(7) AgHR (n =111)							_	-.54**	.16	.09
(8) r-MSSD (n=111)								_	.08	-.09
(9) Time Taken									_	-.17
(10) Accuracy										_
Mean	23.57	15.84	6.32	5.97	5.09	129.52	39.97	43.11	6.28	.83
SD	4.04	7.79	3.44	3.91	2.33	20.30	6.01	21.70	2.24	.16

Note. NPI-40 = 40-item Narcissistic Personality Inventory (range: 0-40); AN-14 = Adaptive Narcissism (range: 0-14); MN-18 = Maladaptive Narcissism (range: 0-18); AgHR = Age-adjusted percentage of maximum heart rate (in %); r-MSSD = Root mean square of the successive differences of the normal to normal R-R intervals (in millisecond).

* $p < .05$; ** $p < .01$

Table 2.3.3

*Descriptive statistics and correlations between study variables in the Stroop task under low pressure condition (*n = *117)*

Measure	1	2	3	4	5	6	7	8	9	10	11
(1) Age	_	.01	.04	-.03	-.06	.08	.09	-.18	.11	.16	_
(2) NPI-40		_	.82**	.87**	-.16	.15	-.13	-.09	.10	.08	_
(3) AN-14			_	.52**	-.17	.19*	-.07	-.14	.04	.08	_
(4) MN-18				_	-.08	.08	-.10	-.05	.18*	.09	_
(5) Anxiety					_	.15	.06	-.05	-.04	.02	_
(6) Mental Effort						_	.09	-.09	-.18	.09	_
(7) AgHR (n =111)							_	-.56**	-.08	.05	_
(8) r-MSSD (n=111)								_	.06	.06	_
(9) TNTP									_	-.04	_
(10) Time Taken										-	-
(11) Accuracy											-
Mean	23.57	15.84	6.32	5.97	3.17	116.01	39.92	42.26	69.73	.89	1.00
SD	4.04	7.79	3.44	3.91	1.81	26.31	6.51	19.59	57.73	.27	0.00

Note. NPI-40 = 40-item Narcissistic Personality Inventory (range: 0-40); AN-14 = Adaptive Narcissism (range: 0-14); MN-18 = Maladaptive Narcissism (range: 0-18); AgHR = Age-adjusted percentage of maximum heart rate (in %); r-MSSD = Root mean square of the successive differences of the normal to normal R-R intervals (in millisecond); TNTP = Total number of trials practiced.

* $p < .05$; ** $p < .01$

Table 2.3.4

*Descriptive statistics and correlations between study variables in the Stroop task under high pressure condition (*n = *117)*

Measure	1	2	3	4	5	6	7	8	9	10
(1) Age	_	.01	.04	-.03	-.17	.06	.17	-.13	.12	.05
(2) NPI-40		_	.82**	.87**	.12	.12	-.25*	.06	.08	.07
(3) AN-14			_	.52**	-.01	.13	-.15	.02	-.08	.15
(4) MN-18				_	.19*	.10	-.19*	.03	-.14	.03
(5) Anxiety					_	.07	.09	-.10	-.12	-.01
(6) Mental Effort						_	.04	-.06	-.07	-.13
(7) AgHR (n =111)							_	-.41**	.11	.06
(8) r-MSSD (n=111)								_	.15	-.01
(9) Time Take									_	.07
(10) Accuracy										_
Mean	23.57	15.84	6.32	5.97	5.09	129.52	40.21	39.56	.80	.95
SD	4.04	7.79	3.44	3.91	2.33	20.31	7.76	19.42	.18	.11

Note. NPI-40 = 40-item Narcissistic Personality Inventory; AN-14 = Adaptive Narcissism (range: 0-14); MN-18 = Maladaptive Narcissism (range: 0-18); AgHR = Age-adjusted percentage of maximum heart rate (in %); r-MSSD = Root mean square of the successive differences of the normal to normal R-R intervals (in millisecond).

* $p < .05$; ** $p < .01$

Table 2.3.5

Regression statistics in the letter transformation task in Experiment 3

Average time taken *(n = 117)*					
	B	*SE*	*t*	*p*	95% CI
Constant	.10	.09	1.07	.285	[-.08, .29]
AN-14	-.14	.22	-.64	.522	[-.57, .29]
MN-18	-.18	.27	.69	.492	[-.71, .35]
AN x MN	-.20	.08	-2.43	.017	[-.36, -.04]
Age	-.01	.09	-.13	.896	[-.19, .16]
NPI-40	.10	.38	.24	.813	[-.67, .85]
TNTP	.03	.10	.28	.782	[-.17, .22]
Accuracy	-.15	.09	-1.65	.101	[-.33, .03]
Mental effort *(n = 116)*					
	B	*SE*	*t*	*p*	95% CI
Constant	-.08	.10	-.86	.393	[-.28, .11]
AN-14	.04	.22	.16	.873	[-.40, .47]
MN-18	.29	.27	1.09	.279	[-.24, .83]
AN x MN	.10	.08	1.18	.240	[-.07, .26]
Age	.06	.09	.67	.502	[-.12, .24]
NPI-40	-.26	.39	-.68	.497	[-1.03, .50]
TNTP	-.18	.10	-1.82	.072	[-.38, .02]
Accuracy	-.04	.09	-.40	.689	[-.22, .14]
Age-adjusted heart rate *(n = 111)*					
	B	*SE*	*t*	*p*	95% CI
Constant	.04	.10	.34	.733	[-.17, .24]
AN-14	.12	.24	.52	.607	[-.35, .60]
MN-18	-.03	.29	-.11	.913	[-.60, .54]
AN x MN	-.07	.09	-.78	.436	[-.24, .10]
Age	.18	.09	1.93	.056	[-.01, .36]
NPI-40	-.16	.42	-.38	.708	[-.98, .67]
TNTP	.18	.10	1.69	.093	[-.03, .38]
Accuracy	-.08	.10	-.83	.407	[-.27, .11]

Table 2.3.5 (continued)

Regression statistics in the letter transformation task in Experiment 3

r-MSSD *(n = 107)*					
	B	*SE*	*t*	*p*	95% CI
Constant	-.11	.09	-1.24	.216	[-.29, .07]
AN-14	-.46	.20	-2.32	.023	[-.86, -.07]
MN-18	-.50	.26	-1.94	.055	[-1.00, .01]
AN x MN	.19	.08	2.29	.024	[.02, .35]
Age	-.02	.08	-.30	.765	[-.18, .13]
NPI-40	.72	.36	2.01	.048	[.01, 1.43]
TNTP	.01	.09	.05	.959	[-.18, .19]
Accuracy	.15	.08	1.90	.060	[-.01, .31]

Note. SE = Standard Errors; CI = Confidence Interval; AN-14 = 14-item Adaptive Narcissism; MN-18 = 18-item Maladaptive Narcissism; AN x MN = Interaction between adaptive and maladaptive narcissism; NPI-40 = 40-item Narcissistic Personality Inventory; r-MSSD = Root mean square of the successive differences of the normal to normal R-R intervals (in millisecond); TNTP = Total number of trials practiced. All dependent variables were residuals regressing high-pressure condition on low-pressure condition. For residualized variables, extreme values over three standard deviation above or below the mean were dropped to reduce standard error and improve statistical power (Cohen et al., 2003). All variables were standardized.

Table 2.3.6

Regression statistics in the Stroop task in Experiment 3

Average time taken *(n = 113)*					
	B	*SE*	*t*	*p*	95% CI
Constant	.06	.08	.76	.448	[-.10, .22]
AN-14	-.02	.19	-.09	.931	[-.38, .35]
MN-18	-.02	.22	-.11	.913	[-.46, .41]
AN x MN	-.14	.07	-2.04	.044	[-.28, -.01]
Age	.13	.08	1.66	.100	[-.02, .28]
NPI-40	-.04	.32	-.13	.895	[-.69, .60]
TNTP	-.02	.10	-.19	.849	[-.21, .18]
Accuracy	.06	.07	.79	.430	[-.08, .21]
Mental effort *(n = 114)*					
	B	*SE*	*t*	*p*	95% CI
Constant	-.10	.09	-1.07	.286	[-.29, .09]
AN-14	.05	.21	.23	.816	[-.37, .47]
MN-18	.28	.25	1.09	.275	[-.22, .78]
AN x MN	.12	.08	1.57	.120	[-.03, .28]
Age	.05	.09	.52	.606	[-.13, .22]
NPI-40	-.29	.37	-.80	.428	[-1.03, .44]
TNTP	-.22	.11	-1.98	.050	[-.44, .00]
Accuracy	-.22	.09	-2.53	.13	[-.39, -.05]
Age-adjusted heart rate *(n = 109)*					
	B	*SE*	*t*	*p*	95% CI
Constant	.03	.11	.31	.754	[-.18, .24]
AN-14	.39	.25	1.57	.119	[-.10, .88]
MN-18	.39	.29	1.36	.177	[-.18, .95]
AN x MN	-.04	.09	-.47	.637	[-.22, .13]
Age	.17	.10	1.69	.094	[-.03, .36]
NPI-40	-.84	.43	-1.98	.050	[-1.68, .00]
TNTP	.05	.13	.38	.703	[-.21, .30]
Accuracy	.01	.11	-.06	.951	[-.22, .21]

Table 2.3.6 (continued)

Regression statistics in the Stroop task in Experiment 3

r-MSSD *(n = 106)*					
	B	*SE*	*t*	*p*	95% CI
Constant	-.12	.10	-1.22	.23	[-.31, .07]
AN-14	-.33	.22	-1.46	.15	[-.77, .12]
MN-18	-.45	.26	-1.75	.08	[-.96, .06]
AN x MN	.14	.08	1.70	.09	[-.02, .29]
Age	-.01	.09	-.07	.942	[-.18, .17]
NPI-40	.69	.38	1.80	.076	[-.07, 1.45]
TNTP	-.06	.11	-.51	.614	[-.28, .17]
Accuracy	.07	.10	-.70	.487	[-.26, .12]

Note. SE = Standard Errors; CI = Confidence Interval; AN-14 = 14-item Adaptive Narcissism; MN-18 = 18-item Maladaptive Narcissism; AN x MN = Interaction between adaptive and maladaptive narcissism; NPI-40 = 40-item Narcissistic Personality Inventory; r-MSSD = Root mean square of the successive differences of the normal to normal R-R intervals (in millisecond); TNTP = Total number of trials practiced. All dependent variables were residuals regressing high-pressure condition on low-pressure condition. For residualized variables, extreme values over three standard deviation above or below the mean were dropped to reduce standard error and improve statistical power (Cohen et al., 2003). All variables were standardized

General discussion

Although global grandiose narcissism as measured by the NPI total score has been the main focus of the narcissism-performance literature, the performance effects of its so-called adaptive and maladaptive components have yet to be explored. Across two motor tasks and two cognitive tasks, we provide the first evidence that adaptive and maladaptive narcissism interactively contribute to performance under pressure. Adaptive narcissism was beneficial to performance under pressure only in the presence of maladaptive narcissism. Importantly, the effects we demonstrated were not artefacts of the NPI global score.

Besides demonstrating clear performance effects, in Experiments 2 and 3 we also investigated why the precise combination of adaptive and maladaptive narcissism might contribute to better performance under pressure. We examined both the *trying harder* and the *trying smarter* positions as suggested by the literature (see Roberts, Woodman, et al., 2018). In the golf-putting and the letter transformation tasks, results consistently demonstrated that adaptive narcissism was unrelated to effort regardless of the levels of maladaptive narcissism; however adaptive narcissism predicted better efficiency and performance when maladaptive narcissism was high rather than low. These findings support the *trying smarter* proposition over the *trying harder* viewpoint, suggesting that adaptive narcissism in the presence of maladaptive narcissism is beneficial to the performance under pressure because of the efficient task processing.

While evidence for the *trying harder* hypothesis has emerged in the existing narcissism-performance literature, our data add new insights to support the *trying smarter* hypothesis. Roberts, Cooke, et al. (2018) demonstrated that effort during a dart-throwing and a muscular endurance task mediated the narcissism-performance relationship. Three reasons may explain the different findings in our and Roberts, Cooke, et al.'s work. First, while Roberts, Cooke, et al. (2018) focused on grandiose narcissism as indicated by NPI total score,

we focused on the interaction between adaptive and maladaptive aspects of grandiose narcissism. Since a high NPI score may reflect high levels of either or both adaptive and maladaptive narcissism, any effect observed in NPI total score is not equivalent to the effect of the precise combination of high adaptive and high maladaptive narcissism. Second, compared to Roberts, Cooke, et al.'s tasks that used novice players (i.e., in dart throwing) and imposed high levels of physical demand (i.e., the muscular endurance task), our tasks involved participants with higher levels of task-related expertise (i.e., recreational basketball players and skilled golfers) and imposed mental rather than physical demand (i.e., the letter transformation and the Stroop task). Since skilled compared to novice performance requires less mental control (Masters & Maxwell, 2008), and cognitive compared to muscular endurance tasks are less physically demanding, it is no surprise that effort quantity may play a less critical role in our tasks compared to Roberts, Cooke, et al.'s (2018) tasks. Finally, the level of pressure matters. Roberts, Cooke, et al (2018) used performance climate to manipulate experimental conditions, but performance climate does not necessarily create high pressure. Conversely, our tasks combined a range of stimuli making our participants pressurized during task performance. Additional effort is less likely to compensate for performance as performance pressure increases (Eysenck & Calvo, 1992; Eysenck et al., 2007). As such, it is possible that *trying harder* could help achieve desired performance under relatively low levels of pressure and that *trying smarter* could optimize the performance when pressure is high. Such a position is worthy of consideration in the future.

Several issues warrant attention. First, although the trying harder and the trying smarter positions we tested rest on the Processing Efficiency Theory (Eysenck & Calvo, 1992) and the Attentional Control Theory (Eysenck et al., 2007), competing theories such as the Theory of Reinvestment (Masters & Maxwell, 2008) also provide important insights. The Theory of Reinvestment states that pressurized performers tend to reinvest attention to task

processing through the use of explicit task-relevant knowledge (Masters, 1992) or the step-by-step monitoring (Beilock & Carr, 2001) to avoid undesired performance. However, such reinvestment will regress effortless skilled performance to a novice level that breaks down automaticity and requires effortful control, which results in performance failure (Masters & Maxwell, 2008). From a reinvestment perspective, since individuals high in narcissism are confident in their ability and seek to approach rather than to avoid performance settings (Zhang et al., 2018), they likely see themselves as so capable as to have no need for reinvestment to ensure good performance. Therefore, high levels of narcissism are likely to protect against the reinvestment effects that commonly occur when performing in high-pressure environments. Our data support this position, especially that adaptive narcissism in the presence of maladaptive narcissism predicted reduced pre-putting time in golf-putting, which reflects automated task execution and lower levels of reinvestment (see also Lam et al., 2010). This position clearly warrants further research attention.

Also, it is noteworthy that our conceptualization and discussion on narcissism and performance in the current research is only relevant to the grandiose and agentic form of narcissism. However, narcissism contains two facets, termed *grandiose* and *vulnerable* (Miller et al., 2011). It can also emerge in a communal rather than an agentic form (Gebauer et al., 2012). These different forms of narcissism also likely play different roles in performing under pressure. For example, vulnerable narcissism reflects hypersensitivity and hypervigilance for criticism and failures (Miller et al., 2011). Therefore, vulnerable narcissism may be related to increased punishment sensitivity and contribute to an early detection of threats which in turn could benefit performance under pressure (Manley, Beattie, Roberts, Lawrence, & Hardy, 2017). Moreover, communal narcissists behave less communally especially when their need for power is validated (Giacomin & Jordan, 2015). Consequently, leaders high in communal narcissism may contribute to increased group

conflicts and thus cause poorer team performance. Future research would do well to consider the role of different forms of narcissism in performance settings.

Finally, despite not considered previously, engaging in performance environments may offer prolonged benefits for individuals high in narcissism. Indeed, narcissists have exceptional needs for self-enhancement and ego-protection (Alicke & Sedikides, 2009), which are believed to contribute to their increased risk of anti-social behaviours such as aggression and violence (see Lambe, Hamilton-Giachritsis, Garner, & Walker, 2018). Since performance environments provide alternative sources for obtaining self-enhancement (Wallace & Baumeister, 2002) and eliminating ego threats (Nevicka et al., 2016), it is possible that individuals high in narcissism could glean benefits from the performance settings and transfer these benefits to mitigate their maladjustments in the social contexts (see also Hardy et al., 2017). Future research should consider examining the post-performance effects of narcissism, providing insights on whether and how the performance settings might provide social-behavioural benefits to individuals with high levels of narcissism.

Conclusions

The current research demonstrated that adaptive narcissism (reflecting assurance and over confidence) was related to better performance under pressure only when maladaptive narcissism (reflecting a strong willingness to dominate) was high. Maladaptive narcissism, therefore, may well be super adaptive in pressurized performance environments. Findings also support that the precise combination of high adaptive and maladaptive narcissism contributes to the efficient use of processing resources so that individuals high in both components of narcissism perform well under pressure because they try smarter rather than simply try harder. These effects are independent of NPI total scores and the performers' levels of expertise. Future research would do well to examine different forms of narcissism in the performance settings and examine the post-performance effects of narcissism.

CHAPTER 3: MALADAPTIVE NARCISSISM AND PERFORMANCE STRATEGIES PROTECT AGAINST THE POTENTIAL ADVERSE EFFECTS OF ADAPTIVE NARCISSISM ON ATHLETE TRAINING

Abstract

Literature suggests that grandiose narcissism may be debilitative to athlete training because the opportunity for self-enhancement that motivates grandiose narcissists to strive for their best is not normally present in training environments. However, this view is rather simplistic as it ignores the potentially differential effects of the so-called adaptive and maladaptive components of grandiose narcissism. In addition, practical strategies that might protect against the possible adverse effects of narcissism on athlete training have yet to be explored. In the present research, we explored interactions between adaptive and maladaptive components of narcissism and performance strategies (specifically goal-setting and imagery), on athlete quality of training. A sample of 175 athletes from different levels and sports in the UK completed measures of narcissism and performance strategy use, and coaches of the athletes completed a measure of athlete training behaviour (assessing distractibility, quality of preparation, and coping with adversity). We demonstrated consistent three-way interactions between narcissism components and each performance strategy on training behaviours. Specifically, when athlete use of goal-setting was low, adaptive narcissism contributed to increased distractibility and poorer quality of preparation when maladaptive narcissism was low but not high. However, when athlete use of goal-setting was high, adaptive narcissism was not associated with impaired training regardless of the level of maladaptive narcissism. We also obtained identical interaction effects when considering imagery. The findings suggest that maladaptive narcissism and performance strategies of goal-setting and imagery protect against the potential adverse effects of adaptive narcissism on athlete training. At a broader level the work underscores the importance of considering grandiose narcissism beyond a simple uni-dimensional construct.

Maladaptive narcissism and performance strategies protect against the potential adverse effects of adaptive narcissism on athlete training

High-quality training is essential to achieve peak performance (Hardy et al., 1996). Research has examined factors that might influence the quality of training, with several studies showing that individual differences in personality have an impact on how well an athlete trains. For example, several studies (Hardy et al., 2017; Woodman, Zourbanos, Hardy, Beattie, & McQuillan, 2010) have shown conscientiousness to positively contribute to athlete training and development. In contrast to such positive effects, certain personality traits appear to influence athlete training negatively. For example, Woodman et al., (2010) and Zhang, Beattie, Pitkethly, and Dempsey (2019) found that athlete extraversion and neuroticism contributed to increased distractibility and impaired coping with adversity in training respectively. However, much is still to be understood about the role of personality in relation to athlete training, especially in relation to which traits might be likely to influence the quality of an athlete's training. One personality trait that has particular relevance in the realm of sport performance and athlete training, but has yet to be examined in detail in this contexts, is grandiose narcissism (Roberts & Woodman, 2015; Roberts, Woodman, & Sedikides, 2018).

Grandiose narcissism

Grandiose narcissism is a non-clinical personality trait encompassing a self-centred, self-aggrandizing, entitled, dominant, and manipulative interpersonal orientation (Morf, Horvath, & Torchetti, 2011). Indeed, narcissists believe they are superior to others (Gabriel et al., 1994) and are high in confidence even when facing failures (Campbell et al., 2004). Despite such an inflated self-view, narcissists normally do not perform any better or worse than their non-narcissistic counterparts (e.g., Ames & Kammrath, 2004; Robins & John, 1997). An exception to this rule occurs when perceived opportunities for self-enhancement or

personal glory are present (Wallace & Baumeister, 2002a). Wallace and Baumeister (2002) demonstrated that the performance of grandiose narcissists rises and falls with the level of self-enhancement opportunity on offer in a particular situation. In a series of studies, these researchers found that an increase in grandiose narcissism was associated with decreased performance when the opportunity for glory was absent but was related to improved performance when such opportunity was present (e.g., performing difficult tasks, performing tasks under time constraints and under performance pressure). These effects have been replicated and extended in field (e.g., Geukes, Mesagno, Hanrahan, & Kellmann, 2012) and laboratory settings (e.g., Woodman, Roberts, Hardy, Callow, & Rogers, 2011) within the sporting domain. Thus, it is clear that individuals high in narcissism are great when opportunity for glory is present, but lousy when such opportunities are absent.

In athletic training, the opportunity for self-enhancement or personal glory is relatively less present. Indeed, training environments are relatively tiring and tedious – often thousands of hours of deliberate practice is required to build up expertise, but such tough experience does not guarantee sporting success (Rees et al., 2016). Considering the context-specific nature of narcissists' performance, one would expect that, all things being equal, narcissistic athletes may not strive in training because they can hardly foresee any glory afforded by the training environments (Roberts & Woodman, 2015; Roberts, Woodman, et al., 2018).

Adaptive/maladaptive components of grandiose narcissism

Although the potential negative effects of grandiose narcissism on training appear reasonable, such a position is likely too simplistic. One limitation of this position is that the conceptualization of grandiose narcissism offered so far only considers the trait at a global level, without recourse to consider its so-called *adaptive* and *maladaptive* components. Such a distinction between the different components of grandiose narcissism is important, as these

different components may exert different effects on training. Specifically, *adaptive* narcissism, reflected by the sense of authority and self-sufficiency in the Narcissistic Personality Inventory (NPI; Raskin & Hall, 1979), is associated with more socially desirable qualities such as high levels of confidence and self-awareness (Emmons, 1984; Raskin & Terry, 1988). On the contrary, *maladaptive* narcissism, reflected by exhibitionism, entitlement, and exploitativeness in the NPI is associated with less desirable qualities such as a dominating orientation (Washburn, McMahon, King, Reinecke, & Silver, 2004). Supporting the adaptive/maladaptive distinction, Barry and colleagues (Barry, Chaplin, & Grafeman, 2006; Barry, Frick, Adler, & Grafeman, 2007; Barry, Frick, & Killian, 2003; Barry & Malkin, 2010) have consistently demonstrated that maladaptive narcissism is associated with conduct problems, prolonged delinquency, as well as peer problems, but adaptive narcissism is not.

Certainly, adaptive and maladaptive narcissism may play different roles in regard to the quality of training. Adaptive narcissism reflects an overly inflated-self (e.g., Ames & Kammrath, 2004) thus maybe debilitative rather than facilitative to athlete training. Indeed, athletes with high levels of adaptive narcissism might not be fully engaged in training because they are overconfident regarding their abilities, and thus feel no need for hard work. In other words, athletes high in adaptive narcissism may be particularly keen on self-dreaming – fantasising without the need to consider the behavioural reality. Different from adaptive narcissism, maladaptive narcissism reflects a willingness to dominate and a desire for personal control (Raskin & Terry, 1988; Washburn et al., 2004). These characteristics may be particularly beneficial to athletic training. Specifically, athletes with high levels of maladaptive narcissism might engage better in training because they want to dominate others during competition, and realise that training is a worthwhile means to aid this likely increased dominance, control, and likely forthcoming glory.

Since grandiose narcissism can reflect either high levels of adaptive or maladaptive narcissism or indeed both, it is important to consider the different roles of adaptive and maladaptive narcissism interactively in order to gain the full picture of how grandiose narcissism influences athlete training. While adaptive narcissism may adversely influence athlete training, maladaptive narcissism may well moderate such a negative relationship. To expand, when maladaptive narcissism is at low levels, reflecting a lack of willingness to dominate and control situations, adaptive narcissism, might have negative impacts on athlete training because the overly inflated sense of self associated with adaptive narcissism likely results in a lack of effort and motivation in training. However, when maladaptive narcissism is high, reflecting a strong willingness for dominance and personal control over situations, one would expect the negative influence of adaptive narcissism to be mitigated. Such an interaction perspective suggests that maladaptive narcissism likely protects against the potential adverse effects of adaptive narcissism on athlete training.

In addition to the need to consider narcissism from a multidimensional perspective when examining its influence on training, another issue is also relevant here. Athlete personality is difficult to change thus it is not practical, or indeed ethical, to manipulate athlete personality for the sake of optimizing athlete training. Therefore, exploring practical means to help narcissistic athletes train better is also worthy of consideration.

Performance strategies

According to Hardy et al.'s (1996) pyramid model of peak performance, athlete personality traits should interact with performance strategies or coping skills to lead to peak performance states. Relevant narcissism literature supports this supposition. For example, Roberts et al. (2010, 2013) demonstrated that individuals high in narcissism performed well in competition only when they used particular performance strategies. More specifically, imagery (especially a third-person perspective), relaxation, and self-talk appeared to be

particularly beneficial to the performance of those high in narcissism. Apart from its implication for attaining peak performance, Hardy et al.'s pyramid model also provides insights into optimizing the quality of training. Indeed, the theoretical perspective that athlete personality and use of performance strategies interactively influence training has received support. In particular, Woodman et al. (2010) found that athletes who had high levels of emotional stability improved coping with adversity as the use of emotional control skills increased, while athletes high in extraversion had higher levels of distractibility in training only when goal setting use in training was low, as opposed to high.

In relation to narcissism and training, literature suggests athletic training environments are lacking in opportunities for self-enhancement that drive narcissists to strive (Roberts & Woodman, 2015; Roberts, Woodman, et al., 2018). Consequently, performance strategies that facilitate athletes to foresee the potential glory afforded by the training environment might be beneficial to athletes high in narcissism, particularly those high in adaptive narcissism, as it is adaptive narcissism that appears most problematic in relation to athlete training. In the present research, we focused on two oft-used performance strategies, namely imagery (see Martin, Moritz, & Hall, 1999) and goal-setting (see Burton, Naylor, & Holliday, 2001) as these performance strategies have been previously linked to self-enhancement.

Literature has supported imagery as a self-enhancement strategy. Imagery involves a voluntary top-down process that allows performers to 'experience' themselves performing any tasks as they want (Holmes & Calmels, 2008). In a dart throwing and a golf task, Roberts et al. (2010) found that narcissists improved performance only when they imaged themselves performing successfully before performing the tasks. These researchers argued that imagining one's successful performance activates narcissists' self-enhancement motives as the individual is able to imagine themselves being successful. As such, imagery use may be

particularly beneficial to narcissistic athletes in training. To expand, imagery allows for the creation of images showing the individual being exceptional; thus, if used in the training environment, athlete perception of self-enhancement opportunities afforded by training environments should increase. Considering that narcissists excel when the opportunity for self-enhancement is present (Wallace & Baumeister, 2002), one would expect athletes high in narcissism train better especially when they increase imagery use in training.

Goal-setting may also provide similar opportunities for self-enhancement. Smith, Arthur, Hardy, Callow, and Williams (2013) suggested that setting goals creates an inspiring vision of the future to engage athletes to fully commit to their training. More importantly, in the context of self-enhancement, the inspiring vision of future can help athletes to foresee the opportunity for glory afforded by training environments. Since the opportunity for glory makes narcissists strive (Wallace & Baumeister, 2002), athletes high in narcissism may be more motivated when using goal-setting in training. Consequently, goal-setting likely interacts with narcissistic qualities and exerts positive effects on training.

The Current Study

It is unknown as to how grandiose narcissism may influence athlete training and what factors can moderate any influence narcissism has. Thus in the present study we focused on examining adaptive and maladaptive narcissism and performance strategy use in relation to training to provide some of the first empirical evidence in this area. Since goal-setting and imagery increase the levels of perceived self-enhancement, we predicted that these strategies would help athletes high in narcissistic qualities train better. Indeed, we extended our earlier interactionist position, to suggest a three-way interaction (adaptive × maladaptive narcissism × performance strategy) on athlete training. Specifically, when performance strategy use was low, we expected adaptive narcissism to have adverse effects on athlete training behaviours when maladaptive narcissism was low but not when it was high. However, when performance

strategies use was high, we expected the potential negative influences of adaptive narcissism on athlete training to be mitigated regardless of the levels of maladaptive narcissism.

Method

Participants

Power analysis (G*Power 3; Faul et al., 2007) indicated that we needed a minimum sample of 159 participants to have adequate power (.80) to detect a small to medium effect, i.e., Cohen's f^2 = .05, at .05 alpha level. With institutional approval, we recruited 175 athletes (*n* = 129 men, 46 women; *M* age = 21.83, *SD* = 5.16). Participants were competing in seven different sports (*n* = 2 individual sports, 5 team sports) and at a variety of levels, including university (*n* = 7 teams), premier leagues (*n* = 2 teams), and national (*n* = 3 teams). These athletes had received formal training in their respective sport for an average of 7.47 years (*SD* = 5.21). To provide informant ratings of athlete training behaviours, the head coaches of all participating teams (*n* = 9 men, 3 women; *M* age = 31.64, *SD* = 11.29) also took part in this research. They had an average of ten years coaching experience (*SD* = 7.24) and had been with those participating athletes for an average of two and half years (*SD* = 1.15). All participants provided written consent before participating.

Measures

Narcissism

We used the NPI-40 (Raskin & Hall, 1979). The NPI-40 is a 40-item forced-choice inventory that asks participants to choose between one narcissistic and one non-narcissistic statement for each item (e.g. "I will be a success" vs "I am not too concerned about success"). Following Barry et al.'s (2003) recommendation, we generated scores for *adaptive* narcissism (14 items; *M* = 6.57, *SD* = 3.09, α = .74), *maladaptive* narcissism (18 items; *M* = 5.08, *SD* = 3.22, α = .72), and *grandiose* narcissism (NPI total score; *M* = 14.58, *SD* = 6.62, α = .84).

Goal-setting and Imagery

We used the goal-setting and imagery subscales from the practice subscale of the Test of Performance Strategies 2 (TOPS-2; Hardy, Roberts, Thomas, & Murphy, 2010). The practice subscale of the TOPS-2 assesses the use of different athlete performance strategies in training contexts. The goal-setting (e.g., “I set goals to help me use practice time effectively”) and imagery items (e.g., “I rehearse my performance in my mind”) from the practice subscale of the TOPS-2 ask s to rate how frequently athletes use these strategies in the described training situations on a 5-point Likert-scale from 1 (*never*) to 5 (*always*). We generated scores for athlete use of goal-setting (M = 3.33, SD = .86, α = .83) and imagery use in training (M = 3.46, SD = .86, α = .76).

Coach-rated quality of training

We assessed athlete training using the Quality of Training Inventory (QTI, Woodman et al., 2010). The QTI assesses three core training behaviours: distractibility (e.g., "I am easily distracted by other people in training”), coping with adversity (e.g., “When my training session isn’t going well, I try to overcome the problem”), and quality of preparation (e.g., “I always have a competition plan that covers all eventualities”). The QTI asks an athlete to respond to a Likert scale from 1 *(strongly disagree*) to 9 (*strongly agree*). We used informant ratings of the training behaviours to minimise issues that are present in studies relying on single-source, self-report questionnaires such as common method variance (Chang, Van Witteloostuijn, & Eden, 2010) and socially desirable responding (Vazire, 2006). We made some minor changes to the original QTI scale to enable informant (coach) ratings to be made (See also Zhang et al., 2019). For example, we changed the original item for distractibility "I am easily distracted by other people in training" to "(Name) is easily distracted by other people in training" for coaches to rate their athletes. We generated scores for athlete distractibility (M = 4.25, SD = 1.57, α = .89), coping with adversity (M = 6.08, SD = 1.61, α = .85), and quality of preparation (M = 5.99, SD = 1.43, α = .91).

Procedure

With institutional approval, we contacted coaches or team managers from sports teams in the UK. Via the initial email, we provided detailed information about our research and invited the prospective teams to participate. We proceeded only when the coach agreed to take part in our research. Once coaches gave consent to approach their athletes, we asked the coach to arrange a post-training session for us to brief the athletes and to ask them to complete the survey. Athletes were free to decide not to participate and were encouraged to raise any questions they had before participating. After confirming voluntary participation, all participants (athletes and coaches) received a questionnaire pack containing an information sheet, written consent form, and all questionnaires to be completed. We (the researchers) were also on hand to answer any questions they raised. At the end of the session, we collected all completed questionnaire packs.

Results

Preliminary analyses

We present the descriptive statistics and zero-order correlations among study variables in Table 3.1. Correlations revealed that years of formal training was negatively associated with athlete distractibility. Narcissism total scores and maladaptive narcissism predicted greater distractibility. Goal-setting and imagery were positively related to quality of preparation.

Main analyses

We tested a three-factor interaction between athlete adaptive and maladaptive narcissism and each of our performance strategies using PROCESS Version 2 (Hayes, 2013) with 5,000 bootstraps. We entered adaptive narcissism as the focal predictor, maladaptive narcissism as the first moderator, and goal-setting/imagery as the second moderator. PROCESS Version 2 contains a cluster function for dealing with nested data while testing

moderation. Since our participating athletes were nested in different teams, the cluster function in PROCESS allowed us to control for any potential between-team effect on the within-team level. PROCESS also has a function to centre predictors around means when performing moderated regression, which reduces possible collinearity among predictors and provides a common metric to aid interpretability (see Cohen, Cohen, West, & Aiken, 2003). Further, we controlled for athlete age and training experience to remove any possible confounds on athlete training behaviours. We also controlled for NPI total scores since the interaction of adaptive and maladaptive narcissism should not be an artefact of grandiose narcissism or NPI scores. Additionally, we analysed simple slopes and plotted them at *Mean ± 1SD.* Lower and upper bound 95% confidence intervals (CI) that do not encompass zero indicate significance at the .05 level. Alpha was set at .05 for all analyses.

Distractibility

For imagery, the model accounted for 28.61% of the variance, F (21, 153) = 2.92, p < .001. While no significant covariates or main effects emerged, the 3-factor interaction was significant, β = .02, ΔR^2 = .02, F (1, 153) = 4.04, p = .046, 95% CI [.00, .05], Cohen's f^2 = .03. Specifically, the adaptive × maladaptive narcissism interaction was significant when imagery use was low (β = -.04, p = .006, 95% CI [-.07, -.01]) but not when it was high (β = .00, p = .953, 95% CI [-.03, .03]). Simple slopes showed that at low levels of imagery use, the association between adaptive narcissism and distractibility approached significance when maladaptive narcissism was low (β = .17, p = .080, 95% CI [-.02, .37]) but not high (β = -.10, p = .387, 95% CI [-.33, .13]). However, when imagery use was high, adaptive narcissism failed to predict distractibility regardless of the levels of maladaptive narcissism. Figure 3.1 (top and bottom left panels) displays the nature of the interaction.

For goal-setting, the model accounted for 30.45% of the variance, F (21, 153) = 3.19, p < .001. While no significant covariates or main effects of adaptive or maladaptive

narcissism emerged, goal-setting predicted reduced distractibility (β = -.30, p = .029, 95% CI [-.57, -.03]). Importantly, the 3-factor interaction was significant, β = .03, ΔR^2 = .04, F (1, 153) = 7.79, p = .006, 95% CI [.01, .05], Cohen's f^2 = .05. Specifically, the adaptive × maladaptive narcissism interaction was significant when goal-setting use was low (β = -.04, p = .001, 95% CI [-.07, -.02]) but not when it was high (β = .01, p = .573, 95% CI [-.02, .04]). Simple slopes showed that, when goal-setting use was low, the association between adaptive narcissism and distractibility was positive when maladaptive narcissism was low (β = .19, p = .056, 95% CI [-.01, .38]) but not high (β = -.09, p = .347, 95% CI [-.30, .11]). However, when goal-setting use was high, adaptive narcissism did not predict increased distractibility regardless of the levels of maladaptive narcissism. Figure 3.1 (top and bottom right panels) displays the nature of the interaction.

Quality of preparation

For imagery, the model accounted for 40.25% of the variance, F (21, 153) = 4.91, p < .001. No significant covariates or main effects emerged. The 3-factor interaction approached significance, β = -.02, ΔR^2 = .02, F (1, 153) = 3.89, p = .050, 95% CI [-.04, .00], Cohen's f^2 = .03. Specifically, the adaptive × maladaptive narcissism interaction was significant when imagery use was low (β = .03, p = .016, 95% CI [.02, .06]) but not when it was high (β = -.00, p = .823, 95% CI [-.03, .02]). Simple slopes showed that, when imagery use was low, the association between adaptive narcissism and quality of preparation was negative when maladaptive narcissism was low (β = -.11, p = .168, 95% CI [-.27, .05]) but not high (β = .08, p = .377, 95% CI [-.10, .27]). However, when imagery use was high, adaptive narcissism was unrelated to quality of preparation maladaptive narcissism was low or high. Figure 3.2 (top and bottom left panels) displays the nature of the interaction.

For goal-setting, the model accounted for 42.76% of the variance, F (21, 153) = 5.44, p < .001. Although no significant covariates or main effects of adaptive or maladaptive

narcissism emerged, goal-setting predicted better quality of preparation (β = .27, p = .018, 95% CI [.05, .49]). Importantly, the 3-factor interaction was significant, β = -.02, ΔR^2 = .03, F (1, 153) = 7.24, p = .008, 95% CI [-.04, -.01], Cohen's f^2 = .05. To expand, the adaptive × maladaptive narcissism interaction was significant when goal-setting use was low (β = .03, p = .009, 95% CI [.01, .05]) but not when it was high (β = -.01, p = .336, 95% CI [-.04, .01]). Simple slopes showed that, at low levels of goal-setting use, adaptive narcissism had a negative relationship with athlete quality of preparation when maladaptive narcissism was low (β = -.11, p = .158, 95% CI [-.27, .04]) but a positive relationship with athlete quality of training when maladaptive narcissism was high (β = .07, p = .380, 95% CI [-.09, .24]). However, when goal-setting use was high, adaptive narcissism was not related to quality of preparation regardless of the levels of maladaptive narcissism. Figure 3.2 (top and bottom right panels) displays the nature of the interaction.

Coping with adversity

For both goal-setting and imagery, none of the covariates were significant. No main or interactive effects were significant. Detailed regression statistics are available in Table 3.2.

Table 3.1

Descriptive statistics and zero-order correlations between study variables

Measure	1	2	3	4	5	6	7	8	9	10
(1) Age (Yrs)	_	.33**	-.08	.00	-.12	-.04	-.12	-.05	-.05	-.09
(2) Training Experience (Yrs)		_	.07	.13	.07	.01	.12	-.26**	.12	.14
(3) NPI Total			_	.78**	.83**	.08	.16*	.19*	.01	-.08
(4) Adaptive narcissism				_	.40**	.16*	.12	.10	-.03	-.01
(5) Maladaptive narcissism					_	-.04	.17*	.17*	.06	-.08
(6) Goal-setting						_	.59**	-.11	-.04	.15*
(7) Imagery							_	-.09	.04	.18*
(8) Distractibility								_	-.45**	-.57**
(9) Coping with Adversity									_	.52**
(10) Quality of Preparation										_
Mean	21.83	7.47	14.58	6.57	5.08	3.33	3.46	4.25	6.08	5.99
SD	5.16	5.21	6.62	3.09	3.22	.86	.86	1.57	1.61	1.43

Note. NPI = Narcissistic Personality Inventory (Raskin & Hall, 1979). Cronbach's alphas are presented in parentheses. The possible range is 0-40 for NPI Total, 0-14 for Adaptive narcissism, 0-18 for Maladaptive narcissism, 1-5 for Goal-setting and Imagery, and 1-9 for Distractibility, Coping with Adversity, and Quality of Preparation.

* $p < .05$; ** $p < .01$

Table 3.2

Detailed statistics for all tested regression model (n = 175)

Distractibility					
	B	*SE*	*t*	*p*	95% CI
Adaptive Narcissism (AN)	-.02	.08	-.23	.82	[-.18, .15]
Maladaptive Narcissism (MN)	.05	.10	.50	.62	[-.14, .24]
Goal-setting (GS)	**-.30**	**.14**	**-2.21**	**.03**	**[-.57, -.03]**
AN x MN	-.02	.01	-1.48	.14	[-.04, .01]
AN x GS	-.07	.04	1.21	.23	[-.03, .13]
MN x GS	.05	.04	1.21	.23	[-.03, .13]
AN x MN x GS	**.03**	**.01**	**2.79**	**.01**	**[.01, .05]**
Age	.01	.03	.18	.86	[-.06, .07]
Training Experience	-.03	.03	-1.10	.27	[-.09, .03]
NPI Total	.04	.07	.62	.54	[-.09, .17]
Distractibility					
	B	*SE*	*t*	*p*	95% CI
Adaptive Narcissism (AN)	-.03	.09	-.34	.74	[-.20,.14]
Maladaptive Narcissism (MN)	.05	.10	.49	.62	[-.14, .24]
Imagery (IM)	-.24	.15	-1.64	.10	[-.53, .05]
AN x MN	-.02	.01	-1.82	.07	[-.05, .00]
AN x IM	-.08	.04	-1.75	.08	[-.16, .01]
MN x IM	.08	.04	1.86	.06	[-.01, .17]
AN x MN x IM	**.02**	**.01**	**2.01**	**.05**	**[.00, .05]**
Age	.01	.03	.08	.94	[-.06, .07]
Training Experience	-.04	.03	-1.37	.17	[-.10, .02]
NPI Total	.04	.07	.55	.58	[-.10, .17]

Note. NPI = Narcissistic Personality Inventory (Raskin & Hall, 1979); SE = Standard Errors; CI = Confidence Interval.

Table 3.2 (continued)

Detailed statistics for all tested regression models (n = 175)

Quality of Preparation					
	B	*SE*	*t*	*p*	95% CI
Adaptive Narcissism (AN)	-.01	.07	-.02	.98	[-.14, .13]
Maladaptive Narcissism (MN)	-.05	.08	-.59	.56	[-.20, .11]
Goal-setting (GS)	**.27**	**.11**	**2.40**	**.02**	**[.05, .49]**
AN x MN	.01	.01	.83	.41	[-.01, .03]
AN x GS	.02	.03	.62	.53	[-.04, .08]
MN x GS	.04	.03	1.05	.30	[-.03, .10]
AN x MN x GS	**-.02**	**.01**	**-.269**	**.01**	**[-.04, -.01]**
Age	-.01	.03	-.18	.86	[-.06, .05]
Training Experience	.03	.03	1.07	.29	[-.02, .08]
NPI Total	.01	.05	.09	.93	[-.10, .11]
Quality of Preparation					
	B	*SE*	*t*	*p*	95% CI
Adaptive Narcissism (AN)	.00	.07	.01	.99	[-.14, .14]
Maladaptive Narcissism (MN)	-.08	.08	-1.01	.31	[-.24, .08]
Imagery (IM)	.16	.12	1.30	.19	[-.08, .40]
AN x MN	.01	.01	1.40	.16	[-.01, .03]
AN x IM	.02	.04	.48	.63	[-.05, .09]
MN x IM	-.01	.04	-.17	.86	[-.08, .07]
AN x MN x IM	**-.02**	**.01**	**-1.97**	**.05**	**[-.04, .00]**
Age	-.00	.03	-.02	.98	[-.06, .05]
Training Experience	.03	.03	1.04	.30	[-.02, .08]
NPI Total	.02	.06	.40	.69	[-.09, .13]

Note. NPI = Narcissistic Personality Inventory (Raskin & Hall, 1979); SE = Standard Errors; CI = Confidence Interval.

Table 3.2 (continued)

Detailed statistics for all tested regression models (n = 175)

Coping with Adversity					
	B	*SE*	*t*	*p*	95% CI
Adaptive Narcissism (AN)	-.07	.08	-.79	.43	[-.23, .10]
Maladaptive Narcissism (MN)	-.01	.10	-.15	.88	[-.20, .17]
Goal-setting (GS)	-.04	.14	-.30	.77	[-.31, .23]
AN x MN	-.01	.01	-.19	.85	[-.03, .02]
AN x GS	-.01	.04	-.30	.77	[-.31, .23]
MN x GS	-.03	.04	-.71	.48	[-.11, .05]
AN x MN x GS	.00	.01	.22	.83	[-.02, .02]
Age	-.01	.03	.73	.47	[-.04, .08]
Training Experience	.02	.03	.73	.47	[-.04, .08]
NPI Total	.03	.07	.47	.64	[-.10, .16]
Coping with Adversity					
	B	*SE*	*t*	*p*	95% CI
Adaptive Narcissism (AN)	-.05	.08	-.64	.52	[-.22, .11]
Maladaptive Narcissism (MN)	.01	.09	.13	.89	[-.17, .20]
Imagery (IM)	-.05	.14	-.37	.71	[-.34, .23]
AN x MN	-.00	.01	-.15	.88	[-.03, .02]
AN x IM	-.00	.04	-.06	.95	[-.09, .08]
MN x IM	-.03	.04	-.62	.53	[-.11, .06]
AN x MN x IM	-.00	.03	-.32	.75	[-.08, .06]
Age	-.01	.03	-.32	.75	[-.08, .06]
Training Experience	.03	.03	.90	.37	[-.03, .09]
NPI Total	.02	.07	.33	.74	[-.11, .15]

Note. NPI = Narcissistic Personality Inventory (Raskin & Hall, 1979); SE = Standard Errors; CI = Confidence Interval.

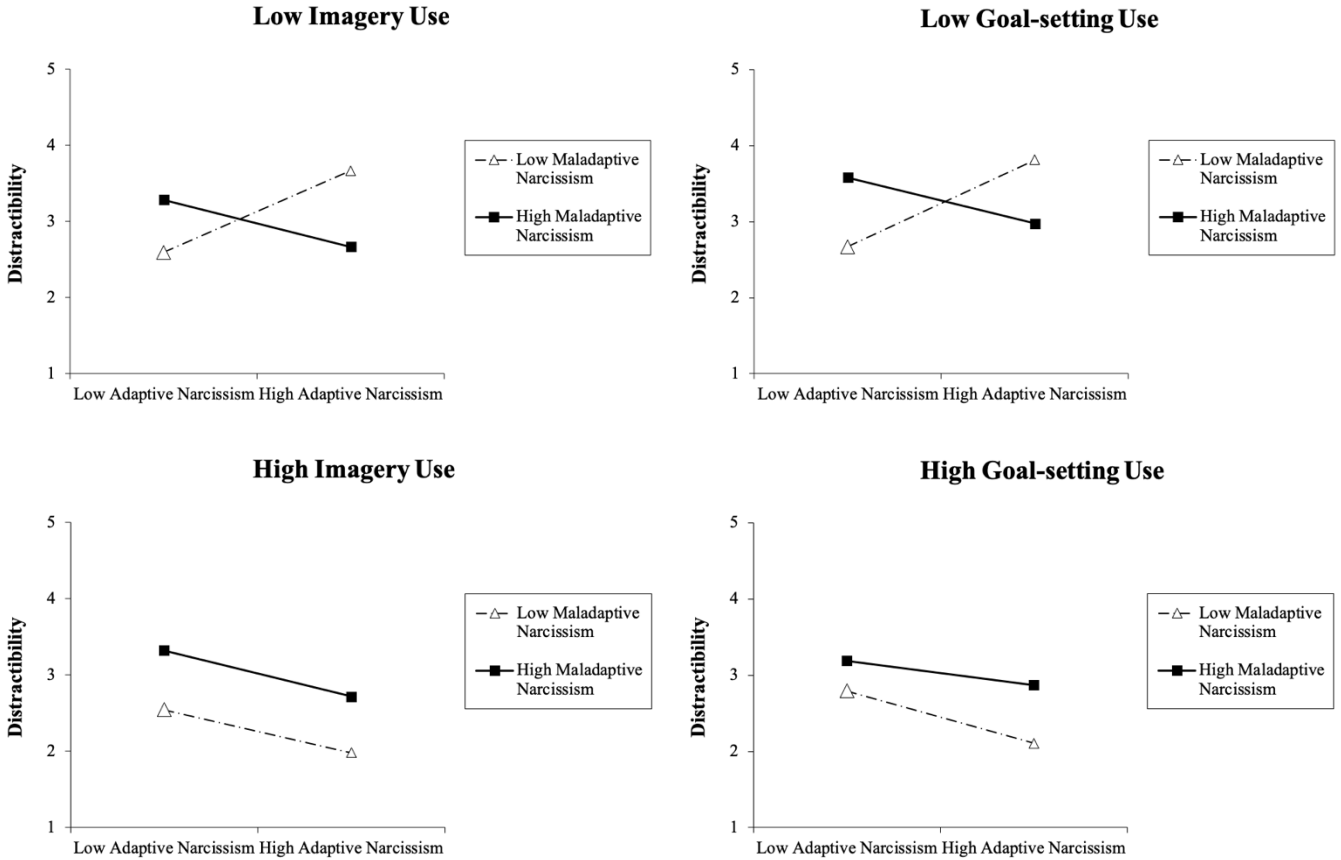

Figure 3.1. The nature of the adaptive × maladaptive narcissism × goal-setting interaction (left) and the adaptive × maladaptive narcissism × imagery interaction (right), on athlete distractibility. Regression slopes were derived from regression equations with hypothetical individuals who are one standard deviation below the mean or one standard deviation above the mean.

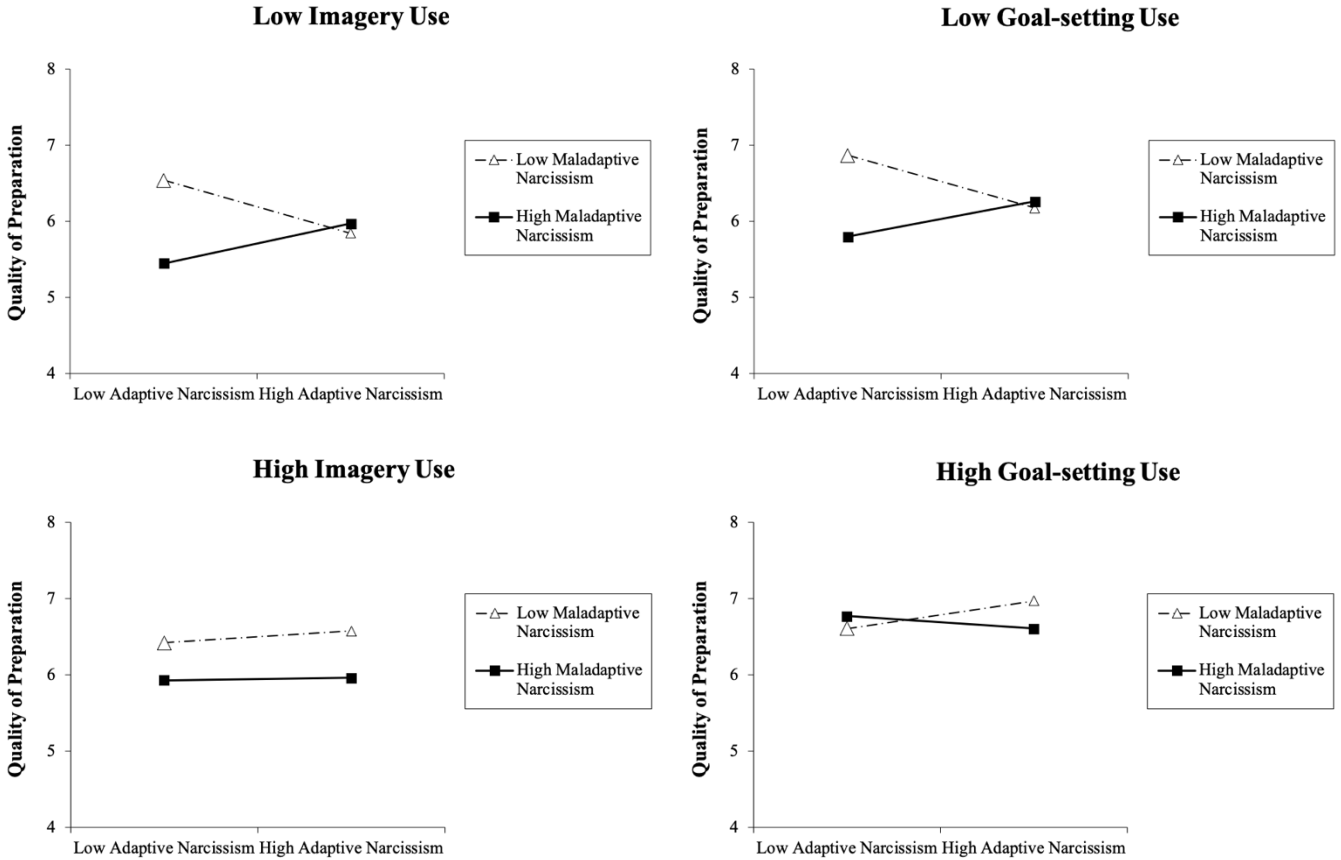

Figure 3.2. The nature of the adaptive × maladaptive narcissism × goal-setting interaction (left) and the adaptive × maladaptive narcissism × imagery interaction (right), on athlete quality of preparation. Regression slopes were derived from regression equations with hypothetical individuals who are one standard deviation below the mean or one standard deviation above the mean.

Discussion

Literature suggests grandiose narcissism may be debilitative to athlete training because the opportunity for self-enhancement that motivates narcissists to strive for their best is usually absent in training environments. However, this view fails to consider the so-called adaptive and maladaptive components of grandiose narcissism in athletic training and also ignores the potential of practical strategies to mitigate any adverse influence of narcissistic qualities on athlete training. The present research provided the first evidence that adaptive narcissism, maladaptive narcissism, and performance strategies (specifically goal-setting and imagery) interactively predict athlete quality of training. Specifically, when performance strategy use was low, adaptive narcissism contributed to increased distractibility and poorer quality of preparation when maladaptive narcissism was low, but higher levels of maladaptive narcissism offset these negative effects. However, when performance strategy use was high, adaptive narcissism was not related to impaired training behaviours regardless of the levels of maladaptive narcissism. The findings suggest that the negative influence of grandiose narcissism in athlete training is driven by its adaptive rather than maladaptive component, especially when the use of performance strategies was at relatively low levels. Overall, maladaptive narcissism and performance strategies of goal-setting and imagery protect against the adverse effects of adaptive narcissism on athlete concentration and quality of preparation.

Several implications warrant attention. First, our data provide support to the position that adaptive and maladaptive narcissism play different roles in athletic training. Indeed, literature has well-documented the distinction between adaptive and maladaptive narcissism in social and interpersonal contexts. For example, maladaptive narcissism, rather than adaptive narcissism, predicts increased conduct problems (Barry et al., 2003), prolonged delinquency (Barry et al., 2007), as well as internalizing symptoms and severe peer problems

(Barry & Malkin, 2010). Compared to evidence from social and interpersonal contexts, our data demonstrate a different pattern in relation to athlete training; adaptive narcissism seems to undermine the quality of training, but maladaptive narcissism seems to benefit athlete training, at least in the absence of performance strategy use. Typically, results showed that adaptive narcissism contributed to increased distractibility and poorer quality of preparation especially when maladaptive narcissism was low and each of our performance strategies was less frequently used. The results also demonstrated that, when the use of performance strategy was low, maladaptive narcissism modified the negative relationship between adaptive narcissism and the quality of training. At the very least, the findings reveal that in sporting environments adaptive narcissism is not as 'adaptive' as it might be in other life domains, and that maladaptive narcissism may be more 'adaptive' than its first impression.

Second, imagery and goal-setting seem to be useful self-enhancement strategies in athlete training. Our data suggest that athletes high in adaptive narcissism but low in maladaptive narcissism are less distractible and prepare better when they use goal-setting or imagery. Indeed, the performance of narcissists rises and falls with perceived opportunity for self-enhancement (Wallace & Baumeister, 2002). Thus, our findings are of considerable importance for practical purposes. Particularly, it is difficult to make narcissists strive during training because training environments offer minimal opportunity to satisfy narcissists' need for self-enhancement (Roberts et al., 2018). However, via committing to goal-setting and imaging oneself performing successfully, athletes high in narcissism may better foresee the opportunity for glory afforded by training environments because the use of these strategies likely activate narcissists' self-enhancement motives. Consequently, one would expect narcissistic athletes to train better via engaging with imagery and goal-setting.

Nevertheless, while demonstrating unique benefits to help narcissistic athletes (especially those high in adaptive narcissism) reduce distractibility and improve quality of

preparation, goal-setting and imagery failed to demonstrate any effects on athlete coping with adversity in our data. Narcissists are overly confident so rarely have concern about any adversity they may come across (Campbell, Rudich, & Sedikides, 2002; Morf et al., 2011). Consequently, the use of these strategies may be less beneficial for narcissistic athletes to overcome tough situations. Alternatively, the lack of effects on coping with adversity may be related to the way imagery and goal setting are measured on the TOPS-2. The TOPS-2 fails to distinguish between different types of goal (such as the outcome, performance, process distinction) or imagery (e.g., cognitive and motivational imagery types). It is likely that only specific aspects of goal-setting or imagery are related to coping. For example, it has been suggested that process or task-based goals (Sajadi, Mohamadi, Eskandari, Heidary, & Darbani, 2011) and/or motivational general-mastery imagery (Martin et al., 1999) are particularly related to effective coping and the mastery of challenging situations. Future research should consider the influence of different goal and imagery types in relation to different aspects of training.

Furthermore, our data indicate that while athletes high in adaptive narcissism seem to take advantage of using performance strategies in their training, such strategies seem less beneficial to those high in maladaptive narcissism. Typically, the results showed that when maladaptive narcissism was at low levels, frequent use of goal-setting and imagery alleviated the association of adaptive narcissism with poorer training. However, when maladaptive narcissism was at high levels, such effects did not become more apparent when goal-setting or imagery was more frequently used. Since goal-setting and imagery are important self-enhancement strategies, our findings indicate that perceived opportunity for self-enhancement does not always motivate individuals to strive especially when one is high in maladaptive narcissism. It is possible that adaptive narcissism might be more associated with impulsivity or a focus on short-term reward that self-enhancement might bring, whereas

maladaptive narcissism might be more related to a long-term desire to gain benefit and to dominate. Consequently, self-enhancement strategies may not add extra motivation to those high in maladaptive narcissism because such strategies may provide a short-term sense of glory but are less effective in helping to achieve dominance and personal control in the long term. Also, if narcissists high in maladaptive narcissism focus more on the long-term "gain", any short-term strategies such as creating a sense of self-enhancement might simply be less effective. Future research should consider using short- and long-term focus of interests to further distinguish between adaptive and maladaptive narcissism in relation to training.

Additionally, considering the influence of narcissism profiling on athlete concentration and quality of preparation, one could conclude from our data that low in both adaptive and maladaptive narcissism seems the most positive profile as it consistently predicted relative desirable athlete training behaviours regardless of the levels of performance strategy use. While such a finding suggests that athletes with relative low levels of both adaptive and maladaptive narcissism usually concentrate in training and prepare well for competition, it also revealed that the training behaviours of these athletes can hardly change by performance strategy use (at least for goal-setting and imagery) as is opposite to those with relatively high levels of adaptive narcissism. Consequently, to uncover athlete fullest potential, coaches and practitioners should consider alternative strategies to help athletes with this typical profile (i.e., relatively low in both adaptive and maladaptive narcissism) to achieve their optimal level of training.

The present research has several notable strengths. First, we used multiple sources of data. We assessed athlete personality and performance strategies use via self-report measures and examined athlete training using informant ratings. Indeed, compared to using multiple source of data, single-source data can result in inflated common method variance (Chang et al., 2010) and increased likelihood of socially desirable responding (Vazire, 2006) with social

desirability being a particularly prevalent concern among narcissists (Watson & Morris, 1991). As such, using multiple sources of data improves the rigour of the present research. Second, we recruited a mixed sample of athletes from different levels (university, premier leagues, national teams) and sport types (team and individual sports) and controlled for potential nested effects. Such an approach allows us to demonstrate findings that have considerable generalisability – applicable to athletes from different backgrounds. Last but not least, while personality traits are difficult to change and commonly regarded as moderating variables in sport (Allen, Greenlees, & Jones, 2013), the present research focused on examining factors (e.g., performance strategies) that moderate the influence of personality (e.g., narcissism). Such an approach suggests that no single "one size fits all" perspective on psychological skills training exists and the findings provide important practical implications by considering the effects of individual differences.

However, the present research is not without limitations. First, the cross-sectional design of the present research may invite concern regarding causality between our study variables. However, the effects we demonstrated are clear, novel, and with sufficient power reflecting reliability and replicability. Despite its correlational nature, the present research provides considerable practical values and directions for future research. Another limitation points to our measure of performance strategies in athlete training. As noted, the TOPS-2 (Hardy et al., 2010) does not assess the use of different goal types and imagery perspectives (Hardy & Jones, 1994) and athlete imagery ability (Roberts, Callow, Hardy, Markland, & Bringer, 2008). Literature (e.g., Hardy & Jones, 1994; Nordin & Cumming, 2005) suggests that there are different types of goals (e.g., outcome, performance, and process goals), imagery perspectives (e.g., internal and external visual imagery) and imagery types (Martin et al., 1999). Without the recourse to consider these issues, the TOPS-2 fails to provide insights on whether narcissists benefit differently from different goals or imagery types in training.

Further, imagery ability is a moderator of imagery effectiveness (Roberts et al., 2008), and so imagery is more useful for those with good imagery ability. Since we only measured imagery use, we do not know how good our participants were at imagery. The unmeasured imagery ability may magnify or reduce the effects of imagery use that we observed.

Finally, our conceptualizations and discussions on narcissism in the present research are only relevant to its grandiose and agentic form. However, narcissism also exists in a vulnerable form (Miller et al., 2011) and at a communal as well as an agentic level (Gebauer et al., 2012). These different forms of narcissism also likely play different roles in athlete training. For example, vulnerable narcissism reflects hypersensitivity and hypervigilance for criticism and failures (Miller et al., 2011). Therefore, vulnerable athletes may be more likely to envisage any negative realities or threats and thus may cope less well with adversity. Moreover, communal narcissists seek to satisfy their grandiose self-view, feelings of entitlement, and power via communal means (Gebauer et al., 2012) but behave less communally especially when their need for power is validated (Giacomin & Jordan, 2015). Consequently, communal narcissism may contribute to increased group conflicts or impaired team cohesion. Future research would do well to examine these possible negative effects and explore ways to protect against them.

Conclusions

Training environments are relatively low in the opportunity for self-enhancement. The present research demonstrated that athlete adaptive narcissism negatively impacts athlete training behaviours. However, maladaptive narcissism, and the performance strategies of goal-setting and imagery that help athletes to foresee the opportunity for glory, protect against the debilitative effects of adaptive narcissism in athlete training. The findings support the adaptive/maladaptive narcissism distinction in athlete training – adaptive narcissism may not be as ‘adaptive' as first thought while maladaptive narcissism may be more adaptive than

previously realized. The findings also suggest that goal-setting and imagery are essential self-enhancement strategies in athlete training. Future research would do well to explore strategies for optimal training while taking athlete individual differences into account.

CHAPTER 4: GENERAL DISCUSSION

This chapter discusses the findings from the research contained in this thesis. The chapter consists of six main sections. The first section summarizes the main findings from this thesis. The second section provides the main theoretical implications arising from the thesis. The third section offers applied implications, discussing practical recommendations based on the thesis findings. The fourth and fifth sections present the strengths and weaknesses of the research programme. The final section offers directions for future research, followed by a concluding remark for the thesis.

Summary of research programme

The purpose of this thesis was to examine the interactive effects of so-called adaptive and maladaptive narcissism on pressurized performance and athlete training behaviours. The first three experiments (Chapter 2) examined the proposal that the interaction between adaptive and maladaptive narcissism contributed to improved performance under high pressure. In Experiment 1, recreational basketball players completed a basketball free throw task in an individual session (low pressure) and a competition session (high pressure). Results demonstrated that adaptive narcissism predicted improved performance under pressure only when maladaptive narcissism was high. In Experiment 2, experienced golfers completed a golf-putting task under practice, low pressure, and high pressure. Experiment 2 found results consistent with Experiment 1; participants' adaptive narcissism predicted reduced putting errors (reflecting better performance) under high pressure when maladaptive narcissism was at high levels. To further examine the replicability and generalizability of the findings from Experiments 1-2, Experiment 3 tested the interaction hypothesis by asking university students to complete a letter transformation task and a colour-word Stroop task under practice, low pressure, and high pressure. The results from Experiment 3 replicated Experiments 1 and2.

Further, all the performance effects observed in Experiments 1-3 were independent of participants' age, levels of expertise, and the NPI total score.

In addition to examining the performance effects of the interaction between adaptive and maladaptive narcissism, Experiments 2-3 also explored why such an interaction benefits pressurized performance. In particular, Experiments 2-3 examined two competing proposals, namely *trying harder* and *trying smarter*. The trying harder position suggests that individuals with a precise combination of (high) adaptive and (high) maladaptive narcissism excel under pressure because they invest a greater amount of effort. As opposed to the *trying harder* position, the *trying smarter* hypothesis suggests that better performance is a result of superior regulation of task processing within the capacity-limited working memory system. Using a self-report measure of effort and a behavioural indicator of processing efficiency during golf-putting (i.e., pre-putt time), Experiment 2 results generally supported the *trying smarter* position as individuals with high levels of adaptive narcissism spent less time initiating a putt under high pressure (reflecting efficient task processing) only when their maladaptive narcissism was at high levels. Using the same self-report together with a physiological measure of effort and a psychophysiological measure of efficiency during task processing (i.e., r-MSSD), Experiment 3 also provided support for the trying smarter position. More specifically, participants high in adaptive narcissism demonstrated a desirable psychophysiological response during the letter transformation task only when maladaptive narcissism was high. A similar result was found in the Stroop task despite its statistically non-significant effects (this point is discussed further in the Weaknesses of the research programme section). The findings from these studies indicate that individuals high in both adaptive and maladaptive narcissism have advantages when performing under high pressure thanks to their superior regulation of task processing.

The final study of the thesis (Chapter 3) sought to investigate the interaction between adaptive and maladaptive narcissism in athlete training, with a special interest in exploring practical means to help narcissistic athletes train better. A sample of athletes from mixed levels (i.e., university, premier leagues, national teams) and sport types (i.e., team and individual sports) completed a measure of their narcissistic personality and use of performance strategies during their training. Coaches of the participating athletes assessed athlete training behaviours of distractibility, coping with adversity, and quality of competition preparation to reflect athlete quality of training. Results demonstrated a three-way interaction between adaptive and maladaptive narcissism and the use of performance strategies (especially imagery and goal-setting) that had an impact on athlete distractibility and quality of preparation. To expand, when the use of the particular performance strategy was low, athlete adaptive narcissism was related to increased distractibility and reduced quality of preparation when maladaptive narcissism was low but not high. However, when the use of performance strategy was high, the potential adverse influences of adaptive narcissism on athlete training was mitigated regardless of the levels of athlete maladaptive narcissism. The findings suggest that maladaptive narcissism and performance strategies use in training (especially imagery and goal-setting) protect against the adverse effects of athlete adaptive narcissism on training.

Theoretical implications

This section aims to draw together the main theoretical implications of the thesis. Four major areas are relevant and thus will be discussed: the distinction between adaptive and maladaptive narcissism, the interaction of adaptive and maladaptive narcissism, mechanisms underlying narcissism and pressurized performance, and the self-enhancement function of performance strategies (especially imagery and goal-setting use during training).

Distinction between adaptive and maladaptive narcissism

Adaptive narcissism is so-called and is originally distinguished from maladaptive narcissism because of its relation to socially desirable (e.g., confidence) rather than undesirable characteristics (e.g., a dominating orientation). Also, in comparison to maladaptive narcissism, adaptive narcissism is associated with lower levels of neuroticism, high levels of self-esteem, and decreased risks of anti-social behaviours. While distinctions between adaptive and maladaptive narcissism have emerged merely from research in social and interpersonal contexts, findings from Chapters 2-3 provide new evidence to support the adaptive/maladaptive narcissism distinction. More specifically, findings from Chapter 2 suggest that adaptive narcissism benefits pressurized performance only in the presence of maladaptive narcissism. Also, findings from Chapter 3 suggest that adaptive narcissism can exert adverse influences on athlete training when there is a lack of maladaptive narcissism, especially if performance strategies are not frequently used. These findings indicate that, in performance contexts, adaptive narcissism is not as "adaptive" as it seems to be in other domains of life, but maladaptive narcissism is more adaptive than its first impression. At a broader level, findings from this thesis suggest that a uni-dimensional conceptualization of narcissism is inadequate. Additionally, findings also indicate that the desirable and undesirable aspects of personality traits are likely to be context-specific. For example, from a social and interpersonal perspective, adaptive narcissism is related to socially desirable qualities such as confidence and assertiveness while maladaptive narcissism is related to less desirable traits such as dominance and personal control. Nevertheless, the current thesis suggests that the more socially desirable adaptive narcissism is not particularly “adaptive” in performance contexts, especially on its own. In contrast, the socially undesirable maladaptive narcissism seems to bring unique benefits that contribute to the performance under pressure

and the quality of training at least at an individual level (see further discussion relevant to this point in relating to interpersonal and group functioning in the Applied Implication section).

Although the findings of this thesis offer support to the distinction between adaptive and maladaptive components of grandiose narcissism, one could argue that such a distinction is too broad as it is unknown which aspect(s) of these components contribute(s) to any of our observed effects. Indeed, adaptive narcissism reflects the sense of authority and self-sufficiency facts in the NPI, while maladaptive narcissism reflects the exhibitionism, entitlement, and exploitativeness in the NPI. Nevertheless, In this thesis and in performance contexts particularly, adaptive narcissism is conceptualized to reflect high levels of confidence *and* assertiveness, and this combination results from the combined influence of the authority and the self-sufficiency facets of narcissism (Emmons, 1984; Raskin & Terry, 1988). Also, maladaptive narcissism is conceptualized to reflect a strong willingness to dominate *and* control situations, which is reflected in the equal contribution of exhibitionism, entitlement, and exploitativeness facets (Washburn et al., 2004; Watson & Biderman, 1993). As such, although adaptive and maladaptive narcissism each consists of multiple facts of narcissism, such a conceptualization is precise rather than overly broad or simplistic and is consistent in predicting divergent effects on a variety of outcomes (see Cai & Luo, 2018). However, since narcissistic qualities may demonstrate divergent effects in different contexts given our findings in comparison to existing literature, we recommend future researchers consider the use of a different term to describe the currently so-called adaptive (e.g., using 'inflated self' instead) and maladaptive (e.g., using 'dominance orientation' instead) narcissism. At the very least, researchers should not conceptualize adaptive narcissism as always being 'adaptive' and maladaptive narcissism as always being problematic.

At a general level, the adaptive and maladaptive narcissism distinction contributes to explaining the dynamic and paradoxical influences of narcissism especially in its grandiose

form (e.g., being charming but also annoying). A theoretical framework relevant here, is the *Narcissistic Admiration and Rivalry Concept* (NARC; Back et al., 2013). While the distinction of adaptive and maladaptive narcissism suggests that adaptive components of narcissism are linked to desirable qualities such as charm but maladaptive narcissism is linked to undesirable qualities such as aggression, the NARC uses admiration and rivalry as two distinctive components of narcissism to explain why narcissism is related to paradoxical outcomes. Typically, the NARC states that narcissists construct and maintain a grandiose self-view via two divergent means; a positive pathway via self-promotion (i.e., admiration) and a negative pathway via self-defence (i.e., rivalry). According to the NARC, both the self-promotion and the self-defence pathways of constructing and maintaining a grandiose self-view can be intra- and inter-personal. For example, individuals high in narcissistic admiration are high in grandiosity (i.e., intra-personal) and demonstrate charmingness (i.e., inter-personal). Also, individuals high in narcissistic rivalry devalue others (i.e., intra-personal) and behave aggressively (i.e., inter-personal). Such divergent patterns of admiration and rivalry in constructing and maintaining a narcissistic self have received empirical support (see Back et al., 2013).

Although the conceptualization of the NARC and the adaptive/maladaptive narcissism distinction shares some similarities in explaining the paradoxical influences of narcissism, these two concepts are different to each other. Typically, the NARC emphasizes the self-promotion (i.e., admiration) and the self-defence (i.e., rivalry) pathways to a grandiose self-view but does not make distinctions between intra- and inter-personal approaches (Back et al., 2013). In contrast, the conceptualization of adaptive and maladaptive components of narcissism focuses on the intra-personal (i.e., adaptive narcissism) and the inter-personal (i.e., maladaptive narcissism) approaches to achieving narcissistic grandiosity but does not distinguish between self-promotion and self-defence motivations (Brown et al., 2009). As

such, one could argue that both the conceptualization of adaptive and maladaptive narcissism and the NARC are not without limitation, especially in that these conceptualizations only focus on one aspect of narcissistic approaches to grandiosity (i.e., via intra- or inter-personal strategies, self-promotion or self-defence). Such a position leaves room for a possible 2 (intra- and inter-personal) x 2 (self-promotion and self-defence) model of grandiose narcissism and is open to future research.

The interaction of adaptive and maladaptive narcissism

While the distinction between adaptive and maladaptive narcissism is important, findings from this thesis also suggest that embracing the interaction between adaptive and maladaptive narcissism contributes to a better understanding of the role of narcissism, at least in performance contexts. Indeed, research and theory suggests that global-level narcissism should play a facilitative role in pressurized performance but a debilitative role in athlete training (Roberts & Woodman, 2015; Roberts, Woodman, et al., 2018). This position is built on the premise that the opportunity for self-enhancement that motivates narcissists to strive is enriched in high-pressure performance settings but is lacking in training environments. Nevertheless, taking an interactionist approach, the present thesis demonstrated that the interaction between adaptive and maladaptive narcissism consistently benefits pressurized performance and athlete training. Typically, an increase in adaptive narcissism likely contributes to improved performance under pressure only when maladaptive narcissism is high. Also, increased adaptive narcissism likely exerts negative effects on athlete training but only when maladaptive narcissism is low, especially when performance strategy use is low. At a broader level, these findings suggest that the interaction between different narcissism components or subdimensions is worthy of consideration when researchers attempt to understand the influence of narcissism in different contexts.

Nevertheless, one could argue that the interaction effects of adaptive and maladaptive narcissism may be an artefact of high grandiose narcissism or NPI scores. Certainly, individuals high in both adaptive and maladaptive narcissism are likely extremely high in grandiose narcissism or NPI scores. However, it is equally possible that individuals with moderate levels of both adaptive and maladaptive narcissism (e.g., scored 9 in both adaptive and maladaptive narcissism) could obtain a similar score using the NPI when comparing to others who score either extremely in adaptive narcissism (e.g., scored 13 in adaptive narcissism but 5 in maladaptive narcissism) or maladaptive narcissism (e.g., scored 3 in adaptive narcissism but 15 in maladaptive narcissism). Taking these incidences as an example, conceptualizing narcissism especially in its grandiose form as a uni-dimensional contrast will treat those individuals in the example as a homogeneous group with the same level of narcissism (i.e., scored 18 in the NPI). Such an approach is problematic as it results in misleading information on the components of narcissistic qualities those individuals possess. In particular, individuals high both adaptive and maladaptive narcissism equally hold high levels of confidence and the willingness to dominate, while individuals with extreme scores in either adaptive or maladaptive narcissism are high in only one aspect of either high confidence or dominating orientation. The differences in one's components of adaptive and maladaptive narcissism likely leads to different effects, which is supported by the findings of this thesis that the different combinations of adaptive and maladaptive narcissism (i.e., the interaction) predicted the variations of performance under pressure and quality of training. It is also noticeable that all observed effects in this thesis were independent of the level of participant expertise and NPI scores. As such, the likelihood of the interaction being an artefact is considerably rare.

Accepting that the adaptive and maladaptive narcissism interaction being meaningful, one would conclude from the findings of this thesis that only a precise combination of high

adaptive and maladaptive narcissism contributes to performance under pressure and the quality of training. Such an interpretation is of interest, especially when considering that an individual high in both adaptive and maladaptive narcissism likely being extremely high in narcissism. Indeed, individuals high in narcissism demonstrate inflated risks of anti-social (e.g., aggression and violence) or socially maladjusted behaviours (e.g., delinquencies) (Lambe et al., 2018). However, while in social and inter-personal contexts high adaptive and high maladaptive components may make individuals head towards a socially undesirable direction, in performance contexts these components seem to dovetail with each other. These divergent effects in different contexts provide support to the position that the influence of narcissistic qualities are context-specific. Typically, it is possible that when there is a realistic way to establish and maintain grandiosity (e.g., beating competitors in a competition) narcissistic qualities are more likely beneficial due to the availability of opportunities to obtain self-enhancement and eliminate ego-threats. However, such opportunities are often lacking in interpersonal contexts and thus narcissism is more likely to be problematic in social and interpersonal contexts. Such a position is relevant to the hypothesis that narcissists may glean benefits from performance contexts to alleviate their maladjustments in social and interpersonal settings. This point is discussed further in the Suggestions for future research directions section.

Mechanisms underlying narcissism and pressurized performance

Early research suggested that narcissists performed better in certain situations (e.g., high perceived opportunity for self-enhancement) because they invested greater effort (e.g., Wallace & Baumeister, 2002). This proposal is termed "*trying harder*" and received support (see Roberts, Woodman, & Sedikides, 2018). For example, Woodman et al. (2011) found that individuals high in narcissism increased effort and cycled further in a ten-minute cycle ergometer test, especially in an individual (i.e., individual performance identifiable) rather

than a group (i.e., individual performance unidentifiable) competition setting. In a dart-throwing and an endurance task, Roberts, Cooke, et al. (2018) demonstrated that the positive influence of participant narcissism on performance was mediated by increased effort quantity during task performance. Since high-pressure performance settings naturally provide a great opportunity for glory (e.g., perform exceptionally when competitors fail), *trying harder* or increasing effort during task performance is likely one of the potential mechanisms underlying narcissism and pressurized performance. This view is in line with the prediction of the Processing Efficiency Theory (Eysenck & Calvo, 1992). The Processing Efficiency Theory states that performers can try harder or allocate more processing resources to protect against any adverse effects of performance pressure on performance effectiveness. As narcissists are motivated to strive for desirable performance states, one would expect them to invest greater effort and thus improve performance.

However, results from Chapter 2 of this thesis suggest that narcissists (especially those high in both adaptive and maladaptive narcissism) performed well under pressure because they regulated their task processing more efficiently, rather than simply investing greater effort. More specifically, in the golf-putting task (Experiment 2, Chapter 2), experienced golfers high in both adaptive and maladaptive narcissism made fewer errors under pressure, which came with reduced task processing time reflecting efficient motor control. Also, in the letter transformation task (Experiment 3, Chapter 2), participants with a precise combination of high adaptive and maladaptive narcissism had psychophysiological responses to pressure that reflected superior mental efficiency, and also performed better than their counterparts under pressure. These findings are in line with the "*trying smarter*" hypothesis that has recently been conceptualized but has yet to receive much empirical support (see Roberts, Cooke, et al., 2018; Roberts, Woodman, et al., 2018). According to the *trying smarter* position, the performer's superior task regulation within the capacity-limited

working memory system can lead to excellent performance under pressure. Such a view is also supported by Attentional Control Theory (Eysenck et al., 2007). Indeed, Attentional Control Theory states that performance pressure diverts resources from a goal-directed (top-down) attentional system to a stimulus-driven (bottom-up) attentional system thus increasing task-irrelevant thoughts (e.g., worry) and causing inefficient task regulation. As such, efficient task processing is central to task performance as it not only helps resist disruption or interference from task-irrelevant stimuli but also one's ability to reallocate attention to task processing. Since narcissists are typically goal-directed (Elliot & Thrash, 2001; Foster & Trimm, 2008), it is not a surprise those high in both adaptive and maladaptive narcissism can process information under pressure more efficiently and thus perform to a higher level under pressure compared to their counterparts.

Certainly, any effect observed in NPI total scores (e.g., findings from previous narcissism-performance research supporting the *trying harder* hypothesis) is not equivalent to the effect of the precise combination of high adaptive and high maladaptive narcissism (e.g., findings from research programmes in this thesis). Regardless, although the findings from Chapter 2 of this thesis provide support to the *trying smarter* position rather than the *trying harder* perspective, both proposals are indeed viable at a theoretical level. Two factors are likely to determine whether *trying harder* or *trying smarter* may emerge to be a more prominent mechanism underlying narcissism and performance. One essential factor to consider is the effort demand of the performance task. More specially, research supporting the *trying harder* position (e.g., Roberts, Cooke, et al., 2018; Woodman et al., 2011) has used tasks involving novice players and/or imposing high physical demand (e.g., cycling, muscular endurance task). In contrast, the relevant experimental tasks (Chapter 2) examined in this thesis involved participants with higher levels of task-related expertise (i.e., recreational basketball players and skilled golfers) and required fine motor control (i.e., basketball free

throw, golf-putting) or imposed mental demand (i.e., letter transformation, Stroop task). Indeed, skilled compared to novice performance requires less effortful control (Masters & Maxwell, 2008), and cognitive and fine-motor control tasks compared to physical tasks rely less on effort quantity. As such, it is possible that current findings support the *trying smarter* rather than the *trying harder* position because the performance tasks used did not rely heavily on the effort quantity.

Another important factor is the level of performance pressure. According to both Processing Efficiency Theory (Eysenck & Calvo, 1992) and Attentional Control Theory (Eysenck et al., 2007), additional effort is less likely to compensate for performance as performance pressure increases. Consequently, it is possible that *trying harder* could help achieve desired performance under relatively low levels of pressure and that *trying smarter* could optimize the performance when pressure is at higher levels. Indeed, previous research supporting the *trying harder* perspective focused on manipulating a high self-enhancement condition (e.g., perceived opportunity for rewards and identification). In contrast, the research from this thesis combined the use of multiple stimuli to create high-performance pressure (i.e., Cohen's d for anxiety increase achieved .99 and .91 for Experiments 2 and 3, reflecting a large effect of the pressure manipulation). With these issues in mind, the findings of the thesis call for attention on the different roles in pressurized performance that *trying harder* and *trying smarter* perspectives may offer when the levels of pressure vary.

Performance strategies and self-enhancement

In Chapter 3 (Study 4) of this thesis, the findings demonstrated the benefits of imagery and goal-setting use during athlete training, especially for those high in adaptive narcissism. Since the opportunity for self-enhancement motivates narcissists but athlete training environments are typically lacking in such opportunities, it has been suggested that athletes high in narcissistic qualities may not strive for their best during training (Roberts &

Woodman, 2015; Roberts, Woodman, et al., 2018). Following this line of reasoning, athletes with high levels of narcissism likely train better if these athletes well perceive the opportunity for self-enhancement afforded by the training environments. The results of Study 4 demonstrated that performance strategy use (especially imagery and goal-setting) is particularly beneficial to athletes high in adaptive narcissism. More specifically, when performance strategy use was low, adaptive narcissism was typically debilitative to athlete quality of training especially when maladaptive narcissism was low. However, when performance strategy use was high, the adverse influence of adaptive narcissism on athlete quality of training was mitigated regardless of the levels of maladaptive narcissism. According to the results of Study 4, the facilitative influence of imagery and goal-setting use during athlete training seemed to be exclusive to athletes high in adaptive narcissism. This may be due to imagery and goal-setting use during training providing athletes with inspiring visions that provide a sense of glory (e.g., imagine oneself performing exceptionally well, foresee an exclusive opportunity for glory through hard training) and activate narcissistic athletes' self-enhancement motives.

Applied Implications

Findings from this thesis provide several applied implications. First, narcissistic qualities, especially a precise combination of adaptive and maladaptive narcissism, are worthy of considering in talent identification and development. This is because individuals with such a precise combination of narcissistic components are more likely to perform well under high pressure (e.g., an important competition). Indeed, performers who compete to seek the honour/glory likely deal better with any performance pressure than those who compete to avoid troublesome consequences (Zhang et al., 2018). Since individuals high in both adaptive and maladaptive narcissism have both high confidence and strong willingness to dominate, they are likely to embrace any performance pressure and seek out the

opportunity to perform at their best. However, as high levels of narcissism contribute to social maladaptive behaviours such as aggression and violence (Lambe et al., 2018), coaches, teachers, supervisors, or other practitioners should seek out means to handle narcissistic individuals effectively in order to get the best out of them and to ensure that they are not disruptive to others.

Second, while a precise combination of adaptive and maladaptive narcissism benefits pressurized performance, adaptive narcissism on its own can be typically debilitative to athlete quality of training. This is probably because training environments lack the opportunity for self-enhancement. According to the findings from Chapter 3 of this thesis, the negative influences of adaptive narcissism on quality of training emerge. However, the use of imagery and goal-setting during athlete training can well protect against any adverse effects of adaptive narcissism on training. Applied practitioners should well consider the influence of athlete narcissistic traits and the use of performance strategies (especially imagery and goal-setting) to optimize the quality of training. Also, applied practitioners might want to think about other ways to improve the perceived self-enhancement opportunities in training, such as making personal performance easily identifiable and using public goals and evaluation. These self-enhancement strategies will likely work well to improve the quality of training especially for narcissistic individuals.

An important note here, relevant to the above two applied implications discussed, is the fact that implicit distinction between performance contexts and social/inter-personal settings have been adopted throughout the thesis. While such an approach facilitates the discussion of narcissism's effects on performance and training effectiveness, it may well be too simplistic as performance contexts and social/interpersonal environments are not exactly isolated to each other in real situations. Indeed, considering performance contexts may well interact with social/inter-personal environments (e.g., sport teams), narcissistic qualities may

be not as beneficial as we would claim from our findings. Specifically, due to the exceptional needs for high agency with a lack of need for intimate connections, narcissists tend to use an inter-personal regulation strategy that causes impaired social relationship over time and push themselves to seek out for more interpersonal "fuel" to consume (Campbell et al., 2006; Morf & Rhodewalt, 2001). Such a process becomes problematic especially when facing a threat to narcissist's inflated-self, linking to increased risk of anti-social behaviors such as aggression and violence and thus being detrimental to interpersonal and group functioning (Baumeister et al., 1996; Baumeister & Vohs, 2001; Bushman & Baumeister, 1998). For example, in sport team contexts, the increased risks of violence, aggression, and abused interpersonal relationships contributed by narcissists (Lambe et al., 2018), could lead to impaired cohesion and increased conflicts. Such undesirable outcomes is debilitative to the accomplishment and effectiveness of a team performance task (Rousseau, 2006). Given these potential adverse influences of narcissism in social/interpersonal contexts within sport environments, the implications of the 'brightness' of the typical narcissism profile we discussed (i.e., high in both adaptive and maladaptive narcissism) are likely to be more applicable to individual sports contexts where social/interpersonal considerations are minimized, as opposed to the team sports settings.

In addition, findings from Chapter 2 of this thesis suggest that performers with a precise combination of adaptive and maladaptive narcissism performed better under pressure because of their superior regulation of task processing within the capacity-limited working memory system, rather than spending greater effort. Indeed, increased effort as a compensating strategy when performing under high pressure can be harmful to performance (see Woodman & Hardy, 2001; Zhang et al., 2018). To optimize performance under high pressure, practitioners should consider strategies that can help performers to *try smarter* or better regulate their task processing under pressure, rather than simply *try harder* or investing

a greater amount of effort. For example, implicit training (e.g., Lam, Masters, & Maxwell, 2010; Otten, 2009), attentional control , and instructions creating a challenge rather than a threat state (e.g., Vine, Moore, & Wilson, 2016) are likely help performers to regulate pressurised task processing better.

While a combination of high adaptive and high maladaptive narcissism is optimal in terms of the performance effectiveness in pressurised environments and athlete concentration and preparation in training sessions, relatively low in either component of narcissism whilst the other is at relatively high levels seems to be the most debilitative profiles. However, considering the moderate-to-strong correlations (i.e., ranging from .25 to .65) between adaptive and maladaptive narcissism, one may question how likely a 'low-high' or 'high-low' may exist. Two points at practical levels are relevant to this concern. First, while the considerable correlation between adaptive and maladaptive narcissism is based on their absolute scores, it is important that our findings are only applicable when low or high levels of either component is considered at a relative level. In other words, a 'high-high', 'low-high', or 'high-low' profile shall be defined by relative scores (e.g., the variation of the score from the mean of a target sample) rather than using a specified level of absolute score to define a 'low' or 'high' status. Such an approach is consistent with our conceptualisation and data analyses, and clearly make sense at a practical level. Another points relevant to the correlation between adaptive and maladaptive components of narcissism is that, such a correlation seems to decrease as age increases. For example, the correlation was .25 in a sample of average 46 years old (Experiment 2) but was .65 in a sample of average 21 years old (Experiment 1). This may be due to that either sub-construct of narcissism may decline as individuals become elder (Cramer, 2011). As such, practitioners should well understand that the appearance of a 'low-high' or 'high-low' profile may increase as age grows.

At a more general level, applied practitioners should not consider narcissism as a uni-dimensional construct and should consider how different components of narcissism or other personality traits may interact with the use of performance strategies. Considering the thesis as a whole, a central message is that individual differences in performance contexts definitely exist and thus a "one model fits all" strategy in performance enhancement and effective training is unrealistic. Applied practitioners should use more individualized consideration to help individuals to train and perform better.

Strengths of the research programme

The research programme contained in this thesis has several strengths that are worth highlighting. For the experimental studies in Chapter 2, comprehensive experimental manipulations were used to ensure the creation of precise experimental conditions. For example, Experiments 1-3 used a combination of various stressors such as competition, rewards and punishment, glory and shame, negative feedback, and pressurized instructions in order to make the perceived level of pressure as high as possible. Experimental control was further established via the use of manipulation checks, confirming that participants' pressure-induced anxiety increased significantly under high-pressure conditions (i.e., Cohen's *d* for anxiety increase achieved .59 in Experiment 1, .99 in Experiment 2, and .91 in Experiment 3). The successfully manipulated high-pressure condition allowed for an appropriate medium to examine the overarching hypothesis in Experiments 1-3. Another strength of the current experimental studies points to its well-established replicability and generalizability. More specifically, across the multi-study experiments, consistent effects were evident across four different performance tasks (i.e., basketball free throw, golf-putting, letter transformation, and Stroop task) and among three different populations (i.e., recreational basketball players, experienced golfers, and university students). As such, a considerable level of confidence in the replicability and generalizability of the research findings from Experiments 1-3 has been

achieved. In addition, self-report, behavioural, physiological, and psychophysiological indices were used in Experiments 2-3 to examine the *trying harder* and *trying smarter* positions. The use of multiple markers of potential mechanisms reduced the likelihood of random errors or biases.

For Study 4, one strength is that a mixed sample of athletes from different levels (university, premier leagues, national teams) and sport types (team and individual sports) was used, with potential nested effects being controlled. Using a sample of athletes from mixed background makes the findings from Study 4 considerably generalizable to a wide range of the athletic population. Also, Study 4 used multiple sources of data. In particular, athlete personality and performance strategies use were measured via self-report measures, while athlete training was assessed using informant ratings. Such an approach improves the rigour of Study 4 as it reduces common method variance (Chang et al., 2010) and the likelihood of socially desirable responding (Vazire, 2006). Additionally, Study 4 focused on examining whether factors that have considerable practicability (e.g., performance strategies) can moderate the influence of personality (e.g., narcissism). Such an approach suggests that no single "one size fits all" perspective on psychological skills training exists and provide important practical implications by considering the effects of individual differences.

Finally, considering the research programme contained in this thesis as a whole, statistical rigour was maintained. Typically, at the planning stage of each study, sample estimation was performed to ensure that a minimum number of participants was targeted in order to have sufficient power (i.e., 1- β = .80) to detect a reasonable effect. In each analysis across different studies, statistical control was used to ensure that any effect emerged was independent of the level of expertise, NPI total score, and other potential confounders. 95% confidence intervals and effect sizes were reported throughout all relevant analyses.

Weaknesses of the research programme

While the research programme within this thesis has noticeable strengths, several weaknesses are also worthy of attention. First, some of the analyses, especially the examination of the *trying harder* hypothesis in Experiments 2-3, were subject to low power and thus led to a risk of inflated Type II error. More specifically, in Experiments 2-3, the analyses of mental effort during task performance revealed non-significant results but with insufficient power (ranging from .12-.25). In Experiment 3, the non-significant results for age-adjusted heart rate during letter transformation and Stroop task ranged from .07-.18. These particular analyses examined whether the potential interaction between adaptive and maladaptive narcissism contributed to investing in greater effort to compensate performance. Further, simple slope analyses suggested that no meaningful differences existed in the relationship between adaptive narcissism and on-task effort regardless of the levels of maladaptive narcissism. It is not impossible that the failure of those aforementioned analyses in producing significant effect may have been due to the low power. As such, a cautious interpretation of findings from Experiments 2-3 was applied, that statements were emphasized on supporting the *trying smarter* position (based on significant effects and relatively sufficient power) rather than rejecting the *trying harder* perspective.

A second weakness concerns the design of the Stroop task used in Experiment 3. Two issues are relevant here. One issue is that the demand of the colour-word Stroop task may be relatively low to the experiment participants. This conclusion was based on the fact that every participant achieved 100% accuracy when performing the Stroop task in the low-stress condition, which had not been reported in any published previous research. Future research would do well to use more comprehensive versions of the Stroop task such as an emotional Stroop task (e.g., Frings, Englert, Wentura, & Bermeitinger, 2010), spatial Stroop task (e.g., Wühr, 2007), numerical Stroop task (e.g., Henik & Tzelgov, 1982), reverse Stroop task (Durgin, 2000), or a combination of the various types of Stroop tests, especially if a high

level of task demand is essential. Another issue is relevant to the short recording length during the Stroop task under the low-pressure condition. Specifically, participants took an average of 60.40 seconds (SD = 41.24) to complete the Stroop task under the low-pressure condition. This short recording epoch reduces the reliability of psychophysiological measure such as the r-MSSD (Mulder, 1992), which might be responsible for the non-significant effects of adaptive × maladaptive narcissism interaction on the r-MSSD during Stroop task. Also, despite its statistical non-significance, further simple slopes analysis revealed a meaningful pattern that adaptive narcissism was related to reduced r-MSSD (reflecting impaired mental efficiency) when maladaptive narcissism was low but not high. It is possible that a significant effect might have been washed out due to the short recording length of r-MSSD measures. Future research using the Stroop task should consider whether the time to complete the task may interfere with any measurements during the task performance.

Also, weaknesses exist in relating to the measures used in Experiments 2 and 3. Specifically, the Experiment 2 and 3 used the single-item inventory (i.e., MRF) to assess participants levels of performance anxiety. While the content validity and test-re-test reliability is established (Krane, 1994), challenges still exist for single-item inventory especially regarding its lack of sensitivity in detecting variances in participants' responses and the difficult-to-assess internal reliability (Bland & Altman, 1997). Nevertheless, because of the less instructive format, the single-item MRF has its unique benefit, allowing to assess performance as close as to the experimental manipulation and the subsequent performance. Besides, the use of word "worry" in the MRF is a better description of state anxiety than the word "concern" in other multi-scale anxiety inventory such as the CSAI-2 (Woodman & Hardy, 2001). Moreover, the use of single-item measurement of anxiety combined with the use of other inventories may minimise the possibility of a participant to guess the pressurized nature of experimental manipulation (Zhang et al., 2018). The increased level of blindness of

participant shall interfere less with the experiment and thus causes less systematic errors or bias. Overall, despite potential limitation of the single-item MRF used, the benefits of MRF shall overweigh its disadvantages.

Besides the use of single-item measure, another measurement issue is related to the performance measures used in Experiment 2. Typically, in the golf-putting task, a half-size target hole was employed, and the error score (i.e., MRE) was used to assess putting performance. Indeed, one could argue that the use of a real target hole may interfere with the measurement of MRE; that one may well putt the golf ball to pass the hole from its edge, or the ball may hit the rim of the hole and came out to stop somewhere far away from the hole. While these concerns are valid, the benefits of using the current measurement setting is also obvious – it is more ecological valid and challenging for participants considering their levels of expertise in golf (i.e., an average handicap of 15). The strict setup (i.e., half-sized real hole), therefore, aimed to increase the level of performance pressure whilst preventing participants from performing too well so as to reduce the sensitivity of performance measures due to insufficient variance in the MRE. Nevertheless, it would be good for further research more using similar measures to record the numbers of abnormal putts (i.e., hitting the rim and out) to allow a more complete evaluation of the measures, which unfortunately failed to be considered in Experiment 2.

Further to measurement issues, in Experiments 2 and 3, efficiency was not related to performance and thus failed to mediate the performance effects. It is likely a limitation as the non-significant mediation effect suggested that the observed performance effects could be due to other unknown factors rather than what we measured (i.e., efficiency). However, according to the distraction theories (Eysenck & Calvo, 1992; Eysenck et al., 2007), optimized performance under pressure can be achieved via either the maintained or improved efficiency reflecting excellent regulation of task processing or the reduced efficiency

attributing to the re-allocation of processing resources to compensate the negative influence of performance anxiety. In other words, both improved and reduced efficiency may benefit performance albeit through different mechanisms. Therefore, the non-significant relationship between efficiency and performance under pressure is explainable from the perspective of the distraction theories. As such, it is no surprise that efficiency does not mediate the performance effect.

Some additional weaknesses are also relevant to Study 4. For example, the cross-sectional design of the present research may invite concern regarding causality between study variables. However, the effects Study 4 demonstrated are clear, novel, and with sufficient power reflecting reliability and replicability. Despite its correlational nature, Study 4 provides considerable practical values and directions for future research. Another limitation points to the measure of performance strategies in athlete training. As noted, the TOPS-2 (Hardy et al., 2010) does not assess the use of different goal types and imagery perspectives (Hardy & Jones, 1994) and athlete imagery ability (Roberts et al., 2008). Literature (e.g., Hardy & Jones, 1994; Nordin & Cumming, 2005) suggests that there are different types of goals (e.g., outcome, performance, and process goals), imagery perspectives (e.g., internal and external visual imagery) and imagery types (Martin et al., 1999). Without recourse to consider these issues, the TOPS-2 fails to provide insights on whether narcissists benefit differently from different goals or imagery types in training. Further, imagery ability is a moderator of imagery effectiveness (Roberts et al., 2008), and so imagery is more useful for those with good imagery ability. Since Study 4 only measured imagery use, it is unknown how good participants of Study 4 were at imagery. The unmeasured imagery ability may have magnified or reduced the effects of imagery use that were observed in Study 4. Researchers and practitioners are encouraged to consider different goal types, imagery perspectives, and participant imagery ability in the training of these performance strategies.

Further, the conceptualizations and discussions on narcissism in this thesis, especially regarding the interaction between adaptive and maladaptive narcissism, are only relevant to its grandiose and agentic form. Indeed, narcissism also exists in a vulnerable form (Miller et al., 2011) and at a communal as well as an agentic level (Gebauer et al., 2012). Both vulnerable and communal narcissism have a well-established uni-dimensional factor structure and consistent rather than paradoxical influences on a range of outcomes (Cheek, Hendin, & Wink, 2013; Gebauer et al., 2012; Hendin & Cheek, 2013), and thus there is no published evidence of adaptive and maladaptive aspects of these forms of narcissism. However, these different forms of narcissism also likely play different roles in performance contexts, but research has yet to explore the possible influences of different forms of narcissism in pressurized performance and athlete training. As such, there is considerable room for future directions.

Finally, although the current thesis focused mainly on the grandiose and agentic form of narcissism, the unassessed vulnerable form of narcissism may be relevant to some of the findings. Compared to grandiose narcissism that primarily reflects characteristics relating to a grandiose self-view (i.e., adaptive narcissism) and a dominating orientation (i.e., maladaptive narcissism), vulnerable narcissism typically reflects a defensive and insecure type of grandiosity that obscures feelings of inadequacy, incompetence, and negative emotions (Miller et al., 2011). Despite a unrelated nomological networks of grandiose and vulnerable narcissism, the maladaptive components of narcissism indeed captures some aspects of vulnerability given their moderate-to-high correlation and consistent relationships with increased neuroticism and reduced agreeableness (Ackerman et al., 2011; Malkin, Zeigler-Hill, Barry, & Southard, 2013). Considering the potential overlapping between maladaptive components of grandiose narcissism and the vulnerable form of narcissism, our findings regarding maladaptive narcissism's moderation of adaptive narcissism's influences on

performance under pressure and athlete concentration/preparation in training, might to some extent attribute to vulnerable narcissism. Also, since the hypersensitivity related to vulnerable narcissism may drive individuals prone to detect any threat and react accordingly to eliminate it (Ronningstam, 2009), vulnerable narcissism might be the catalyst to achieving the highest levels of performance (Roberts & Woodman, 2015; Roberts, Woodman, et al., 2018). This is because performance contexts offer not only increased threats (e.g., risks of failure) but also excellent opportunity to buffer their fragile self-concept (e.g., performing exceptionally), and thus narcissists with considerable levels of vulnerability might be particularly motivated to strive for the highest possible performance. Considering the potential role of vulnerable narcissism in performance, one would expect that the facilitating role of maladaptive narcissism in performance contexts (i.e., reflecting a willingness to dominate) is likely to be strengthened or at least partially ascended to vulnerable narcissism. However, this thesis has left the test of vulnerable narcissism's potential catalytic role in performance settings for future research (see further discussion in Suggestions for future research directions).

Suggestions for future research directions

The findings from the research programme contained in the current thesis provide several future research directions. First, although the test of potential mechanisms underlying narcissism and performance in the current thesis rested on the Processing Efficiency Theory (Eysenck & Calvo, 1992) and the Attentional Control Theory (Eysenck et al., 2007), the results from Chapter 2 suggest that competing theories such as the Theory of Reinvestment (Masters & Maxwell, 2008) also provide important insights into why narcissists are likely to perform well under pressure. According to the Theory of Reinvestment, when under pressure, performers tend to reinvest attention to task processing through the use of explicit task-relevant knowledge (Masters, 1992) or the step-by-step monitoring (Beilock & Carr, 2001) to avoid undesired performance. Such a reinvestment strategy that attempts to compensate

performance will regress effortless skilled performance to a novice level that breaks down automaticity and requires effortful control, which results in performance failure (Masters & Maxwell, 2008). However, when considering individual differences in narcissism, it is possible that individuals with high levels of narcissism see themselves as so capable as to need no reinvestment to ensure good performance (Zhang et al., 2018). As such, individuals high in narcissism may be less likely to suffer from the reinvestment effects that commonly occur when performing under high pressure. Results from Experiments 2-3 in Chapter 2 provide support to this position, especially that a precise combination of adaptive and maladaptive narcissism predicted reduced pre-putt time in a pressurized golf-putting task (reflecting automated task execution and lower level of skill regression) and less decreased r-MSSD during letter transformation (reflecting lower level of effortful task processing and greater mental efficiency). Future research would do well to explore the individual differences of narcissism in reinvestment effects, making use of both behavioural/psychophysiological markers and self-report reinvestment (e.g., Orrell, Masters, & Eves, 2009) to examine the narcissism-reinvestment relationship in larger samples and a variety of performance contexts.

Another relevant future direction here points to the possible development of existing anxiety-performance theories. Indeed, *distraction theories* such as the Processing Efficiency Theory (Eysenck & Calvo, 1992) and the Attentional Control Theory (Eysenck et al., 2007) and *self/skill-focused theories* such as the Theory of Reinvestment (Masters & Maxwell, 2008) are the two dominating perspectives that provide independent explanations of why the likelihood of performance failure increases under high pressure. However, results from Experiments 2-3 supporting the *trying smarter* position, which we explained based on Attentional Control Theory, also seem to fit well in regard to the Theory of Reinvestment. More specifically, as noted earlier a superior regulation of pressurized task processing within

the capacity-limited working memory system (e.g., reduced pre-putt time in golf putting, relatively stable r-MSSD during letter transformation) can also reflect lower levels of reinvestment (e.g., automated task execution, effortless control). Such a possible link between improved efficiency and lower levels of reinvestment suggests that reinvestment that is thought to regress skilled performance to novice level (Masters & Maxwell, 2008) may not be always harmful to performance. Specifically, reinvestment likely serves a motivational function similar to investing greater effort, which may compensate performance especially when the level of pressure is not high because additional processing resources are available for both reinvestment and task processing. However, when performance pressure rises to a high level, reinvestment will be harmful to performance because the capacity-limited working memory system under high pressure requires effortless and efficient task processing. Such a position mirrors the predictions of *distraction theories* that as the level of pressure increase additional effort is less likely to compensate performance, but a superior regulation of task processing will do. As such, the *distraction* and *self/skill-focused* perspectives of why performance failure occurs under pressure may be well-united to offer a more comprehensive picture, which warrants research attention (see also Zhang et al., 2018).

Another future direction relevant to narcissism and performance is the possible post-performance effects. Despite not considered previously, engaging in performance environments may offer prolonged benefits for individuals high in narcissism. Narcissists have exceptional needs for self-enhancement and ego-protection (Alicke & Sedikides, 2009), which are believed to contribute to their increased risk of anti-social and socially maladaptive behaviours (see Lambe et al., 2018). For example, narcissism is related to aggression and violence (e.g., Malkin et al., 2013), as well as conduct problems, peer problems, and interpersonal conflicts (e.g., Barry et al., 2007; Barry, Frick, & Killian, 2003). According to Baumeister, Smart, and Boden (1996), narcissists demonstrate aggression, violence, or other

socially undesirable behaviours because they have no alternative means to eliminate ego threats and to re-establish dominance. While the opportunity to eliminate ego threats and re-establish dominance is rare in social and interpersonal contexts, such opportunities emerge in performance settings. Typically, performance environments provide alternative sources for obtaining self-enhancement (Wallace & Baumeister, 2002) and eliminating ego threats (Nevicka et al., 2016). As such, it is possible that individuals high in narcissism could glean social-behavioural benefits from the performance settings and transfer these benefits to mitigate their maladjustments in the social contexts (see also Hardy et al., 2017). At a more general level, performance experience, such as one's commitment to various types of sports and competitions, may have specific benefits not only to individuals high in narcissism but also to a wider range of population (e.g., individuals high in alexithymia; see Woodman, Hardy, & Barlow, 2018). Future research should investigate whether and how performance settings may provide benefits to different individuals.

Moreover, from an applied perspective learning from Study 4 (Chapter 3), the use of different goals and imagery perspectives/types to optimize the quality of training is worthy of future research. Indeed, findings from the Study 4 suggest that imagery and goal-setting use during athlete training is particularly beneficial to athletes who are high in adaptive narcissism and low in maladaptive narcissism, contributing to improved concentration and quality of competition preparation. However, there are different goals (e.g., outcome, performance, and process goals), and imagery perspectives (e.g., internal and external visual imagery) and types (e.g., motivational general-mastery, motivational general-performance), which were failed to be considered in Study 4. Apart from exceptions such as Roberts et al. (2010), who suggested that external visual imagery is particularly beneficial to the performance of narcissists because "watching" oneself performing successfully activates one's self-enhancement motives, it is unknown if the use of different goals and imagery

perspectives/types may have divergent effects that benefit different aspects of training or to individuals with different personality traits. Future research would do well to examine if different goals and imagery perspectives/types have their unique benefits in relating to different aspects of training and different individuals.

Furthermore, the findings from Study 4 offer an alternative route to distinguish between adaptive and maladaptive narcissism. Typically, Study 4 demonstrated that athletes high in adaptive narcissism seem to take advantage of using performance strategies (especially imagery and goal-setting) in their training, yet such strategies seem less beneficial to those high in maladaptive narcissism. Since these performance strategies are thought to help athletes foresee the inspiring visions and glory afforded by training, it is possible that these perceived opportunities increase a short-term sensation of self-enhancement rather than a reality of achieved dominance and control. Indeed, self-enhancement strategies may not add extra motivation to those high in maladaptive narcissism because such strategies may provide a short-term sense of glory but are less effective in helping to achieve dominance and personal control in the long term. Also, if narcissists high in maladaptive narcissism focus more on the long-term "gain", any short-term strategies such as creating a sense of self-enhancement might simply be less effective. As such, the Study 4 findings indicate that adaptive narcissism may be more associated with impulsivity or a focus on short-term reward while maladaptive narcissism might be more related to a long-term desire to gain benefit and to dominate. Such a potential distinction warrants future research attention and may be particularly relevant to the different roles of adaptive and maladaptive narcissism in training.

Finally, different forms of narcissism such as vulnerable and communal narcissism were not considered in this thesis, and these aspects of narcissism may play different roles in pressurized performance and training. For example, vulnerable narcissism reflects hypersensitivity and hypervigilance for criticism and failures (Miller et al., 2011). Therefore,

vulnerable narcissism may be related to increased punishment sensitivity and contribute to early detection of threats which in turn could benefit performance under pressure (Manley et al., 2017). However, regarding training environments, vulnerable individuals may be more likely to envisage any negative realities or threats and thus may cope less well with adversity. Also, communal narcissists seek to satisfy their grandiose self-view, feelings of entitlement, and power via communal means (Gebauer et al., 2012) but behave less communally especially when their need for power is validated (Giacomin & Jordan, 2015). Consequently, leaders high in communal narcissism may contribute to increased group conflicts or impaired group cohesion and thus lead to poorer team performance and quality of training. Alternatively, communal narcissists might engage particularly well in training. This is because communal narcissists can gain self-enhancement via being a good team player, with one way of being a good team player being training well. Future research would do well to investigate the roles of different forms of narcissism in both training and performance.

Conclusions

To conclude, this thesis has examined the interaction between adaptive and maladaptive narcissism and its relevance to two different performance settings, namely high-pressure performance environments and athlete training environments. The thesis has demonstrated that the precise combination of adaptive and maladaptive narcissism contributes to both pressurized performance and athlete quality of training. Also, the thesis has suggested that *trying smarter*, or a superior regulation of pressurized task processing within the capacity-limited working memory system, accounts for why individuals high in both adaptive and maladaptive narcissism perform well under pressure. Additionally, the thesis has also suggested that adaptive narcissism seems to be particularly detrimental to athlete training, but such an adverse influence can be mitigated by high levels maladaptive narcissism or the use of certain performance strategies (especially imagery and goal-setting)

during training. The findings from this thesis are open to a number of exciting future research directions that should receive attention in the future.

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