Social Power and the Pursuit of Multiple Goals:

Effects of Power on Multitasking

Tendency and Ability

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Submitted for the degree of Doctor of Philosophy

University College London, December 2014

Signed Declaration

I, Alice Ran Cai, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Abstract

Social power, or the ability to control resources and influence others' outcomes, has been found to facilitate successful attainment of single goals by increasing attentional focus and the ability to inhibit irrelevant information. However, the relationship between power and multiple-goal pursuit has not yet been investigated. The current thesis first examined whether power influences strategies during multiple-goal pursuit. It was hypothesized that powerful individuals are more inclined to single-task (attend to tasks in a sequential manner) and powerless individuals tend to multitask (attend to tasks simultaneously or switch rapidly between them) when faced with multiple demands. Six studies were conducted and showed (in general) a effect of power on multitasking and prioritization tendencies. Specifically, reported tendency for multitasking and number of switches planned between various tasks decreased as a function of power (Chapter 2). This negative relationship between power and multitasking tendency was replicated by measuring how many times participants actually switched between multiple goals during goal striving (Chapter 3). Moreover, power was also found to increase prioritization tendency. Second, the thesis investigated the relationship between power and multitasking ability (Chapter 4). It was predicted that powerless participants will show lower multitasking ability than control and powerful participants. Three experiments found that powerless (compared to control and powerful) participants displayed lower performance in dual-tasking and task-switching paradigms, and reported lower abilities in the management of multiple-goals. However, the effect of power on multitasking ability may depend on the multitasking context. These results were found using experimentally manipulated power, individual differences in

power, and real-world power roles. Potential mediating factors of power such as mood, confidence, anxiety, rumination, and motivation were also measured. Overall, the thesis established an ironic effect of power as powerless individuals had a higher multitasking tendency but underperformed during demanding multitasking situations.

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Acknowledgements

First I would like to give me sincerest thanks to Dr. Ana Guinote for her supervision, advice, and wisdom. Your feedback, suggestion, and on-going support have been invaluable in the process of completing this research and in inspiring me to become a better writer and researcher. Thank you for the time you have invested and for your endless patience and enthusiasm.

Second, my most heartfelt appreciation goes to my mom and dad for their unconditional love, positive energy, and endless faith in me throughout the years. Thank you for giving me the ambition and confidence to succeed, as well as the opportunities to fulfill all my dreams and aspirations.

Last, but definitely not least, I am greatly indebted to all my family and friends for their emotional support, encouragement, and for always being there to listen and to put a smile on my face. Thank you for supporting me while I found my way.

Chapter 1:

General Introduction

1.1 Preface

Hierarchical differentiations have been prevalent throughout history in both human and animal populations. Despite the worldwide endorsement and promotion of equality in recent years, almost all cultures, organizations, and groups still have salient power differentials with asymmetrical distributions of resources among individuals. Given the ubiquitous nature of social power, there has been an increasing interest in how the amount of power one possesses (or lacks) can influence cognition and action.

One well documented effect is that power facilitates, whereas powerlessness hinders, self-regulation and the attainment of goals (DeWall, Baumeister, Mead, & Vohs, 2011; Guinote, 2007c; Overbeck & Park, 2006; Scheepers, de Wit, Ellemers, & Sassenberg, 2012). This effect has been attributed to the fact that powerholders, who are at the top of the hierarchy, can benefit from increased freedom, security, and rewards, and have more control over their own as well as the other's outcomes (Magee & Galinsky, 2008; Sidanius & Pratto, 2001). As a consequence, powerholders are able to devote their undivided attention to their primary goals and needs and regulate their behaviors accordingly (Galinsky, Gruenfeld, & Magee, 2003; Guinote, 2007a). On the other hand, powerlessness increases dependency, restraints, and potential threats (Fiske & Berdahl, 2007), and these challenging environments incur multiple concerns for the individual. They therefore need to pay attention to various sources of information, such as their superiors' actions (Fiske, 1993) and the unpredictable environment (Anderson & Berdahl, 2002; Keltner, Gruenfeld, & Anderson, 2003), in order to predict the future and to regain control.

This can increase distractibility and divert attention from pursuing the focal goal because all, instead of only those relevant for the focal goal, information are potentially important. As a result, low-power individuals exhibit goal pursuit deficits compared to high-power individuals (DeWall et al., 2011; Guinote, 2007c; Slabu & Guinote, 2010; Smith, Jostmann, Galinsky, & van Dijk, 2008).

However, thus far previous studies have not examined whether power affects the pursuit of multiple goals and multitasking (also known as polychronicity), where individuals pursue two or more goals simultaneously (i.e., dual-tasking) or in rapid succession by continuously switching between them (i.e., task-switching). This is unfortunate because in everyday lives we usually face a variety of demands that compete for our attention. For example, modern technology and flexible work ethic constantly offer opportunities to do more than one task at a time. Whether driving and talking on cell phones, or being notified of emails while working, we are frequently exposed to multiple inputs and opportunities (Lindbeck & Snower, 2000). Similarly, studies in goal pursuit and performance literatures have not looked at whether social factors, in particular the position that individuals occupy in the social hierarchy, can affect multitasking behavior and performance. Instead, past research has mostly focused on how goal progress (Schmidt, Dolis, & Tolli, 2009), positive affect (Carver, 2003), sensation seeking tendency (Sanbonmatsu, Strayer, Medeiros-Ward, & Watson, 2013), motivational state (Pierro, Giacomantonio, Pica, Kruglanski, & Higgins, 2012), culture (Allen, 1992), and anxiety (Derakshan & Eysenck, 2009) can affect multitasking tendency and performance. The current thesis will address this gap in the literature by investigating the effect that power has on how individuals pursue multiple goals and on their ability to multitask.

Drawing on the idea that power increases (whereas powerlessness decreases) attentional focus and prioritization of goal-consistent information, and on evidence that the ability to focus attention and the amount of distractions experienced affects multiple-goal pursuit (Ansari, Derakshan, & Richards, 2008; Appelbaum, Marchionni, & Fernandez, 2008; Lehle, Steinhauser, & Hübner, 2009; Ophir, Nass, & Wagner, 2009), it was predicted that power can influence how individuals pursue multiple goals. Powerless individuals' need for control encourages them to attend to multiple sources of information, and this willingness to perceive different information as equally important will encourage interruptions and multitasking behavior (i.e., higher polychroncitiy). Conversely, powerholder's tendency to prioritize and focus attention on goal-relevant information will foster a single-tasking pursuit of multiple goals (i.e., higher monochronicity), which involves switching to another goal only after one goal has been progressed to a sufficient degree (Bluedorn, Kalliath, Strube, & Martin, 1999).

The second question addressed in the thesis is whether power affects performance during multitasking. Multitasking is attentionally more demanding and challenging than focusing on only one task (Fishbach & Ferguson, 2007; Kruglanski et al., 2002; Pashler, 1993; Pashler & Johnston, 1998; Rubinstein, Meyer, & Evans, 2001; Stephen Monsell, 2003). Therefore being vigilant to irrelevant information and off-task concerns in powerless individuals can be distractive and absorb attentional resources necessary for efficient multitasking. This will then decrease performance during challenging multitasking situations, which are highly dependent on the amount of cognitive resources available and allocated to the tasks. Since powerless individuals seek more information and have less capacity to control attention during multitasking situations, then low power may ironically lead to increased multitasking behavior, but less ability to multitask.

Before introducing the empirical chapters, the current thesis will first review the literature on power as well as on multiple goals and multitasking. The first part of the introductory chapter will define social power, summarize various operationalization of power, and review the influence of power on attention and goal pursuit. Together, evidences provided in this section suggest a gap in the power literature regarding multiple-goal pursuit. This will then be followed with a second section which will present the literature on multiple goals. The second section was divided into two main domains. The first area revolved around behaviors and strategies that people use during multiple-goal pursuit, where researchers investigated how individuals approached multiple goals. The second strand looked at multitasking ability. Work in this field has examined whether individuals are generally better at single-tasking as compared to multitasking, and what can affect multitasking ability. Lastly, the final section of the introduction will describe the present research questions and explain how power can impact both the behavior and the performance aspects during the pursuit of multiple goals. The introduction will end with an overview of the next empirical chapters.

The introduction will be followed by three empirical chapters that will explore the effect of power on how individuals approach multiple goals, whether or not individuals prioritize the various goals that they have, and performance during multitasking situations. To test the hypothesis that power affects the kind of strategies employed during multiple-goal pursuit, a variety of methodologies were used including self-reports, planning, and measuring actual behaviors. For example, participants were asked to report directly their tendency to engage to multiple tasks simultaneously and to plan out the number of switches they will make from one activity to another (Chapter 2). Participants' strategies during goal striving were also assessed by measuring how many times they actually switched from one task to the other during simulated multitasking situations (Chapter 3). As power decreased, the number of planned and actual switches increased, which indicates a higher propensity to multitask. Finally, the relationship between multitasking ability and power was addressed using dual-tasking and task-switching paradigms, as well as using self-reports (Chapter 4).

1.2 Social Power

1.2.1 The Experimental Study of Power

Social power is arguably one of the most important concepts in social sciences (Russell, 1938), as it is present in virtually all relationships that we have. Whether it is between individuals (e.g., parent and child), within groups (e.g., in organizational settings), or between social groups (e.g., ethnicities, genders, and socio-economic classes), power has a profound impact on how individuals think, feel, and act. Defining power has not always been easy, as it is a complex and multifaceted concept. However, explicit definitions are essential in order to be able to empirically study social power. Traditionally, power has been defined as the ability to influence others at will, where the powerful person can cause the powerless person to behave in a certain way through social compliance (Dahl, 1957; Huston, 1983; Freeman & Pruitt, 1976).

It has later been proposed that defining power in terms of influencing others is problematic because it only explains the effect or consequence of power, but not what power actually is (Fiske & Berdahl, 2007). Rather than describing power through its consequences, many researchers started to define power as an individual's relative ability to possess and control valuable resources and outcomes (Fiske, 1993; Fiske & Berdahl, 2007; Fiske & Dépret, 1996; Keltner et al., 2003). That is, hierarchical differences in power can significantly modify the state of an individual through asymmetrical control over valuable resources, which allows the powerholder to withhold rewards or administer punishments towards those with less power (Dépret & Fiske, 1999; Emerson, 1962; Fiske, 1993; French & Raven, 1959; Yukl & Falbe, 1991). These can be material resources (e.g., food and shelter) or social and psychological resources (e.g., knowledge and affection). The control of these resources can exist at an individual level (e.g., subordinates vs. managers) or at an intergroup level (e.g., gender). This definition of power also suggests that people who have control over others' outcomes have power, regardless of whether or not they attempt to use their power to influence other individuals. Thus the most common definition of power, and the one adapted by the current thesis, is the ability to influence others by having control over resources or outcomes.

The current definition of power does not focus solely on a single outcome or resource, but proposes that power is present in almost all contexts, and can exist in the absence of formal roles (e.g., within informal groups; Weber, 1947). It also distinguishes power from other related constructs such as status and dominance. Although power has been commonly associated with social status (Knippenberg, 1991), but status is related to attributes that produce differences in respect and prominence, and not necessarily the ability to allocate resources. Therefore it is possible to have power without status (e.g., a corrupt politician), or status without relative power (e.g., a religious leader; Blader & Chen, 2012). In addition, power is different than dominance, as dominance is the act of acquiring or wanting power as the end-goal. Hence it is possible to possess power without dominant behaviors (e.g., obtaining powerful positions through cooperation). Thus both status and dominance can be determinants, but not synonyms, of power.

We have evolved to be very sensitive to power and dominance cues because noticing power differences in social situations are so prevalent and important for survival. For example, we can in just a few milliseconds recognize whether a face is dominant or submissive (Oosterhof & Todorov, 2008). Moreover, even in informal one-to-one interactions, individuals often implicitly assume complementary power postures and behaviors where one person acts in a more powerful manner than another, who in turn assumes a more submissive role (Markey, Funder, & Ozer, 2003; Tiedens & Fragale, 2003). In fact, research has showed that the reason why social hierarchies exist is because individuals have an indirect preference for them as hierarchical relationships are easier to cognitively process, understand, and remember (Zitek & Tiedens, 2012). Given the importance and prevalence of power in our society, researchers have actively tried to explain the concept of social power in order to investigate its impact on our feelings, thoughts, perceptions, and actions (Fiske, 1993; Fiske & Dépret, 1996; Galinsky et al., 2003; Guinote, 2007b; Guinote, Judd, & Brauer, 2002).

The experience of having or lacking power can be derived from social relationships and interactions, as well as from the psychological property of the individual. For example, sense of power can be measured as an individual trait variable, where some people generally feel more in control across different social contexts and relationships compared to others. These individual differences can result from chronic personal experiences based on social roles, group memberships, or dominant personalities. In fact, measures of general sense of power correlate with people's standing in social hierarchies and whether they occupy powerful or powerless social roles in real-life (e.g., possessing a managerial vs. a subordinate role at work; Anderson & Galinsky, 2006). As a consequence, differences in social power can be measured as an individual difference variable through social roles (Guinote & Phillips, 2010) or the sense of power scale (Anderson & Galinsky, 2006),

In addition, as suggested by the definition, one's sense of power is also malleable because it can rely on an individual's relative control over outcomes during a particular situation. For example, in a single day, one may experience both having power (e.g., supervising employees at work) and lacking it (e.g., getting a traffic ticket). Since the degree of power experienced can depend on one's circumstance such that those with high sense of power can also activate low-power emotions and vice versa, then it can also be manipulated in the laboratory. Laboratory manipulations of power allow researchers to empirically investigate the effect that power has on behavior and cognition.

One popular manipulation of power is to randomly assign participants to manager or subordinate roles based on ostensible leadership abilities (e.g., DeWall, Baumeister, Mead, & Vohs, 2011; Galinsky et al., 2003; Guinote, 2007a). This can simulate real-life power experiences in a controlled environment. Power has also been operationalized through experiential priming by asking participants to recall a past event where they felt powerful or powerless (Galinsky et al., 2003), by exposing participants to power-related words (Schmid Mast, Jonas, & Hall, 2009; Smith & Trope, 2006), and, more recently, by embodying power through mimicking low- vs. high-power body postures (Bohns & Wiltermuth, 2012; Carney, Cuddy, & Yap, 2010; Huang, Galinsky, Gruenfeld, & Guillory, 2011). Priming power can function in the same manner as actually experiencing it, because the concept of power is linked in memory to various characteristics and behavioral tendencies. Therefore when the construct of power is activated, whether via actual experience of a powerful or powerless role or by mere exposure to cues related to powerfulness or powerlessness, then the same associated concepts and tendencies will also be activated (Bargh, 1997).

The converging results obtained from different power manipulations support the idea that merely exposing individuals to the concept of powerfulness or powerlessness is enough to alter people's mindsets to correspond to their respective roles. For example, power increased tendency for action regardless of whether it was structurally manipulated (Experiment 1) or primed (Experiment 2; Galinsky et al., 2003; see also DeWall et al., 2011). Moreover, experimental manipulations of power yield similar results to naturally occurring power. For instance, power increases attention to stereotype-consistent information and reliance on ease of retrieval in both randomly assigned power conditions and actual power in managerial contexts (Fiske & Dépret, 1996; Guinote & Phillips, 2010; Weick & Guinote, 2008).

1.2.2 The Power Mind-Set and Theories of Power

Regardless of how power is operationalized, it can have a profound impact on an individual's world and mind-set by affecting sense of security and control (Keltner et al., 2003). This, in turn, can have a significant effect on how environmental information is processed and attended to, which can then influence cognition and action in meaningful and predictable ways. According to many scholars, organisms respond to the environment either through approaching or avoiding (Carver, Sutton, & Scheier, 2000; Elliot & Covington, 2001; Gray, 1982, 1987, 1991, 1994; Higgins, 1997). For example, Higgins's (1997, 1999) theory of promotion and prevention self-regulatory focus proposes that individuals can either have a promotion focus on gaining and approaching rewards and positive outcomes, or a prevention focus towards securing needs and avoiding punishments or negative outcomes. Behavior approach system allows individuals to focus on obtaining goals and increases forward locomotion, whereas the behavioral inhibition system increases feelings of threat and uncertainty, and creates vigilance and attention towards potential punishments. As will be described later in the thesis, having a promotion or prevention goal orientation may not only be affected by power, but it can also influence how resources are allocated during multiple-goal situations (Schmidt & DeShon, 2007).

Keltner and colleagues applied this idea of approach and inhibition to the social context of power, and argued that power can influence the relative balance between approach and inhibition tendencies. The approach/inhibition theory of power (Keltner, et al., 2003) suggests that different levels of power can alter the frequency of threats and uncertainties that an individual will face. High-power is associated with abundant resources and rewards, and the freedom to act according to one's own will without the types of external interferences experiments by powerless individuals. This reward-rich environment, and freedom from evaluation, should promote the approach-related cognition, affect, and behavior that are focused on rewards and opportunities. For example, in the real world, adults from higher socioeconomic status (a measure correlated with high power) tend to report lower levels of mistrust in others (Mirowsky & Ross, 1983) and lower levels of worry about crime (Riger, LeBailly, & Gordon, 1981) than individuals from low socioeconomic status. Moreover, people who have high sense of power perceived less risk in their own lives and in the world, and were more optimistic about uncontrollable situations such as avoiding airplane turbulence (Anderson & Galinsky, 2006). This optimism and reward-focused attention also led to higher engagement in risky behaviors.

On the other hand, powerlessness should activate the behavioral inhibition system, because less powerful individuals have fewer material and social resources. This decreases security and independence, because in order to survive, those who are powerless must focus on the threats and potential punishments that are continuously imposed on them by their environment (Fast & Gruenfeld, 2009; Fiske, 1993; Guinote, 2007a; Steele & Aronson, 1995). This inhibited behavior of powerless individuals is adaptive for survival, as they are more likely to be victimized by those with more power. For example, discrimination and violence are targeted more towards minority groups and those in lower status or social classes (Gottfredson & Hindelang, 1981; Sanday, 1981; Sidanius, 1993; Whitney & Smith, 1993). Being constrained by the environment and having to rely on other's evaluations should encourage powerless individuals to regulate their behaviors in a more inhibited manner in order to avoid threats and punishments.

Instead of focusing on approach vs. inhibition-related behaviors, another theory of power emphasizes the effect that power has on the need for control. According to Fiske's (1993) power as control model, the experience of power can alter the satisfaction of the fundamental need for control, and is based on the idea of control motivation where individuals have a universal need to seek and maintain control and predictability. Several theorists from a range of areas including social, health, and developmental psychology agree that being able to control the environment is a core motive (Brehm, 1993; Fiske & Emery, 1993; Stevens & Fiske, 1995). For example, individuals have an instinct to master and control (Hendrick, 1943), to avoid helplessness (Sullivan, 1947), and to strive for personal causation (de Charms, 1968). This desire to control the environment is present from infancy (Lewis & Brooks-Gunn, 1979), and can determine adult's mental health by reducing stress and increasing one's capacity to cope with unavoidable negative events (Fiske & Taylor, 1984; Lefcourt, 1972). In contrast, lack of control increases reactivity to stress both in terms of physiological changes and reported symptoms. Together, evidence from various psychology disciplines concedes that sense of control is a central human need.

Past research also suggests that control deprivation increases activities that can compensate for this loss, such as information-seeking behaviors or engaging in effortful impression formation processes (Pittman & Heller, 1987). Common empirical manipulations of control include non-contingencies between actions and outcomes, variations in naturally occurring depression episodes, unexpected negative events, or concern over outcomes (for a review, see Pittman & Heller, 1987). In most situations, those who lack control are more likely to seek information and knowledge not because of increased curiosity and interest, but to gain prediction and control in order to effectively manage themselves and their environments (Heider, 1958; Jones & Davis, 1965; Kelley, 1972). This is because having a comprehensive and coherent understanding of another person's behavior or of their surroundings can help low-power individuals to better anticipate other people's action and possible situational changes. Hence information seeking tendencies are a natural consequence of control deprivation.

As a consequence, power can exert its influence on an individual by either depriving or providing control (Fiske, 1993; Fiske & Dépret, 1996; Depret & Fiske, 1993). Numerous findings support the idea that feelings of control are associated with power. For example, people with real-life power such as those in high socioeconomic status (Lachman & Weaver, 1998) and members of dominant groups (Guinote, Brown, & Fiske, 2006), are more likely to believe that they can control the future compared to individuals with a more disadvantaged background. Similarly, experimental manipulations of power can also elevate one's sense of personal control, even when the control is illusory. Moreover, participants who recalled a time when they felt powerful preferred to role a dice themselves compared to low-power and baseline participants. Elevated sense of control could also explain approach-related behaviors such as the tendency to act (Galinsky et al., 2003; Magee, Galinsky, Gruenfeld, & Wagner, 2007), as well as mediating the relationship between power, optimism, self-esteem, and risk-taking (Anderson & Galinsky, 2006; Fast & Gruenfeld, 2009). In addition, powerful individuals, who already have control over their own as well as their dependent's outcomes, have lower perspective taking abilities compared to powerless individuals (Galinsky, Magee, Inesi, & Gruenfeld, 2006). This is because those with high power do not need to rely on an accurate and comprehensive understanding of others in order to accomplish their goals. They therefore have greater freedom and an increased sense of control, and can act without any external interference.

In contrast, people who are powerless usually follow orders and are at the disposal of the powerful (Fiske, 1993; Keltner et al., 2003), and this outcome dependency makes the world seem less controllable. Since having a sense of control is a highly adaptive human motive, and its absence can lead to depression, pessimism, and withdrawal from challenging situations (Abramson, Seligman, & Teasdale, 1978; Price, Choi, & Vinokur, 2002), then lacking control can have a profound impact on an individual. As a result, powerless individuals are constantly motivated to gain and restore control and predictability in order to avoid potential threats. For example, powerless individuals spontaneously adopt another person's visual perspective and are more accurate in determining emotions expressed by others (Galinsky et al., 2006). Increasing perspective taking and empathy is an effective way to restore control by predicting and understanding other people's intentions. This need to restore control is so strong that it even drives them to see non-existent patterns in their environments (Whitson & Galinsky, 2008). This thesis will propose that in order for powerless individuals to restore control, they will be motivated to multitask because multitasking allows them to attend to all information and treat all tasks as equally important, as opposed to only focusing on and prioritizing a single task.

In sum, there is indisputable evidence that being in a high- or low-power role can transform people psychologically. Powerless individuals experience a more ambiguous and unstable situation compared to the reward-rich and predictable environment of the powerholder (Fast & Gruenfeld, 2009). Since much of human cognition is motivated by our basic needs to interact effectively with the environment (Fiske, 1992; Pittman & D'Agostino, 1989; Skinner, 1995), then these feelings of security and control associated with having or lacking power can alter the way we view the world and guide our attention and action. The relationship between power and attention is important, as the way individuals attend to and process information around them can influence how they approach multiple goals and their multitasking ability (Kernan & Lord, 1990; Ophir et al., 2009; Shah & Kruglanski, 2002; Strayer, Watson, & Drews, 2011). Thus the next section will discuss how decreased (vs. increased) control and inhibition (vs. approach) focus elicited by low (vs. high) power can affect attention and behaviors.

1.3 Power and Attention Allocation

Attention refers to a cognitive system that allows us to select and process specific information while ignoring other information in the environment that is deemed as less relevant or important (Driver, 2001; Maitlin, 2005; Pashler, 1998; Posner & Petersen, 1989; Schmeichel & Baumeister, 2010). Researchers have long recognized the importance of studying the concept of attention (Hillyard & Picton, 1987; James, 1890), and have proposed three major functions of attention (Kahneman, 1973; Posner & Boies, 1971): orienting to sensory events, detecting signals of focal processing, and maintaining a vigilant or alert state.

Regardless of which attentional subsystem is being used, an individual's attention can be selective and focused on a specific stimulus or it can be divided between multiple stimuli (Corbetta, Miezin, Dobmeyer, Shulman, & Petersen, 1991; Pashler, 1998). For example, situational demands may require an individual to detect only one stimulus from the environment, or it may be necessary to detect multiple cues and inputs (e.g., when faced with multiple demands). Attention can also be differentiated between top-down (goal-driven) vs. bottom-up (stimulus-driven) information processing (Corbetta & Shulman, 2002; Taatgen, 2005). Top-down attention is when we voluntarily concentrate on or look for a certain type of cue, such as focusing on a given task or goal. On the other hand, bottom-up processing of information is when salient cues in our environment grab our attention unexpectedly and involuntarily (Corbetta & Shulman, 2002). This attentional system is recruited during the detection of behaviorally relevant sensory events, and is more adaptive during unpredictable situations that call for heightened vigilance (Moser, Becker, & Moran, 2012).

Sometimes, individuals may voluntarily adopt a focused and top-down attention, instead of a divided and bottom-up attention, depending on personal motivations and preferences. However, in other situations our attention might be involuntarily guided by stimulus-driven information and divided between relevant and irrelevant information. The ability to voluntarily maintain a focused and top-down attention even in the face of distractions is known as attentional control (Burgess et al., 2010; Corbetta & Shulman, 2002; Eysenck, Derakshan, Santos, & Calvo, 2007). Since attention is functionally linked to the needs and challenges that individuals face in their situations, then the different goals that powerful and powerless individuals try to satisfy can affect both the voluntary focus of attention as well as attentional control. The next sections will first illustrate how power affects voluntary allocation of attention in terms of information seeking tendencies and goal-related behaviors, and then present evidence for the relationship between power and attentional control.

1.3.1 Power and Information Seeking

Power can influence how individuals attend to and process information as it activates different modes of behavioral control that is more adaptive to one's respective high or low-power positions. According to the previously mentioned approach/inhibition theory of power (Keltner et al., 2003) and the power as control model (Fiske, 1993), powerless individuals are faced with constraints and dependency on external circumstances. Therefore those without power should exhibit a wider scope of attention because they are constantly attending to multiple sources of information in order to increase predictability and control, and to encode potential warnings. Thus they will by default have a more divided attention. On the other hand, and as proposed by the situated focus theory of power (SFTP), the freedom and control of powerholders allow them to concentrate on the primary factors that drive cognition in a particular situation, and decrease their need to process all available information (Guinote, 2007a; Guinote, Weick, & Cai, 2012). This is because living in a safe and unthreatening environment increases sense of security and control, which will in turn decrease vigilance to potential dangers or challenges. Powerful individuals can therefore afford to ignore irrelevant inputs by selectively processing superfluous information and demonstrate attentional focus (Guinote, 2007a).

A number of empirical studies, especially in social attention and decision-making literature, support the idea that power affects how individuals voluntarily seek information from the environment. It has been documented that those who have less power, in both human populations (Fiske, 1993; Goodwin, Gubin, Fiske, & Yzerbyt, 2000; Smith & Trope, 2006) and nonhuman primates (Shepherd, Deaner, & Platt, 2006), tend to be more vigilant towards the actions and characteristics of those who possess a higher role in the social hierarchy. For example, in the animal world, having lower status and power correlates with heightened arousal and scanning behavior, which translates to fast and reflexive gaze-following and monitoring of higher-status primates (Deaner, Khera, & Platt, 2005; Keverne, Leonard, Scruton, & Young, 1978).

Similarly, low-power individuals are also more vigilant and attend to others more carefully in order to navigate through a more threatening social environment. Powerless people are motivated to form an accurate impression of others by gathering and processing as much information as they can about those that they depend on in order to predict and potentially influence and control their own outcomes (Fiske, 1992). Gathering more information regarding another person means that powerless individuals will increase their chances of understanding their current situation, which can help them infer how it will affect their outcomes in order to discern potential actions. For example, in many situations powerless individuals need to wait for instructions before they can act (Galinsky et al., 2003), and are unable to fully commit to one type of action as they need to be prepared to change their plans according to their superior's goals and directions. Therefore in order to be prepared for unexpected events, low-power individuals are willing to frequently attend to the behaviors of high-power individuals in order to recognize their intentions. On the other hand, lacking outcome dependency decreases incentives to engage in accuracy-based impression strategies when perceiving other people. This is because those with power do not need to pay extra attention, as their fates are not dependent on other people.

The literature on power and stereotyping also supports the notion that powerless individuals prefer to allocate attention to more features of a target compared to powerful individuals. Due to outcome dependency, powerless individuals prefer to engage in the more effortful process of individuation in order to form more accurate and less stereotype-consistent attributions and impressions of others (Neuberg & Fiske, 1987). In contrast, powerholders can afford to make inaccurate judgments and attempt to simplify impression formation of understanding others by categorizing them as members of familiar social groups (Ashmore & Del Boca, 1981; Trolier & Hamilton, 1986). As a result of directing attention to only a limited number of information, high power increases stereotyping and the use of categorical, instead of individual, information when perceiving and evaluating others (Fiske, 1993; Goodwin et al., 2000; Overbeck & Park, 2001).

For example, studies have shown that manipulations of short-term outcome dependency can increase attention to individual attributes and information that are inconsistent with one’s stereotypes and expectations about a given target (Erber & Fiske, 1984; Neuberg & Fiske, 1987). In one experiment, participants were randomly allocated to powerful, powerless, or neutral roles by allowing powerful participants to determine how certain tasks are allocated among other participants and controlling the chance of other participants winning a prize (Goodwin et al., 2000). They were then presented with a target person to evaluate and were asked to read several traits. These traits were either stereotype-consistent with the target's group membership (e.g., gender and age), or stereotype-inconsistent. Powerless participants attended to both stereotype consistent and inconsistent information by reading sentences describing each of the traits, whereas powerful participants attended to only stereotype-consistent information and devoted significantly less attention to stereotype-inconsistent information. Powerless participants even attended to more information than participants in the control condition, which supports the idea that both having and lacking power affects attention allocation. In addition, like people who are powerful because of the social structure, people with dominant personalities also attend to less information by ignoring stereotype-discrepant traits and attending only to stereotype confirming attributes. In contrast, non-dominant people behave like powerless individuals and attend equally to both types of attributes, and thus encoding more information (Goodwin et al., 2000).

Research has also showed that powerless individuals actively seek out more information during decision making processes than their powerful counterparts. Low-power individuals are more concerned with developing accurate impressions and choices as they have more to lose compared with powerful individuals. For example, in a negotiation task, powerless participants asked more diagnostic instead of leading questions (De Dreu & Van Kleef, 2004), which allows them to develop a more accurate impression of their partners (Klayman & Ha, 1987). In addition, powerless individuals also consider more information before they make a decision. For example, participants who recalled a powerless past event took longer to decide on a course of action because they required more information than those who recalled powerful events (Guinote, 2007b, Study 1). These included interviewing more people than powerful participants when looking for a roommate and preferring to wait longer before buying a car in order to gather more information about the available options. Moreover, a study looking at decision-making of real-life U.S. Supreme Court justices found that justices writing from positions of less power (those with smaller sized coalitions) attended to more information, leading to longer deliberations and cognitively more complex reasoning styles (Gruenfeld & Kim, 1998).

This tendency for powerful individuals to voluntarily focus attention, whereas powerless individuals are more concerned with attending to multiple aspects, is present even in situations where attentional focus and prioritization can be detrimental. For example, power was found to increase one's susceptibility to the planning fallacy (Weick & Guinote, 2010), which is a bias in time estimation where individuals underestimate the time it takes to accomplish a task. It has been proposed that this bias originates from the ways individuals process information (Buehler & Griffin, 2003; Kahneman & Lovallo, 1993; Newby-Clark, Ross, Buehler, Koehler, & Griffin, 2000). Specifically, those who focus attention too narrowly on the specific task that they are estimating will fail to take into account other information that they possess that can help them make more accurate and less optimistic predictions. For example, individuals may ignore past experiences with similar situations that can help with their estimations, or fail to take into account other goals that they may have that can interfere with their focal goal and create possible setbacks in the future. Powerful individuals' focused attention increased their likelihood of committing this fallacy, because encouraging powerful participants to adopt a broader attentional scope (by asking them to take into account additional information) made their time predictions more realistic (Weick & Guinote, 2010).

In sum, past studies have shown that powerless individuals engage in more thorough attention and judgment of others compared to powerful individuals, and also deliberate more before making a decision. Together, these results support the idea that power affects information processing styles such that, by default, powerful individuals have a more selective and narrow attentional focus compared to powerless individuals. Being relatively unconstrained, powerful people are in a position to act in accordance with predetermined plans and goals. They are able to prioritize certain types of information over others as they can afford to disengage from effortful processing of additional information. In contrast, powerless individuals possess additional goals related to increasing control and safety. These extra demands increase voluntary information seeking tendencies, so that powerless individuals can be continuously monitoring their environment in order to ensure predictability, control, and accuracy. Powerless individuals are more likely to treat all information as equally important and therefore are more likely than powerful individuals to balance their attention between different types and sources of information that they encounter. These differences in attentional allocation and prioritization between powerful and powerless participants not only affect general information seeking tendencies, but can also have significant consequences for goal pursuit by helping us coordinate our attention, actions, and behaviors.

1.3.2 Power and Goal Pursuit

Goals are defined as cognitive representations of a desired end-point that impact evaluations, emotions, and behaviors. Goals may be divided into various sub-goals or tasks, which are defined as a discrete set of activities that one engages in for the purpose of attaining a goal. There is a general consensus that goals exist in memory as knowledge structures with facilitative as well inhibitory links between different motivational constructs. Therefore goals can be activated on the basis of the perception of a goal-related stimulus in a situation (Kruglanski et al., 2002). According to goal systems theory (Kruglanski et al., 2002), once a goal is activated, information that is relevant to goal achievement become more accessible and evaluated more positively via facilitative links, whilst the accessibility of goal-irrelevant information is decreased via inhibitory links. Whether or not individuals can successfully achieve the goal can, to some extent, depend on how well individuals focus on goal-relevant, and inhibit goal-irrelevant, information. Moreover, environmental cues may trigger only one type of goal, or it may simultaneously activate multiple goals that compete for an individual’s attention (Austin & Vancouver, 1996; DeShon, Kozlowski, Schmidt, Milner, & Wiechmann, 2004). This section will first review past research looking at the effects of power on single-goal pursuit, and then focus on how power may also influence multiple-goal pursuit.

Past literature looking at goal pursuit has been interested in what factors can influence how goals are stored, activated, and pursued. One of the most commonly documented phenomenon in this area is how traditionally disempowered groups (e.g., minorities) are worse at goal attainments in health (Marmot, 2005), academic, and work areas (Sackett, Kuncel, Arneson, Cooper, & Waters, 2009). Therefore, in recent years, there has been a large and growing body of literature investigating whether high social power can enhance behaviors and cognitions facilitative of goal pursuit, while low social power can impede successful performance. Results from previous studies offer two reasons for why power can influence goal pursuit. First, power affects how *willing* individuals are at prioritizing one goal over another and to focus all of their attention on a single task. Second, powerful and powerless individuals also differ in their *ability* to control attention towards successful goal completion. It is important to point out that that these two factors are not necessarily mutually exclusive as they can influence each other. The current section will first describe how power affects the motivational aspect of attention allocation and how this relates to prioritization during goal pursuit in ambiguous situations (i.e., in situations where individuals can choose to either employ a focused or divided attention). It will then review how power also influences attentional control in unambiguous situations where they are explicitly instructed to adopt a focused attention and to ignore irrelevant distractors.

Voluntary Goal Prioritization

Past research looking at the relationship between power and goal pursuit suggests that power motivates prioritization of goal-related information in terms of what individuals attend to and how they behave. Since powerholders live in environments with objectively fewer threats than the powerless, then they feel less need to attend to multiple sources of information and can thus devote more undivided attention to their current goals. In other words, powerholders are quicker than powerless individuals at detecting and acting upon opportunities for goals or rewards because they have fewer concerns and are more able to focus unequivocally on a single aim. They are therefore more sensitive to their focal goals and respond more flexibly and effectively to opportunities for goal attainment (Guinote, 2007c Guinote et al., 2002).

This pattern of activation has been found in individuals using a lexical decision task (LDT) containing goal-related and unrelated words. Powerholders responded faster to goal-related words, indicating increased accessibility of goal-related constructs during goal pursuit. This heightened accessibility decreased after goal attainment (Slabu & Guinote, 2010). Actively inhibiting a completed focal goal is beneficial as it can free up resources that can be efficiently reallocated to other future demands (Förster, Liberman, & Higgins, 2005). On the other hand, powerless individuals had equal reaction-times and accessibility to all constructs, regardless of their relevance to the current goal and whether or not the goal is still being pursued or was already completed. Since participants were unaware of the purpose of the LDT and the relationship between the words in the LDT and their activated goal, then these results support the idea that high power leads to spontaneous, instead of deliberate, goal prioritization.

The idea that powerholders are more goal focused is also supported by studies looking at how power orients attention to instrumental social information. That is, powerful individuals tend to objectify others by viewing them in functional ways (i.e., as objects or means) that can facilitate the attainment of the powerholder's personal goals (Gruenfeld, Inesi, Magee, & Galinsky, 2008). Powerholders also rated instrumental targets more positively, and were more likely to approach others based on how useful they are to goal attainment (e.g., competency), and saw other important attributes that are not directly relevant to the current goal (e.g., similarity and kindness) as less valuable. Moreover, and similarly to the devaluation of instrumental objects after goal completion, it was also found that powerholders approached subordinates when they were instrumental towards an active goal, but decreased approach when performance goal was no longer active and the subordinates were no longer useful (Gruenfeld et al., 2008). Whereas powerful participants were more focused and responsive to a single goal that can be satisfied by a social target, powerless individuals treated all qualities as equally valuable. This suggests that powerless individuals are constantly trying to satisfy multiple goals, even when these goals are not directly relevant or active in a particular situation. For example, low-power participants only preferred instrumental (i.e., competent) targets half of the time, which means that they took into consideration additional target features that can satisfy other goals, such as important interpersonal attributes.

In another line of research, powerless individuals were found to be more distracted by irrelevant cues during goal pursuit (Guinote, 2007b, 2008), whereas powerful individuals focused more on the most accessible construct in a situation (Guinote, 2007a; Overbeck & Park, 2001; Vescio, Snyder, & Butz, 2003). For example, during work situations and on weekdays, participants with power were more likely to engage in, and read information related to, mundane and work-related activities as compared to leisure and social activities. The reverse was true for weekends, holidays, or social situations (Guinote, 2008). This flexible behavior shows once more that powerful individuals are willing to prioritize one pursuit over another depending on the goal that is activated or afforded by the current situation.

Moreover, a study by Guinote (2008) showed that even when powerful participants were presented with the opportunity to pursue an irrelevant goal (e.g., attend an academic conference during the first day of their holiday), they still focused on goal-related activities, and their plans were not influenced by this additional information. On the other hand, powerless participants showed less priorities in their planning strategy compared to powerful participants as they were more likely to consider all of the information provided. They preferred to divide their attention between situational consistent and inconstant information, and were willing to modify their holiday plans accordingly.

Supplementing these results, a recent EEG study also provided neural evidence for the idea that power affects goal-directed attention and information processing (Boksem, Smolders, & De Cremer, 2012). In this experiment, EEG activity was measured while participants were engaged in a task priming procedure of either high or low power. Results showed that different power priming can activate two separate attentional pathways. High power is associated with greater left-frontal brain activity compared to low power, and increases activation of a medio-dorsal pathway that is involved in planning, goal-directed behavior, and applying top-down control over the bottom-up selection of stimuli from the environment (Corbetta & Shulman, 2002; Tucker & Williamson, 1984). This 'dorsal' control system is considered to be proactive and is engaged when behavior follows a predetermined action plan. Conversely, powerlessness is associated with the right lateralized ventrolateral pathway that projects from the limbic area to the orbitofrontal cortex and ventral prefrontal cortex. This pathway is more sensitive to external cues and is specialized in detecting salient, unexpected events in the environment. The ‘ventral’ system is considered to be reactive, and can interrupt dorsal goal-directed behavior when events in the environment call for a change of plans. Powerful individuals therefore rely more on proactive dorsal control system, stimulating approach and goal-directed behavior, while powerlessness activates the right lateralized, reactive ventral system that makes them sensitive to any salient external event. Interestingly, differential hemispheric activation associated with powerlessness also affects how individuals interact with the physical world. That is, powerless participants have an increased spatial bias to the left side compared to powerful participants, due to higher activations of the right hemisphere (Wilkinson, Guinote, Weick, Molinari, & Graham, 2010).

The differences in attentional focus and cognitive flexibility between powerful and powerless individuals also have significant consequences for actual behavior by increasing actions towards attaining goals (Anderson & Berdahl, 2002; Galinsky et al., 2003). As demonstrated by Galinsky et al. (2003) power increases the propensity to act upon their needs even in socially ambiguous situations, such as removing an annoying fan from their environment even though it was not clear whether or not participants were allowed to. In contrast, powerless individuals are less likely to act in line with a single goal because they may be concerned about how their actions may conflict with other goals that they have, such as acquiring social acceptance.

In research focusing specifically on power and goal pursuit, it was found that powerless individuals were also slower than powerful individuals at determining the appropriate course of action and at setting, initiating, and implementing goal-directed activities (Guinote, 2007b; Overbeck & Park, 2006). Powerless participants also exhibited less flexibility in means of approaching a goal and persisted for a shorter period of time in the face of challenges compared to powerful participants (Guinote, 2007b), possibly because they are distracted by other goals or concerns. Since careful reflection and processing more information leads to inaction (Gollwitzer, 1996; Lerner & Tetlock, 1999; Moskowitz, Skurnik, & Galinsky, 1999), then these results suggest that powerholders are more focused on their end goals and deliberate less on the consequences of their actions (Galinsky et al., 2003; Lerner & Tetlock, 1999). In contrast, powerless individuals weigh all types of information as equally relevant, which can result in unfocused behaviors.

Despite these evidences, some may argue that instead of prioritizing a focal goal, powerful individuals are merely "lazy information processors" compared to the vigilant nature of the powerless, and simply overlook additional inputs and prefer to attend to as little information as possible (Briñol, Petty, Valle, Rucker, & Becerra, 2007; Galinsky et al., 2006; Keltner et al., 2003). However, powerful individuals are willing to adapt their information seeking tendencies depending on their goals and intentions (Chen, Lee-Chai, & Bargh, 2001; Côté et al., 2011; Guinote, 2007b; Overbeck & Park, 2006). For example, if one's primary objective was to foster a sense of inclusion, then powerholders will indeed employ a more effortful processing style by attending to individuating information when perceiving other people. If, however, the primary goal was to focus on organizational output, then attention is no longer directed at understanding others but rather at how the social target can benefit production (Overbeck & Park, 2006). Likewise, although powerful individuals rely more on stereotypes, but this is not the case when individuating information is relevant to their goals (Overbeck & Park, 2001). Similar patterns were found in a more recent study, where high power leads to more cognitively costly processing of messages if they contain goal-relevant information (Min & Kim, 2013). Therefore, although powerholders by default have a more focused attention and attend to less information, but they are also goal-oriented and can flexibly adapt their information processing strategies depending on what goal they are trying to attain.

In sum, past research demonstrated that power can motivate individuals to voluntarily adopt a focused and selective attention by concentrating on and prioritizing an activated goal. In contrast, powerless individuals voluntarily exercise a more divided attention, as they want to be attentive to extra information, and display less goal-focused information processing (Gruenfeld et al., 2008; Overbeck & Park, 2006) and behaviors (Galinsky et al., 2003; Guinote, 2007c). Together, these results seem to suggest that power induces a general tendency to spontaneously focus on goal-related concepts and to prioritize information related to the primary construct of a particular situation, whereas powerlessness motivates individuals to attend to multiple different goals. The present thesis will examine this issue in the context of multiple goals.

Moreover, power does not only affect attention in situations where individuals can freely choose their processing styles. Indeed, there is also ample evidence on how powerless individuals are less able to adapt to situational demands, such as being able to successfully focus on a single task in situations where doing so can unambiguously benefit performance. The next section will therefore look at how having a powerless or powerful mindset can also affect basic cognitive abilities, or, in other words, the *ability* to control attention and to ignore irrelevant information.

Attentional Control and Goal Pursuit

The previous section illustrated how powerless individuals are motivated to process additional vs. only goal-relevant information, which may be a result of having multiple concerns and restraints (Fiske, 1993; Guinote, 2007a; Keltner et al., 2003). This motivation can hinder goal pursuit by increasing distractibility and consuming limited resources, which can have a negative impact on cognitive abilities. The current section will first explain what cognitive control is and what factors can influence one's ability to control attention. It will then present previous research looking specifically at the effects of power on attentional control and executive functions, and how this relationship can influence multitasking behavior and performance.

The ability to focus only on task or goal-relevant information by adopting a goal-driven vs. a stimulus-driven attention system is known as attentional or cognitive control. Attentional control is defined by a set of neural processes that allow us to interact with our complex environment in a goal-directed manner (Botvinick, Braver, Barch, Carter, & Cohen, 2001) and is proposed to be related to the central executive component of Baddeley's working memory (WM) system (Baddeley & Hitch, 1974). WM is defined as a set of mental processes, such as processing, storing, and manipulating limited information over a short period of time in the service of ongoing higher-order cognitive functions and problem solving (Baddeley, 1996; Cowan et al., 2005). It consists of one major component, the central executive, and two 'slave' systems known as the phonological loop (used for rehearsal of verbal materials) and the visuo-spatial sketchpad (used for processing and storing visual and spatial information). Recently, an additional component known as the episodic buffer has been added to the central executive system (Baddeley, 2000). The episodic buffer is responsible for integrating information from the subcomponents of WM and long-term memory. Of particular interest to cognitive performance is the central executive system, which is the most complex but least well-understood component of WM. This is an attention-like, domain-free system, which oversees the two ‘slave’ systems. It is involved in attentional control and is used for integrating and regulating various cognitive functions necessary for goal execution, such as planning, focusing, and prioritizing (Miyake et al., 2000; Monsell, 1996; Stuss & Knight, 2002).

There is an ongoing debate concerning the exact number and nature of executive functions, as it is often seen as an umbrella term encompassing a wide range of high-level cognitive processes necessary for controlling, organizing, and monitoring behaviors that can influence performance across a range of different areas. Most researchers agree that four main functions of the central executive (Baddeley, 1996; Baddeley & Della Sala, 1996; Miyake et al., 2000): inhibition, updating, shifting, and coordinating separate task performances, such as dual-tasking. Inhibition is the ability to selectively attend to a particular stimulus while simultaneously inhibiting a separate stimulus. It involves using attentional control in a negative way to prevent (i.e., move away) attentional resources from being allocated to task-irrelevant stimuli and response (Friedman & Miyake, 2004). The updating function involves using attentional control in a positive way to shift, or move the allocation of attention towards, maintaining focus on task-relevant stimuli (Hasher, Zacks, & Rahhal, 1999; Kim, Rasher, & Zacks, 2007; Rowe, Valderrama, Hasher, & Lenartowicz, 2006; Wühr & Frings, 2008). These include manipulating information sourced from temporary stores. The latter two functions of the central executive, shifting and coordinating, are linked to multitasking ability. These functions are responsible for switching between various retrieval strategies for different task-sets, as well as for coordinating concurrent processing of different streams of information.

There is an extensive amount of empirical evidence suggesting that the ability to control attention and to avoid distraction is highly dependent on the amount of WM resources available. For example, individual differences in WM capacity can determine one's ability to maintain goal-related information in a highly active state despite of interferences (Braver, Gray, & Burgess, 2007; Engle, Laughlin, Tuholski, & Conway, 1999; Kane, Bleckley, Conway, & Engle, 2001; Kane & Engle, 2003; Kimberg, D'Esposito, & Farah, 1997; Rapport et al., 2008; Stins, Polderman, Boomsma, & De Geus, 2005). In one study, Kane et al. (2001) showed how individuals with low WM capacity were more distracted by an irrelevant visual cue during an antisaccade task compared to participants with high WM capacity. That is, individuals with low WM capacity found it difficult to inhibit natural tendencies to look in the direction of a distractor cue. They therefore took longer target identification times compared to high WM capacity participants when the target location appeared opposite to the location of a distractor cue.

Moreover, individual differences in WM capacity was found to affect performances on classic measures of inhibition using the Stroop task (Kane & Engle, 2003) and the dichotic listening task (Conway, Cowan, & Bunting, 2001). In the Stroop task, participants are shown color words printed in different ink colors. These words can be either congruent (e.g., the word "red" printed in red ink) or incongruent (e.g., the word “red” printed in blue ink), and participant’s job was to maintain the single goal of naming the word’s color and inhibiting the prepotent response of reading the word’s meaning. Performance on incongruent trials differed substantially for high and low WM capacity participants, with low WM capacity participants making almost twice as many errors as people with high WM capacity. Similarly, WM capacity predicted performance on a dichotic listening task, which measures individuals’ ability to focus attention on words presented to one ear, while ignoring irrelevant information presented to the other ear (Conway et al., 2001).

Although WM capacity may differ between individuals, it is also highly variable across situations such that individuals may have different amount of WM resources available for one task depending on the amount of information that they need to process in another task (Schmeichel & Baumeister, 2010). In other words, successful attentional control depends significantly on the amount of WM resources devoted to the focal task. Numerous evidences support the relationship between the active processing of information in WM and performance of traditional executive functions such as suppression of prepotent responses. Roberts, Hager, and Heron, (1994) first demonstrated this idea by showing how performance on an antisaccade task decreased as active processing required for WM increased. Specifically, they found that increasing WM load using a concurrent mental arithmetic task significantly impaired inhibitory task performance. A similar study using the suppression of reflexive saccades as its inhibition task found that performance declined as a function of increasing WM load (Mitchell, Macrae, & Gilchrist, 2002). In addition, it has been shown that burdening the phonological loop of the WM system detracts resources from executive function tasks because individuals rely on inner speech to maintain the relevant task goal or program (Baddeley, Chincotta, & Adlam, 2001; Hester & Garavan, 2005).

Another example of the relationship between WM and response selection includes the finding that selective visual attention can be influenced by WM load (de Fockert, Rees, Frith, & Lavie, 2001). This study combined a WM paradigm with a selective visual attention task that asked participants to classify famous written names, such as those of pop stars or politicians, while ignoring either congruent (same name and face) or incongruent (different name and face) distractor faces. Participants were either given a high WM load by remembering a sequence of digits in different orders, or a low WM load, by remembering a sequence of digits in the same order. It was found that under high WM loads (compared to under low WM loads), participants were slower to respond to incongruent compared to congruent faces, and also had greater activation of brain areas that are implicated in face processing. The authors concluded that high WM load decreases one's ability to inhibit distractor face processing compared to being under a low WM load. Together, these results indicate that WM capacity is limited, can be manipulated, and affects one's ability to control attention.

The relationship between WM capacity and attentional control has relevance for situations that elicit anxiety, threat, and, central to the current thesis, powerlessness. Research in areas such as stereotype threat (Steele, Spencer, & Aronson, 2002) and anxiety (Eysenck et al., 2007) suggest that WM capacity can be taxed by internal (e.g., self-generated worries) as opposed to external (e.g., WM load manipulation) information processing. This is because regulating negative affect and active monitoring of one's performance can function as a competing demand and consume attentional resources that could otherwise be devoted to the focal task (Beal, Weiss, Barros, & MacDermid, 2005; Kanfer & Ackerman, 1989).

For example, members of stigmatized groups (e.g., African Americans and women) display worse performance on tasks requiring executive functions (e.g., intelligence and math tests) when their group membership is made salient (i.e., under stereotype threat) compared to when it is not salient. Exams that have performance connotations may create extra situational burden and increase intrusive, task-irrelevant thoughts, which can then reduce the stigmatized individuals' WM capacity (Beilock, Rydell, & McConnell, 2007; Schmader & Johns, 2003; Steele & Aronson, 1995). Similarly, the processing efficiency theory (PET; Eysenck & Calvo, 1992) of anxiety suggests that high levels of state anxiety reduces the efficiency of cognitive processing and often lead to impaired performance on the inhibition and shifting functions (Derakshan, Smyth, & Eysenck, 2009; Eysenck, Derakshan, Santos, & Calvo, 2007). This is because the vigilance in anxious individuals can lead to more self- and other-monitoring that can tax WM capacity.

Furthermore, studies have shown that these experiences may specifically impair the central executive system. In one experiment looking at anxiety and resource consumption, participants were asked to perform a primary visuo-spatial task while concurrently performing a secondary task that involved the central executive, the phonological loop, or the visuo-spatial sketchpad (Eysenck, Payne, & Derakshan, 2005). Only when the secondary task required the central executive did the high anxious group perform worse than the low anxious group. This suggests that anxiety reduces the available resources of the WM's central executive required for attentional control, but has minimal effects on the phonological loop and the visuo-spatial sketchpad.

In recent years, conclusive behavioral evidence has demonstrated how power can also influence attentional control and executive functioning abilities (DeWall et al., 2011; Guinote, 2007b; Smith et al., 2008). Two of the most commonly studied systems are those responsible for maintaining goal-focus: inhibition and updating. For example, assigning participants to a powerless role impairs one’s ability to update relevant information as they made more errors on a 2-back task compared to those assigned to a powerful role (Smith et al., 2008). The 2-back task requires participants to constantly update and monitor new information in WM. In addition, powerlessness has also been found to impair inhibitory regulation, as powerless individuals have a higher susceptibility to interference from distractors and an inability to filter out extraneous information effectively (DeWall et al., 2011; Guinote, 2007b; Smith et al., 2008). For example, powerless participants had lower performance compared to their powerful counterparts on the Stroop task (Smith et al., 2008) and the dichotic listening task (DeWall et al., 2011).

In addition, powerless individuals exhibit less attentional flexibility across situations because they are unable to control their attention according to situational demands, even when they are given explicit instructions to do so (Guinote, 2007b). For example, when inhibiting contextual information was relevant to the task, participants in the powerful conditions were more attuned to the focal object and were more successful at inhibiting contextual information compared to participants in the powerless condition (Guinote, 2007b). However, when contextual information was relevant for task execution, no differences were found between powerful and powerless participants' performance. These results suggest that powerful participants have greater attentional flexibility as they were able to inhibit, or attend to, peripheral information depending on task demands. In contrast, powerless participants were unable to inhibit peripheral information even though they were told explicitly that doing so will impair their performance.

It is probable that differences in WM capacity may be responsible for decreased attentional control and attentional flexibility in powerless compared to powerful individuals. This explanation is similar to how situational factors, such as anxiety and stereotype threat, can decrease executive function performance via reduced WM capacity (Ashcraft & Kirk, 2001; Beilock et al., 2007; Eysenck & Calvo, 1992; Schmader & Johns, 2003). Powerless, compared to powerful individuals, voluntarily seek more information in order to restore control in their environment and worry more about potential adversities (De Dreu & Van Kleef, 2004; Fiske, 1993; Goodwin et al., 2000). These tendencies are thought to arise from a greater dependency on others, which channels WM resources away from preparing and implementing one's own actions toward monitoring other people and the environment (Guinote, 2007a). They therefore prefer to process more inputs by treating all information as equally important and by attending to multiple sources of information. Powerful individuals, on the other hand, are more likely to treat some information as relevant and other information as irrelevant. As described previously, WM resources are limited, such that at any one time only a number of information can be attended to carefully and processed extensively; therefore having more concerns than their powerful counterparts can reduce WM resources available for controlling attention and decrease one's ability to inhibit irrelevant distractions when it is necessary to do so. This may influence powerless individuals by making them less focused and more easily distracted by task-irrelevant information.

To summarize, the current section described how WM capacity is related to the ability to control attention, where higher WM load can reduce processing efficiency and cognitive performance by making it difficult for individuals to organize, regulate, and monitor perceptual, cognitive, and motor processes required for flexible and goal-directed behaviors. This suggests that the tendency for powerless (compared to powerful) individuals to attend to task-irrelevant information, such as dealing with internal worries about their uncontrollable situation or excessive encoding of external inputs due to vigilance, can decrease WM resources available for attentional control. Decreased WM capacity can explain why powerless participants underperform on single executive function tasks in previous research (DeWall et al., 2011; Guinote, 2007b; Smith et al., 2008). The current thesis will investigate whether power can affect WM capacity and attentional control in the context of multitasking.

1.4 Summary and Limitations of Power Research

Thus far, studies looking at power and goal pursuit suggest that powerless people often achieve less than powerful people because lacking power itself alters information processing strategies and increases vulnerability to performance decrements during complex executive functions tasks (Smith et al., 2008). Specifically, past studies have shown that in the domain of single-goal pursuit, power increases, whereas powerlessness decreases, resistance to distractibility, prioritization of goal-relevant information, action facilitation, and behavior flexibility and persistence (DeWall et al., 2011; Guinote, 2007c, 2008; Smith et al., 2008). These differences in successful goal pursuit between powerful and powerless individuals could derive from their *willingness* as well as their *ability* to direct all of their attention to the focal goal and to prevent internal and external distractions.

First, powerful individuals have higher selective attention, and are therefore willing to focus more on their current goals and to approach a desired end state (Galinsky et al., 2003; Guinote, 2007c; Keltner et al., 2003). In contrast, powerless individuals have a tendency to be concerned with various issues or threats that are not directly related to the task at hand, such as performance evaluations given by their superiors. They therefore, by default, prefer to attend to multiple information and operate under a more divided attention than the focused mindset of the powerful individual (Guinote, 2007a). By inhibiting fewer distracting information from the environment than the powerful individual, and by voluntarily attending to task-irrelevant stimuli, powerless individuals are less likely to prioritize goal-related information, which can impair successful single-goal pursuit by making them more distractible.

Second, processing excess information that are normally bypassed by powerful individuals can also tax limited WM resources typically recruited to carry out a set of cognitive functions. This can lead to suboptimal performance on difficult tasks that require attentional control and executive functions (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Gollwitzer, 1996; Smith et al., 2008). Lacking power may impair goal pursuit by decreasing one's ability to adopt a selective or top-down (vs. a bottom-up) attention (Guinote et al., 2009; Guinote, 2007b). As a consequence, power not only affects vigilance and information seeking tendencies, with powerful individuals adopting a focused attention and powerless individuals being motivated to consider more information. Instead, powerful individuals also have better attentional control that allows them to distinguish between relevant and irrelevant information, and are more capable than powerless individuals at adjusting processing effort depending on the task at hand.

However, past studies looking at power and goal pursuit have only focused on how powerlessness impairs the activation and achievement of a single, isolated goal, such as attending to only one stimuli or having to solve one puzzle. Whether power affects the pursuit of multiple goals is yet unknown. Similarly, past research only examined performance on single central executive tasks (e.g., inhibiting irrelevant information and updating) and not on central executive tasks linked to multitasking (e.g., shifting and dual-tasking). Since executive functions may not be unitary (Friedman et al., 2006; Miyake et al., 2000), then it is necessary to investigate the ways power affects multiple task performance.

This is an important gap in the literature because of power's ubiquity and the consequences of multitasking for individuals and society. For example, numerous studies have shown negative side effects of multitasking including lack of focus, decreased performance, as well as increased stress levels (Appelbaum et al., 2008; Fried, 2008). If power affects an individual's multitasking tendency and ability, then it can contribute to additional stress and perpetuate to negative performances experienced by disempowered individuals and groups. Moreover, it is necessary to investigate how power affects goal management and performance in more ecologically valid conditions of multiple goals in order to fully understand the effect that power has on goal pursuit. The current dissertation seeks to address this gap by examining how social power affects multiple goals and aims at gaining insight to whether powerholder's enhanced attentional focus and prioritization strategies also extends to the context of multiple goals and multitasking. It will address this issue by looking at how individuals approach multiple tasks (i.e., the tendency to multitask) and its effect on multitasking ability. The next section will review the literature on multiple goals, focusing specifically on the factors that affect how people approach multiple goals and multitasking ability.

1.5 Multiple Goals

In everyday lives, individuals are usually trying to achieve a variety of goals ranging from basic rudimentary tasks, such as eating, to more abstract higher-order pursuits, such as attaining successful careers. For example, governors, politicians, and managers may need to implement goals and succeed at multiple projects that overlap in time. Moreover, in many professions such as medicine and aviation, employees are required to simultaneously manage multiple tasks or to rapidly switch between one task and another. For example, in emergency situations, keeping track of several pieces of information and taking the right action at the right time can be extremely critical (Laxmisan et al., 2007). Similarly, duties of an air traffic controller also include switching attention between various tasks such as coordinating arriving aircrafts while listening and responding to radio calls (Loukopoulos, Dismukes, & Barshi, 2009).

In addition, the onset of media and technology use in recent years (Foehr, 2006; Lindbeck & Snower, 2000) have increased the number of options available for task implementation and have a profound impact on how individuals approach multiple tasks. Technology and other resources in recent years promote multitasking by providing more options and opportunities to multitask. For example, technology promotes multitasking by providing natural breaks (e.g., download times) and regular interruptions (instant messages; Foehr, 2006). Indeed, the percentage of time people spend on the consumption of multiple forms of media at the same time (e.g., watching TV while reading) has increased from 16% in 1999 to 25% in 2005 (Foehr, 2006). In addition, cell phone messages and email notifications activate alternative goals that can easily detract workers from the task at hand. In fact, computer users at work change windows or check other programs nearly 37 times an hour (Foehr, 2006).

Enhanced organizational flexibility and versatility also encourages multitasking behavior, making them more prevalent in everyday life as well as in contemporary work environments (Benbunan-Fich & Truman, 2009; González & Mark, 2005; Otto, Wahl, Lefort, & Frei, 2012). The modern workplace is introducing opportunities to multitask by increasing work demands such as number of goals and projects, which can result in conflicting priorities. As organizations try to do more with less, employees are constantly faced with a number of projects with imposing deadlines, reports to write, and meetings to attend, all of which can encourage multitasking. In fact, in an employment context, nearly all jobs demand a balancing of multiple concurrent responsibilities as a consequence of having to work within more flexible organizations. For example, telemarketing jobs are often seen as simple with regard to job complexity, but individuals who perform such jobs typically have numerous goals to balance such as engaging customers in dialogue, operating calling system, and learning about the products or services they sell.

Similarly, it was found in a sample of office workers that the average time employees spend on one continuous, uninterrupted segment of work before switching to another task was only 10.5 minutes (González & Mark, 2005). As a consequence, employees typically waste more than a quarter of their daily work time checking, answering, and organizing emails instead of doing tasks that have priority. Since people are constantly faced with multiple cues that can activate different goals simultaneously (Fishbach & Ferguson, 2007; Kruglanski et al., 2002), then having difficulties attending to more than one thing at a time can be a severe limiting factor in work and daily life (Zimmermann & Leclercq, 2002).

Due to the fact that multiple-goal pursuit is the norm, not the exception, researchers have started to address the question of how individuals handle various, potentially contradicting, demands (Ashford & Northcraft, 2003; Austin & Vancouver, 1996; Kernan & Lord, 1990; Locke & Latham, 2002; Louro, Pieters, & Zeelenberg, 2007; Mitchell, Harman, Lee, & Lee, 2008; Schmidt & DeShon, 2007; Shah, Friedman, & Kruglanski, 2002). These goals can often be competing for limited resources, and the literature on multiple goals has focused on two main types of goal conflicts. One area looks at multiple goals that are directly in conflict with each other such as dieting and enjoying fattening food. These types of goals undermine each other's attainment as they have opposing behavioral implications and no additional resources can resolve this conflict (Fishbach & Shah, 2006; Kleiman & Hassin, 2011).

On the other hand, multiple goals can also be indirectly conflicting. These goal conflicts occur when the pursuit of one goal prevents or detracts from the pursuit of another at any one time due to physical (e.g., time) or psychological (e.g., attention) limitations. Examples of indirectly conflicting goals include completing two or more different projects, or trying to balance between family and career goals. This thesis will focus on and review how individuals manage and pursue multiple goals for different tasks that are indirectly conflicting. It will first describe the factors that can influence individual's strategies when approaching multiple goals and tasks and subsequently review the literature on multitasking ability.

1.5.1 Polychronicity

Both intuition and scientific evidence suggest that dynamics of goal pursuit in multiple-goal environments can present individuals with different kinds of regulatory challenges as compared to single-goal environments (Louro et al., 2007). When only one goal is activated, all of our available resources can be devoted to the focal goal. Thus effective self-regulation entails identifying the appropriate level of resources that must be allocated to ensure the goal is attained. In such single-goal contexts, only inaction has an opportunity cost in terms of failed or slower goal progress in the focal goal domain (Miller, Galanter, & Pribram, 1960).

In multiple-goal environments, effective self-regulation requires achieving an on-going balance between the competing demands that multiple goals have on one's limited resources, such as time and attention. This is because an individual's time, energy, and cognitive capacity are limited, and any resources allocated to one task will take away resources from another (Ogden, Levine, & Eisner, 1979; Wickens & Kessel, 1980). Therefore optimizing one goal will happen at the expense of another goal. As a consequence, when two goals compete because of time or attentional constraints, a primary concern is how to effectively allocate available resources among the different goals. For example, individuals need to be able to identify whether they should prioritize one task over the others or approach all tasks simultaneously, and decide when it is necessary to switch focus between the various tasks in order to maximize goal attainment. In other words, when we have multiple goals, we need to choose whether to approach them one by one in a sequential manner (single-tasking strategy), or to approach them more simultaneously (multitasking strategy).

One of the earliest literatures looking at how individuals approach multiple goals is in the area of cross-cultural psychology (Hall, 1959, 1988). Research in this field has documented how individuals from different cultural backgrounds have different temporal perceptions (Bluedorn et al., 1999; Bluedorn, 2002; Graham, 1981). Monochronic cultures, typical of North American, Swiss, German, and Scandinavians, view time as linear, separable, and capable of being divided into units, and therefore emphasize doing one thing at a time. On the other hand, polychronic cultures from Japan, Middle East, Latin American, and South Asia, view time as a system where the same events occur in natural cycles (Feldman & Hornik, 1981; Hall, 1983; Kaufman, Lane, & Lindquist, 1991). A polychronic cultural orientation emphasizes working on many projects at the same time with little regard for formal time constraints. Polychronic cultures value loose scheduling and prefer to simultaneously fulfil multiple agendas such as organizing meetings within meetings (Gesteland, 1999).

These cultural differences in time perception have been later developed into an individual variability construct known as polychronicity (Benabou, 1999; Kaufman-Scarborough & Lindquist, 1999; Persing, 1999). An individual's level of polychroncity has been defined as the extent to which he or she prefers to be engaged in two or more tasks or activities at the same time, and believe that this approach is the best way of doing things (Bluedorn et al., 1999; Slocombe & Bluedorn, 1999). Individuals who prefer to actively work on several different projects, tasks, or activities across a specific time period are high in polychronicity (polychrons). Polychrons are more likely to adopt a multitasking strategy, where they engage in different tasks in parallel either by switching constantly between several activities within a short time period or doing two or more tasks simultaneously.

On the other hand, individuals who prefer to work on and complete one project or task before moving on to another during a specific time period are low in polychronicity (monochrons). Monochrons employ a single-tasking strategy by responding to competing demands one after the other. They employ a priority system where the attainment of one goal is viewed, at least temporarily, as more important than the other and devote all their attention and time to only one of their multiple pursuits at a time. Such a process maintains attention to the focal goal in the presence of background alternatives, and individuals only switch focus to alternative goals once sufficient progress has been made on one of them. Therefore the terms multitasking and polychronicity have been used in the literature interchangeably to refer to one's tendency to engage in frequent switches between tasks or to engage in simultaneous pursuits, whereas single-tasking and monochronicity can both refer to the tendency to pursue different goals in a sequential manner.

Polychronicity level can be measured using the Multitasking Preference Inventory (MPI; Poposki & Oswald, 2010), and these self-reports have been found to affect actual behaviors and choices when working on different tasks. For example, when given two tasks to process and work on (e.g., a math task and a letter search task), monochrons attempted to perform both processes sequentially, and selected one process at random to work on first. In contrast, polychrons were more likely to control the two processes simultaneously (Goonetilleke & Luximon, 2010; Zhang, Goonetilleke, Plocher, & Liang, 2005). In these experiments, multitasking tendency was operationalized using number of switches between tasks, such that higher number of switches corresponds to higher polychronicity. In another study, researchers found how polychronic individuals chose to work on more tasks simultaneously compared to monochromic individuals (Poposki & Oswald, 2010). Therefore self-reported multitasking preference can, to some extent, predict actual multitasking behavior.

1.5.2 Goal Accessibility, Inhibition, and Multitasking

Although there is substantial evidence that individuals can vary in their propensity to multitask, the causes of these different behaviors, and its consequences for performance, are still unclear. There are several possible factors that may determine the extent to which individuals engage in single-tasking vs. multitasking strategies. One line of research suggests that how well individuals can inhibit alternative goals from a focal goal can determine how individuals choose to approach multiple goals (Bélanger, Lafrenière, Vallerand, & Kruglanski, 2013; Shah et al., 2002; Shah & Kruglanski, 2002). This process is known as “goal shielding”, where the focal goal shields itself from alternative ones by directly reducing the accessibility of additional goals in memory. Decreased accessibility of alternative goals has been proposed to render the individual more focused on a certain pursuit and be less distracted by other tasks (Shah & Kruglanski, 2002). Goal shielding is highly dependent on motivation and goal commitment, where higher commitment to and motivation on a task can increase prioritization of the focal goal and shielding from interfering goals (Shah et al., 2002). As a consequence, individuals who inhibit alternative goals may be more likely to adopt a single-tasking strategy.

Other studies also suggest that accessibility of secondary goals or tasks can influence multitasking behavior. Specifically, it has been proposed that multitasking behavior in daily life may be uniquely associated with deficits in basic cognitive processes related to attentional control, such as the ability to successfully filter out irrelevant information and ignore distraction (Cain & Mitroff, 2011; Ophir et al., 2009). To test this idea, Ophir et al., (2009) have developed a media multitasking index (MMI) to measure media related multi-tasking behaviors and to identify individuals who frequently engage in multiple tasks concurrently, such as surfing the internet while talking on the phone. It was found that chronically high-multitaskers were more readily distracted than low-multitaskers by both irrelevant external stimuli as well as recently activated internal representations during singular task performance (Adler & Benbunan-Fich, 2013; Ophir et al., 2009). For example, in one study (Ophier et al., 2009), participants were given a visual short-term WM task, and were asked to remember red shapes and ignore blue shapes. Low-multitaskers were unaffected by the number of irrelevant blue distractors, suggesting that they successfully filtered out the irrelevant information. However, high-multitaskers were negatively affected by increasing number of irrelevant distractors. The negative correlation between one's tendency to multitask in real life and inhibition ability suggests that those who have difficulties filtering out irrelevant information may be more easily distracted, and will often attend to information that is unrelated to their focal goal.

Similar conclusions were made by Watson and Strayer (2010), who correlated measures of Operation Span (OSPAN) with multitasking tendency. OSPAN has been developed by Engle (2002) to measure WM and executive functioning. It employs a dual-task paradigm with a letter memorization task and an arithmetic task, and is therefore a classic example of multitasking where people must simultaneously attempt to perform two independent tasks that compete for limited capacity. It was found that individuals who scored low on the OSPAN task—those who have lower WM capacity and executive control required for effective multitasking—were more likely to engage in multitasking than individuals who scored high on the OSPAN task. The negative correlation between OSPAN task performance and multitasking activity provides further evidence that multitasking behavior does not correspond to better multitasking ability, and that deficits in WM and executive functioning are associated with enhanced multitasking activity.

Moreover, recent work by Cain and Mitroff (2011) also indicates that individuals who maintain a wider attentional scope, are more easily distracted and are more likely to engage in secondary task processing. That is, basic attentional focus can also affect multitasking behavior, regardless of whether or not these attentional tasks rely on WM processes (Cain & Mitroff, 2011). To test this assumption, the researchers first divided participants into high vs. low-multitaskers using the MMI. They then measured performance on an addition singleton paradigm, where participants had to search for a shape singleton in the possible presence of an irrelevant color singleton. Participants saw displays of square distractors with a single target circle. Each shape contained either a + or a =, and they were asked to report which symbol (+ or =) was within the shape singleton (circle). Top-down attentional instructions varied across conditions to test whether high-multitaskers are negatively influenced by irrelevant distractions when there are strong attentional demands. On half the trials, all shapes were green, and on the other half of the trials, there was a red colored singleton amongst the green shapes. Participants were told to withhold response if the target circle was red instead of green. In the "never" condition, participants were validly instructed that the red singleton would never be the target circle. In the "sometimes" condition, participants were validly instructed that the red singleton would sometimes be the target circle.

It was found that low-multitaskers were able to use top-down instructions to improve their performance by not attending to the red singleton in the "never" condition. That is, low-multitasker's RTs did not differ depending on the presence of the colored singleton in the "never" condition, but were significantly slower when the red singleton was present (vs. when it was absent) in the "sometimes" condition. However, high-multitaskers attended to and processed the red singleton to the same degree regardless of the top-down instructions. In other words, high-multitaskers responded slower to trials containing (vs. trials that did not contain) the red singleton, regardless of whether or not the red singleton could be the target circle. Variations in attentional mechanisms are likely to be a strong contributor to these performance differences. Specifically, high-multitaskers may have a broader attentional filter than low-multitaskers, which may bias them towards taking in more of the available visual information.

The results on goal accessibility and attentional scope on multitasking tendency suggest that cultural differences in multiple goal strategies could also be due to differences in processing styles. That is, individuals who have a selective information processing style tend to prioritize one goal at a time and engage in single-tasking. For example, individuals from Western cultures tend to process information more selectively, and are also more likely to have a monochronic time-orientation. In contrast, individuals from East-Asian countries have a broader focus of attention (Kitayama, Duffy, Kawamura, & Larsen, 2003; Nisbett, Peng, Choi, & Norenzayan, 2001) and are therefore more polychronic (Hall & Hall, 1990; Schoorman & Palmer, 1999).

Even within cultures, individuals who have a broader and defocused attentional style multitask more. For instance, individual differences in impulsivity, and in particular attentional impulsiveness, are significantly correlated with higher levels of multitasking (Sanbonmatsu et al., 2013). Multitasking was shown to be particularly high amongst impulsive individuals who act without thinking and who find it difficult to regulate their attention. Similarly, high sensation seekers, particularly those scoring high in disinhibition, were more likely than low sensation seekers to report media related multitasking. The MMI was also found to be correlated with higher depression and social anxiety symptoms (Becker, Alzahabi, & Hopwood, 2013), which are disorders associated with poor attentional control, susceptibility to distractions by salient but irrelevant information, as well as the inability to block out ruminative thoughts (Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & van IJzendoorn, 2007; Gotlib, Krasnoperova, Yue, & Joormann, 2004).

1.5.3 Discretionary Switching and Prioritization

There are a limited number of studies in past literature looking at how individuals regulate their behaviors in contexts where they need to pursue two or more goals within the same deadline, and where the goals are incompatible such that they compete for limited time and resources and cannot be enacted truly simultaneously. These studies investigated why participants preferred to prioritize instead of to interleave a task, even when such switching is not strictly necessary and is driven by internal factors as opposed to external demands (i.e., discretionary switching). Several situational factors have been proposed to influence resource allocation decisions between multiple goals including sensitivity to goal progress, situational predictability, goal expectancy, and goal orientation.

In laboratory studies with multiple-goal simulations, participants' behaviors are usually guided by task dynamics and goal-performance discrepancy (GPD), otherwise known as the progress made towards one's goals (Kernan & Lord, 1990; Schmidt & DeShon, 2007; Schmidt & Dolis, 2009). Focusing on goals with higher GPD yields more task switches, as the GPD of unattended tasks will eventually exceed the GPD of the attended task. However, prioritizing tasks with lower GPD will lead to more single-tasking, because the task that participants are currently pursuing is already the one with the lowest GPD and closest to attainment. In highly dynamic and unpredictable situations, where external factors may impede on progress toward goal attainment, participants typically switch more between the tasks. This is because when goal progress can vary not only as a result of participant's own actions, but also due to unpredictable external influences, then participants prefer to allocate time towards goals that are further from attainment (those with higher GPD). However, when the task environment is stable, and it is clear what level of performance is necessary to achieve the task goals and performance is solely a result of participant's own action, then they tend to switch less and prioritize resources towards the goal closest to attainment (those with lower GPD; Kernan & Lord, 1990; Schmidt & Dolis, 2009). Such resource allocation is similar to decision processes, where unpredictable external situations elicit more bottom-up, progress-driven decisions, whereas static choice contexts yield a more systematic, top-down decisions (Brehmer, 2005; Zakay, 1994).

This effect may be due to the need for individuals in unpredictable circumstances to remain responsive to changes in the environment (Allport, 1989; Lord & Levy, 1994). Even when engaging in one task, individuals' attention need to be somewhat diverted from the focal goal in order to address emerging external needs. That is, rather than being able to focus on a single task, individuals need to divide their attention in an attempt to address possible changing circumstances. By flexibly reallocating their attention to other information, such as GPD discrepancies, participants' behaviors will be guided by goal progress and will be constantly switching to tasks with lower GPDs (Carver & Scheier, 1998; DeShon & Gillespie, 2005; Lord & Levy, 1994). Switching between different tasks ensures that all tasks are within seemingly manageable bounds, which is adaptive in a dynamic context where individuals need to remain vigilant to external changes.

Another factor determining task switching is goal expectancy (Schmidt et al., 2009). When goal expectancy is high, individuals switch more between the tasks and devote more time towards the goal with higher GPD as they believe that all goals can be attained. However, if participants do not expect to complete all of the tasks by the deadline, then they are more likely to move to single-tasking by prioritizing the easier task which has lower GDP rather than switching to a more difficult task with a higher GPD. This is because focusing on the goal closest to being attained may ensure that at least one of the goals can be completed, whereas pursuing goals with larger GPD could result in neither goal being met. This tendency for goal expectancy to guide task switching has been shown in the literature by measuring behavioral changes as participants approach the deadline (Schmidt & DeShon, 2007). In the beginning, goal expectancy is relatively high as individuals believe that all goals can be attained with remaining time, but the passage of time decreases goal expectancy. As the deadlines approach, participants may start to perceive little likelihood of attaining all of the goals and will therefore allocate resources to goals that are experiencing the most success (Schmidt & DeShon, 2007). During late stages of goal pursuit, large discrepancies may be discouraging instead of motivating, and hence participants are less likely to reduce this discrepancy and will prioritize the goal that is more likely to be achieved.

Lastly, goal orientation, otherwise known as anticipated consequences of meeting or failing to meet the goals, can also guide resource allocation. Past studies have shown that losses are more salient than gains, and are weighed more heavily such that the negative value of a given loss is greater than the positive value of a gain (Kahneman & Tversky, 1979). As a consequence, individuals exhibit greater sensitivity to avoidance-oriented (i.e., an undesired end state to be avoided) as opposed to approach-oriented (i.e., a desired end state to be gained) pursuits. Tasks that are framed as losses also seem more urgent, and can affect resource allocation decisions and whether or not participants switch to that goal (Schmidt & DeShon, 2007). For example, in a multiple-goal scenario, greater time was allocated to pursuing the goal associated with an avoidance-framed incentive than those associated with an approach-framed incentive (Schmidt & DeShon, 2007). Moreover, research in regulatory focus found how participants presented with promotion-focused (i.e., approach-framed) and prevention-focused (i.e., avoidance-framed) tasks preferred to complete prevention-framed tasks earlier than the promotion-framed task (Freitas, Liberman, Salovey, & Higgins, 2002). The current thesis will therefore incorporate these previous findings by looking at how goal expectancy (in terms of difficult vs. easy goals) and goal orientation (in terms of prevention-focused vs. unspecified goals), can moderate the relationship between power and multitasking tendency.

1.5.4 Phases of Goal Pursuit

The previous sections illustrated how researchers investigated multitasking tendency by measuring how individuals *intend* to behave, such as reporting how many tasks they would like to work on simultaneously (Poposki & Oswald, 2010). Previous studies also measured how individuals behave during actual goal striving in multiple-goal contexts by recording discretionary switches between tasks (Carver & Scheier, 1998; Schmidt & DeShon, 2007). Even though both intentions and actions help promote goal attainment, it is important to note that goal-oriented behavior is not a homogeneous phenomenon and can be conceived as a succession of distinctive stages that are governed by their own principles (Gollwitzer, 1990).

According to the "Rubicon model" of action phases, goal pursuit occurs in various stages, each requiring its own distinct cognitive operations (Gollwitzer, 1996; Heckhausen & Gollwitzer, 1987). These include a preactional phase, which comprises the predecisional phase and the postdecisional phase, an actional phase, and a postactional phase. Each phase of goal pursuit are guided by distinct "mind-sets" (i.e., deliberative, implemental, actional, and evaluative), which are cognitive orientations associated with the various demands and requirements of each particular phase (Gollwitzer, 1990).

During the predecisional phase, individuals choose which goals they want to pursue and deliberate whether or not to take action. In this phase, the individual aims to make the best possible choice between potential goals and to set priorities amongst multiple wishes and desires. Thus the predecisional phase is characterized by a deliberative mind-set, where individuals are attuned to information relevant to the issues of goal feasibility and desirability. Individuals in the predecisional phase are usually open-minded and have heightened receptivity to general information. The subsequent postdecisional phase aims to promote action initiation and includes planning action implementations. This phase is characterized by closed-mindedness, where individuals concentrate on information that can promote goal attainment such as when, where, and how to approach the goal(s) that they decided to pursue during the predecisional phase.

Following the preactional phase is the actional phase, where individuals are required to initiate and efficiently execute actions toward desired outcomes. During this phase, individual's mind-set should promote cognitive tuning towards internal and external cues that can sustain the course of action toward goal attainment and inhibit potentially disruptive information (e.g., self-reflective thoughts, competing goal intentions, and distractive environmental stimuli). Successful completion of the actional phase depends on how well individuals can avoid disruptions that may postpone goal achievement. Lastly, individuals enter a postactional phase where performance outcome is evaluated and decisions are made on whether further action is required (Heckhausen & Gollwitzer, 1987; Heckhausen & Kuhl, 1985).

People's decisions and choices during the preactional phase depend primarily on personal desires, needs, and interests, whereas *how* people actually act upon their goals during the actional phase can be determined by additional variables. During the actional phase, situational constraints and influences may be more conducive for certain types of implementations compared to others, and can alter the plans and intentions made during the preactional phase. It has also been suggested that planning and self-reports of multitasking intention reflect a *preference* for performing multiple tasks at once, or a positive attitude towards multitasking. Although attitudes and pre-formulated schedules are sometimes consistent with actions (Aronson, 1997; Bem, 1972; Cooper & Fazio, 1984), but in actual multitasking situations, individuals may rely on additional factors that are not present during planning which can often impair implementations of initial plans and intentions (Fazio, 1986, 1990; Mitchell et al., 2008; Reason, 1979).

For example, when individuals are planning how they want to approach their goals, they may not experience actual goal progress, which is a reduction in the discrepancy to goal attainment. According to previous studies, goal progress is often used to guide behaviors, and this sense of partial goal attainment can only be altered when individuals are actively moving towards a goal during the actional phase (Brown & McConnell, 2011; Carver & Scheier, 1998). Moreover, additional affective states such as boredom and fatigue, or frustration from unforeseeable challenges and obstacles, are all factors that can guide behavior but are absent during the preactional phase. Therefore individuals may not implement their a priori strategies as they need to employ online adaptations according to how the situation unfolds (Jobidon, Rousseau, & Breton, 2005; Kerstholt, 1995). As a result, plans can often be biased and inaccurate (Buehler, Griffin, & Ross, 1994; Kruger & Evans, 2004). This difference between planning and actual behavior is commonly illustrated by the planning fallacy, where individuals typically underestimate the time required to attain their goals, especially when the deadline is further in the future (Buehler et al., 1994; Kruger & Evans, 2004).

In sum, the conceptual framework explaining how much effort is allocated to, and how much individuals persist on, a given task during the actional phase may be different than the factors affecting goal choice and goal planning during the preactional phase. This is important to consider as individuals may report working on multiple tasks in a certain way but choose to act differently as they move from an implemental to an actional mind-set. In addition, goal seekers may encounter additional external pressures and constraints during the actional phase. Based on the different cognitive operations required at various phases of goal pursuit, the current thesis will differentiate intention from actual behavior by assessing multitasking intention during the preactional phase as well as actual multitasking behavior during the actional phase.

1.5.5 Summary and Limitations

Past research suggests certain situational and individual factors that can influence whether individuals adopt a single or multitasking strategy. These include culture (Poposki & Oswald, 2010), cognitive accessibility of focal and alternative goals (Shah et al., 2002), difficulties focusing on a single task (Ophir et al., 2009; Sanbonmatsu et al., 2013), and situational factors such as GPD and goal orientation (Schmidt & Dolis, 2009). In general, these studies suggest that poor attentional control and processing additional information may increase multitasking (Cain & Mitroff, 2011; Ophir et al., 2009), regardless of whether susceptibility to distracting information is internally driven, such as being highly impulsive (Sanbonmatsu et al., 2013), or externally determined, such as through priming (Shah et al., 2002) or operating under a highly volatile environment (Schmidt & Dolis, 2009). The attentional state and the environmental situation of people who multitask are similar to those of powerless individuals, who also find it difficult to inhibit irrelevant information (DeWall et al., 2011; Guinote, 2007b; Smith et al., 2008) and are faced with external constraints and unpredictability (Fiske, 1993; Keltner et al., 2003).

However, one major limitation in the area of multitasking is that most of the findings on individual differences in attentional control and multitasking tendency are correlational and relied on self-reports (Becker et al., 2013; Poposki & Oswald, 2010; Sanbonmatsu et al., 2013). This limits the conclusions that can be drawn about the actual causes of multitasking activity since the cognitive correlates of multitasking could be a byproduct of multitasking behavior. Moreover, although the multiple-goals literature has looked at how certain factors, such as culture and inhibition, can influence the kind of strategy we employ, but the question of whether social factors can also affect the use of single-tasking vs. multitasking strategies has not been investigated. Therefore the current thesis seeks to understand how social power affects multiple-goal pursuit using both experimental as well as correlational methods. The next section will discuss the second aim of the thesis, which is to investigate the consequences of having multiple active goals for performance, and what affects an individual's ability to multitask.

1.6 Multitasking Ability

Research in the multitasking literature has investigated how different approaches to multiple goals may result in varied performance levels. Under single-tasking strategies, individuals can optimize performance on only one of the goals and forgo another, whereas under multitasking strategies, individuals tend to "satisfice" by doing a satisfactory job on each task (Adler & Benbunan-Fich, 2013; Carver, 2003). It has been suggested that these two types of approaches do not yield similar overall performance level, as simultaneous goal activations often generate negative work outcomes. When a person undertakes more than one task within a given time by allocating available cognitive resources among them, then performance in some or all of the tasks may be affected (Wickens & Hollands, 1999). For example, observational studies of office workers suggest that interruption leads to a substantial loss of productivity and time (González & Mark, 2005), and an estimated 28% of an employee's hours are wasted due to self-initiated interruptions (Spira & Feintuch, 2005). Performance decrements associated with multitasking can even amount to businesses losing approximately $650 billion a year (Lohr, 2007).

It has been proposed that these decrements occur because merely the activation of multiple goals can be distractive and interfere with task performance (Marien, Custers, Hassin, & Aarts, 2012; Shah & Kruglanski, 2002). For example, when multiple goals are activated simultaneously, people often experience indecision and goal conflict (Kleiman & Hassin, 2011). Moreover, our cognitive resources are extremely limited (Baddeley & Hitch, 1974; Kahneman, 1973). Thus constantly dividing attention between two or more different goals can be challenging, as motivational resources are pulled away from the focal goal (Fishbach & Dhar, 2007; Fishbach & Ferguson, 2007; Marien et al., 2012; Shah & Kruglanski, 2002; Van Dillen, Papies, & Hofmann, 2013). That is why goal shielding, which promotes single-tasking behaviors, can also affect goal commitment and performance by decreasing the need to share resources and to manage multiple goals in memory (Shah et al., 2002). For example, it has been shown that participants persisted for a shorter period of time, and had poorer performance, on the focal goal (solving anagrams) when they were subliminally primed with an alternative goal (vs. a neutral concept) that was in indirect conflict with the focal goal (naming different functions of a box; Shah & Kruglanski, 2002).

Choosing to multitask by engaging in discretionary switches between various goals may also lead to inefficiencies. When individuals switch from one task to another, the processing of the initial task must be interrupted and delayed (Kiesel et al., 2010; Vandierendonck, Liefooghe, & Verbruggen, 2010). At the same time, individuals need to maintain the results from the interrupted task so that they can quickly refocus and switch attention back to that initial task and reinstate its processing. Indeed, studies have suggested that individuals who engage in a single-tasking approach, in which one goal is completed prior to allocating time to another, show greater likelihood of completing at least one goal without reducing the chances of meeting both compared to those who engage in discretionary switches (Adler & Benbunan-Fich, 2013; Schmidt, Dolis, & Tolli, 2009). These results suggest that choosing to adopt a polychronic behavior could be more attentionally demanding and cognitively taxing than a monochronic behavior. As a consequence, performance on individual tasks may suffer due to indecisiveness, higher distractibility, and unfocused attention, which can diminish overall productivity.

Although there is a self-regulatory advantage to inhibiting alternative goals, as this will free up resources needed for goal pursuit, but in many situations individuals do not have a choice and are required to multitask due to work demands (Benbunan-Fich & Truman, 2009; González & Mark, 2005; Laxmisan et al., 2007; Otto et al., 2012). In fact, multitasking has been developed into an imperative and desired trait in many settings even though it can be detrimental for performance (Benbunan-Fich & Truman, 2009). There is some support that when participants need to attend to two tasks, polychrons perform better than monochrons (Goonetilleke & Luximon, 2010; Zhang et al., 2005). This is in line with Hall's (1989) hypothesis that monochrons feel disoriented and perform worse than polychrons whenever there are many things to do. However, the notion that high-multitaskers exhibit better multitasking ability than low-multitaskers has been challenged by other researchers (Ophir et al., 2009; Watson & Strayer, 2010). For example, Ophir et al. (2009) examined cognitive abilities of chronic multitaskers, and found that people who frequently multitask actually exhibited greater costs when switching between two different tasks compared to infrequent multitaskers (but see Alzahabi & Becker, 2013).

Accordingly, effective and efficient multitasking performance does not necessarily depend on how likely and often individuals engage in multitasking behavior, but relies more on the amount of WM capacity and attention available to exercise a high level of executive control (Baddeley et al., 2001; Baddeley & Della Sala, 1996; Szameitat, Schubert, Müller, & Von Cramon, 2002). Executive attention is central to multitasking because the information and goals relevant to one task must be actively maintained while other tasks are performed. The next section will therefore review how WM resources can affect two of the most extensively researched functions that are essential for successful multitasking performance: rapidly switching attention between different tasks (task-switching) and attending to information simultaneously (dual-tasking). Both task-switching and dual-tasking are defining aspects of multitasking behavior when individuals are trying to accomplish many goals within a certain period of time (Delbridge, 2001).

1.6.1 Task-Switching Ability

Task-switching is the ability to quickly and flexibly reallocate attention from one cognitive task to another, such as switching attention to a telephone call when writing an article (Monsell, 2003). Task-switching can be driven by external stimuli, such as a phone ring, or guided by internal cues, such as satisfaction with current goal progress (Carver, 2003). Some have attributed improvements in multitasking ability to one's ability to switch between multiple components in a complex task. Switching between different task sets can be challenging and time-consuming and it can incur a "switch cost" (Rogers & Monsell, 1995).

Switch costs are a result of increased reaction-times (RTs) and/or error-rates (ERs) when individuals are required to switch from one type of task to another compared to working continuously on the same task (see Monsell, 2003, for a review). Numerous laboratory studies have found task-switching to be challenging

(Kiesel et al., 2010; Rubinstein et al., 2001; Yeung, Nystrom, Aronson, & Cohen, 2006). For example, participants who switched between addition and subtraction operations responded slower than those who continued with the same operation. These costs have also been found in real life situations, where judges who switch between different court cases take more time than judges who work sequentially (Coviello, Ichino, & Persico, 2014).

It has been proposed that there are two main reasons for why switch costs occur. One is attributable to the time taken to adjust mental control settings that correspond to the new task. That is, every time individuals switch to a different task, extra resources are required to refocus attention on the new task set. Task-set reconfiguration may involve the retrieval, with the help of executive control processes, of task-related information (e.g., task rules) from long-term memory (Luria & Meiran, 2005; Rogers & Monsell, 1995). The second reason is due to task competition, such as the carry-over of the processing and representations from the previous task-set (Rogers & Monsell, 1995). In order to perform well, individuals need to successfully inhibit these interfering activations and responses. Attentional control is required during task-switching to minimize interference from the representations and stimuli associated with the off-task.

Theoretical models of attentional control also argue that the central executive has a major role in the switching of attention, and that successful task-switching ability relies on the amount of WM capacity available for the control of attention (Baddeley, 2002). Higher attentional control allows individuals to rapidly reconfigure to a new task and to more completely inhibit the old task. This will minimize interferences from the representations and stimuli associated with the off-task, which results in lower switch costs. For example, studies have shown that increasing WM load has a deleterious influence on task-switching performance, where high WM loads can decrease the speed with which participants switched from a primary task to a secondary task (Baddeley et al., 2001; de Fockert et al., 2001; Hester & Garavan, 2005; Mitchell et al., 2002; Roberts et al., 1994). These findings are consistent with the idea WM capacity relates directly to executive control functions, such as switching of attention. Moreover, Baddeley and colleagues (2001) demonstrated in a series of dual-task experiments that secondary tasks requiring the use of the central executive and the phonological loop can both tax WM resources, which also interfered with task-switching performance.

In sum, higher attentional control can facilitate rapid reconfiguration of a new task and complete inhibition of the old task, which result in fewer switch costs. Switch costs occur if available resources cannot meet the higher demand for attentional control when one task is replaced by a second task, such as for disengagement from an irrelevant task-set and for reconfiguring mental processes associated with the new task-set (Monsell & Driver, 2000; Rogers & Monsell, 1995). Task-switching can therefore be difficult because if inhibitory regulation is reduced, then individuals will encode more information and sustain access to them even when tasks change (Hasher, Zacks, & May, 1999). Since powerless individuals fail to down-regulate nonrelevant information, then representation of distracting information from a previous task may still be accessible during the processing of a subsequent task, and this may influence the reconfiguration process as well as performance (Healey, Campbell, & Hasher, 2008). The next section will outline another type of multitasking ability, dealing with multiple concurrent tasks, which is also highly dependent on attentional control and WM resources and can therefore be susceptible to the influences of power.

1.6.2 Dual-Tasking Ability

Carrying out more than one task at the same time, such as using cell phones while driving, has become commonplace in everyday life due to society's emphasis on productivity (Strayer & Drews, 2007). Therefore the ability to dual-task is a major concern for both public and scientific interest. This section will focus on dual-tasking ability, which is defined as the capacity of sharing or dividing attention between two simultaneously incoming stimuli. Dual-tasking requires individuals to concurrently process a number of distinct stimuli and select their appropriate responses, to execute a number of distinct acts simultaneously, and to coordinate among the different task components within a short period of time (Campbell, 1988; Wood, 1986).

Research has showed that when mental resources need to be shared between more than one simultaneously presented cues, then individuals take longer to respond and commit more errors as compared to when the information are presented separately (Levy & Pashler, 2001; Welford, 1952). It has been found repeatedly that comprehension and effective processing of one medium are reduced while simultaneously consuming a second medium (Craik, Govoni, Naveh-Benjamin, & Anderson, 1996; Mulligan, Duke, & Cooper, 2007). For example, individuals perform considerably worse, in terms of increased errors and delays in response times, if they are asked to do an auditory and a visual task together compared to when they do the tasks independently (Levy & Pashler, 2001; Pashler, 1994). These dual-task costs have been observed even when pairing together simple tasks that would have been easily performed separately (Pashler, 1994). Additionally, in more realistic every-day tasks where participants were asked to copy a short paragraph while listening to a series of isolated words, it was found that writing speed decreased as a function of the attentional load of the auditory task (Brown, McDonald, Brown, & Carr, 1988). These dual-task costs are not trivial as it can lead to severe consequences in many real-life situations. One common situation is driving an automobile while conversing, either on a mobile phone or with a passenger. This type of dual-tasking can lead to noticeable interference with all tasks, such that both driving performance and conversation flow are significantly impaired (Charlton, 2009; Pashler, 1994, 1998; Strayer & Drews, 2007).

Based on numerous conclusive evidence, most researchers agree that dual-tasking is more difficult than single-tasking, and that there is specific interference when tasks require the same stage of processing and simultaneous response selection (Pashler & Kang, 2006). However, what determines the nature of this interference is still under debate. Two main and fundamentally different perspectives have emerged in this area to account for the undisputed presence of dual-task cost: the structural theory and the central capacity theory.

Structural Theory

The structural theory proposes that dual-task interference stems from the fundamental structure of human cognition, which places limits on dual-tasking (Pashler, 1993; Pashler & Johnston, 1998; Tombu & Jolicœur, 2003). One of the most well-known structural theory is the bottleneck model, which proposes that parallel processing of information may be impossible for certain mental operations due to a cognitive bottleneck (Broadbent, 1958, 1982; Pashler, 1994; Welford, 1952). It is assumed that there are broadly three stages of processing: an early stage involving perceptual processing, a central stage involving response selection, and a final stage involving execution of the response. When two stimuli or messages are presented at the same time, both can gain access to a sensory buffer at the same time. Similarly, execution of the responses for the two tasks can also occur largely in parallel.

The critical assumption is that the limit to divided attention occurs because there is a bottleneck at the central processing stage (Welford, 1952). This bottleneck acts as a filter in the central processor, where only one input is allowed in order to prevent overloading of the filter's limited capacity. Therefore processes leading to response selection can only be carried out for one task at a time (Lien, Ruthruff, & Johnston, 2006) and attention involves a system of "turn-taking" where only one of the inputs can pass through the filter in the central processor (Pashler & Johnston, 1989). The other input remains in the buffer and its analysis must be postponed until central processing of the first task is complete. For example, if someone is trying to divide their attention between two tasks, they might first select and launch action that is part of Task A; whilst this is happening, Task B must be put on hold, resulting in delays and dual-task costs (Pashler & Johnston, 1989)

This theory is supported by evidence from studies using the psychological refractory period (PRP) paradigm, where participants are asked to respond to two tasks that are presented in a sequential order. The intervals between the two tasks can vary from long to short, allowing one to measure the source of the interference between the tasks. A common finding in these PRP studies is that reducing the delay between the tasks impairs performance in the second task. This PRP effect has been taken to support the idea of a structural bottleneck, where the first answer must be completely processed before another one, thus creating a delay for the second task (Meyer & Kieras, 1997; Pashler, 1993). That is, the second task must wait until some critical processing of the first task is complete (Pashler, 1993). These results from the PRP studies have often been used as an argument that perfect time-sharing between two tasks is not possible and that at some point in time, execution of the second task must await the completion of the first task. It also explains why interference occurs between concurrent but quite different tasks, because there is a general limitation to how much information the entire cognitive system can transmit at one time

In sum, structural accounts of dual-task interference assume that, due to structural limitations, parallel processing is impossible as one task will always have to queue (Pashler, 1990). It is therefore not possible to make two decisions about appropriate responses to two or more different stimuli at the same time because as the two tasks must be performed one at a time, and this delay will impair dual-task task performance (Welford, 1952). However, critics of the bottleneck model have pointed out that the PRP effect may be a result of strategic control processes, such as a voluntary organization of processing priorities that ensures the first stimulus is always responded to before the second one (Meyer & Kieras, 1997). For example, the instructions given during the PRP paradigm may have inadvertently encouraged participants to prioritize one of the tasks at the expense of the other. In fact, when given appropriate instructions (explicitly told not to prioritize any of the tasks) and a moderate amount of practice, participants are able to achieve almost perfect time-sharing (no PRP effect) on certain combinations of audiovocal and visuomanual tasks (Schumacher et al., 2001). For example, studies have shown that this processing bottleneck may disappear when well-practiced participants perform simple tasks, such as those with highly compatible stimulus response mappings (McLeod & Posner, 1984; Pashler, Carrier, & Hoffman, 1993) and highly practiced visual manual mappings (Greenwald & Shulman, 1973).

Capacity Theory

As a consequence of the bottleneck theory's limitations, other researchers have proposed that dual-task costs may reflect optional control strategies rather than structural processing limitations. This second perspective is known as the capacity (or resource) models of attention (Kahneman, 1973). Capacity theories do not assume a structural bottleneck, but rather, they propose that several and parallel processes are possible from the first perceptual analyses up to the higher cognitive decision processes.

Two types of capacity theories have dominated the literature. One is the multiple capacity theory, which favors the notion that there are several specific and independent pools of processing resources or modules (e.g., Allport, 1989; Wickens, 1980). The second is the central capacity theory, which assumes that there is a single, multi-purpose central processor or executive (e.g., Kahneman, 1973; Norman & Shallice, 2000). Central capacity theories argue that there is some general, central capacity, such as the central executive system of the WM model (Baddeley & Hitch, 1974), which can be used flexibly across numerous activities, but which has limited capacity. This general resource or processor must be drawn upon for the successful performance of almost all tasks (Kahneman, 1973; Moray, 1967), and is also required to monitor and coordinate performance on a wide range of tasks. Dual-task interference occurs when concurrent demands on the central executive are too great to be met.

According to the central capacity theory, when two tasks are performed simultaneously, they share the same available resources and less capacity can be devoted for each individual task (Kahneman, 1973; Navon & Gopher, 1979; Navon & Miller, 2002). This can then result in impaired dual-task performance. In addition, extra capacity is also needed to synchronize between two concurrent outputs by deciding and preparing the order in which the tasks are to be carried out. In other words, responses must be programmed and executed for two incompatible tasks in order to engage in successful response selection, and this requires substantial coordination and maintenance of the two task-sets in WM. If insufficient resources are available for task coordination, then this may increase confusion and cross-talks between the two tasks. For example, some have suggested that dual-task impairments are not dependent on what sort of operation is to be carried out per se, but on the content of the information actually being processed (Hazeltine, Ruthruff, & Remington, 2006). That is, dual-task interference may be caused by an "outcome conflict" (Navon & Miller, 1987) in which one task produces outputs or side-effects that are harmful to the processing of the other task.

This assumption is supported by findings that performance on tasks requiring attention to two different types of stimuli is affected by task similarity. For example, stimuli of different sensory modalities (combination of a verbal and spatial task) can be attended to together more effectively than stimuli from the same sensory modality (combination of two verbal tasks; Allport et al., 1972). Likewise, similar tasks (e.g., both tasks requiring hearing words) were found to employ the highest amount of mental resources because they compete more with each other for resources and also demand more resources to decrease interference by keeping the two task-sets separate in WM (Cowan & Morey, 2007). Less similar task combinations, such as hearing words and seeing words, required less mental effort and the last combination of hearing words and seeing pictures required the least mental effort. These results suggest that the likelihood of dual-task interference depends on the amount of resources that are required—the more one allocates resources towards conflict resolution and minimizing cross-talks, the fewer resources are left available for dual-task execution.

Since processing two tasks simultaneously can result in interference and cross-talk, then it has been proposed that goal conflict should be associated with difficutlies in or lack of prioritization (i.e., seeing the goals as equal rather than unequal in priority; Erez, Gopher, & Arzi, 1990; Schmidt, Kleinbeck, & Brockmann, 1984). For example, individuals need to be able to manage two tasks by sustaining appropriate inhibition between the upcoming stimuli in order to decrease confusion and crosstalk between them. Since one of the roles of the central executive system in the WM model is to act as an attention controller (Baddeley, 1996), then it can also help individuals focus on specific information and reject information from other sources that are not task-relevant.

Therefore WM capacity is greatly involved in divided attention tasks by allowing people to generate control over how they distribute their finite resources among different but simultaneously presented tasks. Individuals can, to some extent, control how their attention and resources are allocated to cognitive processes involved in different tasks via the central executive system (Baddeley, 1996; Norman & Shallice, 2000). Deficits in executive operations could therefore exacerbate dual-task costs as individuals are no longer able to decrease the interference between the two tasks, such as by temporarily emphasizing one task over the other. Thus in order to carry out these processes successfully, one needs to employ some sort of efficient organization of information or resource allocation, which in turn is dependent on the amount of WM capacity available.

Accordingly, capacity theories suggest that dual-task costs can be minimized if individuals are able to control their attention. Therefore the more central capacity is available the better individuals are at dealing with demanding dual-task situations. Empirical support for these assumptions come from studies showing how various factors that decrease resource availability can also hinder dual-tasking performance. Specifically, task complexities (Bourke, Duncan, & Nimmo-Smith, 1996), practice (Ruthruff, Hazeltine, & Remington, 2006; Schumacher et al., 2001; Spelke, Hirst, & Neisser, 1976), and an individual's current state (Maquestiaux, Hartley, & Bertsch, 2004; Maquestiaux, Laguë-Beauvais, Ruthruff, & Bherer, 2008; Ruthruff et al., 2006) can contribute to the amount of resources available. First, how demanding dual-tasking is can depend on how difficult or complex the individual tasks are. Complex tasks require more resources to process and to complete them properly. For example, studies have shown that higher demanding tasks (e.g., random number generation vs. tone monitoring) interfered with dual-task performance the most (Bourke et al., 1996). Therefore the more difficult a task, the less likely it is that it can be easily performed simultaneously with another task because they increase cognitive load by taking up more attentional resources (Duncan, 1979; Sullivan, 1976).

Second, practice has also been found to affect performance (Ruthruff et al., 2006; Schumacher et al., 2001; Spelke et al., 1976). This is because the more we practice a task, the more automatic it becomes and demands less attention. As a task becomes more automatized, it also becomes easier to be performed simultaneously with another task. For example, expert typists can type and shadow speech at the same time (Shaffer, 1975). Furthermore, students who were given tasks of trying to understand stories while writing down words to dictation improved after six weeks of training (Spelke et al., 1976). In addition, using a dual-task paradigm with basic choice reaction tasks (vocal response to auditory tone and manual response to visual information) Schumacher and colleagues (2001) found that some individuals were able to bypass the central bottleneck of information processing by achieving perfect time-sharing after five practice sessions. Perfect time-sharers could execute a task in dual-task condition as fast as they could when the tasks were performed alone, and the execution of the second task does not suffer from reducing the delay between the two tasks.

Lastly, the amount of central capacity available can also be affected by task-independent factors such as situational or individual differences. Indeed, numerous studies have reported individual differences in the ability to divide attention between the two tasks in a PRP paradigm (Maquestiaux et al., 2004, 2008; Ruthruff et al., 2006). For some people, the simultaneous performance of tasks is achieved quite easily and efficiently, while others have more difficulties. These individual differences in dual-task abilities might be related to different executive functions abilities. For example, behavioural studies that explored the relation between dual-task performance and neuropsychological tests support the idea that individual differences in executive functions can predict the ability of an individual to perfectly share attention between tasks (Holtzer, Stern, & Rakitin, 2005; Laguë-Beauvais, Gagnon, Castonguay, & Bherer, 2013; Tun, O'Kane, & Wingfield, 2002; but see Bull & Scerif, 2001). For example, dual-task performance was best predicted by performance on tasks measuring executive functions, such as the Forward and Backward Digit Span, the Trail Making Test, and the Stroop Task. These correlations suggest that the effective management of two tasks requires one to successfully hold multiple task-sets in WM, to inhibit automatic responses to a task, and to easily switch between two tasks. Together, these results provide evidence for the presence of a general (vs. multiple) limited capacity responsible for task coordination during dual-tasking instead of a structural bottleneck.

In sum, past studies suggest that, instead of a structural limitation, dual-task costs depend on a central attentional capacity that has limited availability (Kahneman, 1973; Norman & Shallice, 2000). Consequently, dual-task costs occur because processing more than one task will compete for limited mental resources (Bourke et al., 1996; Hazeltine et al., 2006; Schumacher et al., 2001). The ability to perform two tasks together depends on how much resources are available for maintaining and coordinating two concurrent tasks in WM. If the combined demands of the tasks do not exceed the central capacity, then they will not interfere with each other and perfect time-sharing between two tasks is then possible (Schumacher et al., 2001).

1.6.3 Summary and Limitations of Multitasking Literature

To conclude, the current section illustrated how the executive system of the WM can increase attentional control, which will then aid multitasking performance. Although past studies have focused more on how different types of tasks or individual differences in abilities can influence task-switching and dual-tasking performance, relatively few studies have examined how social relationships and one's current situation can affect multitasking ability. Thus the present thesis investigates the effect of power on multitasking ability, as it is highly likely that powerless individuals are more easily distracted, have fewer WM resources, and are less able to successfully control attention in multitasking situations compared to powerful individuals. Since concurrent processing of two tasks places high demands on the central executive for coordination and for managing cross-talks, then powerless individuals should show impaired performance in dual-task situations. Likewise, powerlessness should also impair performance during task-switching as task-switching also requires executive control for attentional refocusing and for inhibiting previous task-sets (Friedman & Miyake, 2004; Miyake et al., 2000). This thesis will therefore look specifically at whether powerlessness can affect task-switching and dual-task performance.

1.7 Summary and Aims of the Present Thesis

1.7.1 Aims and Hypotheses

Past literature has proposed that social power, defined as interpersonal outcome dependency, alters the fundamental need for security and control (Fiske, 1993; Guinote, 2007a; Keltner et al., 2003). This in turn has a profound impact on how individuals attend to and process information and on how they behave. As a consequence of satisfying fundamental needs, high power increases (whereas low power decreases) approach-orientation towards rewards and opportunities and attentional focus on current goals and demands (Guinote, 2007a; Keltner et al., 2003). Since successful goal pursuit requires individuals to be both motivated and have the ability to concentrate on goal-related tasks, then it is unsurprising that high power can facilitate, whereas low power can hinder, goal achievement and performance (Guinote, 2007a).

In spite of the research on power and goal attainment and performance in the context of single-goal pursuit, the literature lacks evidence on how power affects goal-related intention, action, and ability in the domain of multiple-goal pursuit. It is unclear whether the willingness and ability of powerful and powerless participants to prioritize relevant information when pursuing a single goal can affect behaviors and performance in the context of multiple goals, where all information can be potentially relevant. This aspect is important to investigate as people are often juggling between competing demands every day (Locke & Latham, 1990). Thus the current thesis will address this gap in the literature and has two main aims. First is to look at whether power affects how people approach multiple tasks (intentions and behaviors) and, second, is to investigate whether power influences one’s ability to multitask.

Multitasking Tendency and Prioritization

The first aim of the thesis is to look at how social power can affect the balance between multiple goals. Powerholders are more likely to prioritize information that are relevant to a focal goal or situational affordance, and attend less to other considerations because they are seen as less crucial (Guinote, 2007b, 2007c; Overbeck & Park, 2001; Slabu & Guinote, 2010). On the other hand, powerless individuals are less focused on information relevant to their focal goal because they have multiple concerns and are faced with a more volatile and unstable environment. As a consequence, they prefer to gain additional information in order to satisfy the multiple goals that they have. They may therefore treat various goals as equally important and are more willing to be guided by all the information that demands their attention, such as differences in GPD (Kernan & Lord, 1990; Schmidt & Dolis, 2009).

Moreover, individuals who are limited in their ability and willingness to inhibit secondary activities may be especially prone to multitasking (Cain & Mitroff, 2011; Ophir et al., 2009). Powerholder's tendency to prioritize goal-relevant, and to inhibit goal-irrelevant, information in single-goal contexts may also be extended to the context of multiple goals. That is, prioritization during multiple-goal contexts will encourage powerholders to behave similarly to monochrons by taking up important tasks first and allocating most of their time to that one task while other tasks are left to do later or omitted if time runs out (Hall, 1989). Power should therefore decrease multitasking tendency, since goal commitment and prioritization encourage a more focused, single-tasking strategy.

Multitasking tendency has been measured in the past using self-reports (e.g., MPI) as well as measuring behavior during laboratory multitasking simulations. However, past studies have not investigated whether there are differences in how individuals plan and schedule multiple goals. As indicated in previous sections, planning is important to look at in addition to actual behaviors, as cognitive operations differ depending on whether the individual is in the preactional or actional phases of goal pursuit (Gollwitzer, 1996; Heckhausen & Gollwitzer, 1987). As a result of these possible differences, the current study aimed to measure multitasking tendency in the preactional phase using self-reports and task planning, as well as to investigate actual multitasking behavior in the actional phase.

Based on the finding that attentional strategies and information seeking tendencies seem to vary with the level of power and control that individuals have at their disposal (e.g., Smith & Trope, 2006; Weick & Guinote, 2008), it is first hypothesized that multitasking tendency should have a positive relationship with powerlessness. That is, powerless participants should have a higher multitasking tendency compared to participants in neutral positions, who will have a higher multitasking tendency compared to powerful participants. Moreover, since power increases prioritization of goal-relevant information whereas powerless individuals treat all information as equally important, then the second hypothesis proposes that powerholders are also more likely to spontaneously prioritize one of their multiple goals.

Boundary Conditions

The current thesis also aims to investigate the boundary conditions of multitasking behavior by manipulating task difficulty and task outcome. As outlined earlier in the introduction, task switching can be influenced by goal expectancy and goal orientation (Kernan & Lord, 1990; Schmidt & DeShon, 2007; Schmidt & Dolis, 2009). First, low goal expectancy decreases switching to that particular goal, and may moderate the relationship between powerlessness and multitasking. Therefore the current thesis manipulated task difficulty in order to investigate whether a more difficult goal can decrease switching behaviors by encouraging participants to focus on the easier task with higher goal expectancy. Therefore the third hypothesis states that task difficulty should decrease multitasking tendency as participants switch less to the difficult task.

Second, previous studies found that individuals have a high tendency to avoid negative consequences and outcomes (Kahneman & Tversky, 1979). Therefore prevention tasks that call for loss aversion should moderate the relationship between high power and single-tasking, because switching toward goals instrumental to avoiding losses should be weighed more heavily than focusing on a goal without loss-aversion (Schmidt & DeShon, 2007). Since discrepancies relevant to the prevention task are likely to be seen as more severe than discrepancies to non-prevention (i.e., neutral) tasks, the fourth hypothesis predicts that powerful participants should be willing to multitask more if the secondary task is prevention-focused as opposed to being neutral.

Multitasking Ability

Past research suggests that individuals who prefer to engage in multitasking are not necessarily better at multitasking compared to individuals who prefer to pursue multiple goals sequentially (Konig, Buhner, & Murling, 2005; Ophir et al., 2009). As a consequence, even though powerless individuals may multitask more, this does not necessarily mean that they have an advantage when multitasking. Multitasking ability is primarily constrained by the amount of WM resources available (Colom, Martínez-Molina, Shih, & Santacreu, 2010; Kahneman, 1973; Konig et al., 2005). Therefore the second aim of the thesis was to investigate whether power affects overall multitasking ability. This is probable because in addition to affecting the willingness to focus on current needs and desires (Galinsky et al., 2003; Magee et al., 2007; Smith & Bargh, 2008), power can also affect the ability to control attention (DeWall et al., 2011; Guinote, 2007b; Smith et al., 2008).

Processing and seeking task-irrelevant information, such as worrying over evaluations and regulating affect in powerless individuals, can consume more WM resources (Beal et al., 2005) compared to powerful individuals, who attend to less extraneous information. Powerless individuals will therefore have fewer resources available to devote to the central ongoing task. These deficits in WM capacity will be especially apparent in demanding situations such as dual-tasking, where individuals need to simultaneously store and process multiple sources of information (Baddeley, 1992). Thus, dual-task performance is indicative both of WM capacity and of the ability to complete two goals in parallel. Therefore the fifth hypothesis predicts that powerlessness should decrease WM capacity, which is manifested through higher dual-task costs.

Lastly, since the shifting function is also highly dependent on executive control to successfully refocus attention and inhibit previously activated task-sets (Monsell & Driver, 2000), then the sixth hypothesis predicts that powerless individuals should have higher switch-costs than powerful individuals. The effect of power on task-switching ability should occur in situations where individuals are required to multitask, as well as in situations where individuals can choose to switch between tasks according to their own discretion due to similar underlying cognitive operations (Spira & Feintuch, 2005). Whereas both low and high power is predicted to affect multitasking tendency, the prediction regarding multitasking ability focuses primarily on powerless individuals. This is because past studies have only found consistent support that powerlessness decreases performance, whereas experiencing high social power may not increase WM resources above the baseline capacity (DeWall et al., 2011; Guinote, 2007b; Smith et al., 2008).

1.7.2 Overview of Studies

The proposed research questions are addressed in Chapters 2-4. The first two chapters focused on the impact of social power on multitasking tendency by testing the hypothesis that social power increases single-tasking, whereas powerlessness leads to multitasking. Six studies were presented to examine this proposition using both correlational (Experiment 1) as well as experimental (Experiments 2-6) designs. Chapter 2 investigated multitasking intention during the preactional phase of goal pursuit by looking at self-reported multitasking behavior (Experiments 1 and 3) and planning between multiple projects (Experiments 2 and 3). It also addressed the moderating role of goal orientation on the relationship between power and multitasking (Experiment 3).

Chapter 3 examined how individuals in high and low power behave when faced with multiple possible tasks to pursue during the actional phase. These studies utilized a computerized (Experiment 4) and a manual (Experiment 5) task, and the moderating role of task difficulty on switching was examined as well (Experiment 5). Chapter 3 also looked at whether power affected individuals' prioritization of a single goal when faced with multiple different goals to pursue (Experiments 4-6), and whether power affected the number of tasks that participants choose to pursue during the predecisional phase (Experiment 6). In sum, Chapters 2-3 examined the hypothesis that individuals low (vs. high) in power had higher multitasking intention as well as behaviors, and were less likely to prioritize a single goal when faced with the opportunity to pursue multiple goals.

The next chapter, Chapter 4, tested the second question regarding power and multitasking ability by investigating the hypothesis that low power decreases multitasking ability. This was done both in constant experimental conditions (Experiments 7-9) and in natural settings (Experiment 10). Participants were invited to engage in dual-tasking (Experiment 7) and task-switching paradigms (Experiments 8 and 9), and the speed and accuracy of their responses were recorded. Multitasking ability was also examined using self-reported abilities to control attention when faced with multiple tasks or interruptions (Experiment 10).

Past studies have suggested that cognitive and behavioral tendencies associated with power are activated whenever individuals are in a high-power role or even when people simply recall an experience of role power (Berdahl & Martorana, 2006; Galinsky et al., 2003). Therefore the present thesis manipulated power experimentally by inviting participants to enact high- and low-power hierarchical roles (Experiment 6), by priming power through past recollections (Galinsky et al., 2003; Experiments 2, 4-5 and 7-9), and by asking participants to imagine and describe a day in the role of a manager or subordinate (Guinote, 2008) (Experiment 3). Power was also measured as an individual trait variable using the Sense of Power scale (Experiment 1). Lastly, Experiment 10 examined how individuals in real-life high and low organizational power positions self-report their performance during multitasking. This allows us to investigate the effects of social power on ability under conditions of high external validity.

In addition, past theories of power have suggested that high and low power produce opposite effects (Keltner et al., 2003). However, data supporting this claim is limited as most research on power has used a two-group design which only compared differences between powerful and powerless participants (Moskowitz, 2004). Therefore empirical evidence is limited on whether possessing power is associated with increased prioritization and executive functions, or lacking power leads to a multitasking mindset and higher distractibility, or both. To tease apart and examine the effects of possessing and lacking power on behaviors and performance independently, a neutral or control condition was included in which participants completed a version of the manipulation task that is unrelated to power. Hence in all of the experimental manipulations of power, participants either possessed power (powerful condition), lacked power (powerless condition), or were in a neutral situation (control condition).

The current experiments also controlled for other confounding factors that can affect the results. For example, the effects of power on switching behaviors and performance might be a result of a change in participants' moods (Keltner et al., 2003). There are studies that show how powerholders experience more positive rather than negative emotions (Anderson & Berdahl, 2002; Berdahl & Martorana, 2006), even though the relationship between power and mood is inconsistent. Since the hypothesis proposes a direct link between power and behavior that does not require the mediation of mood or other affective changes, then additional measures were included to rule out potential confounding factors and to discover other potential mediators of power. These include differences in positive affect (Experiments 2-9), anxiety (Experiments 8 and 9), confidence (Experiments 4 and 6), rumination, and arousal level (Experiment 9). Perceptions of task interest, task difficulty (Experiments 4 and 5), and goal orientation (Experiment 6) were also examined. These factors were assessed because they could affect multitasking behavior and ability (Ansari et al., 2008; Carver, 2003; Rokke, Arnell, Koch, & Andrews, 2002) and have been related to power (Briñol et al., 2007; Fast, Sivanathan, Mayer, & Galinsky, 2012; Keltner et al., 2003).

Finally, Chapter 5 included the General Discussion of the empirical evidences presented in Chapters 2-4. The findings are summarized and strengths and limitations are discussed, followed with implications of the current findings for research on social power and research on multiple-goal pursuit. It also proposed directions for future research as well as potential practical interventions to enhance productivity in organizations and the ability to multitask.

Chapter 2:

Power and Multitasking Intention

2.1 Introduction

One challenge in multiple goal situations is to be able to successfully juggle between multiple activities within a given deadline, such as scheduling one's time and choosing which task to work on and when. For example, individuals need to decide whether they should attend to multiple tasks simultaneously to save time, and whether they should switch to another task or finish the current one first. However, the issue of whether power affects how individuals allocate resources back and forth across competing goals over time has been largely neglected.

The purpose of Chapter 2 was to investigate whether power affects how people approach multiple, competing demands, and specifically focuses on intentions prior to the actional phase. Powerless individuals are more vigilant (Keltner et al., 2003) and may be more motivated to attend to multiple sources of information to better predict the future and to increase their sense of control (Fiske & Berdahl, 2007; Fiske & Dépret, 1996; Guinote & Phillips, 2010; Overbeck & Park, 2001). This tendency to occupy their minds with more information (Fiske & Dépret, 1996; Guinote, 2007a) may lead to higher multitasking as opposed to single-tasking intentions. In contrast, high power promotes a selective and voluntary deployment of attention (Guinote, 2007a), which should increase single-tasking tendency. For instance, in the social domain, powerholders attend selectively to social information depending on their goals (Goodwin et al., 2000; Gruenfeld et al., 2008; Overbeck & Park, 2001; Vescio et al., 2003), their current states (Weick & Guinote, 2008), and the stereotypes that easily come to mind (Fiske, 1993; Fiske & Dépret, 1996; Guinote & Phillips, 2010; Richeson & Ambady, 2003).

Based on these relationships between power and attention, it was hypothesized that powerless participants should have a higher multitasking intention compared to control participants, who will have a higher multitasking intention than powerful participants. This was tested using a multitasking questionnaire and by asking participants to plan how they will approach multiple tasks.

2.2 Experiment 1: Power and multitasking preference

Experiment 1 used an on-line questionnaire to measure the relationship between generalized sense of power (SOP) and multitasking preferences, otherwise known as polychronicity. Polychronicity reflects the preference for multitasking as opposed to performing only one task at a time (Slocombe & Bluedorn, 1999). Higher polychronicity indicates a higher preference for shifting attention among ongoing tasks, rather than focusing on completing one task before switching to another task. An individual's level of polychronicity reflects a combination of past experiences with multitasking and a stable tendency to perceive multitasking as enjoyable and rewarding rather than stressful. Therefore polychronicity is a particularly useful predictor of multitasking related constructs (Poposki & Oswald, 2010), and can measure participant's intentions to multitask during the preactional phase of goal pursuit.

Since low power increases divided attention whereas high power enhances selective attention, a negative relationship was predicted between the amount of power and the preference for multitasking. Ethnicity and gender were recorded and controlled for in the regression model. These variables could confound the results because they can correlate both with power and with polychronicity (Bluedorn, 2002; Ren, Zhou, & Fu, 2009). For example, Caucasian participants are more likely to be monochronic (e.g., emphasize single-tasking) and Asian and African participants are more polychronic (e.g., emphasize multitasking; Bluedorn, 2002).

Methods

Participants

Participants (*N*=135; 93 women) were recruited from the UCL Subject Pool. Average age was 23.3 (*SD*=6.49). Eighty-nine participants were Caucasian, 40 were Asian, and 6 were African. Participants were entered into a lottery to win £40.

Materials and Procedure

The questionnaire was administered through eSurveyPro.com and included the generalized Sense of Power Scale (SPS; Anderson & Galinsky, 2006) and the Multitasking Preference Inventory (MPI; Poposki & Oswald, 2010). The SPS is an 8-item questionnaire measuring individual's generalized beliefs about the power that they have in their relationships (e.g., "In my relationships with others, I think I have a great deal of power"). The scale showed internal consistency, α=.75. The MPI is a 14-item questionnaire measuring individual preferences for multitasking (e.g., "I do not like to shift my attention between multiple tasks"). The scale showed internal consistency, α=.73. Answers for both questionnaires were provided on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Subsequently, participants indicated their demographic information and were provided with a description of the study.

Results and Discussion

A regression analysis was conducted with preferences for multitasking as an outcome variable. Culture, gender, and sense of power were entered as predictor variables. The overall regression model was significant, $F(3, 131)=4.85$, $p=.003$, explaining 7.9% of the variance in multitasking preferences. Culture and sense of power were both significantly associated with multitasking preferences, ($\beta=.278$, $p=.004$ and $\beta=-.199$, $p=.028$, respectively). In line with previous literature, Asian and African participants from polychronic cultures had a higher preference for multitasking than Caucasian participants who are from monochronic cultures[1]. More importantly, the hypothesis that low sense of power is associated with higher multitasking preference was also supported, even after controlling for culture and gender. However, no cause and effect can be inferred in the current study because power was not manipulated. This limitation was addressed in Experiment 2 by manipulating power experimentally.

2.3 Experiment 2: Planning between assigned and self-generated tasks

Experiment 2 aimed to extend the findings of Experiment 1 by manipulating instead of measuring power, and aims to further investigate if power affects multitasking during the preactional phase of goal pursuit by measuring how individuals plan and schedule their tasks. Participants were given two weeks to finish two Essays, and were asked to plan how they will approach the two tasks. Experiment 2 also encouraged participants to consider and plan out other activities

[1] The results from Experiment 1 and from past literature on polychronicity (Bluedorn et al., 1999; Bluedorn, 2002; Graham, 1981) indicate that cultural and temporal orientations can influence multitasking tendency. Therefore only participants who were *not* from an East-Asian nationality were invited to participate in subsequent studies.

that they will normally undertake in their everyday lives, which measures whether power affects attention to multiple goals when deciding which goals to pursue. That is, powerless participants may have more concerns than powerful individuals (Fiske, 1993; Keltner et al., 2003; Weick & Guinote, 2010), which may motivate them to consider additional goals that are beyond the tasks at hand. This allows one to investigate how many spontaneous switches are generated among tasks that are not assigned by the experimenter. In addition, increased number of tasks that powerless participants consider represents increased attention to multiple information and concerns, which may mediate the relationship between power and multitasking tendency. A negative relationship was expected between power and multitasking, where number of switches planned between the different tasks (an indication of multitasking behavior) decreases with increased power. Powerless participants were also expected to plan more activities than control and powerful participants.

Moreover, previous studies have shown how affect can influence multiple-goal pursuit. Positive affect have been found to increase switching behaviors, as it signals that a goal is well maintained and effort can be reallocated to other tasks, whereas negative affect indicate that greater effort and sustained attention on the current task is necessary (Carver, 2003; Carver & Scheier, 1998). In a later study it was shown how negative affect increases effort towards goals that are close to attainment and have lower GPD, whereas positive affect directs effort toward distant goals with high GPD (Louro et al., 2007). Also, positive feelings may open people to noticing and taking advantage of emergent opportunities and to be distracted into enticing alternatives. For example, positive affect promotes an enjoyment of varieties and a wide range of possibilities, where participants switched among choice alternatives of food more than control participants (Kahn & Isen, 1993). Since some studies have demonstrated a link between power and positive emotions (Anderson & Berdahl, 2002; Berdahl & Martorana, 2006; Keltner et al., 2003), whereas others have shown null effects of power on mood (Anderson & Berdahl, 2002, Study 2; Galinsky et al., 2003; Smith & Trope, 2006; Weick & Guinote, 2008), then this possible mediating factor of power was accounted for in the current study.

Methods

Participants and Design

Thirty-four participants (31 females; mean age=22.2, *SD*=10.67) were recruited from UCL. Two outliers (those who switched 3 SDs above the mean) were excluded from the analysis. Thus, 32 participants (30 females, mean age = 22.0, *SD*=8.82) completed the study in exchange for £3 and were randomly assigned to one of the three between-subjects conditions: powerless (*N*=10), control (*N*=12), and powerful (*N*=10).

Materials and Procedure

Participants expected to take part in two unrelated studies. The first study was allegedly investigating everyday life situations in organizational contexts, but in reality it was the power manipulation (Appendix 1). Participants were asked to imagine being in the role of a person in a given organizational context, and write about what a typical day in their life would be if they were in that particular role (Guinote, 2008). Powerful participants were assigned to the role of a managing director in a marketing organization. Managers were told that they had 20 employees working under them and that they could evaluate the employee's projects and had control over the employee's workload and salary. Those in the powerless condition were asked to imagine that they were an employee in a marketing organization. Employees were told that they had to follow the manager's instructions and that the managers were able to evaluate their performance and determine their workload and salary. Control participants were asked to imagine working in a team of 20 people, but that they work mostly independently on the tasks and can determine their own salary and workload depending on how many project-based bonuses they undertake. All participants were asked to describe a day in their work role as vividly as possible, from morning to evening. Participants were given an empty sheet to write their responses, and they completed the experiment at their own pace.

Afterwards, participants were asked to participate in what was supposedly a separate experiment, which investigates how people plan events in the future (Appendix 2). They were asked to imagine that they don't need to go to lectures or work for two weeks, but they had to hand in two 1000-words essays at the end of the two weeks. This task was chosen because it was familiar to participants, who were university students. Participants were instructed to plan how they will work on the two essays. They were given 12 steps that they could consider whilst planning, such as "picking the essay topic" and "writing the introduction". It was clarified that they don't need to plan the essay in the particular order given as these are just possible suggestions. However, it was emphasized that they had to label clearly whether the task they were doing was for Essay 1 or Essay 2 (e.g., "writing the introduction for Essay 1"). They were also told to plan other activities that they may pursue in a normal 2-week period, such as socializing, checking-emails, eating, etc. A calendar for two weeks was then given to the participant. Each day on the calendar was divided into four sections: morning (6:00 – 12:00), afternoon (12:00 – 18:00), evening (18:00 – 24:00), and night (24:00 – 6:00). Participants were asked to plan their days as precisely and accurately as possible. The number of switches between Essay 1 and Essay 2, as well as the number of switches that participants planned between all activities, were recorded.

After participants finished planning, they were asked to reflect back to the essay that they wrote for the first experiment and indicate on two 9-point scales how much influence they felt they had at work and the extent to which they felt in charge of the work situation. This served as a power manipulation check. Following (Galinsky et al., 2003), participants in the control condition did not complete the manipulation check because the situation reported by control participants were unrelated to power. Participants' mood was then assessed with 4-items ranging from -3 (*very sad, very discontent, very tense, very bad*) to 3 (*very happy, very content, very calm, very good*), as power can affect mood (Keltner, 2003). Demographic information was then recorded. Participants were debriefed and thanked for their participation at the end of the experiment.

Results and Discussion

Manipulation Check

The average ratings for the manipulation check were combined into one score (α=.816). An independent t-test on the combined score revealed that powerful participants felt more in control (*M*=6.95, *SD*=1.23) than powerless (*M*=3.11, *SD*=1.21) participants, $t(17)=6.74$, $p<.001$, $\eta_p^2=.72$[2].

Number of Switches Planned

There were two types of switches. The number of switches made from Essay 1 to Essay 2 (i.e., essay switches), and the number of switches made between additional activities that are generated by participants themselves (other switches). . Due to the directional nature of the hypothesis that number of switches increases from the powerful to the powerless condition, with control condition in between, the number of switches were subjected to a 3(power: powerful vs. control vs. powerless) x 2(switch type: essay switches vs. other switches) mixed ANOVA, with repeated measures on the second factor. Because of the directional prediction that preferences for multitasking will decrease as power increases, a linear contrast analysis was used for power (powerless=-1; control=0; powerful=+1). In order to test for deviation from linearity, a quadratic contrast analysis was also used (powerless=+1; control=-2; powerful=+1). Both the linear contrast, $F(1, 29)=6.15$, $p=.019$, $\eta_p^2=.18$, and the quadratic contrast analyses, $F(1, 29)=7.37$, $p=.011$, $\eta_p^2=.20$, were significant. No other effects were significant. Powerful participants planned fewer switches between the activities (*M*=20.6, *SD*=3.87) compared to control (*M*=37.4, *SD*=3.53) and powerless participants (*M*=32.2, *SD*=3.87), but the control condition did not fall in between the two power conditions (see Table 2.1).

[2] Following Galinsky et al. (2003) participants in the control condition did not complete the manipulation check because the situations reported by control participants were unrelated to power.

Table 2.1. Means and Standard Deviations for Number of Switches and Tasks in Experiment 2

	Switches		Tasks	
Power	M	SD	M	SD
Powerless	32.2	3.87	10.1	2.51
Control	37.4	3.53	10.4	3.63
Powerful	20.6	3.87	9.1	3.70

Note. “Switches” indicate the combined number of switches between essay switches and other switches. “Tasks” indicate the amount of extra activities that were spontaneously generated by participants themselves.

Furthermore, there were no differences between the power conditions on the total number of activities planned, $F(2, 29)=.447$, $p=.644$, $\eta_p^2=.03$, indicating that power only affected how many switches participants planned and not how many activities were planned. Total number of activities planned was also unrelated with number of switches made, $r=.21$, $p=.24$. This shows that power does not affect the number of goals that participants are pursuing and attending to, and number of switches made is not dependent on how many activities participants are pursuing.

In addition, some participants did not plan for the full 2-week period as they submitted both essays before the deadlines. However, there was no difference between the power conditions on the number of days planned, $F(2, 29)=2.07$, $p=.145$, $\eta_p^2=.125$. Mood ratings were also combined into a single score ($\alpha=.879$, $M=4.88$, $SD=1.33$) and subjected to a One-way ANOVA. The results indicated that power did not affect mood, $F(2, 27)=0.165$, $p=.849$, $\eta_p^2=.012$. Together these results provide further support for the hypothesis that reduced power elicits a multitasking intention, whereas increased power triggers a single-tasking intention. This is true for tasks that were assigned to participants, but also for tasks that participants spontaneously generated when planning their weekly schedule. Also, the effect of power on multitasking tendency is not influenced by how many tasks participants wanted to consider. Mood, total number of activities, and total days planned did not account for these effects.

Experiment 2 only partially supported the hypothesis as powerless participants did switch more than powerful participants, but the control condition did not fall in between the two power conditions. One possible explanation is due to the type of power manipulation used. That is, the control condition used in this experiment might have induced feelings of powerlessness, as participants could have felt dependent on others for evaluating their performances and determining their salaries and bonuses. Unfortunately, no manipulation check was given for control participants in order to support this claim. Therefore the absence of a general pattern that multitasking increases with decreased power in this particular experiment could have been attributed to an ineffective neutral condition, instead of concluding that there is no effect of powerlessness on multitasking.

2.4 Experiment 3: Hypothetical scenarios and scheduling work day

Experiment 2 showed how power decreases the amount of switches that participants made between two tasks over a two-week period. However, little is known about how individuals allocate their time and attention as they pursue multiple goals over a shorter period of time, such as a few hours instead of a few days. The reduction in deadline would be interesting to investigate, as planning goals with shorter deadlines has been found to be more accurate and reflective of actual behaviors than planning for goals with further deadlines. For example, goals with closer deadlines are less susceptible to the planning fallacy (Buehler et al., 1994; Kruger & Evans, 2004; Sanna & Schwarz, 2004; Zauberman & Lynch, 2005). Therefore the first aim of Experiment 3 was to replicate the results of Experiment 2, and extend it to situations where individuals need to plan for a shorter period of time (8 hours instead of 2 weeks). Moreover, Experiment 3 used three distinct tasks for participants to plan with no deadline, whereas Experiment 2 only asked participants to plan their time between two tasks that were similar, and both had a two-week deadline. Experiment 3 therefore simulates hectic work environments where individuals face the difficult decision about how to juggle the many demands placed on their limited time and attention.

The second aim of Experiment 3 was to investigate whether power affects a general tendency to report multitasking behavior and whether this relation can be affected by the type of task. Past studies suggest that individuals are more likely to switch to prevention-focused goals (Schmidt & DeShon, 2007); hence powerholders may adapt to the situation (Guinote, 2007a) by increasing the tendency to switch between tasks if the secondary task was prevention-focused. The tasks were framed either as a prevention goal, where inattention can lead to negative consequences, or a non-prevention goal, where the consequences of inattention are not specified.

Lastly, a different power manipulation was also used in order to examine whether the effect of power on multitasking tendency remains consistent across various operationalizations of power. By using a more established power manipulation in the literature (Galinsky et al., 2003), the current experiment aimed to find the predicted pattern that multitasking increases with powerlessnes, which was not present in Experiment 2.

Participants were first primed with power (vs. control or powerless). They were then asked to imagine themselves in scenarios that encompassed multiple goals in order to investigate the relationship between power and preferences for either single-tasking or multitasking strategies when faced with the pursuit of multiple concomitant goals (following Bluedorn et al., 1999). Specifically, participants were given a series of scenarios and were asked to what extent they preferred to deal with these situations simultaneously or sequentially. Upon completion of these scenarios, participants were invited to plan a day and were given multiple tasks that they needed to accomplish in that day. The tasks simulated real-life work scenarios by giving individuals multiple tasks that they need to work on independently. Participants were able to have considerable control over their resource allocations and make volitional switching decisions throughout the day. Since power may influence mood (Keltner et al., 2003), then mood measures were also included in the current study to rule out the possible mediating factor.

Based on previous research on power, attention, and information seeking styles, it was predicted that powerlessness triggers a polychronous pursuit of multiple goals rather than a monochronous approach, both in rating the scenarios and in planning the day (i.e., plan more switches between the tasks). In contrast, powerholders were expected to prefer a monochronous management of multiple tasks. The preferences of control participants were predicted to fall in between powerless and powerful participants. Therefore a general pattern was expected where reported multitasking intention (vs. single-tasking intention) and number of switches planned between the various tasks decrease with increased power. However, all participants, even those in powerful conditions, will report more switches if the secondary task is prevention-focused and can lead to negative consequences.

Methods

Participants and Design

Fifty-three participants (33 women; mean age=20.3, *SD*=3.88) were recruited from UCL. Participants completed the study in exchange for entering a raffle to win £30. Participants were randomly assigned to one of the three between-subjects conditions: powerless (*N*=18), control (*N*=19), and powerful (*N*=16).

Materials and Procedure

Participants expected to take part in two unrelated studies. The first study was ostensibly described as investigating how people recollect past events. Following Galinsky et al. (2003), participants wrote a narrative essay about an incident in which they had power (powerful) or did not have power (powerless), or the last time they went to the supermarket (control). Power was defined as having control over the ability of someone to get something they wanted, or being in a position to evaluate others (Appendix 3).

Subsequently, participants were told that they will participate in a second study looking at decision-making and planning. Participants read and responded to three scenarios (Appendix 4) adapted from Bluedorn et al. (1999). The scenarios depicted a work situation in which an initial task (task A) was interrupted by another demand (task B). For two of the scenarios, goal consequence was not specified (e.g., "you were inspecting the production line when you received a call from the company's sales representative"). However, for one scenario the goal was prevention-focused where inattention can lead to negative consequences (e.g., "you were inspecting the production line when you noticed a machine had been left running, which created an extremely dangerous safety hazard"). They were then asked to indicate their preferred strategy to deal with this situation on a likert-scale ranging from 1 (*focus on task A*) to 9 (*switch to task B*). The scale median (5) represented the choice of working on the two tasks simultaneously. Lower scores on the scale therefore indicated a preference for single-tasking strategies whereas higher scores indicated a preference for multitasking. Multitasking involves either performing the first and second task concurrently or switching to the second task without completion of the first one.

Participants were then invited to write a plan for a hypothetical work-day. They were given three projects to work on (developing a website, preparing a presentation, and writing a request) for an 8-hour working day. Participants were informed that each project takes 4-hours to complete, and therefore they will not have time to finish everything and should schedule these tasks based on their personal preferences. At the end, participants were given one last question regarding their preferences for dealing with the three tasks on a scale ranging from 1 (*I prefer to leave the other 2 projects untouched until I have finished the first one*) to 9 (*I prefer to frequently switch back and forth among the projects*). Participant's responses to the four questions and the number of times participants planned to switch between the three projects were measured.

As a power manipulation check, participants indicated on a 9-point-scale the extent to which they felt in charge of the situation that they recollected. Participants' mood was assessed similarly to Experiment 2. Demographic information was then recorded. Participants were debriefed and thanked for their participation at the end of the experiment.

Results and Discussion

Manipulation Check

An independent t-test revealed that powerful participants felt more in control (*M*=7.06, *SD*=1.57) than powerless (*M*=2.06, *SD*=1.06) participants, $t(32)=11.03$, $p<.001$, $\eta_p^2=.792$. Therefore the manipulation was successful.

Multitasking Preference

The average ratings of the two unspecified multitasking scenarios and their preferences at the end of the planning task were combined into one score (α=.71) to yield an overall preference score for unspecified goals. These ratings were then subjected to a 3(power: powerful vs. control vs. powerless) x 2(goal orientation: unspecified vs. prevention-focused) mixed ANOVA, with repeated measures on the second factor. This analysis yielded a main effect of goal orientation, where participants preferred to switch more to the prevention-focused secondary demand (M=4.16, SD=0.22) compared to unspecified secondary demands (M=1.98, SD=0.23), $F(1, 50)=55.8$, $p<.001$, $\eta_p^2=.53$. Because of the directional prediction that preferences for multitasking will decrease as power increases, a linear contrast analysis was used for power (powerless=-1; control=0; powerful=+1). In order to test for deviation from linearity, a quadratic contrast analysis was also used (powerless=+1; control=-2; powerful=+1). As expected, power significantly influenced strategy preferences, $F(1, 50)=3.21$, $p=.049$, $\eta_p^2=.114$. Powerless participants had a higher preference for multitasking (M=3.58, SD=0.30) compared to control participants (M=3.14 SD=0.29), who had higher multitasking preference compared to powerful participants, (M=2.49, SD=0.32). There was no quadratic deviation from linearity, $F(1, 50)=0.071$, $p=.79$, $\eta_p^2=.001$.

The analysis also yielded a significant power x goal orientation linear interaction, $F(2, 50)=6.63$, $p=.003$, $\eta_p^2=.21$. As shown in Table 2.2, there was no effect of power on the prevention-focused task, $F(1, 50)=0.16$, $p=.69$, $\eta_p^2=.003$. All participants preferred to switch to the prevention-focused task before completing the current one (M=7.02, SD=1.63). However, for the unspecified task, the linear contrast was significant indicating that power influenced preferences for goal pursuit, $F(1, 50)=18.7$, $p<.001$, $\eta_p^2=.272$. Powerless participants preferred multitasking (M=5.33, SD=1.97) more than control participants, (M=4.23 SD=1.30), who in turn had higher preferences for multitasking than powerful participants, (M=2.92, SD=1.56).

Table 2.2. Means and SDs for Scenario Ratings in Experiment 3

	Unspecified Goal		Prevention-Focused Goal	
Power	M	SD	M	SD
Powerless	5.33	1.97	7.17	1.58
Control	4.23	1.30	6.95	1.75
Powerful	2.92	1.56	6.94	1.65

Note. Higher means indicate an increased multitasking (vs. single-tasking) intention.

Similar contrast analyses were conducted on the number of switches among tasks that participants planned in their schedule. These analyses showed a significant linear contrast for power, $F(1, 50)=6.19$, $p=.016$, $\eta_p^2=.110$. The quadratic contrast analysis was not significant, $F(1, 50)=0.099$, $p=.75$, $\eta_p^2=.002$, showing no deviation from linearity. Powerless participants switched more often ($M=3.22$, $SD=1.56$) than control participants ($M=2.60$, $SD=2.18$), who switched more often than powerful participants ($M=1.81$, $SD=1.22$), Lastly, mood ratings were combined into a single score (α=.84, *M*=3.05, *SD*=2.20) and subjected to a One-way ANOVA. Power did not affect mood, $F(2, 50)=0.791$, $p=.459$, $\eta_p^2=.031$. Together, these results provide further support for the hypothesis that reduced power elicits a multitasking intention, whereas increased power triggers a single-tasking intention. That is, powerless participants switched more often to a secondary task whereas powerful participants continued longer on the initial task before switching to another one. However, powerholders are able to adapt their behaviors flexibly and are willing to switch attention if doing so can prevent negative consequences.

2.5 Summary and conclusions

Chapter 2 looked at how power affects the ways individuals approach multiple tasks during preactional phases of goal pursuit. It also investigated whether preferences for monochronic behaviors reflect a general tendency to consider fewer goals (Experiment 2) and the role of goal orientation (Experiment 3). The results from Experiment 1-3 provide initial evidence that power affects how individuals plan to approach multiple goals, and this is not related to how many goals individuals were willing to pursue. In general, powerlessness was found to increase polychronic tendency and powerfulness was found to promote monochronic tendency. This tendency occurs irrespective of task type, such as how similar the tasks are to each other or if they are assigned by the experimenter or generated by the participant. The effects of power on multitasking is also consistent across a short (a normal 8-hour work day; Experiment 3) as well as a long (over 2 weeks; Experiment 2) time period. However, powerful participants do report more multitasking behavior if switching to the secondary task can prevent negative consequences (Experiment 2).

Chapter 3:

Power, Multitasking Behavior, and Prioritization

3.1 Introduction

So far, the current thesis has looked at the effects of power on reported multitasking intention and how individuals *plan* to approach multiple tasks during the preactional phase of goal pursuit. For example, the MPI questionnaire used in Experiment 1 usually refers to an individual's preferences or intentions for doing several things at one time and not the behavior of multitasking per se (Persing, 1999). In fact, most of the studies in the multitasking literature associated multitasking choice with personal characteristics using questionnaires or asking participants to report how many tasks they would like to engage in. Only a few studies (e.g., Schmidt & DeShon, 2007) investigated whether individual characteristics affect how someone distribute their time on different tasks by measuring actual behavior in a given time period. This difference between intention and behavior is important because one may believe they prefer one strategy over the other and intend or plan to behave in a certain way, yet they could behave differently in an actual environment where they experience various environmental pressures or constraints.

Chapter 3 will examine whether power not only affects reported intention to multitask, but it can also influence multitasking behavior during the actional phase of goal pursuit. This is investigated by measuring the number of switches participants make between tasks (an indication of multitasking). Moreover, by measuring actual behaviors, one can also assess whether monochronic behaviors yield better performance compared to polychronic behaviors, and examine whether one type of strategy is more demanding and/or depleting than the other. As mentioned in Chapter 1, multiple goals not only compete for limited time, but goals also acquire their motivational force from a limited pool of resources (Shah & Kruglanski, 2002). Therefore, if individuals attend to multiple goals by switching between them, then this may decrease overall performance by reducing attention and commitment to each of the goals.

Moreover, the current chapter was also interested in assessing prioritization in the context of multiple-goal pursuit, by measuring how many questions participants answered from each of the tasks that they were assigned. That is, although powerful participants may multitask less than powerless participants, they may have treated all tasks as equally important (e.g., answered 10 questions from each task) instead of spontaneously approaching them in order of priority (e.g., answered 19 questions from one task and 1 question from the other task). Based on previous literature showing how power increases attentional focus and prioritization whereas powerlessness leads to divided attention and the tendency to treat all information as equally important (Fiske, 1993; Galinsky et al., 2003; Guinote, 2007a, b; Slabu & Guinote, 2010), it was predicted that power should have a positive relationship with single-tasking behaviors, prioritization, and performance.

3.2 Experiment 4: Multitasking behavior and goal accessibility

The aim of Experiment 4 was to examine whether power affects the ways individuals pursue multiple goals by assessing actual behavioral choices, rather than only multitasking intention in a hypothetical situation, and the associated consequences for performance. It also investigated whether power affects balancing vs. focusing (e.g., spontaneous prioritization) when individuals are faced with multiple tasks. Moreover, the current study aimed to assess the underlying mechanism of the effect of power on multitasking by measuring levels of goal accessibility.

Participants were given a set of three simple tasks to work on (arithmetic, picture, and geometric) and they were allowed to allocate their time and effort across the tasks at their own discretion. This paradigm simulated real-life work situations where people are required to decide when to engage in their multiple projects and to decide for themselves what is an acceptable target and when they have reached it (González & Mark, 2005). The number of times participants switched from one task to another indicated their multiple-goal pursuit strategies. The more participants switched, the more they adopted a multitasking (vs. a single-tasking) strategy. Performance was measured by how many total correct questions participants answered, and prioritization was measured by differences in the number of questions answered between the three tasks. Accessibility of goal-relevant information was then assessed using a lexical decision task (LDT). Participants were asked to indicate whether the words presented were real-words or non-words. The real-words were either relevant or irrelevant to each of the three tasks, such that there were three types of goal-relevant words (arithmetic-relevant words, picture-relevant words, and geometric-relevant words). Since individuals activate goal-related information from long-term memory more easily compared to neutral memories (Goschke & Kuhl, 1993; Marsh, Hicks, & Bink, 1998), then faster reaction times to goal-related words vs. neutral words indicate greater accessibility of goal-related constructs (Neely, 1991).

If decreased power instills multitasking, then the less power individuals have the more often they should switch between tasks in an effort to pursue the tasks simultaneously. That is, number of switches was predicted to increase with decreased power. Due to powerholder's selective and focused mindset, and powerless individual's tendency to divide attention and render all information as equally important, it was first hypothesized that there will be a negative relationship between power and number of switches. Specifically, number of switches was predicted to be lower for the high-power condition compared to the neutral-power (control) condition, which was predicted to switch less than the low-power condition. Similarly, powerholder's preference for attentional focus may encourage spontaneous prioritization. That is, they will answer more questions from the task that they prioritized compared to the task that they did not prioritize. Therefore the second hypothesis predicted that the difference in the number of questions answered between the three tasks will be larger for powerful, than control, than powerless participants.

Furthermore, self-initiated interruptions can also decrease overall productivity. This is because deciding and choosing which task to work on next may be cognitively demanding (Vohs et al., 2008) and leave less resources available for actual task performance. Moreover, task-switching can incur cognitive costs as mental resources are required for attentional refocusing (Borst, Taatgen, & Van Rijn, 2010; Buser & Peter, 2012; Rubinstein et al., 2001). Thus switching between tasks can cause delays in response times and people who prefer to interleave their activities may have worse overall performance than those who do not switch between tasks. Since multitasking behavior can incur further costs that decrease performance in the context of multiple-goal pursuit, then it was expected that reduced power would decrease overall performance. Therefore the third hypothesis predicts a positive relationship between the total number of items correctly answered and power.

Lastly, the motivation to multitask and the defocused attentional strategies of powerless individuals should create a mindset that renders multiple goals more equally important and accessible (Adler & Benbunan-Fich, 2013). Thereby the frequent interruptions and multitasking behavior displayed by powerless individuals should be reflected in their equal levels of goal accessibility. On the other hand, powerful individuals prioritize a focal goal and decrease accessibility of other goals (Guinote, 2008; Slabu & Guinote, 2010). Thus the fourth prediction was that powerless individuals should respond faster to all three goal-related words (vs. neutral words), whereas powerful participants will be focused on only one of the tasks and will therefore respond faster only to words that relate to the prioritized task (i.e., the task that they answered the most questions from) than to neutral words.

In addition the current study measured some possible factors that could be related to multitasking and are confounded by the power manipulation. Past studies suggest that allocation of resources is driven by goal attractiveness (e.g., interest and motivation) and perceived probability of obtaining the goal (e.g., confidence and goal difficulty; Kernan & Lord, 1990; Klein, 1989). Increased confidence in one's ability and motivation to attain a goal can increase goal focus and accessibility (Fishbach, Zhang, & Koo, 2009; Förster et al., 2005). For example, previous studies found that participants prioritized tasks in which they reported greater expectancies of achieving the goal (Kernan & Lord, 1990). Among tasks of equal urgency, individuals are more likely to allocate resources to those tasks for which they have the highest relative levels of self-efficacy and have the most confidence in attaining

(Ashford & Northcraft, 2003). In contrast, if efficacy is judged to be low, the person may abandon the task and move on to a different one, which causes switching behaviors (Bandura & Cervone, 1986; Kanfer & Ackerman, 1989). Moreover, motivation and goal importance could also affect behaviors as the extent to which individuals pursue a focal goal and inhibit competing goals depends on focal goal importance (Köpetz, Faber, Fishbach, & Kruglanski, 2011; Shah et al., 2002). Therefore mood, motivation, and confidence in their ability to complete the tasks were measured since these factors have been implicated in multitasking behavior (Carver, 2003) and have also been associated with power (Briñol et al., 2007; Keltner et al., 2003).

Methods

Participants and Design

Fifty-three participants (37 women; mean age=23.8, *SD*=2.75) were recruited from UCL and received £3 for their participation. Participants were randomly assigned to powerless, control, or powerful conditions. Three participants were excluded from the analyses: two for not following directions regarding the essay topic and one for being an outlier (switching 3 standard deviations above the mean). Thus, 50 participants (35 females, mean age = 22.8, *SD*=2.80) were included in the final analyses. The study utilized a between-subjects-design with three conditions: powerless (*N*=17), control (*N*=16), and powerful (*N*=17).

Materials and Procedure

Power was manipulated similarly to Experiment 3. Participants were then given three simple tasks to work on for the second study, which was allegedly investigating problem solving (Appendix 5). The tasks were adapted from Gouveia, Brucki, Malheiros, & Bueno (2007), and consisted of an arithmetic task (simple additions and subtractions), a picture-naming task (writing the names of everyday objects), and a geometric task (copying simple figures). To ensure that switching was not an artifact of perceived task difficulty and motivation, and that powerholders did not disdain any of the tasks (see DeWall et al., 2011), a pilot study (N=16) was conducted to match the tasks for difficulty, level of interest, and suitability for participants in different power conditions to perform. The pilot study ensured that all three tasks did not differ in difficulties, how interesting they were perceived to be, and how appropriate they were for a person with influence over others to complete, $ps > .40$.

The items from each task appeared individually on the computer screen and participants could choose which task they wanted to do by pressing one out of three keys on a computer keyboard. The keys were labeled according to the task it contained. Participants were asked to write down their answers to each question on separate pieces of paper, and could move on to the next question at their own pace. Participants were further informed that they can work on the three tasks in any order that they prefer and that they could return to each task as often as they liked. The only restriction was that they will need to answer at least one item from each of the three tasks within 20 minutes. After giving participants one practice item from each task, they were asked to begin the actual experiment. Participants were given allegedly 20 minutes to complete the tasks but were stopped after nine minutes. Participants were stopped earlier because our interest was on multiple-goal initiation and progress, rather than the dynamics triggered by approaching a deadline, such as possible increases in goal focus and goal expectancy (Louro et al., 2007; Schmidt & DeShon, 2007; Schmidt et al., 2009). Moreover, a generous time limit (20 minutes) was given to avoid interference from stress and concern about time, and increased the perceived possibility of attaining the goals within the allotted time (Schmidt & DeShon, 2007). Number of switches between tasks and number of items answered were recorded.

Participants were then told that before they continue on the three tasks, they will complete another task for a side project on perception and attention. Participants were made to believe that they will continue working on the three tasks in order to avoid the feeling of goal completion. This is important because powerful individuals are more attuned to the current situation; therefore they may have decreased accessibility of all goal-related information after goal fulfillment (Slabu & Guinote, 2010). For the LDT, participants were asked to indicate, as quickly and as accurately as possible, whether a string of letters presented on a computer screen formed a real-word or a non-word. Responses were made by pressing one of two keys using their left and right index fingers; the two keys were counterbalanced across participants. The LDT was carried out on a computer, with a 60-Hz color monitor. Participants sat at a viewing distance of 60 cm. There were 108 trials in total, half of which were non-words. Out of the real-words, nine contained words related to the arithmetic goal (e.g., subtract, math, addition), nine contained words related to the picture goal (e.g., picture, label, name), and nine contained words related to the geometric goal (e.g., figure, geometric, draw). The rest were neutral words that were matched to each of the target words in frequency and in length using the English Lexicon Project database (Balota et al., 2007). Each trial began with a fixation cue consisting of a letter-string (xxxxxxxxxxxx) printed in black against a white background at the center of the screen. After a delay of 100 ms, this fixation cue was replaced by a sequence of lower-case letter-strings presented in a Courier New Font (16 point size). The letter-string remained on the screen until participants gave their response.

Upon completion of the LDT, participants filled in the power manipulation check, indicated their mood, optimism in being able to finish the tasks, and confidence in their abilities to perform well. To measure motivation, participants indicated the amount of attention and time devoted to each task, how interesting each task was, and the flow of time (how quickly the time had passed). In addition, participants reported their perceived difficulty of the tasks and confidence in their ability to perform the tasks. Lastly participants were asked to rate how indicative each task was for a person with influence over others to complete. This was to ensure that switching was not an artifact of perceived difficulty and interest, and that powerholders did not disdain any of the tasks (see DeWall et al., 2011). All of the answers were given on 9-point scales. Mood was also assessed using a 4-item mood questionnaire ranging from -3(*very sad, very discontent, very tense, very bad*) to 3(*very happy, very content, very calm, very good*), as mood can affect task-performance (Forgas & George, 2001). As a power manipulation check was also administered, where participants indicated on a 9-point-scale the extent to which they felt in charge of the situation that they recollected. Demographic information was then taken and participants were probed for suspicion and debriefed.

Results and Discussion

Manipulation Check

An independent t-test revealed that powerful participants felt more in control (M=7.06, SD=1.60) than powerless (M=2.06, SD=1.06) participants, $t(32)=4.77$, $p<.001$, $\eta_p^2=0.79$. The manipulation was therefore successful.

Behavioral Strategies

The first analysis was conducted on the total number of switches. Due to the directional nature of the hypothesis that number of switches increases from the powerful to the powerless condition, with control condition in between, a linear contrast analysis was conducted on the total number of switches made (powerless=-1; control=0; powerful=+1). In order to test for deviation from linearity, a quadratic contrast analysis was also used (powerless=+1; control=-2; powerful=+1). The analysis revealed a significant Levene's test, indicating unequal variances across cells, $F(2, 47)=3.47$, $p=.039$. Therefore the degrees of freedom were adjusted from 47 to 30.2. As expected, the adjusted linear contrast analysis showed that number of switches increased as power decreased, $t(25.3)=2.31$, $p=.029$, $\eta_p^2=.118$. The quadratic contrast analysis was not significant, $t(36.7)=1.30$, $p=.20$, $\eta_p^2=.028$, showing no deviation from linearity. As shown in Table 3.1, powerless participants switched significantly more (M=20.6, SD=13.5) than control participants (M=12.7, SD=7.90), who switched more than powerful participants (M=11.9, SD=7.66). These results support the hypotheses that the less power participants have, the more they switch across tasks.

Table 3.1. Means and SDs for Number of Switches and Total Items Answered in Experiment 4

Power	Number of Switches		Total Items Answered	
	M	SD	M	SD
Powerless	20.6	13.5	48.9	14.9
Control	12.7	7.90	57.9	16.1
Powerful	11.9	7.66	60.1	15.1

Note. Higher values indicate increased multitasking (vs. single-tasking) behavior when pursuing multiple goals, and better overall performance.

Prioritization

The previous analysis confirmed that powerful participants switched less between various task demands compared to powerless participants and employed a more single-tasking strategy. Further analyses were conducted to measure task performance and spontaneous prioritization (i.e., whether powerful individuals preferred to focus on a single task compared to powerless participants). For example, powerful participants may have switched less, but still answered an equal number of questions across the three tasks. Similarly, powerless participants may have switched more often, but they could have focused more on a particular task by constantly switching back to this focal task.

To test whether power affected prioritization, the number of questions correctly answered was analyzed. Power did not affect error rates, $F(2, 45)=0.89$, *p*=.42, η_p^2=.038. This was expected given the simplicity of the tasks (ERs: *M*=0.014, *SD*=.017). The number of questions that participants answered for each task were then converted into task 1 (task with most questions answered and the task that participants spent the most time on), task 2 (task with second-most questions answered), and task 3 (task with least questions answered). In other words, task 1 represented the task that the participant focused on the most, and task 3 was the one they focused on the least. Task prioritization was determined by how many questions participants answered from that particular task and how much time they spent on the task because these factors have been used to indicate the amount of effort and scarce resources devoted to a certain goal (Larson & Callahan, 1990).

These variables were then subjected to a 3(power: powerful, control, powerless) x 3(task 1 type: arithmetic, geometric, picture) x 3(tasks: task 1, task 2, task 3) mixed ANOVA with within-subject measure on the last factor. The ANOVA yielded a significant Mauchly's test, indicating that the assumption of sphericity had been violated, chi-square=31.1, *p*<.001. Therefore degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity (epsilon=.653). The results showed a main effect of task, $F(1.31, 54.8)=24.4$, $p<.001$, η_p^2=.367. Post-hoc analysis revealed that all three tasks were significantly different from each other, *p*<.001, indicating that overall, all participants prioritized one of the tasks instead of balancing their time and effort across the tasks. More importantly, there was a significant power x task linear interaction, $F(2.49, 54.8)=3.51$, $p=.044$, η_p^2=.11. No other effects were significant, *F*<1, indicating that the results were not confounded by the type of task that was prioritized. There was no main effect of power, which means that power did not affect overall performance (see Figure 3.1).

Further analysis showed that there was a significant effect of power on the number of questions answered for task 1, $F(1, 47)=4.51$, $p=.036$, $\eta_p^2=.088$. As shown in Figure 3.1, powerful participants ($M=40.8$, $SD=17.3$) answered more questions compared to control participants ($M=37.5$, $SD=18.7$), who answered more than powerless participants ($M=28.6$, $SD=14.0$). There were no significant differences on the number of questions answered for task 2, $F(1, 47)=0.824$, $p=.369$, $\eta_p^2=.017$, and task 3, $F(1, 47)=2.45$, $p=.124$, $\eta_p^2=.050$.

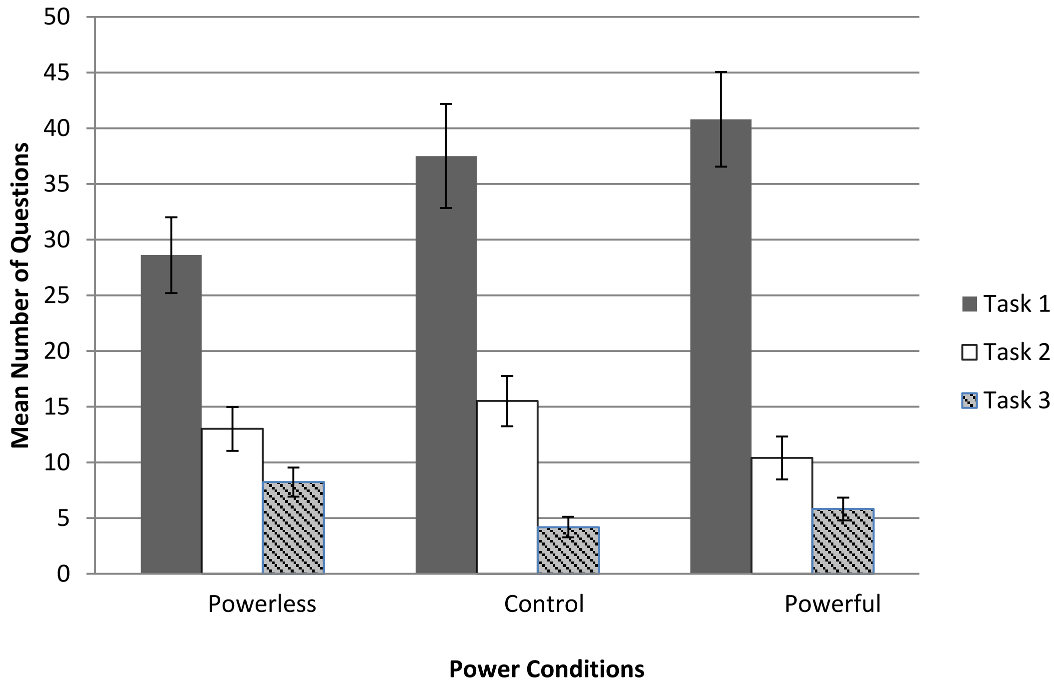

Figure 3.1: Mean number of questions answered for the three tasks as a function of power in Experiment 4; error bars represent 1 standard error above and below the mean.

Moreover, the difference in number of questions answered between task 1 and task 2 increased as a function of power, $F(1, 47)=4.50$, $p=.039$, $\eta_p^2=.087$. Specifically, the differences between task 1 and task 2 were smaller for powerless ($M=15.6$, $SD=16.1$) compared to control ($M=22.0$, $SD=23.3$), which was smaller compared to powerful ($M=30.4$, $SD=21.2$) participants. Similar pattern was found for the differences between task 1 and task 3, such that the differences in number of questions answered between task 1 and task 3 increased as a function of power, $F(1, 47)=4.96$, $p=.031$, $\eta_p^2=.095$. The differences were smaller for powerless ($M=20.4$, $SD=16.9$) than control ($M=33.3$, $SD=20.9$), than powerful ($M=35.0$, $SD=19.6$) participants. Lastly, the differences in the number of questions answered between task 2 and task 3 did not vary across the three power conditions, $F(1, 47)=0.004$, $p=.951$, $\eta_p^2<.001$. Hence these results suggest that power promotes a tendency to prioritize one of the tasks.

This pattern indicates that task prioritization (measured by the difference in the number of questions answered between task 1 and task 3) could mediate the relationship between power and number of switches. A mediation analysis (Baron & Kenny, 1986) was conducted with power as the independent variable, number of switches as the outcome variable, and prioritization as the mediator. As noted above, power was related to prioritization and number of switches. However, when prioritization was regressed on power and number of switches, the originally significant relationship between power and number of switches became non-significant, $t(48)=1.57$, $p=.12$, $\beta=-.20$, but prioritization remained significant, $t(48)=-3.56$, $p=.001$, $\beta=-.46$. These results, as well as a Sobel test using raw coefficients ($z=1.87$, $p=.061$), suggest that the effect of power on switching behaviors was mediated by differences in prioritization. A more sensitive and robust bootstrapping estimate of the 95% confidence interval around the indirect effect of power on number of switches via difference in prioritization was also used (Preacher & Hayes, 2008). The confidence interval from the bootstrapping estimate excludes zero (-4.13, -0.36), which supports the mediation. This suggests that, as indicated in Figure 3.2, the effect of power on the number of switches was mediated by the tendency to prioritize. Powerful participants were more likely to prioritize one task over the other, and they therefore switched less than powerless participants, who showed lower prioritization tendency.

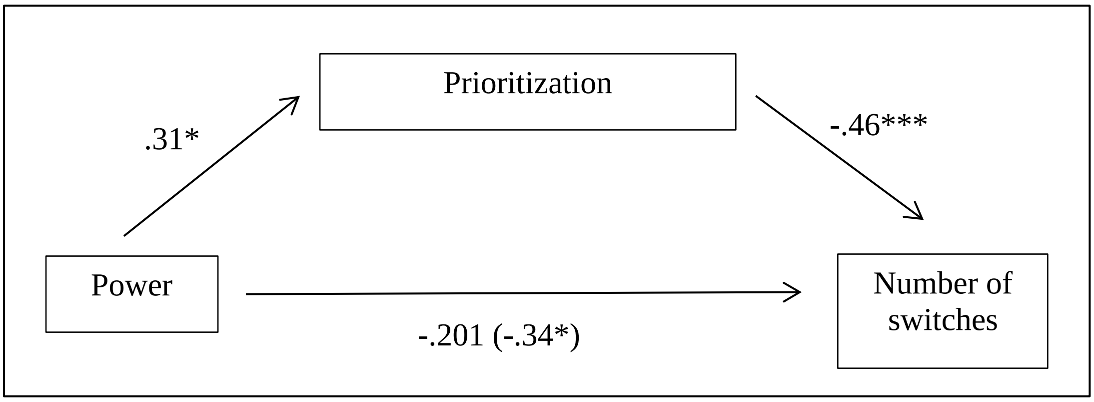

Figure 3.2: The effect of power on number of switches mediated by prioritization in Experiment 4; all entries are standardized coefficients. The association between the mediator and number of switches is represented by a coefficient from a model where power is also a predictor of number of switches. The number in the parenthesis refers to the total effect of power on number of switches.

Performance

Additional analyses were conducted to investigate whether power affected performance on the primary (i.e., task 1) compared to secondary (i.e., task 2) and tertiary tasks (i.e., task 3). Performance was calculated by dividing the total number of seconds participants spent on each task by the total number of questions answered from that task. This yielded an efficiency-score (ES) of how many seconds participants spent per question, with lower scores representing higher efficiencies. Subjecting these ESs to a 3(power: powerful, control, powerless) x 3(task 1 type: arithmetic, geometric, picture) x 3 (task: task 1, task 2, task 3) mixed ANOVA with within-subjects measure on the last factor yielded a main effect of task type, $F(2, 46)=5.25$, $p=.007$, $\eta_p^2=.102$. All participants were more efficient for task 1 ($M=8.74$, $SD=0.63$), compared to task 2 ($M=10.7$, $SD=0.87$) and compared to task 3 ($M=12.9$, $SD=1.40$), $ps<.005$. Task 2 and task 3 did not differ significantly, $p=.17$. There was also a marginal power x ES linear contrast interaction, $F(2, 46)=2.90$, $p=.065$, $\eta_p^2=.112$. No other effects were significant, $F<1$, indicating that the results were not confounded by the type of task that was prioritized.

Linear contrast analysis indicated that the relationship between ESs of the three tasks was not significant for powerless participants, $F(1, 16)=.212$, $p=.65$, $\eta_p^2=.013$. However, the linear contrast was significant for control, $F(1, 14)=11.0$, $p=.005$, $\eta_p^2=.441$, and powerful participants, $F(1, 16)=5.67$, $p=.030$, $\eta_p^2=.262$. As shown in Figure 3.3, ESs for control and powerful participants increased according to task importance. That is, ESs for task 1 was lower (representing higher efficiency) than task 2, which was lower than task 3. There were no between-subjects differences for the efficiencies of the three tasks across power conditions, $ps>.05$.

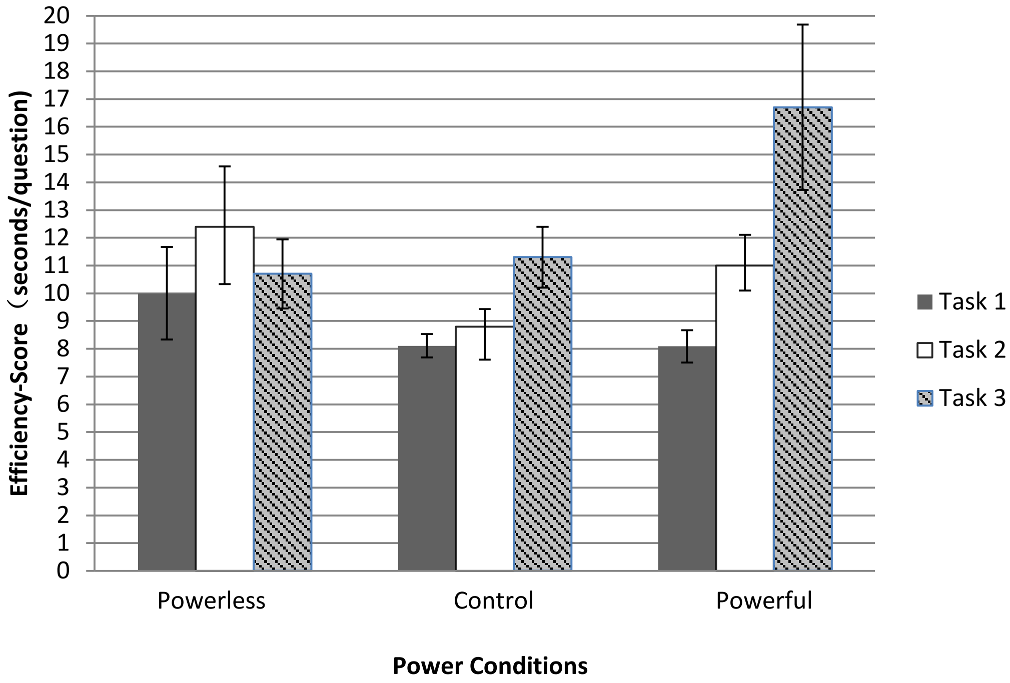

Figure 3.3: Mean RTs (seconds per question) for the three tasks as a function of power in Experiment 4; error bars represent 1 standard error above and below the mean.

Lastly, further analysis was conducted to investigate if performance was affected by whether participants switched from another task (switch trial) or continued on the same task (repeat trial). Response times to the questions were subjected to a 3 (power: powerless, control, powerful) x 2 (trials: switch, repeat) ANOVA with repeated measures on the last factor. There was a main effect of trials, $F(1, 46)=2.09$, $p=.013$, $\eta_p^2=.126$, where response times (in seconds) on repeat trials ($M=9.27$, $SD=0.53$) were faster than switch trials ($M=10.2$, $SD=0.51$). No other effects were significant. These results suggest that, consistent with previous literature, switching between tasks is more costly than continuing on the same task.

However, powerless participants did not have lower overall performance compared to powerful participants, even though they switched more between the tasks compared to powerful participants. This could be because the costs of switching are not apparent with limited numbers of switching. Although, as shown in Table 3.1, there was a tendency for powerless participants to answer fewer questions than control participants, who answered fewer questions than powerful participants, but these differences were not significant. However, since switching is costly in terms of task efficiency, then a difference in performance may appear in the long-term, when the differences in the number of switches and the associated cumulative time lost from switching between powerless and powerful individuals become larger.

In sum, power affected performance and efficiency on the task that they prioritized but this did not translate to differences in overall performance (i.e., total number of questions answered from all three tasks). Moreover, this study showed that even for very simple tasks with self-generated discretionary switching, participants perform worse on switch compared to repeat trials. Therefore in the current paradigm, powerful participant's single-tasking approach seems to be more effective than the multitasking strategy of powerless participants.

Goal Accessibility

Reaction times (RTs) that were three standard deviations above and below the mean (2.7% of the responses) and those that were incorrect (3.8% of the responses) were eliminated from the analysis. Power did not affect the number of incorrect responses ($F<1$). Instead of grouping the RTs into type of task (i.e., arithmetic, picture, and geometric), RTs for each of the goal-related words were separated into task 1, task 2, and task 3. This is because different participants may have prioritized different types of tasks. The RTs were then submitted to a 3 (power: powerless, control, powerful) x 3 (task 1 type: arithmetic, geometric, picture) x 3 (task: task 1, task 2, task 3) x 2 (word type: goal-relevant, neutral) mixed ANOVA, with repeated measures on the last two factors. This analysis revealed an expected significant main effect of word type, $F(1, 38)=7.61$, $p=.009$, $\eta_p^2=.167$. As can be seen in Figure 3.4, goal-relevant words ($M=569$, $SD=8.98$) were responded to faster than neutral words ($M=587$, $SD=11.2$). No other effects were significant in the ANOVA. However, a linear contrast analysis revealed that overall, powerless participants had slower RTs ($M=603$, $SD=15.3$) compared to control participants ($M=576$, $SD=17.7$), who were slower than powerful participants ($M=554$, $SD=17$), $F(1, 38)=4.59$, $p=.039$, $\eta_p^2=.108$. Moreover, the differences between goal-relevant and neutral words were marginally significant for powerless participants (*M*s=593 vs 614, *SD*s=14.3 vs 17.8), $F(1, 15)=3.11$, $p=.098$, $\eta_p^2=.172$, and significant for control participants (*M*s=562 vs 590, *SD*s=16.5 vs 20.6), $F(1, 11)=5.32$, $p=.042$, $\eta_p^2=.326$, but were not significant for powerful participants (*M*s=552 vs 556, *SD*s=15.8 vs 19.8), $F(1, 12)=0.262$, $p=.618$, $\eta_p^2=.021$. No other effects were significant, $F<1$, indicating that the results were not confounded by the type of task that was prioritized.

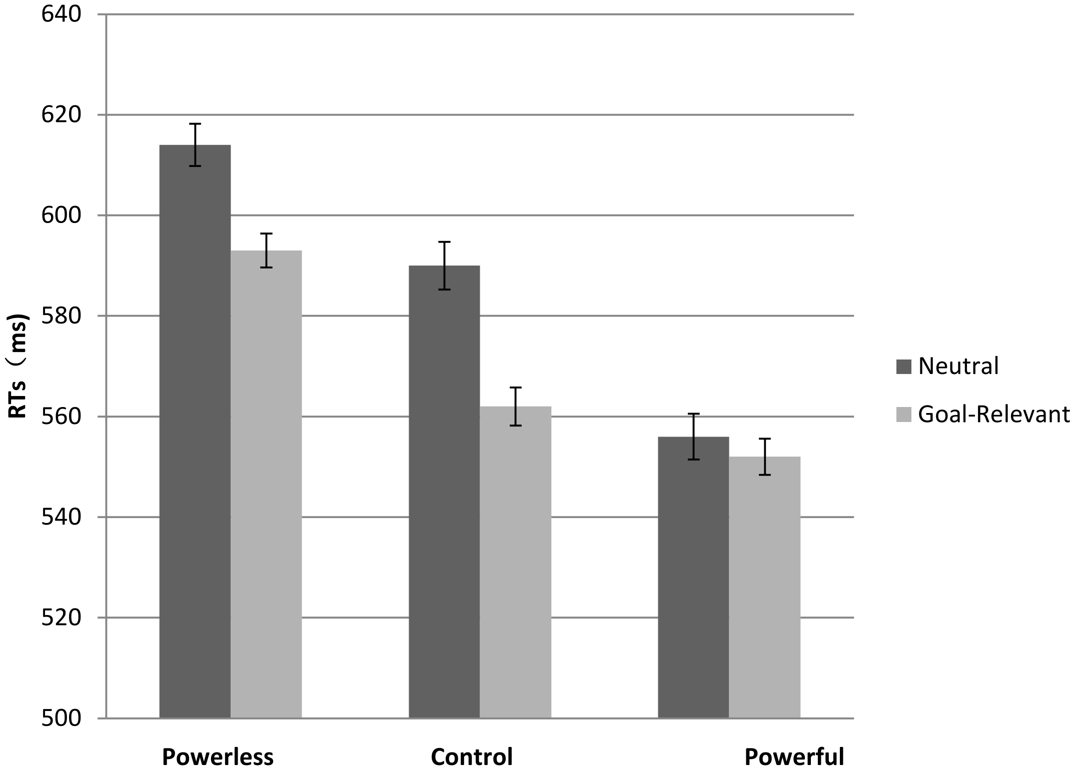

Figure 3.4: Mean RTs across word-type as a function of power in Experiment 4; higher RTs represent more time taken to respond; error bars represent 1 standard error above and below the mean.

These results may indicate that differential goal accessibility does not predict multitasking or prioritization tendencies. That is, even though powerful individuals have all of the goals equally activated, but they still decide to single-task and to prioritize only one of the goals. However, this conclusion is tentative because, unlike control and powerless participants, powerful participants responded similarly to goal-relevant vs. goal-irrelevant words, suggesting that powerholders did not have any of the goals activated. That is, even though participants were informed that they will continue on the three tasks, powerful participants still decreased their accessibility of the previous three goals in order to focus primarily on the LDT. Especially since the current tasks were brief and self-contained, then they did not require participants to keep goal-related information activated in WM in order to find a solution or to complete the tasks later. Decreased accessibility of all goal-relevant words may have facilitated performance on the LDT, which explains why powerful participants had faster overall RTs compared to control and powerless participants.

As a result, even though the current findings did not indicate that powerful participants had one of the three tasks more accessible compared to the other two tasks, but the null effect could be due to the fact that powerholders were successful at decreasing accessibility of all goal-related constructs once they were stopped. In order to test for this possibility, goal accessibility should be assessed whilst participants are performing the three tasks. Also, instead of using discrete tasks, one can employ continuous tasks that are contingent on previous performance (i.e., tasks requiring problem solving and creativity (Csikszentmihalyi & Sawyer, 1995; Dijksterhuis, 2004).

Mood, Confidence, and Motivation

A One-Way ANOVA revealed that power affected participants' confidence in their ability to perform well on the three tasks, $F(2, 46)=4.11$, $p=.023$, $\eta_p^2=.15$. Unexpectedly, powerless participants were more confident ($M=6.10$, $SD=0.77$) than powerful participants ($M=5.23$, $SD=0.97$), $p=.02$. The control condition ($M=5.77$, $SD=0.88$) did not differ from the other two conditions, *p*s>.2. However, level of confidence was not related to the number of times participants switched across tasks, $t(48)=0.15$, $p=.88$, $\beta=.022$, nor was it related to prioritization, $t(48)=1.00$, $p=.32$, β=-

.15. Therefore confidence did not mediate the effects of power on number of switches and task prioritization.

This increase in confidence levels of powerless participants is inconsistent with past literature (e.g., Min & Kim, 2013; Morrison, Rothman, & Soll, 2011), but it may be due to the fact that participants were given a choice on how to approach the three tasks. Past studies have shown how choosing is the central means by which individuals exert control over their surroundings and can increase personal control, which is a vital and adaptively advantageous human motive that is lacking in powerless individuals (Bandura, 1986; Deci & Ryan, 2002; Inesi, Botti, Dubois, Rucker, & Galinsky, 2011; Shapiro, Schwartz, & Astin, 1996; Thompson & Schlehofer, 2008). For example, research connects choice with increases in various forms of control including self-efficacy, illusions of control, and self-determination (Ariely & Norton, 2008; Leotti, Iyengar, & Ochsner, 2010). Hence having opportunities for choice via multitasking allows powerless individuals to regain control, which can in turn increase their confidence levels. However, powerful individuals, who have recently experienced control, may be less affected by task choice.

Lastly, some may argue that the reason why powerholders did not switch as much to the other tasks was because of the task characteristics. For example, powerholders might have disdained one of the tasks. As shown by previous studies, powerholders will put less effort in certain tasks that they do not view as suitable for people in positions of power to undertake, such as solving arithmetic problems (see DeWall et al., 2011). However, this is unlikely as the tasks were piloted and they were perceived as equally suited for managers and subordinates to undertake. The tasks were also matched for interest and difficulty level. The post-experimental questions also did not reveal any differences between the power conditions in how interesting and difficult the tasks were, how much attention and time participants devoted to the tasks, the flow of time, and how suitable the tasks were for a person with influence over others would complete, *p*s>.1. There was also no effect of power on the combined score of the mood rating (α=.81), $F(2, 46)=0.75$, $p=.48$, $\eta_p^2=.032$.

Similar to the previous experiments, and in line with the hypotheses, powerless individuals were more likely to switch and multitask whereas powerful individuals employed a single-tasking strategy during multiple-goal striving. Moreover, power was found to affect prioritization, where the tendency to prioritize one task over another increased as a function of power. This prioritization tendency mediated the relationship between power and number of switches made, which suggests that multitasking behavior is related to prioritization tendency. Moreover, powerless individuals engaged more in multitasking, even though switching between tasks may undermine their performance in the long-run. Differences in motivation, confidence, perceived task difficulty, and mood did not influence the effect of power on number of switches.

3.3 Experiment 5: Multitasking behavior with varied task difficulties

To establish the effects of power on behavior strategies, Experiment 4 focused on goals of similar difficulty. However, in everyday life, concomitant goals often vary in difficulty such that more effort, time, and attention are required for some goals compared to others (Brandstätter & Gollwitzer, 1997). In multiple-goal scenarios, task valence and goal expectancies have been found to exert a substantial influence on self-regulation (Kernan & Lord, 1990), such that individuals place greater goal priority on tasks that have smaller discrepancy between the goal and current performance. For example, control theory models (Carver & Scheier, 1981; Hyland, 1988) argue that when individuals deal with multiple goals and attempt to divide their resources among these goals, a large goal-performance discrepancy is likely to lead individuals to direct their resources to other tasks in the environment. This processes, termed 'disengagement from a control system' (Hyland, 1988), is seen as a functional response that protects individuals from the consequences (e.g., dissatisfaction and negative affect) that are associated with the pursuit of difficult, and perhaps unattainable, discrepancies. As a consequence, individuals focus their attention and resources on the smaller discrepancy (i.e., the easier goal) in an attempt to minimize the negative consequences associated with effortful pursuit of the larger discrepancy. Thus when goals vary in difficulty in a multiple-goal environment, people often orient their effort towards the easier goals (Buckert, Meyer, & Schmalt, 1979). Introducing goals with different difficulty levels could therefore decrease multitasking behavior in powerless individuals. However, if powerlessness induces a strong tendency to multitask, then powerless individuals may continue their multitasking behavior even in the presence of a difficult goal.

Experiment 5 expanded the previous findings in three ways. First, instead of presenting three tasks of equal difficulties, participants were given two easy tasks and one difficult task to work on. The presence of a difficult goal provides a strong test for the link between powerlessness and multitasking. Second, compared to Experiment 4, it employed an ecologically more valid method of task selection and execution. Whereas in Experiment 4 participants selected the tasks using the computer, in Experiment 5 the tasks were presented physically and were selected and completed manually, which simulate many daily tasks and activities.

Lastly, to ensure the validity of the findings, Experiment 5 employed a different power manipulation that gave powerholders actual control over powerless participants. A different power manipulation was used to create power dynamics that are more experientially real and significant to the perceiver (Stevens & Fiske, 1993). In the current experiment, participants expected to work together with another participant, and were either dependent on or in control of the allocation of valuable resources (i.e., performance evaluation and money). Moreover, following established experimental procedures, the power manipulation using role assignments were allegedly based on individual skills on a leadership questionnaire (Anderson & Berdahl, 2002; DeWall et al., 2011; Galinsky et al., 2003; Guinote et al., 2002; Guinote, 2007a; Overbeck & Park, 2001). This procedure maximizes credibility of the manipulation, as power positions in real life are often occupied due to superior competence or knowledge (French & Raven, 1959; Overbeck & Park, 2001).

Similar to the previous experiment, number of switches was predicted to decrease with increasing power. Powerholders were also predicted to prioritize one task over the other, such that the differences in the number of questions answered between the three tasks would be larger for powerful, than control, than powerless participants. Lastly, switching between multiple tasks may decrease productivity compared to focusing on just one task. Hence the third hypothesis predicted a positive relationship between power and performance, such that powerful participants will perform better than control participants, who will perform better than powerless participants.

Methods

Participants and Design

Fifty-two participants (27 women) were recruited from UCL. Participants took part for £3. Three participants were outliers and were excluded from the analyses (switching 3 SDs above the mean). Thus, 49 participants (25 females) with a mean age of 24.2 (*SD*=5.87) were included in the final analysis. Participants were randomly assigned to one of the three between subjects conditions: powerful (*N*=17), control (*N*=16), and powerless (*N*=16).

Materials and Procedure

Participants believed that they were taking part in two unrelated studies: one on group-work and creativity and one was a pre-test for a future study (Anderson & Berdahl, 2002). Before coming to the laboratory, all participants filled in an on-line "Leadership Questionnaire", which ostensibly measured their leadership abilities and creativity. Participants then arrived at the laboratory individually. For the group-work experiment, they were told that they will be building something called a Tanagram out of Lego's with one or two other participants (adapted from Galinsky et al., 2003). In reality, participants completed the entire experiment alone. Participants in powerful and powerless conditions were informed that their responses on the Leadership Questionnaire were used for role assignments. In actuality, participants were randomly assigned to one of three roles that connoted different levels of power: manager (high-power), general worker (control), and subordinate (low-power). Managers and subordinates were then informed that only the manager could (1) decide how to structure the building process, (2) evaluate subordinate's performances, and (3) determine how to divide a bonus monetary payment between each participant (Appendix 6). This manipulation corresponds to the definition of power as managers had control over subordinate's access to valuable resources (see Fiske, 1993). Participants in the control condition were not informed of their relative roles. They were told instead that they will be working independently on the Tanagram, but with the presence of one or two other participants in order to simulate real-life work environments. After delivering the appropriate information, participants were told that they will first complete a separate pilot study looking a problem solving.

For the second part of the experiment, participants were given three different tasks to work on, with the goal of answering as many questions as possible. The three tasks consisted of an arithmetic task (additions and subtractions), a picture naming task (writing definitions of objects), and a geometric task (copying geometric figures). These tasks were adopted from previous multitasking experiments (e.g., Gouveia et al., 2007). The tasks were similar to those of Experiment 4, but with two important alterations. To investigate the effect of task difficulty on multitasking tendency, one task was modified. A pilot study was conducted (N=18) to ensure that the geometric task was perceived as more difficult (M=4.00, SD=2.45) than the arithmetic task (M=2.56, SD=2.04) and the picture naming task, (M=2.33, SD=1.46), ps<.04. The two easy tasks did not differ in difficulty level, p=.69. The three tasks did not differ in how interesting they were perceived to be and how appropriate they were for a person with influence over others to complete, ps>.30.

The questions from each task were separately cut and inserted into three different envelopes (150 questions per envelope). Participants could only take out one question at a time. This ensured that participants selected the questions randomly. These three envelopes were placed on a table in front of the participant, one next to the other. The envelopes were labeled according to which task it contained, and their placement order was counterbalanced. Participants were given written instructions for the experiment. They were told that they could work on the three tasks in any order that they prefer and that they could return to each task as often as they liked. The only restriction is that they will need to answer at least one question from each of the three tasks within 20 min. In order to disguise the fact that one task was more difficult than the other, participants were told that the three types of tasks are judged, (on average) of equal difficulty by most people, although the questions within each task can vary in their respective difficulties. They will receive more points for more difficult questions within each task, but they will not know beforehand which questions are more difficult as the question's difficulty levels are not labelled and the questions are selected randomly from the envelope. After a few practice questions, participants started the actual experiment and were stopped when 12 min have passed. Number of switches and time of switch were recorded manually.

Participants were then given post-experimental questions to answer. To verify that managers were perceived as having more power than subordinates, participants in the powerless and powerful conditions were asked, to indicate on two 9-point scales how much they thought managers and subordinates were in charge of the situation. Subsequently, participant's mood, task interest, task difficulty, attention and time devoted to each task, and suitability of each task for a person with influence over others to complete were assessed similarly to Experiment 4. In addition, participants were asked to indicate how long they thought they had worked on the tasks to measure the flow of time. This was included because the perception of time can affect multitasking (Kushleyeva, Salvucci, & Lee, 2005; Schmidt & DeShon, 2007; Schmidt et al., 2009). Demographic information was then taken and participants were debriefed and probed for suspicion.

Results and Discussion

Manipulation Checks

To verify that managers were perceived as having more power than subordinates, participants were asked at the end to indicate on two 9-point scales how much they thought managers and subordinates were in charge of the situation. This was subjected to a 2(power: powerful vs. powerless) x 2(manipulation: manager vs. subordinate) mixed ANOVA, with repeated measures on the second factor. Only a significant main effect of manipulation emerged, with managers being perceived as having more control (M=6.84, SD=1.16) than subordinates (M=4.34, SD=1.80), $F(1, 29)=41.5$, $p<.001$, $\eta_p^2=.59$, suggesting that the power manipulation was successful.

Behavioral Strategies

A linear contrast analysis (powerless=-1; control=0; powerful=+1) on the total number of switches across the tasks revealed a significant Levene's test indicating unequal variances, $F(2, 47)$, $p=.01$, so degrees of freedom were adjusted from 47 to 23.0. As expected, the adjusted linear trend analysis showed that number of switches increased as power decreased, $t(23.0)=2.98$, $p=.007$, $\eta_p^2=.16$. The quadratic contrast analysis (powerless=+1; control=-2; powerful=+1) was not significant, $t(32.7)=1.34$, $p=.19$, $\eta_p^2=.034$, showing no deviation from linearity. As shown in Table 3.3, number of switches decreased from powerless (*M*=12.3, *SD*=7.09) to control (*M*=7.35, *SD*=5.10), to powerful (*M*=6.60, *SD*=3.25) participants. Again, these results support the hypothesis that the less power participants have, the more they switch across tasks, even in the presence of a difficult task.

Further analysis was conducted to investigate whether task difficulty affected number of switches, and could be a way to reduce switching, particularly in powerless individuals. To do so, the proportion of switches to the difficult task was calculated. This was done by dividing the number of switches that participants made from one of the easy tasks (i.e., picture naming or arithmetic task) to the difficult task (i.e., geometric task) by the total number of switches. This proportion was then subjected to a One-Way ANOVA with power as the independent factor. A marginal main effect of power was found, $F(2, 46)=2.92$, $p=.064$, $\eta_p^2=.11$. As shown in Table 3.2, the proportion of switches to the difficult task was significantly higher for powerless participants (*M*=0.27, *SD*=0.16) compared to control participants (*M*=0.16, *SD*=0.17), $p=.028$, and marginally higher compared to powerful participants (*M*=0.18, *SD*=0.094), $p=.074$. There was no difference between control and powerful participants, $p=.72$. These results show that the proportion of switches into the difficult task was higher for powerless participants compared to powerful and control participants.

Table 3.2. Means and Standard Deviations for Number of Switches in Experiment 5

	Number of Switches		Proportion of Switches to Difficult Task	
Power	M	SD	M	SD
Powerless	12.3	7.09	0.27	0.16
Control	7.31	5.17	0.16	0.17
Powerful	6.60	3.20	0.18	0.094

Note. Higher number of switches indicate a higher a tendency to multitask.

Additional analyses inspected whether within each power group, the proportion of switches to the difficult task deviated from the expected proportion of switches if task difficulty would not affect switching behavior (i.e., deviated from .33). For powerless participants, this difference was not significant, $t(16)=1.65$, $p=.12$. Task difficulty therefore did not affect powerless participants' switching behavior. In contrast, both control and powerful participants switched less to the difficult task than what would have been expected if task difficulty would have no effect on behavior ($t(16)=4.33$, $p=.001$ and $t(15)=6.44$, $p<.001$, respectively). These results indicate that control and powerful participants switched more among the easy tasks than into the difficult task. Together, these findings show that asymmetric task difficulty decreased multitasking for powerful and control participants, but not for powerless participants.

Prioritization

Next, task prioritization was measured. Error rates were not analysed because of task simplicity (ERs: M=0.016, SD=0.023). The arithmetic, picture, and geometric tasks were again converted into task 1, task 2, and task 3, using the same method as in Experiment 4. These variables were subjected to a 3(power: powerful, control, powerless) x 3(task 1 type: arithmetic, geometric, picture) x 3(tasks: task 1, task 2, task 3) mixed ANOVA with within-subject measure on the last factor. The ANOVA yielded a significant Mauchly's test, indicating that the assumption of sphericity was violated, chi-square=33.7, p<.001. Therefore degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity (epsilon=.644). The results showed a main effect of task, F(1.28, 55.4)=31.4.4, p<.001, η_p^2=.422. Post-hoc analysis revealed that participants answered more questions from task 1 (M=35.9, SD=19.5) compared to task 2 (M=12.1, SD=8.58) and task 3 (M=6.26, SD=4.87), ps<.02. Task 2 and task 3 were marginally different from each other, p=.08. This indicates that overall, all participants prioritized one of the tasks instead of balancing their time and effort across the tasks. More importantly, there was a marginal power x task interaction, F(2.54, 59.6)=2.66, p=.066, η_p^2=.102. No other effects were significant, F<1, indicating that the results were not confounded by the type of task that was prioritized.

Further analysis showed that there was a significant effect of power on the number of questions answered for task 1, F(1, 47)=4.65, p=.036, η_p^2=.09. As shown in Figure 3.5, powerful participants (M=56.9, SD=28.5) answered more questions from task 1 compared to control participants (*M*=44.5, *SD*=14.6), who answered more than powerless participants (*M*=41.5, *SD*=15.9). There was also a significant effect of power on the number of questions answered for task 3, $F(1, 47)=4.75$, $p=.034$, $\eta_p^2=.092$. However, this effect was in the opposite direction where powerful participants (*M*=7.06, *SD*=5.80) answered fewer questions from task 3 compared to control participants (*M*=7.23, *SD*=7.22), who answered fewer questions than powerless participants (*M*=12.6, *SD*=8.67). There was no significant effect of power for task 2, $F(1, 47)=2.34$, $p=.13$ $\eta_p^2=.048$.

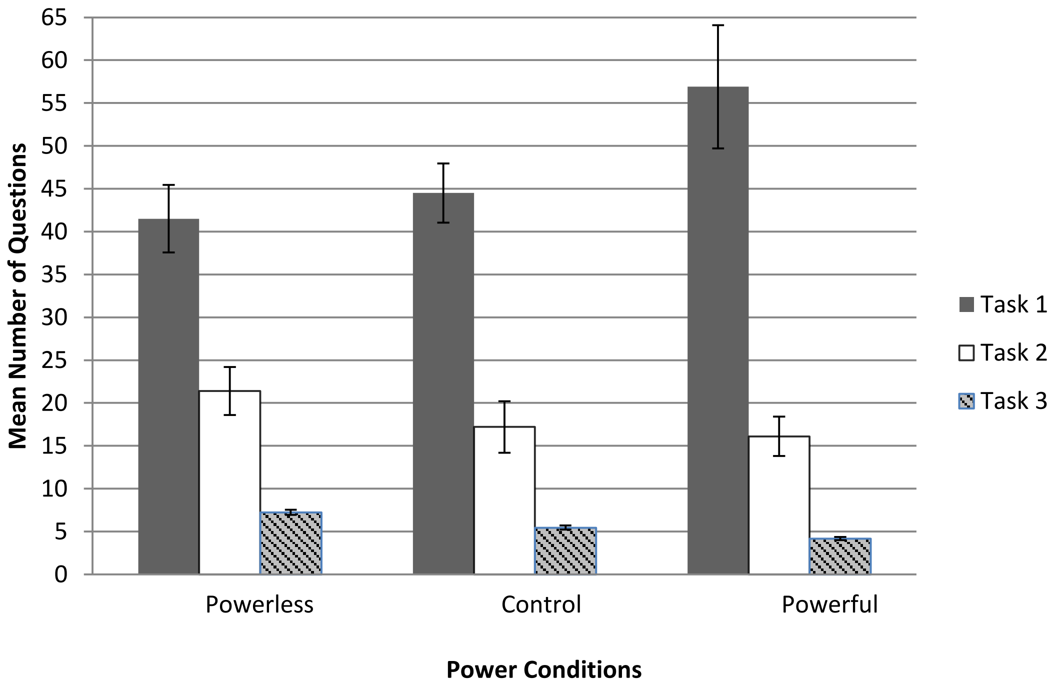

Figure 3.5: Mean number of questions answered for the three tasks as a function of power in Experiment 5; error bars represent 1 standard error above and below the mean.

Moreover, the differences in number of questions answered between task 1 and task 2 increased as a function of power, $F(1, 47)=5.45$, $p=.024$, $\eta_p^2=.104$. Specifically, the differences between task 1 and task 2 were smaller for powerless ($M=19.9$, $SD=21.1$), compared to control ($M=23.6$, $SD=19.4$), which was smaller compared to powerful ($M=40.6$, $SD=33.7$) participants. Similar pattern was found for the differences between task 1 and task 3, such that the differences in number of questions answered between task 1 and task 3 increased as a function of power, $F(1, 47)=4.97$, $p=.031$, $\eta_p^2=.096$. The differences were smaller for powerless ($M=34.1$, $SD=19.3$) than control ($M=35.4$, $SD=18.1$), than powerful ($M=52.4$, $SD=31.7$) participants. Lastly, the differences in the number of questions answered between task 2 and task 3 did not vary across the three power conditions, $F(1, 47)=0.331$, $p=.568$, $\eta_p^2=.007$. Hence, in line with the second hypothesis and with the results of Experiment 4, power promoted prioritization of one of the tasks.

A mediation analysis (Baron & Kenny, 1986) was again conducted, to investigate whether task prioritization (measured by the difference in the number of questions answered between task 1 and task 3) mediated the relationship between power and number of switches. As noted above, power was related to prioritization and number of switches. When prioritization was regressed on power and number of switches, the relationship between power and number of switches was reduced but was still significant, $t(47)=2.16$, $p=.036$, $\beta=-.28$. Prioritization remained significant, $t(47)=-3.23$, $p=.002$, $\beta=-.42$. A further Sobel test using raw coefficients indicated that this reduction in the effect of the independent variable, after including the mediator in the model, was marginally significant ($z=1.84$, $p=.066$). A more sensitive and robust bootstrapping estimate of the 95% confidence interval around the indirect effect of power on number of switches via difference in prioritization was also used (Preacher & Hayes, 2008). The confidence interval from the bootstrapping estimate excludes zero (-2.06, -0.017), which supports the mediation. This replicates the results of Experiment 4, and suggests that, as indicated in Figure 3.6, the effect of power on task switching behavior was mediated by differences in prioritization. Again, powerful participants were more likely to prioritize one task over the other, and they therefore switched less than powerless participants, who showed lower prioritization tendency.

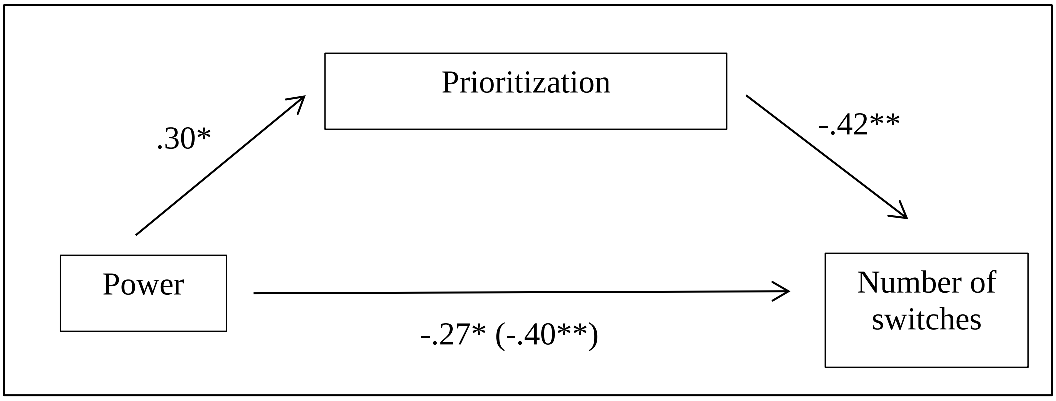

Figure 3.6: The effect of power on number of switches mediated by prioritization in Experiment 5; all entries are standardized coefficients. The association between the mediator and number of switches is represented by a coefficient from a model where power is also a predictor of number of switches. The number in the parenthesis refers to the total effect of power on number of switches.

Performance

In order to measure overall task-efficiency, on the primary (i.e., task 1) compared to secondary (i.e., task 2) and tertiary tasks (i.e., task 3), an efficiency-score (ES) was again computed. The ES represents how many seconds participants spent on each question, with lower scores representing higher efficiencies. Subjecting these ESs to a 3(power: powerful, control, powerless) x 3(task 1 type: arithmetic, geometric, picture) x 3(ES: task 1, task 2, task 3) mixed ANOVA with within-subjects measure on the last factor yielded a significant power x ES linear contrast interaction, $F(2, 40)=5.46$, $p=.015$, $\eta_p^2=.19$. No other effects were significant, $F<1$, indicating that the results were not confounded by the type of task that was prioritized.

Linear contrast analysis showed that there was no significant relationship between the ESs of the three tasks for powerless, $F(1, 16)=.038$, $p=.847$, $\eta_p^2=.002$ or control participants, $F(1, 16)=.804$, $p=.384$, $\eta_p^2=.051$. However, there was a significant relationship in ESs for powerful participants, $F(1, 15)=7.851$, $p=.013$, $\eta_p^2=.329$. As shown in Figure 3.7, ESs of powerful participants increased according to task importance. That is, ESs for task 1 ($M=8.67$, $SD=3.28$) was better than task 2 ($M=11.0$, $SD=3.69$), which was better than task 3 ($M=12.3$, $SD=4.81$). There were no between-subjects differences for the efficiencies of the three tasks across power conditions, $ps>.05$.

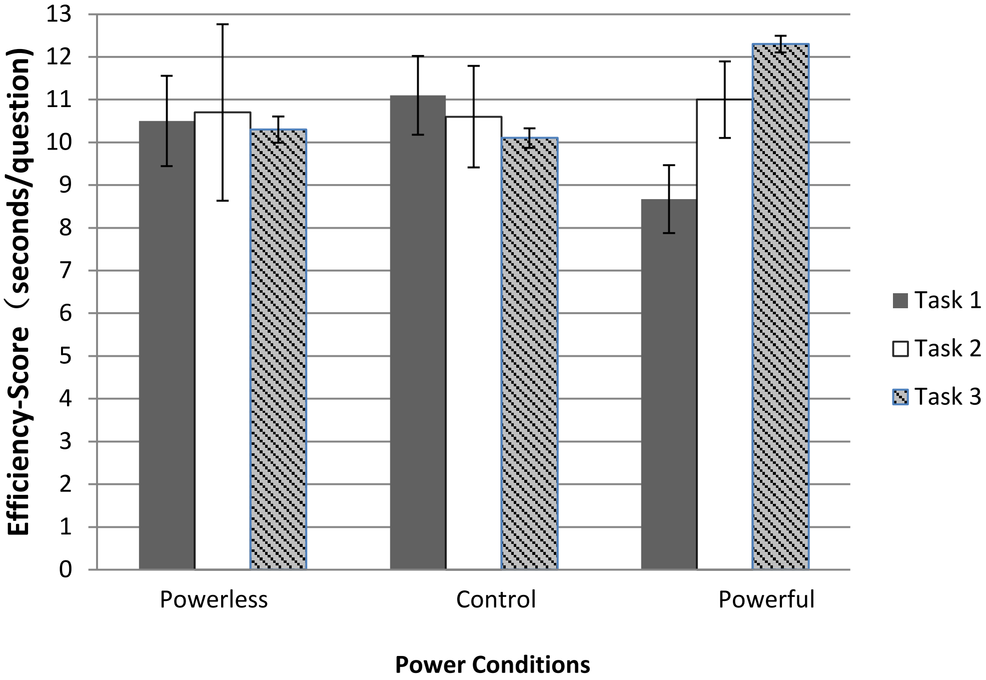

Figure 3.7. Mean RTs (seconds per question) for the three tasks as a function of power in Experiment 5; error bars represent 1 standard error above and below the mean.

Even though power did not affect overall performance, powerful participants were more efficient on the task that they prioritized than the ones that they did not. In contrast, powerless and control participants exhibited the same efficiencies on all task, regardless of prioritization. This efficiency was reflected in how many questions they answered, as powerful participants answered more questions than powerless participants on the task that they prioritized (task 1), but answered fewer questions than powerless participants on the task that they focused on the least (task 3).

Mood, Confidence, and Motivation

There were no differences between the power conditions on task interest, task difficulty, how much attention and time they devoted to the tasks, the flow of time, and suitability of the task for a person with influence over others to complete, ps>.2. The different power groups also did not differ in mood (α=.73), ps>.2.

Consistent with Experiment 4, the present experiment found that power affected strategies of multiple-goal pursuit. Powerful participants focused on one task at a time, following a single-tasking or monochronic strategy of multiple-goal pursuit, whereas powerless participants preferred to switch across tasks, following a multitasking or polychronic strategy. Participants in the control condition were in between these two groups. Importantly, task difficulty did not affect the switching behavior of powerless individuals, which speaks for the strong links between powerlessness and parallel goal pursuit strategies. Moreover, both experiments showed how power increases task prioritization and performance on the prioritized task. The tendency for powerholders to prioritize mediated the relationship between power and number of switches, which supports the idea that powerholder's higher tendency to prioritize and to inhibit secondary and irrelevant information decrease multitasking behavior, whereas powerless individual's lack of priority increases multitasking behavior.

3.4 Experiment 6: Goal prioritization using hypothetical scenarios

Experiments 4-5 showed a relationship between power and multitasking behavior, where low power generally increases, and high power decreases, multitasking. It was also found that low power decreases, whereas high power increases, prioritization tendency during the actional phase of goal pursuit. Since the cognitive processes and attentional orientations differ depending on whether participants are in the actional or preactional phase (Gollwitzer, 1996; Heckhausen & Gollwitzer, 1987), then Experiment 6 aimed to investigate the relationship between power and prioritization tendency during the preactional phase.

As mentioned earlier in the thesis, the preactional phase is divided into a predecisional phase and a postdecisional phase. That is, individuals in the predicisional phase are concerned with the expected value of available goal options, whereas those in the postdecisional phase focus on how to direct behaviors towards existing goals (Heckhausen & Gollwitzer, 1987). Thus the second aim of Experiment 6 was to investigate whether powerholder's prioritization tendency leads them to choose fewer goals and to engage in fewer activities during the predecisional phase of goal pursuit (i.e., lower goal engagement). This is an important issue because if powerholders multitask less than powerless individuals, then this tendency could affect choices made during the predecisional phase by decreasing the overall number of goals that participants are willing to pursue. When faced with multiple goals, individuals must manage their effort and resource allocation in order to take advantage of the opportunities that are available to pursue their goals. Due to limited resources, participants need to prioritize their goals, and sometimes focusing all attention on a top-priority goal may create problems for other goals that may, at that particular time, have lower priority (Ferguson, 2006; Kruglanski & Higgins, 2007). As a consequence, powerful individuals, who focus solely on a single task, may forgo opportunities to pursue an additional goal. On the other hand, powerless participants are expected to have a broader focus of attention and higher degrees of distractibility compared to powerful participants (Fiske, 1993; Guinote, 2007b; Weick & Guinote, 2010), which should facilitate detection of unexpected opportunities and render them more susceptible to opportunities that lie outside the framework of their current goal pursuit.

According to previous studies on power and goal pursuit, high power does not necessarily decrease the number of goals that participants choose to pursue; in fact, it actually promotes approach related behaviors towards rewards and encourages one to initiate action and seize opportunities for goal pursuit (Galinsky et al., 2003; Guinote, 2007c). Likewise, the results of Experiment 2 showed that powerholders were not less likely to plan fewer activities and to pursue fewer goals compared to control and powerless participants. Moreover, the predecisional stage involves a "motivational" state of mind, which encompasses careful deliberation and proper estimates of success and failures. Choices made during the predecisional phase are based on feasibility, such as whether individuals believe they have enough resources to attain the goal, as well as goal desirability. This is qualitatively different than the "volitional" state of mind during the postdecisional phase, where individuals often disregard deliberative issues related to the goal's worthiness and whether goal achievement can bring about desired outcomes. Instead, individuals in this stage are more concerned with how to properly implement their goals. This suggests that even though powerful individuals prefer to prioritize and focus on one goal during the postdecisional phase, but power should not affect the number of tasks that individuals choose to undertake during the predecisional phase.

The current experiment tested these questions by asking participants to report their preferred choices and actions during a hypothetical multiple-goal scenario. It was hypothesized that there should be no difference between powerful and powerless participants in their tendency to engage in additional goals during the predecisional phase. However, power should affect how participants approach the multiple goals that they have during the postdecisional phase. Based on the relationship between power, multitasking, and prioritization found in Experiments 1-5, it was predicted that prioritization (an indication of monochronic tendency) will increase as a function of power such that powerful participants will be more likely to focus and prioritize one of the goals compared to control participants, who will prioritize more than powerless participants.

In addition, the current study also measured other factors that may determine resource allocation. These include mood, confidence, as well as promotion/prevention orientation. First, according to the approach/inhibition theory of power (Keltner et al., 2003; Min & Kim, 2013), powerholders are more likely to focus on positive information. For example, power leads to positive biases regarding outcomes and better well-being than their powerless counterparts (Fiske & Berdahl, 2007; Lachman & Weaver, 1998). This may affect goal pursuit because positive experiences and self-beliefs represent psychological resources that permit people to confront problematic situations such as health threats (Pomerantz, 1998). Powerful participants may therefore pursue more goals than powerless participants because of positive affect.

Second, powerful individuals might be generally more optimistic about the future and have greater confidence in their abilities to overcome difficulties and to complete tasks successfully (Anderson & Galinsky, 2006). Individual's beliefs concerning whether both goals can be attained within the available time, a construct referred to as dual-goal expectancy (Schmidt & Dolis, 2009), can also affect goal engagement. As long as individuals believe both goals can be achieved, then they will allocate time and attention to additional goals. Therefore confidence levels were also measured in the current experiment, as power may induce individuals to feel more confident about their abilities or their current situation, which increases the likelihood of taking on additional tasks from another domain. Lastly, whether participants viewed the goals as promoting a positive outcome or preventing a negative outcome (i.e., promotion vs. prevention goal orientation) was also measured. Goal orientation could be affected by power (Keltner et al., 2003), and individuals tend to persist longer on prevention-focused tasks and hesitate to pursue alternative activities (Liberman, Idson, Camacho, & Higgins, 1999; Shah & Higgins, 1997).

Methods

Participants and Design

Participants (*N*=67, 49 women) were recruited from UCL. Participants were entered into a raffle to win £30. The average age was 25.8 (*SD*=10.5). Two participants were excluded from the analyses for not following directions regarding the essay topic. Thus, 65 participants (48 females, mean age = 25.7, *SD*=9.09) remained in the final analysis. Participants were randomly assigned to one of the between subjects conditions: powerful (*N*=21), control (*N*=22), or powerless (*N*=22).

Materials and Procedure

Power was manipulated similarly to Experiment 3. Participants then read a scenario (adapted from Louro et al., 2007) in which they had to decide how to allocate their time between pursuing two goals that competed for limited time (Appendix 7). One was an athletic goal, where participants were trying to win the current season's 100-m sprint race. Participants were asked to imagine that, given their running talents, they are part of the University's track and field team and will compete in a 100-m sprint race. They were then told that an opportunity has arisen for them to earn extra money by working part-time as a museum tour guide. Participants were made aware that accepting the job meant less training hours for the race. They could either forgo this work opportunity and focus on the race, or take up this opportunity and choose to work between 6 to 18 hours each week.

After reading the scenario, participants answered several questions about their preferences and behaviors on a 7-point scale (1 = *not at all*, 7 = *very much*). There were two questions asking how much effort they will devote to the athletic goal and how much effort they will devote to the financial goal. The absolute differences between these two questions were used to measure whether or not participants will prioritize one goal over the other. Higher difference indicates higher monochronic behaviors, where participants will focus more on one goal vs. the other. To measure participant's preference for pursuing only one of the two goals vs. their preference for engaging in an additional goal, participants were asked to what extent they will prefer to *only* engage themselves with one of the two goals. The order of which goal was asked first was counterbalanced between participants.

Next, participants' confidence and goal orientation was measured using 7-point scales. Confidence was measured by asking participants how good they think they are in the 100-m sprint race and in being a museum tour guide (1= *not good at all*, 7 = *very good*), how confident they are in their ability to win the 100-m sprint race and in getting hired permanently as a tour guide (1 = *not confident at all*, 7 = *very confident*), and how optimistic they are about attaining each goal (1 = *not at all optimistic*, 7 = *very optimistic*). Goal orientation was measured by asking participants whether they see achieving the financial and athletic goals as pursuing something they want or avoiding something they don't want (1 = *avoiding*, 7 = *pursuing*). Participants were also asked to indicate which goal is more important (1 = *athletic more important*, 7 = *financial more important*).

Lastly, participant's mood was measured and the manipulation check of power was administered (similarly to Experiment 3). Demographic information was then recorded and participants were debriefed and probed for suspicion.

Results and Discussion

Manipulation Check

An independent *t*-test revealed that the power manipulation was effective as powerful participants felt more control (M=7.17, SD=0.70) than powerless participants (M=3.48, SD=1.79), $t(44)=9.06$, $p<.001$, $\eta_p^2<.001$.

Goal Prioritization and Goal Engagement

Preliminary analyses indicated that gender did not affect the results; therefore gender was excluded from further analyses.

Goal prioritization was first assessed by taking the absolute value of the difference between participants' ratings of how much effort they will devote to the athletic goal and how much effort they will devote to the financial goal. Larger differences indicate that participants were more likely to engage in one goal vs. the other; in other words, higher difference scores translate to higher goal prioritization. Goal prioritization was subjected to a linear contrast analysis (powerless=-1; control=0; powerful=+1). In order to test for deviation from linearity, a quadratic contrast analysis was also used (powerless=+1; control=-2; powerful=+1). This yielded a significant linear contrast effect of power, $F(2, 62) = 4.64$, $p=.035$, $\eta_p^2=.070$. Powerful participants had higher difference scores ($M=1.91$, $SD=1.34$) than control participants ($M=1.47$, $SD=1.47$), who had higher difference scores than powerless participants ($M=1.04$, $SD=1.30$). The quadratic contrast analysis was not significant, $F(1, 62)<.001$, $p=.99$, $\eta_p^2<.001$, showing no deviation from linearity. This supports the hypothesis that high power increases, whereas low power decreases, goal prioritization (see Table 3.4).

Next, participants' preference for only engaging in one of the goals was analyzed. To facilitate interpretation, this rating scale was reverse coded such that higher ratings indicate a higher preference for engaging in additional goals. Since no specific directional predictions were made regarding the relationship between power and goal engagement, a one-way ANOVA was employed. This yielded a main effect of power, $F(2, 62)=7.32$, $p=.001$, $\eta_p^2=.19$. Further post-hoc analysis showed that powerful participants had marginally higher ratings ($M=4.55$, $SD=1.44$) compared to powerless participants ($M=3.54$, $SD=1.44$), $p=.073$, and significantly higher ratings compared to control participants ($M=2.74$, $SD=1.69$), $p=.001$. Powerless and control participants did not differ, $p=.20$. This supports the hypothesis showing that powerful individuals are more likely to seize opportunities for goal pursuit and are more likely to engage in additional goals compared to powerless participants.

Table 3.3. Means and Standard Deviations for Prioritization and Engagement in Experiment 6

	Goal Prioritization		Goal Engagement	
Power	M	SD	M	SD
Powerless	1.04	1.30	3.54	1.44
Control	1.47	1.47	2.74	1.69
Powerful	1.91	1.34	4.55	1.44

Note. Higher scores on goal prioritization indicate a higher a tendency to focus attention on effort on one goal instead of devoting equal attention to both goals. Higher scores on goal engagement indicate a higher tendency to pursue additional goals.

These results indicate that although powerful participants prioritize one goal over the other, they are unwilling to entirely forgo any additional opportunities for goal pursuit. As a result of being more goal-oriented and more likely to seek opportunities for goal pursuit (Galinsky et al., 2003; Gruenfeld et al., 2008; Guinote, 2007c), powerful individuals might not necessarily pursue fewer goals than powerless individuals. Although power may increase the willingness to pursue both goals compared to powerless and control participants, but they still employ a single-tasking strategy whilst pursuing these multiple goals, as they are more likely to prioritize one goal over the other. In contrast, powerless participants prefer to pursue fewer goals than their powerful counterparts, but they have a higher tendency to multitask when faced with multiple goals.

Confidence Level

Belief about ability, confidence, and optimism were combined into an overall confidence score for the athletic goal (α=.851) and an overall confidence score for the financial goal (α=.841). A 3 (power: powerful, control, powerless) x 2 (goal: athletic, financial) mixed ANOVA with repeated measures on the last factor was conducted on the overall confidence score. This analysis revealed a marginal effect of goal, where participants were overall more confident in the financial goal (*M*=5.57, *SD*=0.13) than the athletic goal (*M*=5.21, *SD*=0.14), $F(1, 61)=3.66$, $p=.06$, $\eta_p^2=.057$. There was also a significant power x goal interaction, $F(2, 61)=3.35$, $p=.041$, $\eta_p^2=.099$. Further analysis showed that, as shown in Figure 3.8, both powerless and control participants were more confident in the financial (*M*=5.74, *SD*=0.87; *M*=6.00, *SD*=0.74) compared to the athletic goal (*M*=5.32, *SD*=0.96; *M*=5.07, *SD*=1.29), *F*s > 4, *p*s<.04, η_p^2s>.18. However, there was no difference in confidence level for powerful participants between financial (*M*=4.95, *SD*=1.29) and athletic goals (*M*=5.23, *SD*=0.99), $F(1, 21)=0.46$, $p=.51$, $\eta_p^2=.021$.

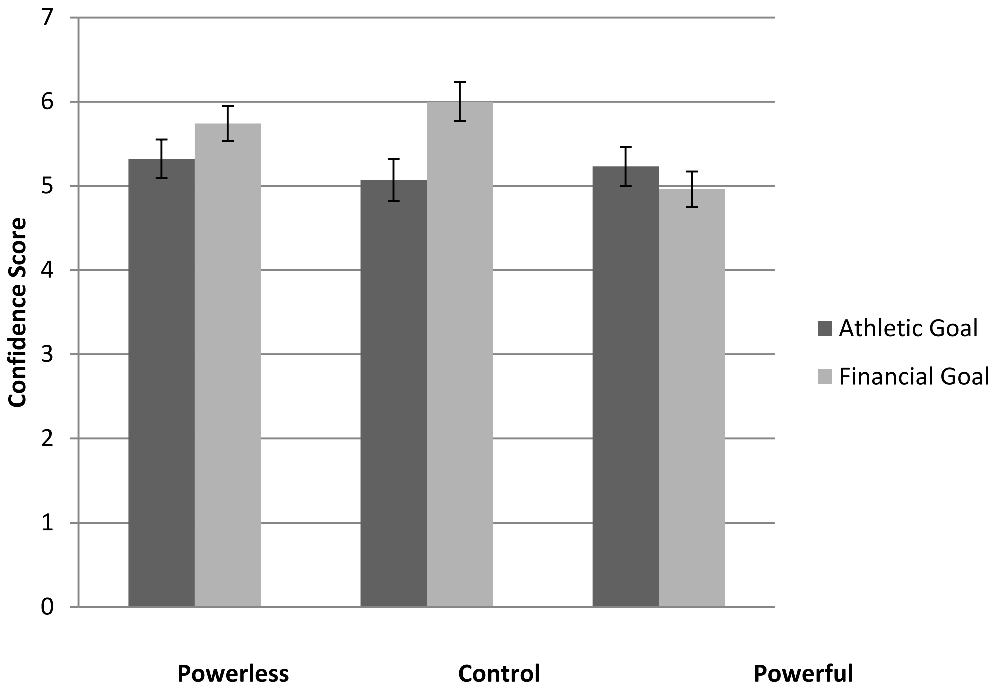

Figure 3.8: Mean confidence score for athletic and financial as a function of power in Experiment 6; error bars represent 1 standard error above and below the mean.

There was also a marginal effect of power on the overall confidence score for the two goals, $F(2, 61)=2.67$, $p=.077$, $\eta_p^2=.08$. Further post-hoc analysis showed that powerless and control participants had higher confidence scores compared to powerful participants, *p*s <.06. This pattern indicates that confidence could mediate task prioritization. A mediation analysis (Baron & Kenny, 1986) was conducted with power as the independent variable, goal prioritization as the outcome variable, and overall confidence as the mediator. As noted above, power was related to difference in overall confidence score and task prioritization. However, when goal prioritization was regressed on power and overall confidence, the originally significant relationship between power and goal prioritization became non-significant, *t*(62)=1.43, *p*=.16, *β*=.28, but overall confidence remained significant, *t*(62)=-3.12, *p*=.003, *β*=.-70. These results, as well as a marginally significant Sobel test using raw coefficients (*z*=1.69, *p*=.09), suggest that the effect of power on goal prioritization was also mediated by differences in overall confidence. A more sensitive and robust bootstrapping estimate of the 95% confidence interval around the indirect effect of power on goal prioritization via difference in confidence was also used (Preacher & Hayes, 2008). The confidence interval from the bootstrapping estimate excludes zero (0.016, 0.39), which supports the mediation. This suggests that the effect of power on goal prioritization was mediated by overall task confidence. Powerful participants were less confident in general, and they therefore prioritized one task over the other. The overall confidence was not related to one's tendency to engage in additional goals, *F*(1, 62)=0.375, *p*=.542.

Furthermore, even though powerful participant's level of confidence was independent of goal content (financial vs. athletic), but they may have displayed higher differences in confidence levels between the two goals. In order to test for this possibility, the absolute values of the differences in confidence scores between the two goals were obtained. This difference in confidence score was subjected to a one-way ANOVA, which yielded a marginal main effect of power, *F*(2, 61)=3.13, *p*=.051, η_p^2=.093. Post-hoc Bonferroni analysis[3] showed that powerful participants had marginally higher difference scores (*M*=1.45, *SD*=1.19) than powerless participants (*M*=0.77, *SD*=0.63), *p*=.078. Control participants (*M*=1.39, *SD*=1.15) did not differ between the two power conditions, *p*>.1. Since powerful participants were more confident in one task compared to the other, then this difference in

[3] A Bonferroni correction was used because the result was unexpected.

confidence may have mediated the relationship between power and prioritization. A second mediation analysis was conducted with power as the independent variable, goal prioritization as the outcome variable, and difference in confidence as the mediator. As noted above, power was related to difference in confidence score and task prioritization. However, when goal prioritization was regressed on power and difference in confidence, the originally significant relationship between power and goal prioritization became non-significant, $t(62)=1.28$, $p=.205$, $\beta=.252$, but difference in confidence remained significant, $t(62)=3.27$, $p=.002$, $\beta=.523$. These results, as well as a Sobel test using raw coefficients ($z=1.87$, $p=.061$), suggest that the effect of power on goal prioritization was mediated by differences in task confidence. The confidence interval from the bootstrapping estimate (0.03, 0.45) excludes zero, which supports the mediation. Therefore powerful participants are more confident in one task than the other, which explains why they prioritize one task over the other. The mediation results are illustrated in Figure 3.9. Difference in confidence was not related to one's tendency to engage in secondary goals, $F(1, 62)=0.841$, $p=.363$.

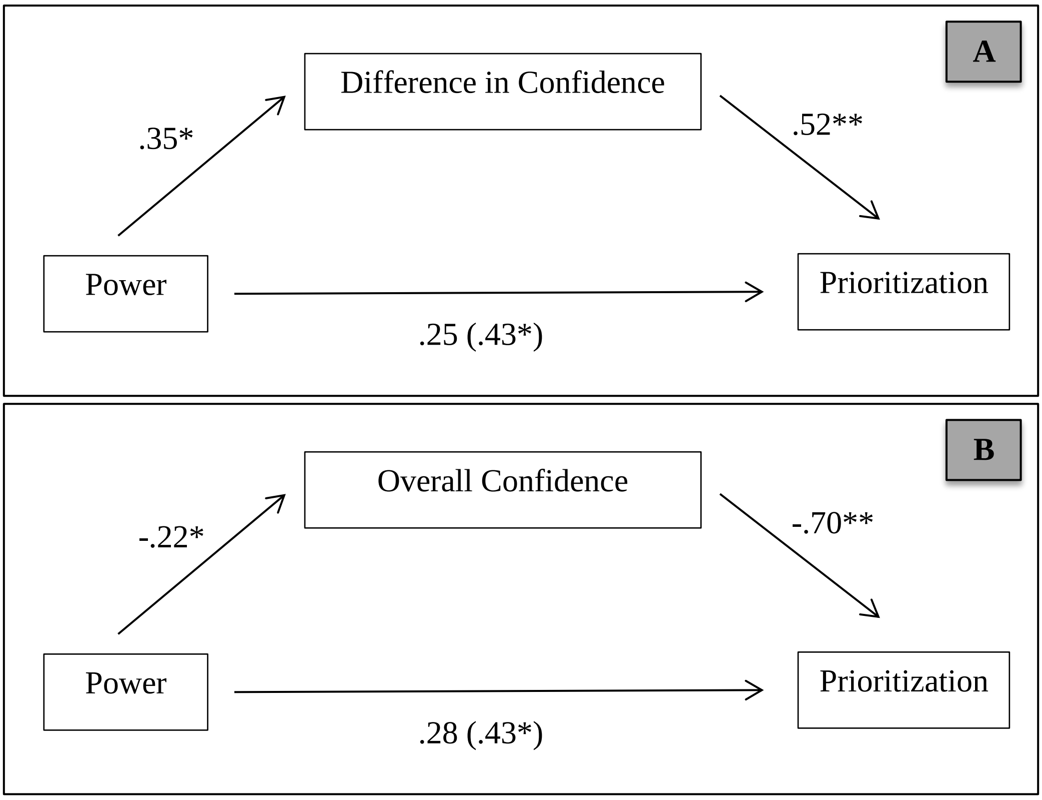

Figure 3.9: The effect of power on goal prioritization mediated by difference in confidence (Panel A) and overall confidence (Panel B) in Experiment 6; all entries are standardized coefficients. The association between the mediator and the goal prioritization is represented by a coefficient from a model where power is also a predictor of goal prioritization. Numbers in parentheses refer to the total

Goal Importance, Goal Perception, and Mood

Goal importance was also analyzed in order to assess whether power affected how important participants perceived the goals to be, and whether they perceived one goal as more important than another. Goal importance may have decreased multitasking behavior if powerful participants perceived one goal to be more important than the other. A bipolar scale was used, where participants rated the relative importance of the two goals. Higher values on the goal importance scale represent higher importance for the financial goal, and lower values represent higher importance for the athletic goal. The median score (4) represent equal task importance. This importance score was subjected to a one-way ANOVA, which yielded a main effect of power, $F(2, 62)=3.65$, $p=.032$, $\eta_p^2=.105$. Post-hoc (Bonferroni corrected) analyses showed that control participants perceived the financial goal as more important (*M*=5.29, *SD*=1.79) compared to powerful participants (*M*=3.80, *SD*=1.49), $p=.027$. The differences between the powerless (*M*=4.56, *SD*=1.55) and control, and powerless and powerful conditions were not significant, *p*s>.4. Although there was a difference in goal importance between powerful and control participants, goal importance was not correlated with goal prioritization, $r=.107$, $p=.398$, nor with additional goal engagement, $r=.082$, $p=.518$.

Since the median of the scale was 4, then any deviation from 4 meant that participants viewed one goal as more important than the other. A difference score for goal importance was also calculated by subtracting goal importance by 4 and taking the absolute value of the answer. Power did not affect the difference score in goal importance, $F(1, 63)<.001$, $p=.996$. Unsurprisingly, the difference in goal importance did yield a significant effect on goal prioritization, $p=.022$, $\beta=.410$, and on preference for additional goal engagement, $p=.001$, $\beta=.513$. When participants saw one goal as more important than the other, then they had higher goal prioritization and lower additional goal engagement. However, the effect of power on goal prioritization, $p=.028$, $\beta=.43$, and additional goal engagement, $p=.03$, $\beta=-.49$, was still present after ruling out this possible confound of goal importance. Due to the nature of how the question was asked, it was impossible to assess overall goal importance as the scale forced participants to choose one goal vs. the other.

Finally, to see whether power affected goal orientation, the goal orientation ratings for both goals were subjected to a 2 (goal: athletic vs. financial) x 2 (power: powerless, control, powerful) mixed ANOVA with between-subjects on the last factor. This analysis did not yield any significant results, *p*s>.1. None of these effects were driven by mood, as a one-way ANOVA did not reveal any mood differences between the power conditions, $F(2, 61)=1.42$, $p=.250$, $\eta_p^2=.068$.

3.5 Summary and conclusions

The thesis so far has focused on how power affects prioritization of a single goal and how individuals choose to pursue multiple goals. It was predicted that there will be a negative relationship between power and multitasking, with lower multitasking tendency in high-power individuals. In line with the prediction, it was found that both task prioritization and single-tasking strategies increase with high power (and decrease with low power). Chapter 2 showed that power can decrease multitasking through self-reports and planning. However, it also showed that powerholders may multitask if doing so can prevent negative consequences (Experiment 3).

Chapter 3 expanded the findings of Chapter 2 by examining actual multitasking behavior, prioritization, and performance during multiple-goal pursuit. Again, a negative relationship was found between power and multitasking behavior. Powerless individuals preferred to multitask even when doing so may decrease overall performance and even in the presence of a difficult task (Experiment 5).

Moreover, prioritization tendency mediated this relationship between power and multitasking (Experiments 4 and 5). The mediations support the idea that powerless individuals multitask because they lack priority by constantly seeking information that can help them increase their control of the environment, and by attending to other events that can override the focal goal.

This is similar to the attention capture associated with multitasking as high multitaskers have increased vulnerability to distractions by irrelevant items (Boot, Brockmole, & Simons, 2005; Lavie, Hirst, de Fockert, & Viding, 2004). Powerlessness may therefore be comparable, in some respects, to working on one task while simultaneously being distracted by another, which increases concurrent attention to task demands and engagement in more switches between various tasks. Having a multitasking mindset and constantly attending to multiple events can also decrease concentration and selective attention, because attending to multiple sources of information renders them equally important and creates less clear priorities (Guinote, 2008).

On the other hand, powerful individuals have a focused mind-set. This makes it easy for them to shut off their multitasking tendency. Therefore powerful individuals may prefer to attend to new tasks only after processing the initial task to a sufficient degree. This pattern of resource allocation over time reflects a more systematic, sequential approach to dealing with competing goals, which is a luxury afforded by the stable, predictable nature of the powerholder's environment. Although powerholders are more likely to single-task and prioritize than powerless participants, but there was no evidence that power decreases the total number of goals that participants are willing to pursue and the willingness to forgo opportunities to pursue additional goals (Experiments 2 and 6). Instead, powerful participants were actually more likely to pursue additional goals compared to powerless and control participants; but once the goals are set, they will approach them in a more monochronic (vs. polychronic) fashion (Experiment 6).

The studies so far also ruled out the possibility that the relationship between power, multitasking, and prioritization is mediated by mood, motivation, or goal orientation. However, Experiment 6 showed that power *decreased* participants' confidence in their abilities, and this decrease in overall confidence level mediated the relationship between power and goal prioritization. The relationship between higher confidence and multitasking is in line with past research showing how increased goal expectancy leads to more multitasking (Schmidt et al., 2009). However, this may seem inconsistent with past research on power, which suggests that power increases optimistic perceptions of outcomes and confidence in one's ability to deal with responsibilities and to achieve desired goals (Anderson & Galinsky, 2006; Briñol et al., 2007; See et al., 2011). It is thus possible that power may affect confidence differently depending on whether individuals only need to focus on one goal or on multiple goals.

Moreover, the *difference* in confidence levels between the two tasks also mediated the relationship between power and goal prioritization. This suggests that powerful individuals prefer to focus more on one goal vs. another because they are more confident in their abilities in one goal compared to the other. They will therefore focus on only one of the goals in order to ensure successful attainment of at least the focal goal. However, powerholders are still willing to devote left over resources to additional goals. Powerless and control individuals, on the other hand, believe they have the ability to meet the demands of both goals, and therefore tend to pursue them together and are willing to divide attention between the two goals more equally.

Performance was also examined in these studies. Powerful participants may have answered more questions from, and were more efficient on, the prioritized task compared to powerless participants, but this slight benefit was not reflected in overall performance. Perhaps the paradigm used in Experiments 4 and 5 may not reliably capture the challenges of multitasking because the tasks were designed to measure primarily multitasking tendency (see (Gouveia et al., 2007; Rubinstein et al., 2001). Moreover, the tasks were simple and not demanding enough, as their execution did not require WM resources. Indeed, it is highly probable that powerless participant's division of attention may compromise performance during more attentionally demanding multitasking situations, due to fewer WM capacities available for cognitive control compared to powerful individuals.

In addition, past studies suggest that multitasking tendency and multitasking ability are conceptually and operationally distinct from each other. For example, previous research failed to find a relationship between polychronicity and multitasking ability (Delbridge, 2001; Konig et al., 2005; Poposki & Oswald, 2010), indicating that the tendency to multitasking is independent of multitasking ability. Likewise, a person may excel at one type of performance (e.g., multitasking) yet prefer performing tasks in a different way (e.g., single-tasking). Therefore one question that arises is whether power affects performance during demanding multitasking situations. This is investigated in Chapter 4 using paradigms designed to specifically measure multitasking ability under controlled conditions.

Chapter 4:

Power and Multitasking Ability

4.1 Introduction

Even when an individual prefers to perform only one task at a time, many external circumstances, such as job requirements, demand multitasking. Therefore an important question to address is whether individuals are able to adapt to changing circumstances required by their situation. Since the tendency to engage in multitasking does not correlate with one's ability to multitask (Ophir et al., 2009; Poposki, Oswald, & Chen, 2009), then it is necessary to assess how power affects multitasking ability in situations where individuals are compelled to multitask. In order to investigate the effects of power on multitasking ability, this chapter used paradigms that have been designed to specifically measure multitasking ability. Experiment 7 used a dual-tasking paradigm, Experiments 8 and 9 used task-switching paradigms, and Experiment 10 used self-reports.

In order to perform well under demanding multitasking situations, individuals not only need to inhibit alternative goals when necessary but also need to be able to quickly re-focus attention on new tasks, minimize cross-talks and interferences between various tasks, coordinate information, and select appropriate responses to environmental demands (Kushleyeva et al., 2005). The executive function deficits previously found in powerless individuals (Guinote, 2007b; Smith et al., 2008) suggest that powerlessness leads to a general depletion in cognitive resources and abilities to effectively allocate attentional resources. As a result, low-power individuals are more guided by situational constraints and have difficulties inhibiting goal-irrelevant information (Guinote, 2007c; Overbeck & Park, 2006). For example, powerless individuals may dedicate more cognitive resources to processing irrelevant aspects of the task that they are performing, as well as to internal processes such as ruminative thoughts. Processing excessive information exhausts WM capacity and diminishes one's ability to willfully allocate attention between various tasks. Consequently, powerless individuals should have fewer resources available for effective multitasking, such as focusing attention and manipulating temporarily stored information at the service of current goals.

On the other hand, powerholders attend to less irrelevant information, which will then free up limited WM resources. However, even though powerholders deploy attentional resources more selectively, power may not improve multitasking ability per se. That is, high power may not increase WM capacity beyond standard levels. This is likely as there have been mixed evidence regarding a power advantage in single executive functions tasks. In some studies, powerful participants were better at inhibiting interference compared to standard participant responses (Guinote, 2007b) or to responses of a control condition (DeWall et al., 2011), whereas in other studies they did not show superior performance on these tasks (Smith et al., 2008). Therefore the notion that power improves WM capacity is not supported by strong evidence. Consequently, although the prediction for multitasking tendency was for both powerless and powerful condition, the prediction regarding ability focused primarily on powerless individuals. It was predicated that powerlessness should decrease multitasking ability compared to control and powerful participants, whereas powerful participants may exhibit similar performance levels compared to control participants.

4.2 Experiment 7: Dual-task ability

Experiment 7 investigated whether powerless individual's tendency to multitask and to attend to multiple goals (Experiments 1-6) can create the ironic effect of decreasing their ability to manage multitasking situations, such as dual-tasking. Dual-task paradigms mimic one of the strategies often used by multitaskers: completing two tasks simultaneously. Responses during dual-task trials are often delayed and less accurate compared to responses during single-task trials, where the tasks are performed in isolation. This dual-task cost occurs because dual-tasking requires additional WM resources to monitor and coordinate attentional processes linked to the two tasks (Lavie et al., 2004; Szameitat et al., 2002). It is therefore demanding on the central executive (Lavie et al., 2004; Logan, 2003), and it has been proposed that dual-task coordination is a potential fourth factor of the central executive (in addition to shifting, inhibition, and updating functions; Collette & Van Der Linden, 2002; Miyake et al., 2000). Having sufficient WM resources can therefore reduce dual-task costs by enabling the individual to simultaneously store and process multiple sources of information. Without sufficient WM capacity, individuals may suffer from cross-talks and confusions between the tasks, as it will be difficult to maintain independent representations for two separate processes. Thus dual-task paradigms are similar to the OSPAN task which has been traditionally used to measure WM capacity. For these reasons, the difference between single and dual-task performance has been seen as a test of WM capacity (Baddeley, 1992), and is indicative of one's ability to complete two goals simultaneously.

In the present experiment, participants performed an auditory and a visual task either independently (single-tasking) or simultaneously (dual-tasking; following a paradigm developed by Levy and Pashler (2001). This paradigm requires participants to perform two tasks with a temporal overlap, and meets the criteria for multitasking as it involves multiple tasks characterized by distinct goals, stimuli (auditory and visual), and response outputs (vocal response and manual response). The two tasks were chosen because they compete for attentional resources when performed concurrently, as both tasks need access to the same functional units of information processing.

Evidence from current (Experiments 1-6) and past studies (Fiske, 1993; Guinote, 2007b, 2008) suggest that powerless individual's divided attention and multitasking mindset should encourage one to process superfluous information, which will decrease WM capacity. This explains the negative impact that low power has on executive functions performance (Guinote, 2007b; Smith et al., 2008), which are dependent on WM capacity (Kane & Engle, 2003; Miyake et al., 2000). Therefore it is predicted that powerlessness should decrease dual-task performance (higher RTs and ERs) compared to control and powerful participants, because powerless participants have fewer WM resources available to help them overcome the difficulty of attending to two simultaneous stimuli that are of equal importance. However, power should not affect performances on single-tasks because it is not cognitively demanding. Mood was also measured as positive mood was found to enhance performance on secondary tasks (Bless, Clore, & Schwarz, 1996).

Methods

Participants and Design

Sixty participants (32 females) were recruited from UCL. Participants took part for £3. Four participants were excluded from the analyses: one for not following instructions regarding the essay topic and three for being outliers (3 SDs above the mean). Thus, 56 participants (30 females) were included in the final analyses. The average age was 24.8 (*SD*=7.61). The experiment was a 3(power: powerful vs. control vs. powerless) x 2(tasks: single vs. dual) x 2(modality: auditory vs. visual) design, with power as a between-subjects factor. Participants were randomly assigned to the power conditions: powerless (*N*=19), control (*N*=18), and powerful (*N*=19).

Materials and Procedure

Following Galinsky et al. (2003) and similarly to Experiment 3, participants wrote a narrative essay about an incident in which they had power (powerful), did not have power (powerless), or the last time they went to the supermarket (control). Power was defined as having control over the ability of someone to get something they wanted, or being in a position to evaluate others.

Subsequently, participants completed the auditory and visual categorization tasks on a computer, with a 60-Hz color monitor. Participants sat at a viewing distance of 60 cm. All trials began with a warning stimulus consisting of three adjacent horizontal white lines (2.2 cm in length) that were displayed in the center of the screen against a black background. The separation between the lines was 1.2 cm.

Stimulus presentation began 501 ms after the onset of the warning stimulus (see Figure 4.1).

For the auditory single-task, a computer-generated tone was emitted for 40 ms. Tone frequency was selected at random from one of three values (220, 880, and 3520 Hz) and participants responded by saying one, two, or three, respectively. Vocal responses were recorded using a tape-recorder in order to detect ERs, and RTs were measured using a microphone located on a stand in front of the seated participant. The next trial began 1,500 ms after participant's response.

For the visual single-task, a solid white circular disk (radius 2.2 cm) replaced one randomly selected horizontal line. This display remained visible until participants responded to the circle's location by pressing the third, fourth, or fifth key on the E-prime Serial Response Box using their index, middle, or ring fingers of their dominant hand. The three possible locations and the three response keys were spatially compatible. RTs and ERs were recorded. For the dual-task, both visual and auditory stimuli were presented simultaneously. Participants were instructed to respond to both.

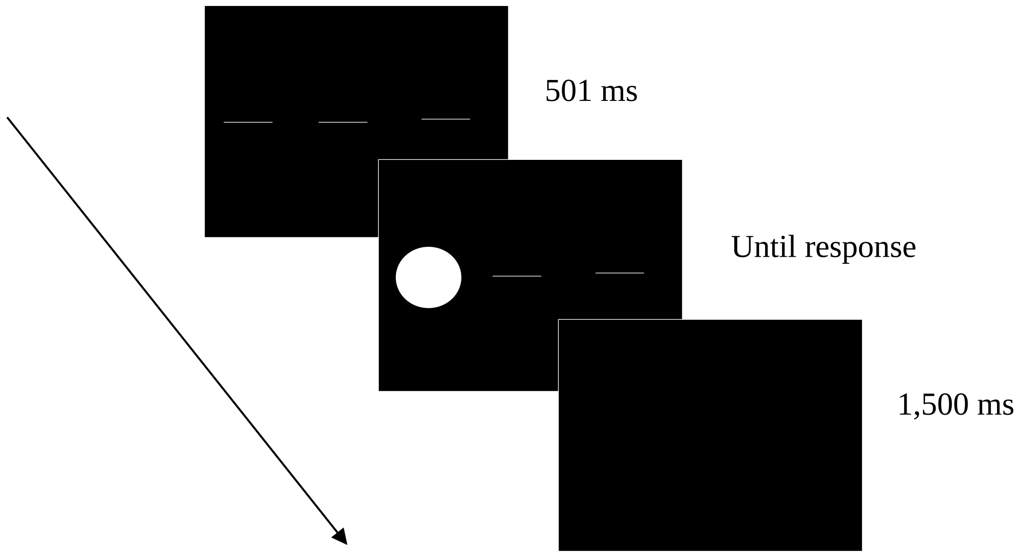

Figure 4.1: Example of a sequence of events in a trial of Experiment 7. Trial onset was indicated by three horizontal lines. Then, for the visual trial, a circle replaced one of the horizontal lines. Participants pressed one of three keys to indicate the circle's location. For the auditory trial, no circle appeared (the three horizontal lines remained on the screen) and instead, participants heard an auditory tone. The three horizontal lines remained on the screen until participants indicated their answer verbally. For the dual-task trials, the visual circle and the auditory tone appeared simultaneously.

Participants started off with a practice of 8 trials of each of the three block types (auditory-single, visual-single, and dual). This was followed by the test session of six blocks (48 trials per block), with each block type appearing twice. Participants were informed what block type to expect, and block order was counterbalanced across participants.

Lastly, to assess any possible mood effects on attentional capacity and dual-tasking performance (Mackie & Worth, 1989; Seibert & Ellis, 1991), participants completed the same mood questionnaire as in Experiment 3. A power manipulation check similar to the one in Experiment 3 was also administered. Demographic information was then recorded and participants were probed for suspicion, thanked, and debriefed.

Results and Discussion

Manipulation Check

An independent samples *t*-test revealed that the power manipulation was effective as powerful participants felt more control (M=7.37, SD=1.01) than powerless participants (M=3.23, SD=2.20), t(31)=7.16, p<.001, η_p^2=.62.

Reaction-Times

Following (Levy & Pashler, 2001), trials on which any response was incorrect (3.3% of all responses), faster than 150 ms, or slower than 3,000 ms (4.7% of all responses) were excluded. Trimmed RTs were then analysed using a 3 (power: powerful, control, powerless) x 2 (task: single, dual) x 2 (modality: auditory, visual) mixed ANOVA with power as a between-subjects factor.

This yielded a main effect of modality *F*(1, 53)=401, *p*<.001, η_p^2=.88, where auditory RTs (*M*=768, *SD*=151) were slower than visual RTs (*M*=475, *SD*=142), and a main effect of task, *F*(1, 53)=134, *p*<.001, η_p^2=.72, where dual-task RTs (*M*=726, *SD*=213) were slower than single-task RTs (*M*=516, *SD*=81). These results replicate previous findings by Levy and Pashler (2001), and show how dual-tasking and the auditory task was attentionally more demanding than single-tasking and the visual task, respectively. There was also a modality x power interaction, $F(2, 53)=3.62$, $p=.034$, $\eta_p^2=.12$, and, as expected, a task x power interaction, $F(2, 53)=4.12$, $p=.022$, $\eta_p^2=.14$. No other effects were significant, *F*s<1.

The task x power interaction showed that the difference in RTs between single and dual-task performance (i.e., dual-task cost) was higher for powerless (*M*=272, *SD*=177) than control (*M*=157, *SD*=121), $t(35)=2.31$, $p=.027$, and powerful (*M*=174, *SD*=75.4) participants, $t(35)=2.20$, $p=.035$ (see Figure 4.2). There was no difference between control and powerful participants, $t(36)=0.53$, $p=.69$. This underperformance suggests that powerless individuals had less WM capacity available for dual-task coordination (see Baddeley, 1996, 2000) than control and powerful participants.

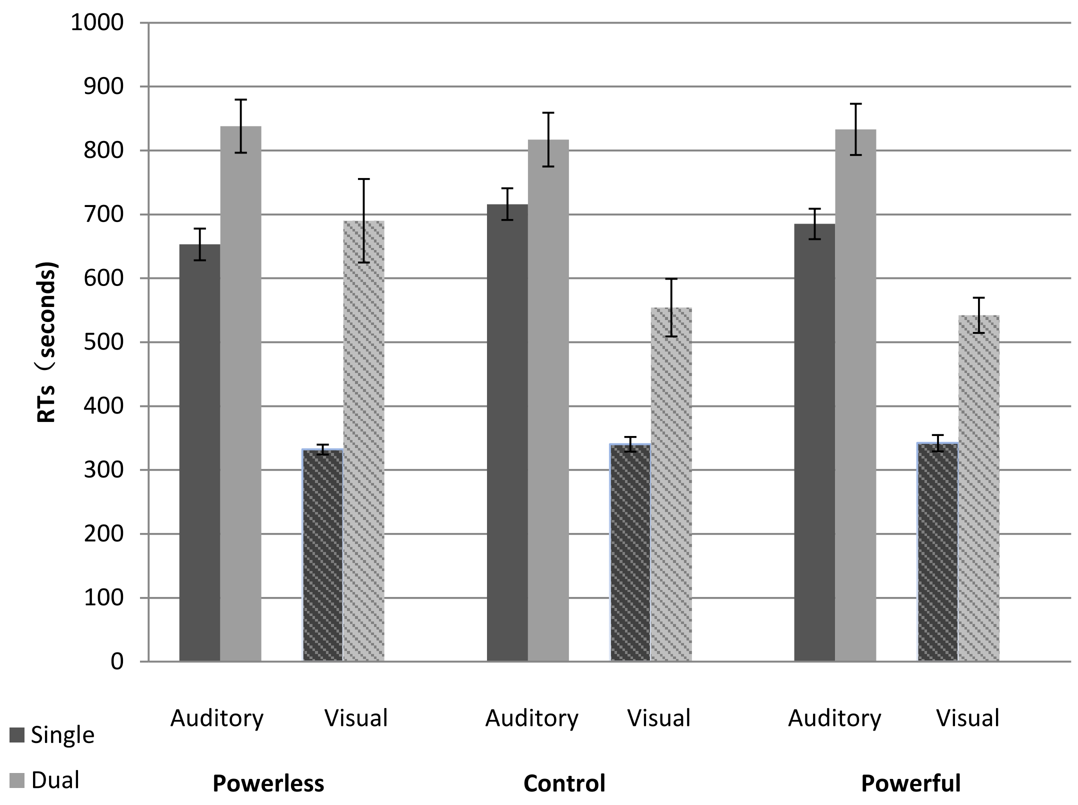

Figure 4.2: Mean RTs across tasks and modalities as a function of power in Experiment 7; error bars represent 1 standard error above and below the mean.

Furthermore, the modality x power interaction revealed that the differences between auditory and visual RTs were smaller for powerless participants (*M*=235, *SD*=89.1) compared to control (*M*=320, *SD*=115), *p*=.021, and powerful participants (*M*=317, *SD*=118), *p*=.021. There was no difference between powerful and control participants, *p*=.93. Hence powerful and control participants were faster at the visual than the auditory task, whereas powerless participants' RTs were more similar between the two tasks.

Error-Rates

Participants' ERs were subjected to a 3(power: powerful, control, powerless) x 2(task: single, dual) x 2 (modality: auditory, visual) mixed ANOVA with power as a between-subjects factor. This revealed a main effect of task, $F(1, 53)=16.3$, $p<.001$, $\eta_p^2=.24$, with higher dual-task ERs ($M=3.87$, $SD=0.29$) than single-task ERs ($M=2.66$, $SD=0.26$). There was also a main effect of modality $F(1, 53)=93.2$, $p<.001$, $\eta_p^2=.64$, with higher auditory ($M=5.49$, $SD=0.45$) than visual ERs ($M=1.04$, $SD=0.13$). In addition, there was a modality x task interaction, $F(1, 53)=9.15$, $p=.004$, $\eta_p^2=.15$, with higher dual-task costs for the auditory modality ($M=2.05$, $SD=4.08$) than the visual modality ($M=0.35$, $SD=1.31$). This, again, replicates previous findings of Levy and Pashler (2001) and shows how dual-tasking and the auditory task were attentionally more demanding than single-tasking and the visual task, respectively. The main effect of power was also significant, $F(2, 53)=3.99$, $p = .024$, $\eta_p^2=.13$. Nothing else was significant, *F*s<1.

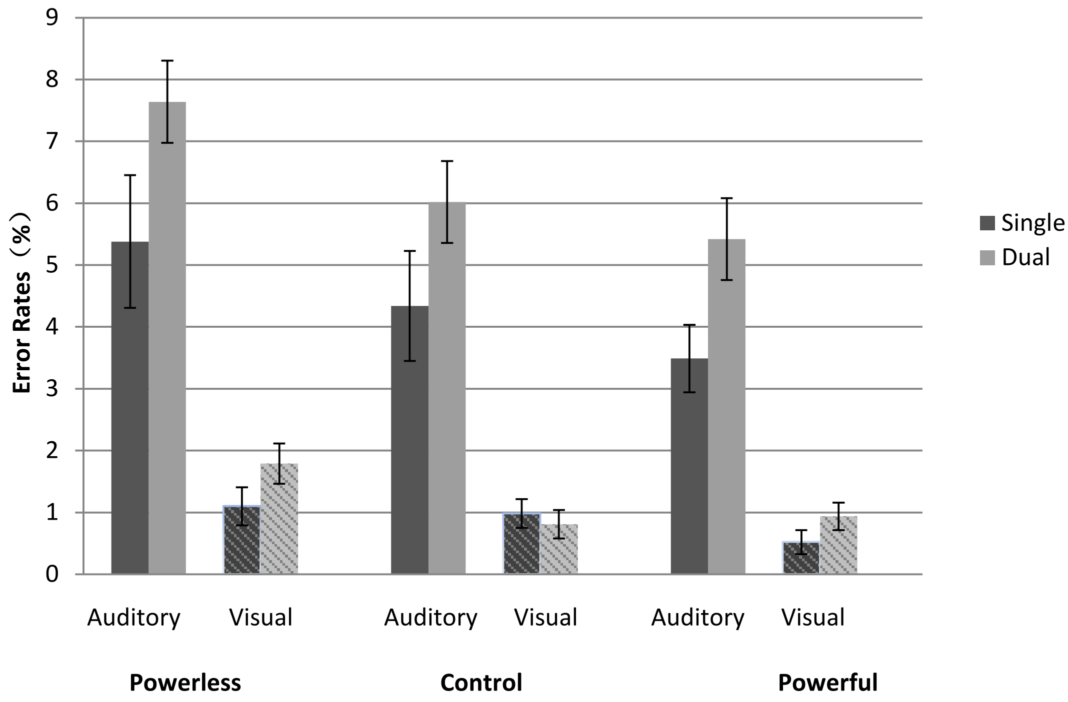

Figure 4.3: Mean ERs across tasks and modality as a function of power in Experiment 7; error bars represent 1 standard error above and below the mean.

As shown in Figure 4.3, powerless participants had higher ERs (M=4.14, SD=0.41) than powerful participants (M=2.54, SD=0.40), p=.007, and marginally higher ERs than control participants (M=3.13, SD=0.40), p=0.083. Participants in the control group did not differ from participants in the powerful condition, p=.30. These results indicate that there was no trade-off between speed and accuracy, and that the increased dual-task cost in the RTs of powerless individuals was not a byproduct of providing more accurate answers. Instead, differences in dual-task cost in RTs are due to differences in one's basic ability to share attention between two tasks.

Overall, the results supported the hypothesis that powerless individuals had higher dual-task costs than control and powerful participants. This suggests that powerlessness decreases one's ability to manage two tasks simultaneously by decreasing WM capacity needed for dual-task coordination (see Baddeley, 1996; 2000). These findings were not task specific and occurred for both auditory and visual tasks. In addition, power led to faster RTs for the visual compared to the auditory task, showing perhaps that powerholders prioritized the visual over the auditory task. Lastly, powerlessness decreased ERs in general, suggesting that power can enhance performance even in undemanding, single-task situations. None of these effects were mediated by mood, as a one-way ANOVA did not reveal any mood differences between the three power conditions (α=.94), $F(2, 56)$=.929, p=.404, η_p^2=.029.

4.3 Experiment 8: Task-switching ability

Experiment 7 examined how power affects the ability to pursue two attentionally demanding goals simultaneously. In addition to dual-tasking, another type of multitasking consists of constantly switching between goals (Oberlander, Oswald, Hambrick, & Jones, 2007). Task-switching paradigms involve comparing performance on repeat trials (answering consecutive questions from the same task-set) with performance on switch trials (answering consecutive questions from different task-sets). Switch trials have been consistently found to incur higher costs (switch costs) compared to repeat trials (Monsell, 2003). This is because switch trials require individuals to use the shifting function (Miyake et al., 2000), which places high demands on WM resources linked to attentional-refocusing between tasks, retrieving task-related intentions and rules, reconfiguring task-sets, and inhibiting interfering activations from the previous task-set (Meyer & Kieras, 1997). Therefore Experiment 8 examined whether power affects one's ability to deal with the challenges that arise when people switch from one goal to another.

Experiment 8 employed a number-letter task-switching paradigm, where participants were simultaneously presented with a number-letter pair and had to switch between the classification of one or the other stimulus (following Ophir et al., 2009). They were asked to either classify the number (even or odd) or the letter (consonant or vowel). A cue informing participants about which classification to perform was presented just before the stimuli appeared on each trial. In repeat trials, the classification required was identical to the previous trial and in switch trials the classification was different from the previous trial. This paradigm can be used to measure switching abilities, as people generally take longer to perform the classification for switch trials than repeat trials, which shows that switch trials require additional resources to mentally reconfigure the task sets involved (Monsell, 2003).

Since switch costs are mainly associated with an insufficient use of WM resources to overcome the difficulty of inhibiting rules and responses from the prior task-set and of refocusing attention on the new task (Rogers & Monsell, 1995), then the lower WM capacity in powerless compared to powerful individuals (Experiment 7) should decrease their ability to respond to the challenges associated with task-switching. It was expected that powerless participants will exhibit greater switch costs compared to control and powerful individuals. In addition, powerlessness may activate the behavioral inhibition system associated with negative mood and anxiety

(Keltner et al., 2003), and anxiety was also found in previous literature to increase switch costs (Derakshan & Eysenck, 2009). Therefore the role of state anxiety and the role of mood were examined in this experiment.

Methods

Participants and Design

Fifty-seven participants from UCL (44 females; mean age=23.3, *SD*=2.59) took part in exchange for a £3 payment. The study was a 3(power: powerful, control, powerless) x 2(switch: switch, repeat) x 2(congruency: congruent, incongruent) mixed design, with power as a between-subjects factor. Participants were randomly assigned to the power conditions: powerless (*N*=18), control (*N*=18), and powerful (*N*=21).

Materials and Procedure

Power was manipulated similarly to Experiment 2. Subsequently, participants completed the task-switching paradigm on a computer (see Figure 4.4). In this task, a cue was presented at the beginning of each trial, which indicated whether participants had to categorize the number or the letter of a compound stimulus. The cue, either "NUMBER" or "LETTER", was presented for 200 ms and was followed by a stimulus consisting of a digit and a letter (e.g., "2 b" or "b 2"). Participants were asked to classify the stimulus by pressing one of two buttons with their left and right index fingers. If shown the "NUMBER" cue, participants were asked to press the left button for an odd number and the right button for an even number. If the "LETTER" cue was shown, participants were instructed to press the left button for a vowel and the right button for a consonant. The response mapping was counterbalanced across participants. Half of the trials were congruent, such that participants could respond to either cue by pressing the same button regardless of the cue (e.g., 1 a). Half of the responses were incongruent, where participants had to respond using different buttons depending on whether the cue was "NUMBER" or "LETTER" (e.g., 1 p). Incongruent responses are more difficult than congruent responses, and should therefore yield higher switch costs (Kiesel, Wendt, & Peters, 2007).

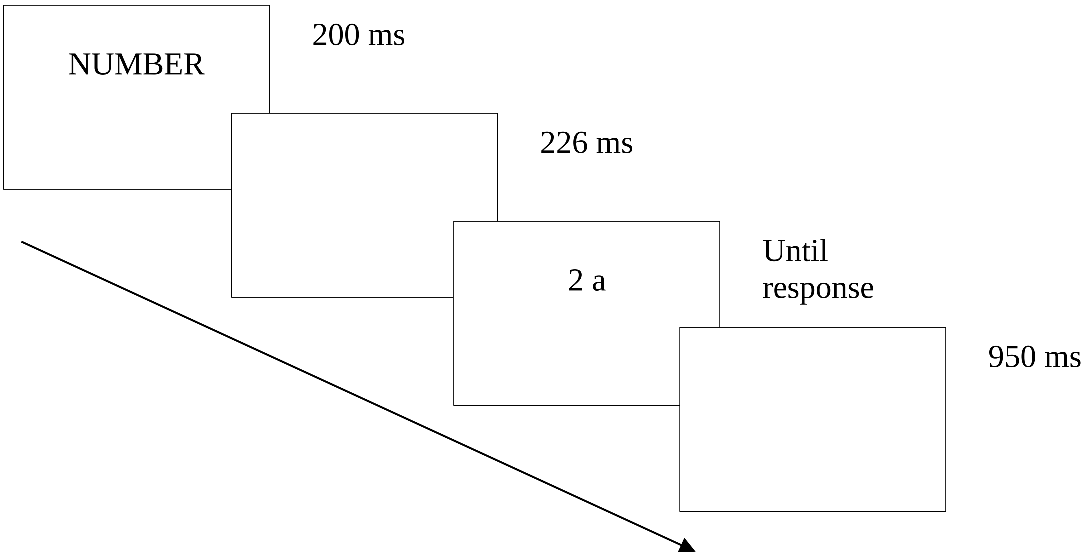

Figure 4.4: Example of a sequence of events in a trial of Experiment 8. Trial onset was indicated by a classification cue which was either "NUMBER" or "LETTER". This was followed by a blank screen and then the target letter-digit combination. The target letter-digit combination remained on the screen until participants indicated their answers (either a letter classification or a digit classification task) by pressing one of the two corresponding keys on the keyboard.

The vowels used consisted of the letters a, e, i, and u, and the consonants consisted of p, k, n, and s. The set of even numbers consisted of 2, 4, 6, 8, and the set of odd numbers consisted of 3, 5, 7, and 9. The position of the number and letter was counterbalanced across participants. The interval between cue offset and stimulus onset was 226 ms and the intertrial interval was 950 ms. Participants first performed 20 practice trials. They then completed 80 experimental trials, with an equal frequency of 1, 2, 3, and 4 same-trial sequences, yielding 40% switch trials and 60% repeat trials. A repeat trial was preceded by the same cue (e.g., a “NUMBER” trial followed by another “NUMBER” trial), whereas a switch trial was preceded by a trial with a different cue (e.g., a “NUMBER” trial followed by a “LETTER” trial). The difference in RTs and ERs between repeat and switch trials represented switch costs.

After completing the task-switching paradigm, mood ratings (similar to Experiments 3) and the State-Trait-Anxiety-Inventory (Marteau & Bekker, 1992) were then administered. Participants also completed the power manipulation check (similar to Experiment 3). Finally, participants were probed for suspicion, debriefed, and thanked for their participation.

Results and Discussion

Manipulation Check

An independent-samples *t*-test revealed that powerful participants felt more control (*M*=5.44, *SD*=2.41) than powerless participants (*M*=3.39, *SD*=1.82), $t(34)=2.89$, $p=.007$, $\eta_p^2=.20$. The manipulation of power was therefore effective.

Reaction-Times

Following (Ophir et al., 2009), trials that were incorrect (1.2% of all responses) and trials that were faster than 150 ms or slower than 3,500 ms (2.6% of all responses) were excluded. In addition, participants whose ERs were higher than 3 SDs above the mean were excluded (*N*=5). Trimmed RTs were then analyzed using a 3 (power: powerful, control, powerless) x 2 (trial: repeat, switch) x 2 (congruency: congruent, incongruent) mixed ANOVA with power as a between-subjects factor.

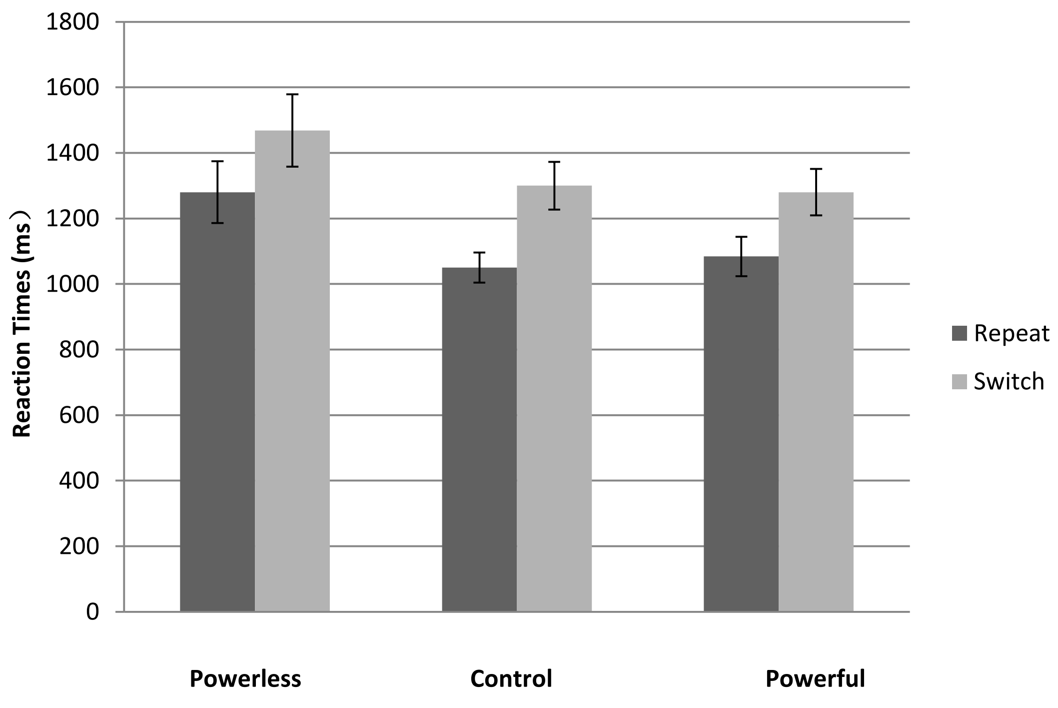

Figure 4.5: Mean RTs for repeat and switch trials as a function of power in Experiment 8; error bars represent 1 standard error above and below the mean.

This analysis yielded an expected main effect of trial, $F(1, 54)=85.8$, $p<.001$, $\eta_p^2=.61$. As shown in Figure 4.5, RTs during repeat trials were faster ($M=1138.42$, $SD=310.47$) than during switch trials ($M=1349.24$, $SD=374.63$). This result indicates that all participants experienced task-switch interference. No other effects were significant.

Error-Rates

ERs were then subjected to a 3 (power: powerful, control, powerless) x 2 (trial: repeat, switch) x 2 (congruency: congruent, incongruent) mixed ANOVA with power as a between-subjects factor. This analysis yielded a main effect of trial, $F(1, 54)=8.71$, $p=.005$, $\eta_p^2=.14$, with higher ERs for switch ($M=1.44$, $SD=1.54$) compared to repeat ($M=0.99$, $SD=1.13$) trials. Switching across tasks was therefore more costly than repeating the same task. More importantly, there was a significant power x trial interaction, $F(1, 54)=6.96$, $p=.002$, $\eta_p^2=.21$. As shown in Figure 4.6, powerless participants had significantly higher ERs in switch ($M=2.12$, $SD=1.61$) compared to repeat trials ($M=0.87$, $SD=0.81$), $F(1, 17)=10.9$, $p=.004$, $\eta_p^2=.39$. For control and powerful participants, the difference in ERs between switch ($M_{control}=0.90$, $SD_{control}=0.72$, $M_{powerful}=1.31$, $SD_{powerful}=1.10$) and repeat trials ($M_{control}=1.08$, $SD_{control}=0.91$, $M_{powerful}=1.01$, $SD_{powerful}=0.96$) was not significant, ps>.2.

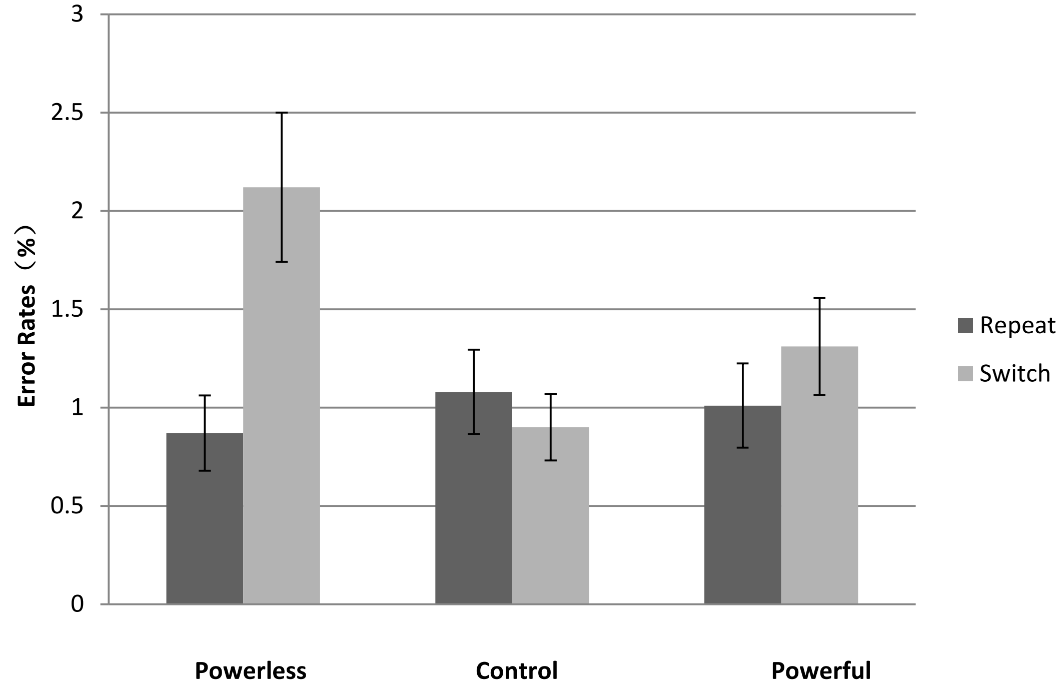

Figure 4.6: Mean ERs for repeat and switch trials as a function of power in Experiment 8; error bars represent 1 standard error above and below the mean.

Furthermore, ERs during repeat trials did not differ significantly between the three power conditions, $F(2, 54)=0.25$, $p=.78$, $\eta_p^2=.009$. However, this was not the case for switch trials, $F(2, 54)=4.67$, $p=.013$, $\eta_p^2=.15$. As expected, powerless participants had higher ERs for switch trials compared to control and powerful participants, *p*s<.05. Control and powerful participants did not differ from each other, $p=.30$. These results indicate that powerlessness decreased performance when participants had to switch between task-sets (i.e., increased switch costs).

The ANOVA also yielded a significant main effect of congruency, $F(1, 54)=22.2$, $p<.001$, $\eta_p^2=.29$. ERs were lower for congruent ($M=0.83$, $SD=1.08$)

compared to incongruent (*M*=1.28, *SD*=1.27) trials. There was also a significant congruency x trial interaction, $F(1, 54)=9.60$, $p=.003$, $\eta_p^2=.15$. For congruent trials, ERs did not differ between switch (*M*=0.85, *SD*=1.14) and repeat trials (*M*=0.79, *SD*=1.03), $t(56)=0.38$, $p=.70$. However, for incongruent trials, ERs were significantly higher for switch (*M*=2.01, *SD*=1.93) compared to repeat trials (*M*=0.95, *SD*=0.99), $t(56)=3.32$, $p=.002$. No other effects were significant.

Overall, the results supported the hypothesis. Powerlessness increased ERs associated with switching across different tasks. The fact that having or lacking power did not affect RTs but only ERs indicates that there was no speed vs. accuracy trade-off in performance. Even though, as Experiments 1-6 demonstrated, powerless individuals switched more between tasks compared to powerful individuals, switching was particularly taxing for those with low power. None of these effects were triggered by mood ($\alpha=.90$) and state anxiety ($\alpha=.89$), *p*s>.1.

4.4 Experiment 9: Backward inhibition

The goal of Experiment 9 was to replicate the effects of power on task-switching performance and to determine if powerless individual's higher switch costs found in Experiment 8 are due to difficulties with inhibiting previously relevant information. As was mentioned in the introduction, task-switching decrements can result from the inability to disengage from a previous task-set or difficulties with engaging in a new task-set, or both (Monsell, 2003). Some propose that flexible switching between various task-sets relies on noninhibitory switching processes (NISPs), which involve activating the mental representations of, and retrieving information relevant to, the demands of the new task and to reconfigure information in WM. Others suggest switch costs result not only from an inability to actively maintain a new task-set, but also from an insufficient inhibition or deactivation of an old task-set. Therefore in order to allow a faster and smoother transition between different tasks, one needs to be able to prevent the previously activate task-set from further influencing action by disengaging from, or inhibiting, this previous task-set (Koch, Gade, Schuch, & Philipp, 2010; Mayr & Keele, 2000; Rogers & Monsell, 1995; Vandierendonck et al., 2010).

The idea that inhibition is essential in task-switching is supported by findings showing how shifting back to a task that has been recently abandoned yields higher switch costs compared to shifting to a task-set that has been abandoned earlier on in the sequence (Mayr & Keele, 2000). This is because the recently abandoned task may not yet be fully recovered from inhibition, whereas more time was available for individuals to recover from residual inhibition of a task that was abandoned earlier. For example, switching from task B to A in an ABA task sequence will take more time than switching to an earlier abandoned task, such as from B to A in a CBA task sequence (Mayr & Keele, 2000). The higher performance impairment during ABA compared to CBA sequence is known as backward inhibition (BI). BI was taken as evidence that extra time and effort are needed to overcome the persisting inhibition of a task that was abandoned two trials ago (n – 2) (Mayr & Keele, 2000).

The current experiment uses a BI task-switching paradigm to assess the effects of power on task-switching performance and to investigate whether inhibitory processes, NISPs, or both, are impaired by power by measuring how successful participants were at inhibiting a previously relevant task-set (Mayr & Keele, 2000; Whitmer & Banich, 2007). Participants switched between three different task sets with four different types of trial sequences: repeat trial (AA sequence), BI switch trial (ABA sequence), control switch trial (CBA sequence), and unclassified switch trial (BBA sequence). If switch cost in powerless participants is due to their inability to effectively inhibit prior task-sets, then they should also require fewer resources than powerful participants to reactivate and overcome the inhibition during an ABA sequence. On the other hand, powerholders do not exhibit high switch costs because they are able to quickly and successfully inhibit task-irrelevant information from a previous task-set (Guinote, 2007b; Slabu & Guinote, 2010; Smith et al., 2008). Successful inhibition may then render it more difficult for powerful participants to re-activate the task-set again when it appears immediately after it has been inhibited. Based on power's effect on inhibitory processes (DeWall et al., 2011; Guinote, 2007b; Smith et al., 2008), it was first predicted that powerless participants will have smaller BI effect when reusing those representations than control and powerful participants. Second, based on the results of Experiment 8, it was predicated that powerless participants will have higher switch costs than control and powerful participants, but this difference in switch costs should decrease for ABA sequence compared to CBA and BBA sequences. Since power did not decrease switch cost when compared to control participants in Experiment 8, then it was predicted that powerful participants should display similar effects as control participants.

Other possible effects of switch costs include arousal level (e.g., energy), anxiety, and rumination. For example, the more aroused we are, the more attentional resources are available to deal with task-switching. Worrisome thoughts and anxiety are also assumed to impair processing efficiency because task-irrelevant thoughts and emotional regulation use up attentional resources necessary for current task demands, and leave fewer resources available for task-switching (Whitmer & Banich, 2007; Whitmer & Gotlib, 2012). Since these factors may also be affected by power (Anderson & Galinsky, 2006; Galinsky et al., 2003; Keltner et al., 2003), then they could mediate the relationship between power and switch costs and were therefore measured in the current study.

Methods

Participants and Design

Eighty-two participants (46 females) were recruited from UCL. Participants took part for £3. One participant was excluded from the analysis for not following instructions regarding the essay topic. Thus, 81 participants (45 females) were included in the final analysis. The average age was 23.4 (*SD*=5.64). The study was a 3(power: powerful, control, powerless) x 2(switch: repeat, control switch, backward inhibition switch) mixed design, with power as a between-subjects factor. Participants were randomly assigned to the power conditions: powerless (*N*=27), control (*N*=28), and powerful (*N*=27).

Materials and Procedure

Power was manipulated similarly to Experiment 3. Subsequently, participants completed the task-switching paradigm on a computer (see Figure 4.7). The task-switching, (adapted from Mayr & Keele, 2000), allowed one to measure set shifting as well as inhibition of previously relevant information. Each stimulus display contained four rectangles arranged into a 2 x 2 matrix. The rectangles varied from each other on one of three dimensions: size, motion, or orientation. Shortly before the rectangles appeared, a centrally presented cue indicated the dimension that should be used to identify the rectangle that differs from the others. The position of the deviant rectangle was randomly selected. Responses were made on keys that have the same spatial position on the number pad as the rectangles on the screen (i.e., keys “1”, “2”, “4”, and “5”). Participants had 20 practice trials, followed by two blocks of experimental trials (each block consisting of 504 trials). For each trial, a central cue indicated the relevant dimension was presented for 100 ms before the presentation of the stimulus display. Participants had unlimited time to respond. After a correct response, a blank screen was presented for 100 ms before the cue for the next trial appeared. After an incorrect response, an error sign appeared for 500 ms before the 100 ms blank screen.

The experiment contained four types of trials. First were repeat trials, where participants focused consecutively on the same dimension (i.e., AA trials). Second were BI trials, where the cue on the current trial was different from the cue on the immediately preceding trial ($n - 1$), but was the same as the cue of two trials back ($n - 2$). These trials have an ABA sequence and can be referred to as ABA trials. Third were control trials, where the cue was different from the cue on the preceding two trials. In addition, the preceding two trials also had to have different cues from each other (i.e., CBA trials). Both CBA and ABA trials were preceded by at least two task switches; the only difference was that the BI trial required participants to switch back to a recently abandoned task, which allowed one to measure the effects of BI. Higher ABA switch costs compared to CBA switch costs indicate stronger BI effects, as more resources (i.e., time) were required to overcome the recently inhibited representation of task A (see Figure 4.8). Lastly, participants also had unclassified switch trials, where a switch trial was preceded by a repeat trial (i.e., BBA trials). The cued dimension was pseudo random, with the constraint that CBA and ABA trials occurred equally often (22% of the time). AA trials occurred 33% of the time. The remaining 23% of trials were BBA trials.

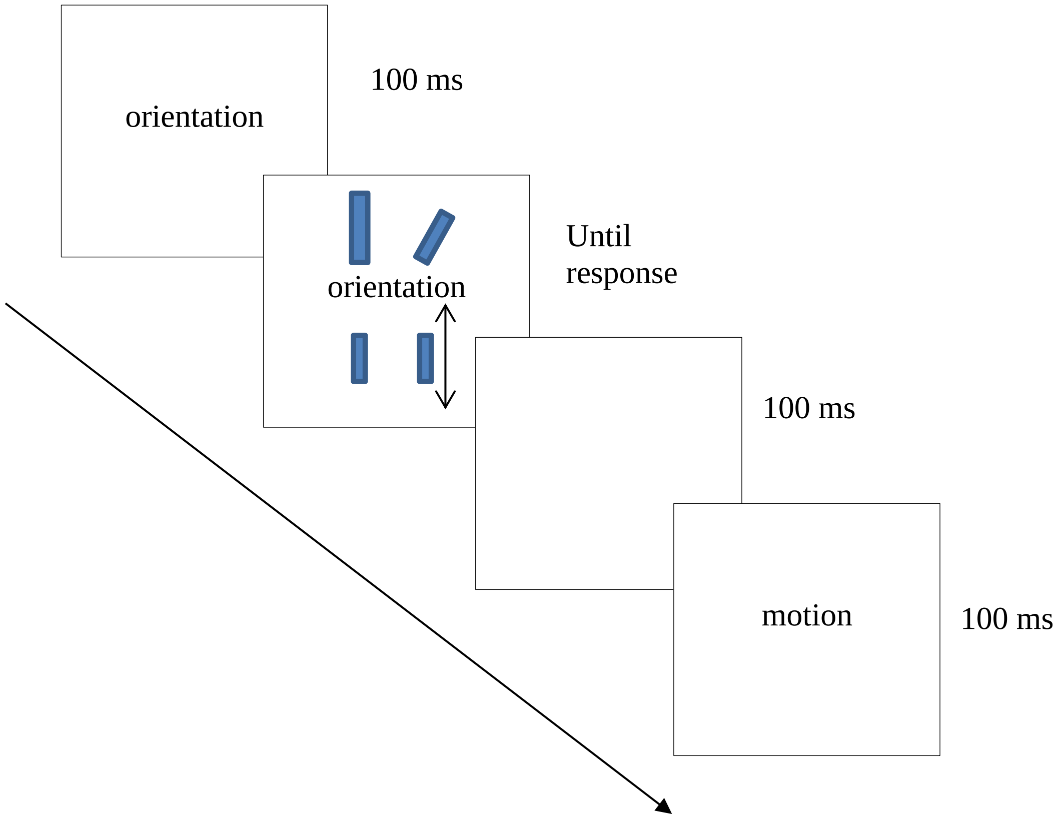

Figure 4.7: Example of a sequence of events in a trial of Experiment 9. Trial onset was indicated by a classification cue which was either "orientation", "color", or "motion". This was followed by the target screen, which remained on the screen until participants indicated their answers.

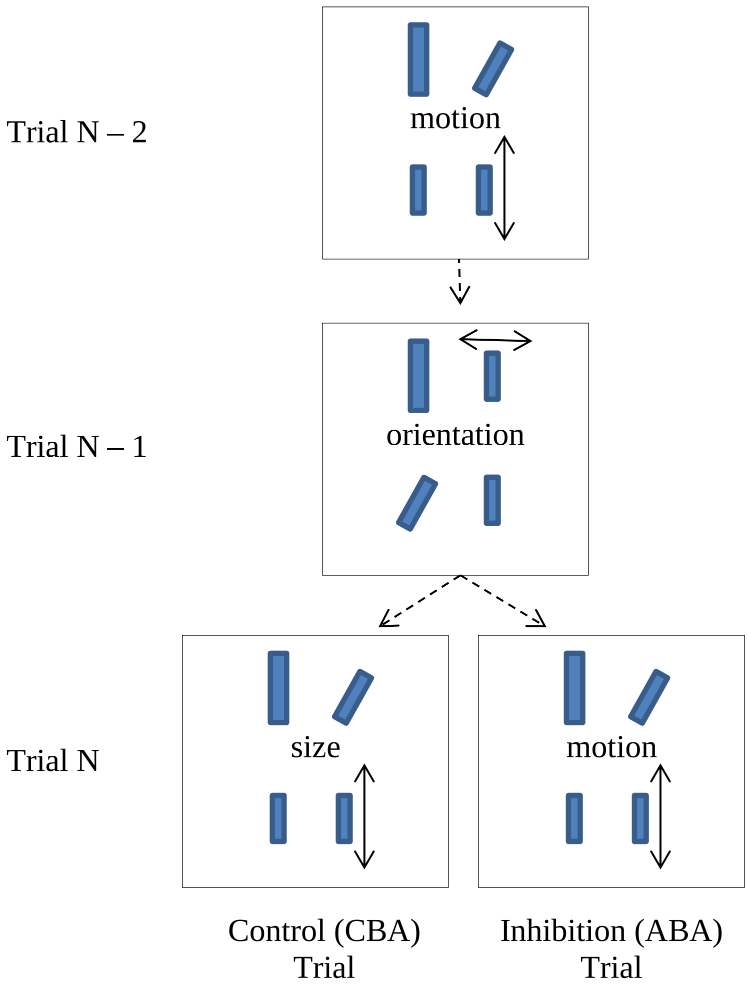

Figure 4.8: Example of a possible control (CBA) sequence and a possible inhibition (ABA) sequence in Experiment 9. Small horizontal or vertical arrows indicate small back-and-forth horizontal or vertical movement of the object. The figure does not represent the exact scaling of the stimuli.

After the task-switching paradigm, participants completed the power manipulation check (similar to Experiment 3) and rated their mood and state anxiety (similar to Experiment 8). Arousal level was also measured by asking participants to indicate how they felt by placing any number ranging from -10 (corresponding to extreme tiredness, boredom, or fatigue) to +10 (corresponding to extreme alertness, hypersensitivity, or excitement) (Dermer & Berscheid, 1972). Questions from the worry domain of the Short Stress State Questionnaire were also administered on a 5-point scale (1 = *never*, 5 = *very often*) to assess the extent of task-irrelevant thoughts (e.g., I feel concerned about the impression I am making) (Helton, 2004).

Results

Manipulation Check

An independent-samples *t*-test revealed that powerful participants felt more control (*M*=5.44, *SD*=2.41) than powerless participants (*M*=3.39, *SD*=1.82), $t(34)=2.89$, $p=.007$, $\eta_p^2=.20$. The manipulation of power was therefore effective.

Reaction-Times

In accordance to the methods used by Mayr and Keele (2000), trials in which RTs exceeded 3 standard deviations from each participant's mean RT, incorrect trials, and the two trials after each incorrect trial, were excluded from the analysis. First, to determine whether power affects task-switching performance, a 3 (power: powerless, control, powerful) x 4 (trial: AA, ABA, CBA, BBA) mixed ANOVA was conducted on RTs, with repeated measures on the second factor. This analysis, yielded a significant main effect of trial $F(3, 78)=8.58$, $p<.001$, $\eta_p^2=.098$. As shown in Figure 4.9, the RTs on repeat trials (*M*=976.8, *SD*=15.7) were faster than the average RTs of all three types of switch trials (*M*=1127, *SD*=18.0), $F(1, 78)=195.6$, $p<.001$, $\eta_p^2=.712$. Neither the main effect of power, $F(2, 78)=0.425$, $p=.655$, $\eta_p^2=.011$, nor the power x trial interaction, $F(2, 78)=0.188$, $p=.829$, $\eta_p^2=.005$, were significant.

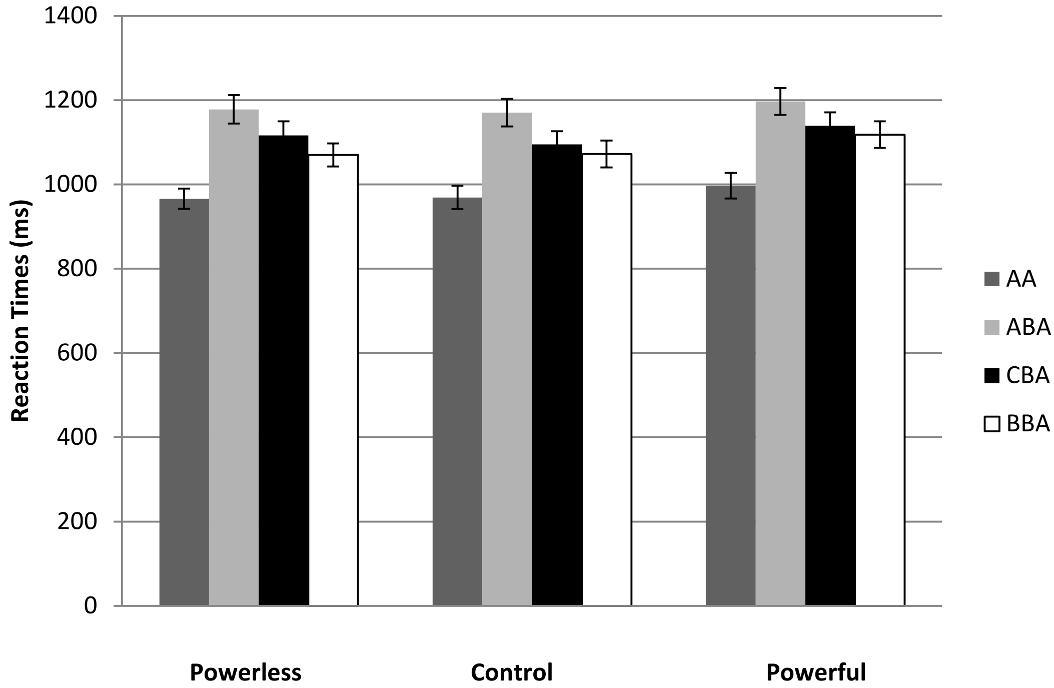

Figure 4.9: Mean RTs for repeat trials (AA) and the three types of switch trials (ABA, CBA, BBA) as a function of power in Experiment 9; error bars represent 1 standard error above and below the mean.

To examine how different types of switch trials affected switch costs, further analyses were conducted. It was found that all of the three switch trials—ABA (M=1181, SD=169), CBA (M=1116, SD=166), and BBA (M=1086, SD=158)—yielded longer RTs compared to AA trials (M=977, SD=142), Fs(1, 78)>144, ps<.001, η_p^2s>.60. Furthermore, RTs on CBA trials were significantly longer than RTs on BBA trials, $F(1, 78)=23.9$, $p<.001$, $\eta_p^2=.235$. Lastly, RTs on ABA trials were longer than RTs on both CBA and BBA trials Fs(1, 78)>81, ps<.001, η_p^2s>.5.

This replicates the classic BI effect. None of these effects interacted with power, *F*s(2, 78)>1, *p*s<.6, η_p^2<.01.

Error-Rates

Participants whose ERs were higher than 3 SDs above the mean were excluded (*N*=3). ERs were then subjected to a 3 (power: powerful, control, powerless) x 4 (trial: AA, ABA, CBA, BBA) mixed ANOVA with repeated measures on the last factor. Again, there was a significant effect of trial *F*(3, 78)=7.82, *p*<.001, η_p^2=.091. Neither the main effect of power, *F*(2, 78)=0.12, *p*=.88, η_p^2=.003, nor the interaction of trial and power, *F*(2, 78)=0.41, *p*=.67, η_p^2=.010, were significant.

To examine how different types of switch trials affected switch costs, further analyses were conducted. It was found that both ABA (*M*=4.00, *SD*=4.28) and BBA (*M*=3.39, *SD*=3.58) trials yielded higher ERs compared to AA trials (*M*=2.54, *SD*=2.61), *F*s(1, 78)>9, *p*s<.004, η_p^2s>.10 (see Figure 4.10). However, CBA trials (*M*=2.96, *SD*=3.60) had only marginally higher ERs than AA trials, *F*(1, 78)=2.78, *p*=.099, η_p^2=.034. Furthermore, ERs on ABA trials were higher than ERs on both CBA and BBA trials *F*s(1, 78)>3, *p*s<.005, η_p^2s>.04. This again replicates the classic BI effect, as switch costs were higher for inhibitory trials compared to control trials. The difference in ERs between BBA and CBA trials was not significant, *F*(1, 78)=2.39, *p*=.13, η_p^2=.029.

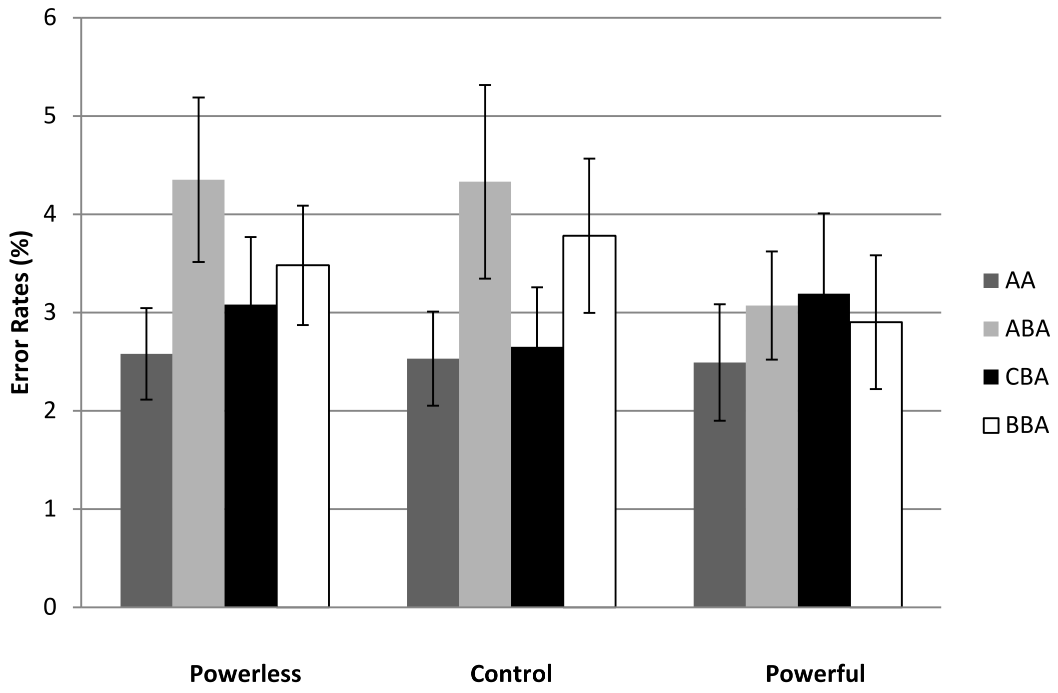

Figure 4.10: Mean ERs for repeat trials (AA) and the three types of switch trials (ABA, CBA, BBA) as a function of power in Experiment 10; error bars represent 1 standard error above and below the mean.

Although the power x trial interaction was not significant for the 3 (power: powerful, control, powerless) x 4 (trial: AA, ABA, CBA, BBA) mixed ANOVA, the power x trial interaction was marginally significant for the 3 (power: powerless, control, powerful) x 2 (trial: ABA, CBA) mixed ANOVA, $F(2, 78)=2.55$, $p=.084$, $\eta_p^2=.06$. This marginal power x trial interaction indicated that power affected BI. As shown in Figure 4.10, higher ERs for ABA ($M=4.35$, $SD=4.35$) compared to CBA ($M=3.08$, $SD=3.57$) trials were significant for powerless $F(1, 26)=4.42$, $p=.045$, $\eta_p^2=.145$ and control participants ($M=4.33$ vs 2.65, $SD=5.21$ vs 3.21), $F(1, 27)=9.22$, *p*=.005, η_p^2=.255, but was not significant for powerful participants (*M*=3.33 vs 3.17, *SD*=3.07 vs 4.09), *F*(1, 25)=0.058, *p*=.812, η_p^2=.002.

Lastly, power did not affect mood (α=.88), state anxiety (α=.93), rumination (α=.81), and arousal level, *p*s>1.

Discussion

Experiment 9 showed that overall switch trials were more costly than repeat trials in terms of both RTs and ERs. In addition, an overall BI effect was also found on RTs and ERs. These results are in line with the predictions and replicate previous findings in the task-switching literature (Mayr & Keele, 2000; Monsell, 2003). These results also indicate that ABA trials are the most difficult switching sequence as it yielded highest ERs and longest RTs. This not surprising as switching during an ABA trial involves both inhibition of the current task set plus re-activation of a highly inhibited task-set.

Although the BI effect was replicated in the current study, the pattern was opposite to what was predicted with regards to powerless and powerful conditions. That is, powerless participants actually showed the BI effect in both ERs and RTs, whereas powerful participants only showed the BI effect in RTs and not ERs. Since powerless participants showed the BI effect, then the extra resources required for ABA indicates that they were able to successfully inhibit irrelevant task-sets during task-switching. This suggests that the deficits in task-switching found in Experiment 8 could be primarily due to deficiencies in executive resources required for NISPs (Monsell, 2003).

The fact that powerful participants did not display the BI effect in ERs can be taken as evidence for decreased inhibitory executive abilities, but it can also indicate that they can flexibly and rapidly refocus attention on task-relevant information and reactivate recently inhibited information. That is, powerful participants were able to successfully employ the inhibition system during task-switching, which is why they needed to recruit more resources (i.e., time) during an ABA sequence. The extra employment of resources (i.e., longer RTs) was enough for powerful participants to overcome the BI effect and decrease the likelihood of making an error. Therefore powerful participants do not exhibit the BI effect in terms of ERs. On the other hand, powerless and control participants also recruited more resources to overcome the BI effect, but having longer RTs were insufficient for decreasing ERs. Therefore powerless and control participants exhibited the BI effect in both RTs and ERs. This explanation is likely since high power has been generally associated with greater attentional flexibility compared to low-power individuals (Guinote, 2007b; Smith et al., 2008).

However, it is important to point out that, contrary to what was predicted and found in Experiment 8, power did not affect overall switch cost in the current experiment. This inconsistency could be due to the congruency sequence effect (CSEs). CSE is the observation that there are smaller costs in performance after incongruent, than congruent, trials (Gratton, Coles, & Donchin, 1992). For example, inhibitory performance on a Stroop task can vary depending on the proportion of congruent (trials that do not require inhibition) and incongruent trials (trials that require inhibition) in a list (Bugg, Jacoby, & Toth, 2008). Performance is usually higher for lists with mostly incongruent trials, as compared to lists with equally occurring incongruent and congruent trials, even when the former list requires participants to be actively engaged in inhibitory processes.

According to the conflict monitoring model, CSE occurs because of response conflicts (e.g., the need to employ executive control such as inhibition) elicited by previous trials (Botvinick et al., 2001; Yeung, Botvinick, & Cohen, 2004). That is, prior response conflicts increases one's attention to task-relevant stimuli in the current trial. Moreover, in a context with mostly incongruent trials, participants can use frequencies to predict what type of trial is most likely to occur next, and can therefore encourage a preparatory, goal-driven control mechanism that is implemented in a sustained fashion across all trials (Bugg et al., 2008). This proactive control mechanism makes it easier to maintain the inhibition goal at the focus of attention. However, a context with equal congruent and incongruent trials demands a more flexible control mechanism because of the inability to anticipate the upcoming trial type and to prepare control processes accordingly.

Since powerlessness decreases one's ability to actively maintain a goal in WM and to initiate a goal (Slabu & Guinote, 2010; Smith et al., 2008), a phenomenon known as goal neglect, then they should be more susceptible to the CSE. Indeed, it has been found that powerlessness decreases one's ability only in situations when it is difficult to maintain the goal within the focus of attention, such as in the absence of external cues (Kane & Engle, 2003). In their study, Smith et al. (2008) gave participants two types of Stroop tasks. In the no-congruent Stroop task, almost all trials were incongruent and hence participants had to employ executive functions on the majority of the trials in order to override their prepotent response. This type of Stroop task continuously prompts participants to maintain the inhibition goal. On the other hand, the majority-congruent Stroop task is more demanding and relies more heavily on attentional control because participants are required to rely on their own executive ability of remembering, initiating, and acting on the task goal of inhibiting prepotent responses. Powerlessness only decreased inhibition ability in the majority-congruent Stroop task and not in the no-congruent Stroop task.

Based on these results and previous literature on CSE and power, the inconsistent finding in switch cost may be due to the different attentional and control mechanisms that were elicited by the task-switching paradigms used in Experiments 8 and 9. Since the percentage of switch trials in the current experiment (77%) were higher than the percentage of switch trials in Experiment 8 (40%), it is possible that it was easier for participants to maintain the goals for all tasks in a state of higher readiness. Encountering more switch trials in Experiment 9 might have better prepared participants to deal with switching situations and increased attention in monitoring response conflicts, such as inhibiting the residual interference from a previous task-set. In contrast, it was more difficult to maintain and activate the switching goal in Experiment 8, as there were lower percentages of switch trials. It is therefore possible that powerless participants could have exhibited inhibitory deficits associated with task-switching during Experiment 8.

In sum, the current experiment showed that there was no effect of power on overall switch cost and powerless participants exhibited the BI effect. This suggests that, at least in the context of the current task-switching paradigm, powerless participants were able to successfully inhibit irrelevant task-sets. The inconsistent effect of power on switch costs from Experiment 8 and 9 indicate that, similar to what was found before regarding inhibitory deficits using the Stroop paradigm

(Smith et al., 2008), powerless participant's task-switching abilities may be highly context dependent, such as on the proportion of switch trials. Future studies could test for this possibility by systematically varying the percentage and type of switch trials per block.

4.5 Experiment 10: Self-reported multitasking ability

Thus far the studies only examined power relations temporarily induced in the laboratory, and mostly with university students. It has not yet investigated how existing, real-life power roles affect performance in multitasking situations encountered outside the laboratory. Moreover, since students have little experience of power, it is important to test the ecological validity of the previous findings. The aim of Experiment 10 was to find further support for the claim that powerlessness decreases the ability to multitask, and also to provide evidence for the ecological validity of this hypothesis. Moreover, Experiments 7-9 focused on actual multitasking ability, whereas the current experiment investigated whether power affects *perceived* ability to multitask. This is important as actual multitasking performance may not always relate to self-conceptions of multitasking ability since in certain behavioral domains, beliefs about the self have been found to be only weakly correlated with actual abilities and traits (Dunning, Heath, & Suls, 2004).

Self-reported multitasking ability was measured using the Attentional-Control-Scale (ACS; Derryberry & Reed, 2002) and two subscales (goal planning and implementing) of the Self-Regulation-Questionnaire (SRQ; Brown, Miller, & Lawendowski, 1999). The ACS measured an individual's ability to focus and shift attention between various tasks. The SRQ measured the ability to plan, implement, and maintain behavior when faced with multiple demands. Participants held actual powerful (manager) and powerless (employee) roles in organizations. Managers had specific institutional power over many people's outcomes in the workplace. It was predicted that individuals in a subordinate, compared to a managerial, position will report lower multitasking ability as they have lower WM resources available for controlling attention in demanding multitasking situations.

Methods

Participants and Design

Forty-nine full-time employees (23 managers and 26 subordinates) participated voluntarily in this experiment. Managers (five females) worked in a variety of businesses (e.g., banking, technology, education). All managers had subordinates under their supervision. Eleven managers (48%) occupied middle management positions, and 12 (52%) occupied top management positions. Thirteen percent had five or fewer subordinates, 39% had 5 to 25 subordinates, and 48% were in charge of more than 25 subordinates. Managers were aged between 26 and 54 years (*M*=42.7, *SD*=8.14). All employees were in subordinate positions (13 females) and worked under the supervision of one or more managers. Most subordinates (75%) were office workers in clerical positions (e.g., advisors, administrators, assistants). The subordinates were between 19 and 56 years old (*M*=32.2, *SD*=9.03), and none of them had personnel responsibilities. This experiment was a between subjects design with two different power conditions (managers vs. subordinates).

Materials and Procedure

Participant's self-reported multitasking ability was measured using the ACS (Derryberry & Reed, 2002) and the SRQ (Brown et al., 1999). The ACS contains 20 items measuring one's ability to focus attention when faced with distracting opportunities to multitask (e.g., *It's very easy for me to concentrate on a difficult task when there are noises around*), one's ability to shift attention between different tasks (e.g., *I can quickly shift from one task to another*), and one's ability to balance attention during dual-tasking (e.g., *It is easy for me to read or write while I'm also talking on the phone*).

Two subscales of the SRQ were also administered. These subscales consist of 17 items measuring one's ability to make plans and decisions when faced with multiple demands (e.g., *I can easily make up my mind about things*) and one's ability to implement plans (e.g., *I have so many plans that it's hard for me to focus on any one of them,* reverse coded). Participants rated their responses on scales ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Participants were thanked for their participation at the end of the questionnaire.

Results and Discussion

The results of the ACS and the two subscales of the SRQ were averaged into one score (α=.91). To ensure that differences in age and gender across managers and subordinates did not account for the effects of power, these factors were included in the analyses. Gender did not affect ACS and SRQ, p>.3, therefore this factor was not considered in further analyses. An ANCOVA was then conducted on the averaged ACS-SRQ scores, with power (subordinate vs. manager) as a between subjects factor, and age as a covariate. This analysis yielded a significant effect of power $F(1, 46)=13.59$, $p=.001$, $\eta_p^2=.23$. As predicted, the self-reported ability to control attention during multitasking and to deal with the difficulties of planning and implementing plans when faced with multiple goals was lower in subordinates ($M=3.30$, $SD=0.41$) compared to managers ($M=3.88$, $SD=0.40$). No other effects were significant.

In sum, being in a naturally occurring subordinate (vs. managerial) decreased reported ability to self-regulate during the pursuit of multiple goals. Subordinates reported lower ability than managers in various multitasking domains, including balancing attention between multiple goals and implementing multiple tasks and plans. One possible alternative explanation for the lower ability reported by subordinates is that managers were less likely to admit that they have problems with multitasking. This is likely as multitasking ability is an important and desirable ability to possess and it has also been suggested that these estimations of personal abilities are not correlated with actual multitasking ability (Sanbomatsu et al., 2013). In addition, one may argue that individuals who ultimately achieve senior levels of management differ in their abilities and motivations from those who do not.

Therefore pure reliance on self-reports limits the conclusions that can be drawn. However, differences observed here were also found in Experiments 7-9, where actual multitasking ability was measured and power was randomly assigned to participants. Taken together, these results indicate that lower reported abilities by subordinates (vs. managers) were not due to biased sampling or reporting, but may reflect a direct effect of real-life power on actual multitasking ability. Experiment 10 also showed that powerless participants' multitasking tendency found in

Experiments 1-6 were not influenced by their perceptions of their ability to multitask. That is, even though powerless individuals realize their multitasking deficiency, they still displayed a higher multitasking tendency.

4.6 Summary and conclusions

The current chapter predicted and found that powerless individuals have lower actual and self-reported multitasking ability in demanding situations compared to control and powerful participants. This difference in multitasking ability was found using both experimentally manipulated power as well as naturally occurring power structures. Although decision theories suggest that people should multitask when they are good at it and expect to benefit from it (Ajzen & Fishbein, 1980; Einhorn & Hogarth, 1981; Sanbonmatsu & Fazio, 1990), but these results showed that multitasking behavior may not be contingent on (actual as well as perceived) multitasking ability and the associated consequences and outcomes. However, it is important for future research to consider paradigms other than the ones used in order to assess the generalizations of the findings, especially to situations that require high goal-monitoring.

Chapter 5:

General Discussion

5.1 Overview of findings

5.1.1 Multitasking Intention and Behavior

The current thesis addressed the research questions of whether social power, which is highly malleable and easily manipulated across various contexts, can impact the way individuals pursue multiple goals and whether it influences performance during multitasking. The first empirical part of the thesis (Chapters 2 and 3) provided an initial examination of how social power affects the strategies that individuals engage in when pursuing multiple goals. It was hypothesized that reduced power should generate more interruptions and a preparedness to multitask because powerlessness is associated with vigilance and attention to multiple sources of information (Fiske, 1993; Guinote, 2007b; Keltner et al., 2003). Thereby, powerless individuals have less clear priorities and should be more likely to pursue multiple goals either simultaneously or with frequent switches between the various tasks. In contrast, given that high power is associated with attentional focus and prioritization (Guinote, 2007a, 2007b), then high power should trigger a single-tasking mindset, with effort and behavior geared towards the pursuit of one goal at a time.

These predictions were supported in Experiments 1-6. Power was found to have an effect on the pursuit of multiple goals as powerless participants have a higher multitasking intention during the preactional phase of goal pursuit, as well as a higher multitasking behavior during the actional phase of goal pursuit. In contrast, powerful participants were more likely to single-task. Control participants were in between these two groups. This pertained to both self-reported multitasking tendency (Experiments 1 and 3), planning between different tasks (Experiments 2 and 3), as well as actual behaviors across multiple tasks (Experiments 4 and 5). The current thesis also looked at whether power affects individuals' prioritization of a single goal when given multiple different goals to pursue (Experiments 4-6). It was found that low power decreases, whereas high power increases, prioritization in the context of multiple-goal pursuit. Prioritization tendency mediated the relationship between power and multitasking behavior (Experiments 4 and 5).

Although powerholders were more likely to prioritize a single goal and to engage in monochronic (vs. polychronic) behaviors than powerless participants, but this tendency did not affect the number of tasks that participants chose to pursue during the predecisional phase of goal pursuit (Experiment 6). Instead, powerholders were actually *more* likely to take on an additional goal compared to powerless and control participants. This is in line with previous studies showing how high power increases one's tendency to approach goals and to seize all opportunities for goal pursuit (Galinsky et al., 2003; Guinote, 2007c; Keltner et al., 2003), and highlights the idea that power only affects the *strategies* employed to pursue multiple goals but does not decrease the *aspiration* to achieve multiple goals. This behavior can be beneficial for powerholders as forgoing goal opportunities may make its attainment less likely in the future. Especially if the second goal is important, emerging problems for its attainment need to be registered and taken into account instead of only focusing attention on a single task.

The current thesis also addressed the moderating role of goal orientation (Experiment 3) and goal difficulty (Experiment 5). Goal orientation was found to affect multitasking tendency in powerful individuals, as they were more likely to switch to an additional task if it was framed as a prevention-focused goal (where switching prevents negative loses) compared to when the consequence was unspecified. Moreover, Experiment 5 provided strong evidence for the link between powerlessness and multitasking behavior by manipulating task difficulty. In this experiment, the difficult goal was generally avoided by control and powerful participants, but not by powerless individuals, who continued to switch equally between the difficult and easy goals. Therefore, regardless of the task type, powerless individuals still switched to it, which reflected a strong preference for multitasking behavior.

Lastly, powerless participants had higher confidence levels compared to control and powerful participants (Experiments 4 and 6), and also had higher differences in confidence between two goals (Experiment 6). Although the increased confidence level of powerless participants is inconsistent with past literature (Min & Kim, 2013; Morrison et al., 2011) , but, as mentioned earlier in the thesis, providing participants with choices in the context of multiple-goal pursuit may increase confidence levels in powerless individuals (Ariely & Norton, 2008; Leotti et al., 2010). Interestingly, the link between power and prioritization in the context of multiple-goal pursuit was mediated by confidence levels as well as the difference in confidence between the two goals (Experiment 6). That is, powerless participants had higher overall confidence and viewed their abilities to be equal in both goals, which decreased the likelihood of prioritization. On the other hand, powerful participants had less confidence in their ability to pursue both goals and had higher confidence in one goal compared to the other, which enhanced prioritization. This mediation is in line with previous studies showing how individuals are more likely to multitask when they have inflated views of their abilities (Sanbonmatsu et al., 2013; Schmidt & DeShon, 2007), and when they have relatively similar levels of self-efficacy across the various tasks (Ashford & Northcraft, 2003). Prioritization can ensure that powerholders will successfully complete at least one of the goals, which is a common approach when confidence and goal expectation are low. However, in Experiment 4, confidence levels did not mediate the relationship between power and prioritization, and the relationship between power and multitasking behavior. Therefore more research is needed to understand the mediating effect of confidence between power, prioritization, and multitasking.

Together, converging evidence from different measurements of multitasking tendency (i.e., self-reports, planning, and actual behaviors) and power manipulations (i.e., individual differences, priming, and hierarchical role assignment) from Experiments 1-6 provided compelling evidence of a general negative relationship between power and multitasking tendency. The negative relationship between power and multitasking tendency is in line the hypotheses and with past studies, which were based on the idea that powerless individuals process more information and are more attentionally defocused, and processing more information can increase multitasking. For example, previous theories (Fiske, 1993; Guinote, 2007a; Keltner et al., 2003) and empirical findings of power (De Dreu & Van Kleef, 2004; Goodwin et al., 2000; Gruenfeld et al., 2008; Guinote, 2007c, 2008; Neuberg & Fiske, 1987; Overbeck & Park, 2006; Slabu & Guinote, 2010; Weick & Guinote, 2010) support the idea that powerless individuals operate under a divided attention and treat all information as equally important regardless of their relevancy. This is because low-power individuals are either unwilling (due to motivational factors) or unable (due to attentional control abilities) to inhibit irrelevant information in favor of goal-relevant information. On the other hand, powerholders are more attentionally focused on their current goal, and prioritize information that can help them achieve that particular goal and ignore distracting information that may impede goal pursuit.

The current findings also coincide with past research on multitasking, which showed how individuals were more likely to multitask in highly volatile and unpredictable situations because they need to be vigilant and pay attention to external factors (Kernan & Lord, 1990; Schmidt & DeShon, 2007). Moreover, decreased inhibitory ability and increased distractibility, factors that are associated with powerlessness, predicted multitasking tendency in previous studies as well (Cain & Mitroff, 2011; Ophir et al., 2009; Sanbonmatsu et al., 2013; Shah et al., 2002).

5.1.2 Multitasking Ability

The paradigms used in thus far in the thesis were designed to only measure multitasking tendency and not to investigate multitasking ability. It is therefore possible that power does not affect performance on relatively simple tasks that were used in Experiments 4 (ERs: M=0.014, SD=0.017) and 5 (ERs: M = 0.016, SD = 0.023), but will have an effect on tasks that are more attentionally demanding. In order to address the second aim of the thesis, multitasking ability was assessed directly in Chapter 5 by using dual-tasking (Experiment 7) and task-switching paradigms (Experiments 8 and 9) that were designed to measure multitasking ability.

It was hypothesized that powerless individuals should have less WM capacity available compared to their control and powerful counterparts, which should translate to poorer multitasking ability. Consistent with the hypothesis, powerless participants' dual-task costs were greater compared to control and powerful participants, suggesting that they had less WM capacity and less ability to manage multiple tasks in parallel (Experiment 7). Likewise, switching between two different task-sets also incurred higher switch costs for powerless than control and powerful participants (Experiment 8). Finally, using a sample of real-life managers and subordinates and self-reported multitasking ability, Experiment 10 provided ecologically valid support for the hypothesis that powerlessness impairs multitasking ability. However, the extent to which power affects multitasking ability may be dependent on the context, such as whether or not it encourages or prevents goal neglect (Experiment 9). This is similar to the finding by Smith et al. (2008), who showed that powerlessness decreases inhibition ability, but only in no-congruent as opposed to majority-congruent Stroop trials. Therefore deficits of powerlessness may only be manifested in contexts where there is a high likelihood for goal neglect.

It is also important to note that sex did not moderate any of the effects, as the relationships between power and multitasking were equally strong for men and women. This goes against some studies suggesting that women are more likely to multitask than men (Schneider & Waite, 2005), and the assumption that women are superior multitaskers (Fisher, 1999; O'Connell, 2002). However, limited studies examining gender differences in multitasking tendency have been inconsistent (Buser & Peter, 2012; Foehr, 2006), and research suggests that multitasking ability is more likely to be associated with executive control than inherent gender differences (Ren et al., 2009; Strayer, Medeiros-Ward, & Watson, 2013). Moreover, these consistent effects of power on multitasking across both genders might seem surprising, as men have been shown to be more ‘power-oriented’ than women in various ways. For example, men show a stronger preference for hierarchical relations (Pratto, Stallworth, & Sidanius, 1997), perceive relationships as more hierarchically organized (Mast & Hall, 2004), and are more likely to assume leadership positions (Johnson, Eagly, Karau, & Miner, 1994). However, the findings are consistent with previous work that has found men and women to be similarly affected by possessing power (e.g., Anderson & Berdahl, 2002; Galinsky et al., 2003). Thus, in spite of the fact that men and women have traditionally differed in their power experiences on a societal level, but they are similarly affected by the possession and feeling of power.

In sum, these findings demonstrated that those in high-power positions choose to single-task whereas powerless individuals prefer to multitask, even though they have lower multitasking ability. These findings are consistent with the hypotheses, as well as with previous research on power and single-goal pursuit and theoretical propositions that powerlessness is associated with multiple constraints. The next section will discuss the possible mechanisms for these results in more detail. Theoretical as well as practical implications of the findings for research on social power and on multiple-goal pursuit will then be presented. Lastly, the limitations of the empirical studies both with regard to the power manipulations implemented and the measures of multitasking tendency and performance will be discussed. The discussion will conclude with prospects for possible future directions of the current research.

5.2 Possible Mechanisms

A critical question concerns the underlying mechanisms through which hierarchical interpersonal relationships affect multitasking tendency and ability. One possibility is via attentional focus and information seeking tendencies. First, as argued in the Introduction (Chapter 1), powerlessness might increase multitasking because it creates a threatening and unpredictable environment and leads people to attend more to potential dangers and additional information, goals, and concerns (De Dreu & Van Kleef, 2004; Fiske, 1993; Guinote, 2007a; Keltner et al., 2003). This alters the amount of information that individuals are willing and able to inhibit. The proposed mechanism was supported by the finding that spontaneous prioritization mediated the relationship between power and number of switches made (i.e., multitasking behavior; Experiments 4 and 5). Since prioritization indicates a cognitive orientation associated with greater attentional focus (Ophir et al., 2009; Guinote, 2007a; Shah et al., 2002), then this mediation supports the idea that multitasking tendency relies on the effect of power on information processing styles.

The current thesis also proposes that the effect of power on multitasking tendency and ability is initially voluntary and caused by a motivation to seek more information. This motivational account is supported by the fact that powerless individuals voluntarily attend to multiple information, even when attentional demands are low and WM capacity is not compromised (Fiske, 1993; Guinote, 2007c; Weick & Guinote, 2010). For example, when participants read simple traits of a target person at their own pace, those without power carefully read all information provided. In contrast, powerful participants focused more on some traits whilst disregarding others (Fiske, 1993). This effect is also consistent with the observation that across primate species, subordinates are motivated to pay more attentions of their superiors and to encode more information compared to their dominant counterparts (see Fiske, 1993; Shepherd et al., 2006).

Powerless participants are also more willing to attend to possible challenges and threats in the environment (Keltner et al., 2003). For instance, prior to making a decision, powerless individuals seek more information in order to weigh the different opportunities for action, such as the opinions of other people (Galinsky, Magee, Gruenfeld, Whitson, & Liljenquist, 2008). On the other hand, powerholders disregard other information and only focus on rewards. It has been consistently found across various studies that powerful people attend to information more selectively, inhibit peripheral information and vary their attentional focus as a function of the demands of the situation (Guinote, 2007a; Guinote et al., 2012; Slabu & Guinote, 2010). They may therefore be focused on a single task and do not want, or see the need to, attempt other ones.

As a consequence, powerless individuals might by default be drawn to multiple goals and concerns, whereas the tendency for powerholders to single-task is consistent with their motivation to focus attention more narrowly across various domains. Such behaviors are motivational in nature (Fiske, 1993; Fiske & Neuberg, 1990; Goodwin & Fiske, 1996), and do not seem to derive from reduced WM capacity. Furthermore, this conjecture is indirectly supported by the finding in the present thesis, because the tasks used to measure multitasking behavior were relatively simple and do not require WM capacity (Experiments 2-5). Yet even in these conditions, powerless participants still switched more between the tasks than control and powerful participants, which supports the assumption that power creates a motivational force towards multitasking intention and behavior.

Furthermore, if powerless individuals worry more and are vigilant to external cues and information in order to detect potential threats and to increase stability and control (Fiske, 1993; Guinote, 2007a; Keltner et al., 2003), then they should be operating under a divided attention and are motivated to treat all inputs as equally important. Processing excessive information exhausts WM capacity, which diminishes one's ability to willfully allocate attention between various demands and thus affecting multitasking ability. In contrast, living in a resource-abundant and constraint-free environment assures security and control, which can then *allow* powerholders to selectively focus their attention and to inhibit distractors (i.e., to prioritize relevant information). Remaining cognitive resources can then be employed to control attention in demanding multitasking situations.

Although high multitasking tendency and low multitasking ability in powerless individuals may depend initially on the states and needs of the performer and the corresponding attentional and prioritization strategies that they voluntarily choose to adopt, but this relationship can be bidirectional. This is because WM capacity is necessary for keeping priorities, coordinating information, and decreasing interference from competing tasks (Cain & Mitroff, 2011; de Fockert et al., 2001; Kane & Engle, 2003; Ophir et al., 2009). Therefore decreasing WM capacity by being motivated to divide attention and exhibit a multitasking mindset can render powerless individuals even more distractible and susceptible to competing external stimuli or internal thoughts, and contribute to further reductions in WM capacity (for similar issues in the domain of mind-wandering see Smallwood

& Schooler, 2006). As shown in Figure 5.1, cognitive deficits in powerless individuals may be responsible for further development as well as maintenance of multitasking tendency in the future. Thus powerless individuals may also be less *able* (instead of only less *willing*) than powerful individuals in focusing on a single goal and to block out additional tasks and pursuits. On the other hand, having a focused attention may promote a productive cycle of social power. Those high in power have higher prioritization and attentional focus than the powerless, which can generate a focused attention and a single-tasking mindset. Having an initially focused behavior may in turn enhance single-tasking even more by encouraging better attentional control over time.

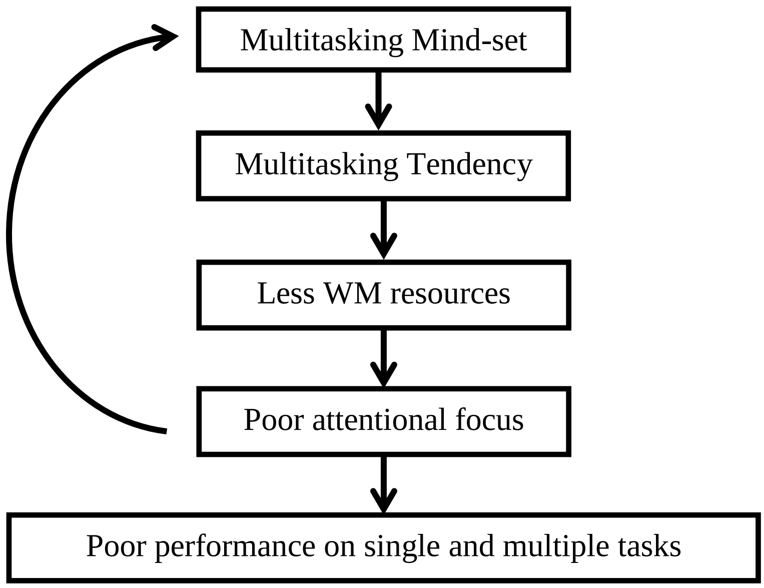

Figure 5.1: Relationship between power, attention, and multitasking.

This bidirectional interpretation is consistent with previous proposals that once people multitask, fractured thinking can persist even when they are no longer multitasking, which can lead to increasingly higher distractibility and lack of focus (Ophir et al., 2009). It may also explain why the tendency to multitask has little relation to multitasking performance (Konig et al., 2005; Ophir et al., 2009). For example, previous researchers have suggested that chronic exposure to multitasking may lead to a broadening of attentional filters and lowers the level of executive control (Ophir et al., 2009). It may also explain the somewhat counterintuitive results of the current thesis, as powerless individuals, who lack the necessary executive control resources to perform multiple tasks effectively, are also more apt to multitask than powerful people with abundant resources. However, currently there lacks direct empirical evidence for this possible vicious cycle where the multitasking mindset of powerless individuals and the single-tasking mindset of powerful individuals are reinforced. Hence future studies could investigate whether WM capacity or attentional control mediates the relationship between power and multitasking tendency.

In sum, the current thesis proposed that powerless individual's multitasking tendency is primarily motivational and linked to the needs and multiple demands faced by these individuals. Vigilance and attention allocation to multiple demands can also instill a multitasking mindset, which in turn consumes WM resources and decreases attentional focus and multitasking ability. Since the reverse relationship is also possible, then powerless individuals' reduced WM capacity and inability to focus attention could further enhance multitasking behavior, despite the potential losses of doing so. Unfortunately, it is still unclear what causes increased motivation to treat all tasks as equally important (vs. prioritizing a single task). In order to deepen our understanding of the relationship between power and multiple goals, further research will need to elucidate the mechanisms underlying the present findings. This can be done by investigating additional factors (e.g., worrying thoughts and concerns, vigilance, or need for control and predictability) that can mediate the relationship between power, WM capacity, and multitasking tendency.

5.3 Implications of the Present Results

5.3.1 Theoretical Implications

The current thesis integrated two literature domains, the research on social power and on goal pursuit, which results in potential contributions to both of these areas. It will first discuss the important implications for the literature on social power, attention, and behavior. Specifically, the findings speak for the divided attention strategies of powerless individuals (Fiske, 1993; Keltner et al., 2003) and the selective attention and prioritization of relevant information in powerful individuals that were proposed by the SFTP (Guinote, 2007a). Previously, support for the theory that power increases prioritization came from literatures on person perception, decision making, and single-goal pursuit. For example, in past studies, powerless participants voluntarily attended to multiple attributes in a person, as opposed to selectively attending to only salient, stereotypic (Fiske, 1993; Guinote & Phillips, 2010), or goal-relevant (Gruenfeld et al., 2008; Gruenfeld, 1995; Overbeck & Park, 2001, 2006; Vescio et al., 2003) attributes. Moreover, indirect empirical support for the SFTP came from the context of single-goal pursuit, where powerful, compared to powerless, individuals had higher attentional focus when pursuing a single goal (Guinote, 2007b; Smith et al., 2008), had higher accessibility of goal-relevant information (Slabu & Guinote, 2010), and displayed more focal goal-directed behaviors upon encountering distracting action opportunities (Guinote, 2008). In contrast to prioritizing a focal goal, powerless individuals treated all goals and tasks as equally important were more likely to consider distracting alternatives for action and to incorporate these new opportunities into their plans (Guinote, 2007c; Guinote, 2008; Overbeck & Park, 2001; Overbeck & Park, 2006; Vescio et al., 2003).

Thus support for the SFPT has been previously found by showing attentional focus and prioritization in powerhodlers in the context of social perception and single-goal pursuit. Here it showed, for the first time, that power leads to greater attentional focus and prioritization even when participants were given the opportunity to divide their attention between multiple tasks in the environment. This is an important extension from previous studies because in the domain of single-goal pursuit, only one task or goal was assigned or activated in a particular situation and all other tasks were considered irrelevant or were distractors that can impede goal pursuit. However, in the context of multiple-goal pursuit, there are a number of goals to obtain and tasks to work on, all of which are potentially relevant and important. These findings can therefore advance previous theories of power and provide direct support for the SFTP (Guinote, 2007a). That is, even in situations where all tasks are relevant, powerful, compared to powerless, participants were still more likely to spontaneously prioritize only one of the tasks and to approach multiple potential goals by single-tasking. It suggests that powerholders not only neglect information that is irrelevant to the current context, but they also choose to momentarily inhibit multiple goals so that they are constantly prioritizing and focusing on a single task.

On the other hand, the defocused attention that powerless individuals exhibited during single-goal pursuit also translates to multitasking behavior, as powerless individuals were more likely to multitask than single-task. Therefore the current thesis can extend previous research on power and goal pursuit, and confirm the idea that powerless participants are more inclined to attend to multiple sources of information. Moreover, the current work allows one to look at the implications of the SFTP in more ecologically valid situations of pursuing multiple goals. Together with findings in the domains of social perception, decision making, and single-goal pursuit, the present research unravels a deep rooted tendency of powerless individuals to dilute priorities and to activate divided mindsets, intentions, and behaviors between multiple sources of information and action opportunities.

In addition, past studies suggest that individuals with strong approach orientation to rewards or gains may be especially enticed to multitasking because of the high potential for rewarding outcomes (König, Oberacher, & Kleinmann, 2010; Sanbomatsu et al., 2013). In contrast, people who are avoidance oriented, that is, those that are risk averse and sensitive to losses or punishments, may be more inclined to focus on a single task, rather than on multiple tasks because of the higher potential losses associated with trying to do more in a short period of time. Since powerholders were less likely to multitask than powerless individuals, then these results suggest that high power may not always promote approach-related behaviors (Keltner et al., 2003). Instead, the current thesis suggests that approach-related behaviors exhibited by powerholders may be a consequence of their focused attention and tendency to prioritize their goals. That is, whether or not powerholders exhibit approach-related behaviors depends on situational factors. Under multitasking situations, powerholders were less likely to multitask, even though multitasking generally entails greater potential rewards than single-tasking. Therefore powerholders are not always oriented towards attaining greater rewards, but their behaviors are guided more by their tendency to prioritize and focus attention on a single source. Similarly, powerless individuals, who live in more dangerous environments, usually act in a more inhibited and cautious manner such as taking longer to deliberate (Guinote, 2007c; Keltner et al., 2003). However, their divided attention and mindset can lead to harmful behaviors that can yield greater losses, such as through multitasking.

The effect of power on multitasking tendency also expands our knowledge about the links between power and goal pursuit. That is, how power influences single-goal pursuit may be affected by the way individuals pursue multiple goals (see Figure 5.1). It was previously found that powerless individuals take longer to act (Galinsky et al., 2003), take longer to set goals and to initiate goal pursuit, are less flexible, cannot easily maintain goal-directed behavior (DeWall et al., 2011; Guinote, 2007c, 2008), and have decreased goal-accessibility (Slabu & Guinote, 2010). The current research suggests that these impairments in single-goal pursuit may, in part, derive from a readiness to multitask. This is because even when background goals are not visible to the observer (see Shah & Kruglanski, 2002) and participants are not visibly multitasking, the multitasking mindset of powerless individuals could still be harmful. Therefore having a multitasking mindset may be the reason why low-power individuals are less capable than high-power individuals at keeping the primary goal at the focus of their attention.

This interpretation is in line with Kruglanski et al.'s (2002) theory of goal systems, which suggest that active goals in memory can compete for limited attentional resources. Since goals do not exist in isolation, and the pursuit of a single goal is usually embedded within a number of competing demands, then being highly concerned with multiple goals and tasks can affect performance and commitment to a focal task (Shah & Kruglanski, 2002). Even when powerless individuals are only assigned one task to complete, but having a multitasking mindset decreases their ability to shield additional goals from interfering with performance on the focal goal. In addition, decisions made in conflictual situations are characterized by inconsistent behavioral intentions and take longer due to the negotiation process between the various goals (Fishbach, Friedman, & Kruglanski, 2003). Goal conflict also induce people to set lower goals (Locke, Smith, & Erez, 1994) and cause pressure, which can be negatively related to productivity (Locke et al., 1994). If one goal is viewed as less important than the other (i.e., when one goal is prioritized), then the conflict should be less than when both outcomes are highly valued (Ilgen & Hollenbeck, 1991). Consequently, the multiple concerns and goals that powerless individuals have may also create higher goal conflicts, which explains their tendency to deliberate and delay decisions. Therefore constant high activations of multiple goals and concerns can explain why powerless participants exhibit lower performance on single-goal pursuit compared to powerful individuals, such as shorter persistence time and longer deliberations (Guinote, 2007c). The current thesis suggests that, in order to understand performance on single goals, it is essential to take into account the broader context of an individual's multiple goals.

An additional implication of the present results is to help understand the effects of power on cognitive processes by revealing how powerlessness decreases the amount of WM capacity required for successful executive control during demanding multitasking situations. These findings are in line with previous studies showing how powerless, compared to control and powerful, participants are more vigilant and process excessive amounts of information (Fiske, 1993; Keltner et al., 2003). They can also potentially explain why powerless individuals were found to have lower executive function abilities in the context of single-goal pursuit compared to powerful individuals (DeWall et al., 2011; Guinote, 2007b; Smith et al., 2008). That is, the result of Experiment 7 shows that powerlessness may decrease WM capacity, which is essential for minimizing distractions and goal conflicts (Baddeley, 1996; de Fockert et al., 2001; Eysenck et al., 2005; Mitchell et al., 2002; Roberts et al., 1994). For example, when WM is reduced through a WM load exercise, people are less able to inhibit prepotent responses (Mitchell et al., 2002). Therefore decreased WM capacity in powerless individuals could be the umbrella factor responsible for poor executive functions related to both single-goal pursuit (Guinote, 2007c; Smith et al., 2008) and multiple-goal pursuit (Experiments 7, 8, and 10). Moreover, the fact that only powerlessness decreased, whereas possessing power did not increase, WM capacity and multitasking ability suggests that it is more likely for low power to tax WM capacity than for high power to improve WM capacity above baseline. This is in line with previous studies showing deficits of executive functions for powerless participants, but not improvements of executive functions for powerful participants (e.g., Smith et al., 2008).

The link between power and multitasking tendency also adds to the literature of multiple-goal pursuit, as previous research in this area (e.g., Bendoly, Swink, & Simpson, 2013; Payne, Duggan, & Neth, 2007; Schmidt & DeShon, 2007) did not focus on social factors as determinants of multitasking tendency. By manipulating social power, the current thesis shows how the extent to which people can control resources and outcomes can actually *cause* higher multitasking tendency, and complements previous correlational predictors of multitasking behavior (Cain & Mitroff, 2011; Ophir et al., 2009; Sanbomatsu et al., 2013). Lastly, the present thesis developed novel paradigms to study how individuals approach multiple goals (i.e., planning tasks used in Experiments 2 and 3 and switching tasks used in Experiments 4 and 5), and can be adapted in future research interested in multitasking intention and behavior.

5.3.2 Practical implications

The present findings have significant applied values as they point out that powerlessness not only decreases cognitive performance, but also affects the decisions that people make in approaching multiple tasks. This can provide practical implications for interventions and procedures that may be implemented in work environments to improve performance as well as health and safety. Understanding these issues will be extremely beneficial as we live in a world of multiple and competing demands where the pace of life and work are increasing and growing ever more complex (Brown & Eisenhardt, 1998). Moreover, due to implementation of technology and many other changes in the workplace such as job enrichment, competition, and faster deadlines, multitasking has now become an important component of job performance for many workers (Lindbeck & Snower, 2000). These new trends encourage polychornic behaviors, as they demand handling different tasks, activities, and roles simultaneously. However, when two goals are equally important and conflicting, pressure and performance decrements might ensue (Junco & Cotten, 2011; Locke, Smith, & Erez, 1994).

Since power could predict resource allocation (time on task) between two goals, then employees with less social power may be constantly engaging in multiple tasks. This not only decreases performance and leads to poor work outcomes, but it can put employees under pressure as well and induce stress (Appelbaum et al., 2008). In the long-term, the relationship between powerlessness and multitasking tendency may lead to significant adverse effects on well-being and general quality of life. Feeling powerless may also have significant implications for personal safety by putting individuals at risk in situations where multitasking can be dangerous, such as driving and speaking on the cell phone (Strayer et al., 2011). For example, driving performance is significantly degraded by cell phone conversations, and it has been estimated that a minimum of 24% of all accidents and fatalities on U.S. highways are caused by distracted drivers. Moreover, studies have found that polychronicity relates negatively with job performance (Benabou, 1999; Conte & Jacobs, 2003). Knowing that employees with less power tend to multitask, then assigning projects in a sequential manner could minimize the side-effects of multitasking.

Another issue to consider is that individuals who prefer to work on multiple tasks simultaneously may enjoy the experience of multitasking more (Poposki & Oswald, 2010). For example, participants who prefer to do more tasks at once reported that doing so would be challenging, that they were simply comfortable doing more tasks at once, or that working on fewer tasks would be boring (Poposki & Oswald, 2010). Highly polychronic people might also derive more personal fulfillment out of jobs requiring higher levels of multitasking and would be more satisfied with the job. Since powerless individuals are more likely to multitask by default, then they may enjoy multitasking more than powerful individuals and find these jobs more rewarding as a whole. Therefore restricting employees to working on tasks in a sequential manner may decrease job satisfaction and increase the likelihood of quitting. Instead, giving employees some discretion and choice in setting strategies to achieve multiple goals can positively benefit goal acceptance, performance, and goal satisfaction (Earley & Kanfer, 1985). It might also be beneficial to assign simple (vs. difficult and demanding) tasks that require multitasking to employees, as powerless individuals do not underperform on simple tasks (Experiments 4 and 5) and may be unsatisfied with jobs that do not allow them to multitask. Organizations can then reserve tasks that require focused behaviors, or high-demanding multitasking jobs, to high-power individuals. By tailoring task allocation to different employees based on their hierarchical ranking allows them to experience greater levels of fit with their job, which increases satisfaction, fulfillment, motivation, and fewer likelihoods of burnouts (Mathieu, 1991). Therefore the current results might inform how managers should delegate tasks in organizations.

However, it may not always be possible to allocate tasks according to individual's power, as multitasking ability is an increasingly sought after skill in all prospective employees (Appelbaum et al., 2008; González & Mark, 2005; Lindbeck & Snower, 2000). Personnel often work on multiple projects with time sensitive demands, which compel them to work on the projects simultaneously, even when this is not desirable. Jobs such as receptionists, administrative assistants, emergency room personnel, and air traffic controllers can all illustrate how the ability to successfully multitask is of crucial importance (e.g., Laxmisan et al., 2007; Loukopoulos et al., 2009). Some authors have even asserted that almost every job requires at least some degree of multitasking (Bühner, König, Pick, & Krumm, 2009). Since in many work situations it is not always possible to reduce the amount of multitasking needed, then individuals need to be able to deal with these multitasking challenges that are demanded the external environment.

The present results indicate that hierarchical positions should be taken into consideration when predicting multitasking ability, and that a subordinate position may backfire when multitasking is necessary. That is, those who are disempowered will not only disproportionately multitask, but the negative effects of multitasking will be even more detrimental for individuals who are lower in the organizational hierarchy. As a result, practical interventions could be provided to promote better performance and decrease mistakes and accidents. First, developing time management skills and the ability to focus and prioritize various information and tasks should be emphasized in personnel training, as time management training have been found to improve job performance for polychronics (Nonis, Teng, & Ford, 2005) and decreased emotional exhaustion in teachers with low autonomy levels

(Peeters & Rutte, 2005). Thus, time management skills such as setting goals, prioritizing them, planning actions, and monitoring progress, may compensate for low levels of control and help powerless individuals to better manage their multiple goals. Second, the tendency for powerless individuals to multitask can be particularly harmful if individuals do not seem to perceive the challenges associated with multitasking. Hence, educating employees about the hidden costs of multitasking can help people choose single-tasking strategies that can boost efficiency, especially with complex tasks.

The current results also suggest that multitasking ability can be altered and improved. If having power can decrease multitasking tendency and counteract underperformance, then enhancing employee's sense of power or control could induce prioritization and increase performance in organizations. As shown in the current thesis, people do not need to possess long-term power roles in order to think and act like a powerful person. Instead, temporarily heightening a person's social power can be sufficient in improving basic cognitive processes underlying multitasking ability. Power is also an embodied concept and grounded in bodily states, as posture expansiveness can create neuroendocrine shifts, activate a sense of power, and produce behavioral changes (Carney et al., 2010; Huang et al., 2011). Therefore exercises that encourage individuals to recall or imagine being in positions of power or authority, or engaging in high-power postures, may counteract the negative effects of powerlessness.

Another way to increase sense of power and control is by giving employees choice (see Chua & Iyengar, 2006), as choosing can increase feelings of self-efficacy (i.e., perceived self-control) and facilitates performance (Rokke, Fleming-

Ficek, Siemens, & Hegstad, 2004). Importantly, the benefits of choice were partially mediated by thoughts of personal control. For example, past studies showed that choice over treatment alternatives improves treatment effectiveness by enhancing personal control (Geers et al., 2013). This assumption is further supported by findings from (Inesi et al., 2011) demonstrating that restoring individual control when being powerless, for instance by providing individuals with high choice, compensates for the effects of low power. Therefore in order to prevent low performance, it might be crucial for organizations to render employees a certain amount of freedom and autonomy in their work environment, such as having opportunities to determine work procedures and outcomes. Organizations can also encourage certain types of behaviors by the structures that they create. Less salient hierarchical structures may be important in restoring the sense of control of those in low power positions and promote performance among employees who will otherwise feel powerless.

Lastly, high power was found to increase secondary goal engagement compared to low-power individuals. This could be because powerholders focus on the bigger picture and think more abstractly (Smith & Trope, 2006; Weick & Guinote, 2010). That is, they are driven by goals and values rather than by small details, and may therefore overlook goal feasibility (Weick & Guinote, 2010). Focusing on more abstract information, such as distant future plans compared with near future plans, increases desirability of activities rather than attention to time constraints (Liberman & Trope, 1998). This may put powerful individuals at a risk for over-commitment as they are less likely to consider time constraints when deciding whether or not to take on yet another task. Promoting more concrete representations of goals may prevent over-commitment of powerful individuals.

In sum, research in this area can emphasize the important role that power plays in determining multitasking ability and in how individuals choose between various strategies when faced with multiple goals and provide some interesting implications for daily life and for organizations. These include the type of training that could be provided, how task can be allocated among employees, and the importance of maintaining a sense of power and control. As we are better at understanding and predicting how power affects cognition and behavior, we will be more effective at creating procedures that mitigates the undesirable effects of powerlessness.

5.4 Strengths, Limitations, and Future Directions

5.4.1 Confounds of Power

The current thesis attempted to measure potential confounding factors of power and multitasking. Although the causal role of motivation and ability to prioritize (vs. to treat all information as equally important) and to process information more selectively (vs. more broadly) in multitasking behavior was emphasized, but other factors could also be attributed to the effects of power on multitasking ability. For example, some may suggest that powerless individuals switch more than powerful individuals because of demand characteristics. In addition, mood (e.g., negative affect and anxiety), task interest, and motivation have all been shown to affect multitasking behavior and performance (Carver, 2003;

Derakshan et al., 2009; Rokke et al., 2002). The roles of these factors were therefore examined throughout the experiments in order to rule out alternative explanations.

First, asking participants to answer at least one question from each task might have created the impression that the experimenter wanted them to switch. This could have generated more demand characteristics in powerless compared to control and powerful individuals, because low-power participants might want to conform to experimenter's expectations more than high-power participants (Anderson, Keltner, & John, 2003; Cast, 2003; Galinsky et al., 2008; Guinote et al., 2002). For example, those who have power are more able to "be themselves" whereas those without power try to accommodate social norms (Anderson & Berdahl, 2002; Chen et al., 2001; Keltner et al., 2003). Although this is probable, but explicitly instructed and emphasized that participants can work on the tasks in whichever manner and order that they prefer. In addition, findings from other experiments which measured self-reported preferences to multitask as well as scheduling daily and weekly plans (Experiments 1-4) all indicate that switching in powerless participants is not a result of conforming to experimenter's expectations.

Second, mood was a possible confound as having or lacking power may alter the amount of positive and negative affect experienced (Keltner et al., 2003). However, mood was an unlikely mediator of the effects between power and multitasking behavior as positive mood that is usually associated with powerfulness actually broadens attentional focus and encourages creative and divergent thinking as well as switches between tasks (Carver, 2003). Similarly, negative emotions associated with powerlessness, such as anxiety, often narrows attention to process information selectively (Isen, 2000). Moreover, in all of the experiments, power manipulations did not affect reported mood (Experiments 2-9).

In addition, the effects of powerlessness on decreased multitasking ability (especially task-switching) could be a byproduct of negative affect and anxiety. For example, positive emotions were found to increase whereas negative emotions decrease effort in focal goal pursuit (Herrald & Tomaka, 2002; Ilies & Judge, 2005). Moreover, processing inefficiency in high anxious individuals is often related to deficiencies of attentional control mechanisms (Bishop, 2009), which is similar to the effects of powerlessness. Anxious and depressive moods also increase ruminative and distractive thoughts, which can consume WM resources required for successful multitasking performance (Eysenck & Calvo, 1992; Phillips, Bull, Adams, & Fraser, 2002). However, there were no differences in self-reported mood, anxiety, arousal, and rumination between powerful and powerless participants (Experiments 8 and 9). These results suggest that the effects of power on multitasking behavior and performance were not driven by differences in affective states elicited by priming power.

A third factor that may affect multitasking tendency is increased interest and stimulation afforded by multiple task engagement. Past studies found that participants who indicated that they would like to perform multiple tasks simultaneously reported that doing so would be more challenging and interesting (Poposki & Oswald, 2010). Also, impulsive individuals and sensation seekers are more apt to multitasking as they are more susceptible to boredom (König et al., 2010; Sanbonmatsu et al., 2013). Therefore individuals may take on several tasks for the sheer enjoyment of it, even if it may be distracting and detrimental to overall productivity and performance. However, no difference was found between powerful and powerless participants in perceived task interest and the flow of time (Experiments 4 and 5), which can be an indication of how boring or engaging participants were on the tasks (Sackett, Meyvis, Nelson, Converse, & Sackett, 2010). In addition, past studies have consistently found powerfulness to be associated with disinhibition and risk-taking behaviors (Anderson & Galinsky, 2006) which should promoted multitasking instead of single-tasking behaviors. Therefore even though impulsivity and preferences for challenging situations were not measured directly, but these are unlikely mechanism for why powerless individuals engage in more multitasking activities than powerful individuals.

Fourthly, past studies have reported a positive correlation between motivation and multitasking tendency, where polychrons attempt to put in more effort in order to take care of the many different tasks at hand (Zhang et al., 2005). It is therefore possible that powerless participants might have put more effort in, as they did not avoid the difficult tasks in Experiment 5. However, there was no difference in overall performance between the three groups (Experiments 4 and 5), and all participants reported the same amount of effort and attention devoted to the tasks. Moreover, Experiment 6 showed that power does not decrease overall motivation, as powerful participants were more willing to pursue additional goals. This is in line with previous research suggesting that individuals exposed to high, instead of low, power are motivated and exert more effort (DeWall et al., 2011). Hence, at the very least, differences in multitasking behavior are unlikely to be attributed to conscious reports in motivation.

Lastly, motivation and effort may also be potential mediators for multitasking ability, as motivation could affect resource allocation and resource availability (Humphreys & Revelle, 1984). For example, motivational factors can contribute to a considerable variance in WM performance (Norman & Shallice, 2000; Pochon et al., 2002) and the negative effects of high trait anxiety had on performance only occurred when motivation was low, but were eliminated when motivation was high (Hayes, MacLeod, & Hammond, 2009). As a consequence, effort could have been attributed to the results of multitasking ability, where powerlessness decreased the amount of effort required for high performance quality during demanding multitasking situations. In addition, in Experiment 6, there was a main effect of power for ERs even under undemanding single-tasking conditions, which suggests that powerless individuals may have put in less effort in general compared to control and powerful participants. However, if powerless participants put in less effort, then they should have responded faster, in addition to making more errors, compared to control and powerful participants, in an attempt to finish the tasks quickly. This speed-accuracy trade-off in performance was not observed, and powerless participants even responded slower than control and powerful participants (Experiment 7). Having both slower RTs and higher ERs supports the idea that power has a detrimental effect on resource allocation ability, which cannot be explained by a mere lack of motivation. This is in line with previous findings that low-power, control, and high-power participants all reported putting similar effort into executive functions tasks (Smith et al., 2008).

However, one cannot completely rule out the role of effort in explaining the results, and it is possible that powerlessness may have decreased both the ability as well as the willingness to perform well in demanding multitasking situations. Furthermore, increases in motivation and power might actually make more resources available by producing a higher level of arousal (Kahneman, 1973). Although no effect of power was found on self-report arousal levels (Experiment 9), future studies could employ physiological measures, such as increased pupil dilation, in order to obtain a valid, objective measure of mental effort (Hess & Polt, 1964; Hess, 1965; Kahneman & Wright, 1971; Steinhauer, Siegle, Condray, & Pless, 2004). Introducing physiological measurements of effort would be valuable as it is not always clear where capacity limits come from. Nevertheless, the current studies suggest that power is a fundamental psychological phenomenon that has its own unique and basic effects on multiple-goal pursuit that are independent of mood, interest, and, to some extent, motivation.

5.4.2 Directionality of the Effects of Power

An additional strength of the current thesis is that all studies contained a control condition, so that it was possible to investigate whether the effects were triggered more by powerlessness, powerfulness, or both. This is important because studies including control conditions in the power literature are scarce, and have also yielded inconsistent findings. For example, some studies have shown strong behavioral effects in individuals primed with high power or assigned to high-power roles, in comparison to a control group (e.g., DeWall et al., 2011; Galinsky et al., 2003; Guinote, 2007c; Keltner et al., 2003; Schmid Mast et al., 2009), while others have reported stronger effects in participants with low power (e.g., Smith et al., 2008; Willis, Guinote, & Rodríguez-Bailón, 2010), with only a few studies finding both effects (Smith & Trope, 2006).

By including control conditions, the current thesis showed, at least in terms of attention and prioritization, a general negative effect of manipulated power on multitasking tendency and task prioritization (Experiments 3-6) where powerless participants were more likely to multitask and prioritize, followed by control participants, and with powerful participants least likely to multitask and prioritize. Moreover, self-reported sense of power also had a negative correlation with multitasking tendency (Experiment 1). Although the downside of using self-reports is that it does not demonstrate cause and effect, but together with the results from other experimental studies it can provide support for the claim that power causes a continuously increasing tendency to single-task, and vice versa with low power.

It should also be noted that Experiment 2 found an asymmetrical effect of power, where powerless participants did not make more switches compared to control participants. This inconsistent finding might be due to the difficulty of generating an adequate neutral control condition in the first place, that are of similar extremity to the low- and high-power conditions (Smith & Trope, 2006) and do not trigger some insecurity of powerlessness (DeWall et al., 2011). As a consequence, the control condition used in Experiment 3 might not have been viewed as completely neutral. Participants were asked to write a day as an independent worker in an organization, but this may have induced some feelings of powerlessness in terms of receiving salaries and bonuses. Therefore the fact that control participants did not fall in between powerless and powerful participants in this particular experiment could have been attributed to an ineffective control manipulation. Unfortunately, no power manipulation check was given to the control condition to verify this claim.

Unlike the general effect of power and the propensity to multitask, the effects of power on multitasking ability were driven my lacking power as only powerlessness showed a clear disadvantage in multitasking ability (Experiments 7, 8, and 10). Powerless individuals experience challenges and constraints that seem to decrease their cognitive resources and impede efficient goal pursuit (see Keltner et al., 2003), whereas experiencing high social power may not increase WM resources above the baseline capacity. Given that multitasking ability and WM capacity were only affected by powerlessness, then the present findings suggest that WM can be more easily exhausted (vs. enhanced) by situational factors.

These findings are consistent with prior work showing that the effects of power on executive functions are more pronounced for powerless than powerful individuals (Smith et al., 2008), but are inconsistent with other studies showing how powerlessness does not affect executive functions such as inhibition during a dichotic listening task (DeWall et al., 2011). Again, the method used to manipulate high and low power could have contributed to the asymmetrical effect of power on multitasking ability. For example, out of all the studies looking at the relationship between power and attentional control, only the one by DeWall et al. (2001) used a role assignment, instead of priming, for the power manipulation. Using role assignments might reflect a tendency for some people to resist powerlessness. That is, when participants believe they should have had power but feel that they do not, then they may resist this lack of power and attempt to restore their authority (Bugental & Happaney, 2000). Since individuals generally desire control, then they might misperceive reality in order to maintain the illusion that they have power (Langer, 1975). To explore this possibility, future research should include measures of individual's willingness to be in superordinate or subordinate roles, as well as participant's need for power.

In addition, previous (Smith et al., 2008) and present experiments (Experiments 7 and 8) that only found how powerless (but not powerful) participants differed from the control condition have all primed power by asking participants to write about their actual experience of having or lacking power. This experimentally controlled methodology was used extensively in the power literature to show how priming the mere concept of social power can activate behavioral tendencies and concepts associated with power and can result in similar effects as the actual possession (or lack) of power (Galinsky et al., 2003). However, the asymmetrical results found may reflect the differential experience of low- and high-power roles by undergraduate participants who may have encountered more low-power situations (e.g., following the rules from parents or school authorities), and less experience with equally extreme high-power roles. Therefore this particular power prime with student populations might have yielded a much stronger and more effective prime of low rather than high power. By including control conditions, the current thesis was able to better understand the effects of power and any methodological limitations than can be accounted for and explored in future research. It also suggests that the directionality of power depends on the concept being tested, such as whether it is looking at behavioral strategy or ability.

5.4.3 Power Manipulation

An additional issue to consider is the generalizability and applicability of the power manipulations and the multitasking paradigms to real-life situations.

Experiential priming of power are common methods used in social psychology, but there is a gap between the actual experience of power and a retrospective essay about a power-related incident. Second, it is tempting to think of powerholders as unconstrained and free (Keltner et al., 2003), but in organizational contexts, the expectations and responsibilities associated with high-power roles can also constrain them (Hamilton & Biggart, 1985). For example, leaders must ensure high productivity by instigating a cooperative relationship with those below them and the approval of those above. Though powerholders may have considerable freedom in terms of how they accomplish their tasks, but they may also have multiple concerns and accountabilities, and powerful individuals have more people competing for their attention than individuals at the bottom of the hierarchy (Fiske, 1993). Therefore experimental manipulations of power fail to take into account that power in real life is often possessed for a longer period of time, implies social interactions with those low in power, and have different levels or responsibility and perceived legitimacy. Consequently, the current thesis may be limited by the fact that such a vast and complex construct as power is limited only to the context of manipulated power, where inexperienced individuals are given high or low power only for a short period of time.

Despite these limitations, the present studies constitute a strong and valid test of the hypotheses. First, the current studies were able to isolate and attribute the effects of power to the ability to control resources and evaluations, and not to the effects of other covariates of power such as dominance, status, or other factors that can co-occur in more natural settings. Second, although experiments relied largely on data from undergraduate students who have little prior experience with social power, the design created *relative differences* in power, which are sufficient to test the hypotheses.

Third, the current thesis employed various operationalizations of power to show that the effect of power is consistent across different situations. These include assignment to different power roles (Experiment 5), activation of the power mindset through priming (Experiments 2-4 and 6-9), measuring individual differences in sense of power (Experiment 1), which represents one's real-life power standings (Anderson, John, & Keltner, 2012), as well as using natural samples of powerholders (Experiment 10). Recruiting real-life managers and subordinates can address the issue of external validity. Nevertheless, external validity and generalizability should be obtained by replicating the present results with different populations.

Nevertheless, it is important to point out that social power is not a static concept and cannot be analyzed in isolation as it interacts with contextual factors such as culture and individual difference variables to produce more complex outcomes (Chen et al., 2001). Therefore an important area for future research in the power literature is to consider the different types of power that exist in real-world situations. Three particular issues should warrant future consideration. These include legitimacy, responsibility, desire for power, and differentiation between personal and social power.

First, in the current studies, most powerholders felt, either subjectively or objectively, that they deserve to be in that position and that their power is secure and stable. For example, in Experiment 5, the power manipulation was carefully designed to not undermine legitimacy of powerful positions by making participants believe that their role assignment was based on actual leadership and creativity skills. However, the consequences of power depend, to a great extent, on the legitimacy that people make of their power relationships. Studies showed that leaders tend to be more efficient when they perceive their power as legitimate (e.g., French & Raven, 1959; Pfeffer, 1993; Yukl, 1989). When power relationships are perceived as illegitimate, unjust, or undeserved, then these results change considerably and the benefits of high (compared to low) power may decrease (e.g., Lammers, Galinsky, Gordijn, & Otten, 2008; Rodriguez-Bailon & Moya, 2002; Rodríguez-Bailón, Moya, & Yzerbyt, 2006; Sligte, de Dreu, & Nijstad, 2011). For example, illegitimately powerless individuals exhibited the same attentional control as legitimately powerful individuals (Willis et al., 2010). This may be due to the fact that the perception of illegitimacy implies a threat to the stability of power hierarchies (Tajfel, 1981; Tajfel & Turner, 1979). By focusing on potential gains, illegitimately powerless individuals may therefore have a higher sense of control similar to those experienced by powerful individuals (Langens, 2007). On the other hand, illegitimate powerholders may focus more on possible losses and experience a decreased sense of control (Langens, 2007).

Second, in the real world, power is often related to responsibility and accountability. When powerholders were primed with a sense of responsibility, then they started to increase attention to more attributes and became less focused on the most accessible or stereotype-consistent information (Goodwin & Fiske, 1993). Therefore the stability and legitimacy of power relationships, as well as responsibility, can make powerholders more sensitive to the actions and intentions of others and the environment, and disrupt the relationship between high-power and attentional focus. As a consequence, individuals who possesses power and is unlikely to lose it should be more likely to single-task than someone who possesses power, but who could lose it at any moment. These possibilities have not yet been explored empirically.

Third, power is manipulated in the current thesis as direct outcome control where powerholders can determine resource allocation or evaluate performance (e.g., Galinsky et al., 2003; Guinote, 2007a). However, there are individuals (e.g., those with low levels of testosterone) who avoid such high-ranking positions (Josephs, Sellers, Newman, & Mehta, 2006). Previous studies showed that when individuals who were low in testosterone were put in a high-power position, then they exhibited greater emotional and physiological arousal, increased attention to social rank, and decreased performance on cognitive tasks (Josephs et al., 2006). Hence the effects of power on the powerholder may differ for those who are driven to achieve high social rank and those who prefer low-power positions. Individuals low in dominance may not necessarily experience the type of constraint- and threat-free environment that is currently depicted for all powerholders in the literature.

Lastly, it should also be noted that social power can, and often is, confounded by personal power. Although related, these two types of power are conceptually different and may elicit different, even opposite, effects on the individual (Lammers, Stoker, & Stapel, 2009). Social power is the ability to influence and control others and it gives one the ability to do and get what one wants without external constraints. However, the ability to ignore the influence of others, and thus be less dependent and more free to make one's own decisions, is known as personal power (van Dijke & Poppe, 2006). These subtle differences are important as people usually prefer to increase personal power (i.e., independence from others) but have no special desire for social power (i.e., control over others; van Dijke & Poppe, 2006)

More importantly, Lammers et al. (2009) demonstrated that these two types of power are inversely associated with independence and interdependence, and can thus have opposing effects, depending on the type of behavior examined. For example, social power and personal power have opposite effects on stereotyping but similar effects on behavioral approaches. That is, people primed with personal power increased stereotypic thoughts (rated an ambiguously female target in more stereotypical terms for women) compared to those primed with social power (Lammers et al., 2009). These distinctions suggest that personal power decreases motivation to perceive others accurately and to spend effort on attending to multiple information, and increase reliance on automatic cognition such as stereotypes (Fiske, 1993; Neuberg & Fiske, 1987). Although in the present thesis power was defined and manipulated as social instead of personal power, but the effects on multitasking tendency and ability may rely more on the amount of personal (vs. social) power that individuals derive from having control over another individual. That is, personal power may be driving the effects on multitasking tendency and ability as it is associated more with independence and freedom from constraints. On the other hand, social power is more related to interdependence and responsibility, and may actually increase the feeling of constraints and accountability that decreases attentional focus (Lammers et al., 2009). This hypothesis should be acknowledged and investigated in future studies by comparing the effects of personal power on multitasking to those of social power.

5.4.4 Multitasking Paradigm

Another potential limitation can be directed towards the paradigms used to measure multitasking behavior and ability. It could be disputed that the dual-tasking and task-switching paradigms do not predict real world multitasking ability (Burgess, 2000; Chaytor, Schmitter-Edgecombe, & Burr, 2006; Lamberts, Evans, & Spikman, 2010). However, these paradigms have been employed extensively in cognitive research, and have been proposed to share similar underlying processes and cognitive requirements that individuals face in everyday multitasking situations. For example, dual-task paradigms have been widely used in human performance studies to investigate the ability of human operators to cope with high work load situations (Gopher & Donchin, 1986). In addition, Experiment 10 attempted to account for ecological validity by measuring participant's ability to deal with real-life multitasking situations.

Therefore it is possible that a different pattern might emerge with different multitasking paradigms, and it remains for future research to determine if the current findings generalize to other measures of multitasking ability. For example, extending the current work by using more realistic dual-tasking simulations, such as driving whilst holding a conversation, could be beneficial. In addition, real-life multitasking is highly dependent on prospective memory, which involves remembering to carry out an intended action in response to predetermined cues while performing another task (Burgess, Veitch, de Lacy Costello, & Shallice, 2000). Failures on the prospective memory task occur when participants do not shift attention to the task when cued. Since powerlessness decreases the goal-directed attentional system and task-switching abilities, then it could also impair prospective memory performance. Instead of looking at only the ability to rapidly change focus between two tasks within a few seconds interval, future experiments could test task-switching impairment in more ecologically valid conditions that require the use of prospective memory.

Moreover, real-life tasks are dynamic and differ in terms of priority, difficulty, and the length of time they will occupy. Experiments 3 and 5 did attempt to take into account these factors by looking at the effects of task orientation and task difficulty on switching behaviors, but the studies so far did not consider switching and interruptions between tasks that have continuity. Thus future experiments could investigate whether powerless individuals switch between tasks that can yield cumulative performance outcomes (e.g., finding as many words from a single puzzle) instead of using tasks that are self-contained and require participants to start a new question every time they switch.

In addition, the relationship between power and multitasking behavior was tested using paradigms where multitasking does not affect (or can slightly harm) performance (Experiments 4 and 5). Focusing on the negative effects of multitasking may lead one to believe that the strategies adopted by powerful individuals are more adaptive. However, multitasking is not always detrimental, as certain amount of cognitive disengagement from a goal may be beneficial. For example, multitasking may lead to psychological benefits such as increased excitement and interest (Delbridge, 2001). In one study, it was found that faculty members who worked on several projects at one time (typical behaviors of polychrons) had higher quantitative and qualitative productivity than faculty members who worked on only one project at a time before starting the next project (typical behavior of monochrons; Taylor, Locke, Lee, & Gist, 1984). This illustrates how switching to another goal is necessary for individuals to achieve a better balance between their various pursuits, and help people notice deficiencies and avoid larger problems later on. Furthermore, switching between different goals may foster creativity (Madjar & Shalley, 2008), as switching away from a task allows time for the unconscious to solve creativity problems (Csikszentmihalyi & Sawyer, 1995; Dijksterhuis, 2004). Multitasking opportunities may therefore enhance creativity and contribute to an organization's innovation.

Thus, in some situations, the effects of high power on multitasking behavior may need to reverse in order to prove effective and promote subsequent goal attainment. It is unclear whether social power can promote such adaptation, where powerful individuals will strategically switch from single-tasking to multitasking behavior in order to reach their goals. Based on past research suggesting that powerholders adapt their behavior and the strategies more effectively to situational demands than the powerless (e.g., Gruenfeld et al., 2008; Guinote, 2007a; Guinote et al., 2012; Karremans & Smith, 2010; Overbeck & Park, 2001), then it may be assumed that social power promotes multitasking only when it is functional. However, due to the their tendency to focus attention on a single construct, it is also possible that powerful participants might be so fixated on only one of the goals and fail to concentrated on another task. Future research should address these questions empirically and should also investigate the net effect of multitasking on powerless individuals' wellbeing and performance in situations where multitasking is beneficial.

It should also be noted that the effect of power on multitasking tendency and multitasking ability were examined separately in the present thesis. It is therefore possible that although powerless participants tend to multitask, but they may only do so in situations with relatively simple tasks where switching does not interfere with performance (Experiments 4 and 5). However, when multitasking becomes difficult and demanding (Experiments 7-9), then this tendency may disappear. Moreover, impairment in multitasking ability may only occur when powerless individuals are forced to switch, but are less pronounced in discretionary switching situations where participants can switch when they want to or when they feel ready. This is indeed probable as (Goonetilleke & Luximon 2010) found that polychrons performed better than monochrons when participants had the discretion to choose how to approach the tasks, even when they switched more between the tasks. It is therefore important for future studies to measure behavior and performance in a single paradigm.

Another issue that may affect multitasking ability in real-world situations is the effect of practice on performance. For example, recent studies have found how extensive cognitive training may improve multitasking ability, with benefits extending to untrained cognitive control abilities (e.g., enhanced sustained attention and WM; Anguera et al., 2013). This is because practice shifts the controlled or effortful processing into more automatic processing where less attentional resources are required and the task becomes less demanding (Schneider & Shiffrin, 1977). However, evidence on whether more multitasking leads to better cognitive abilities associated with multitasking is mixed (Alzahabi & Becker, 2013; Ophir et al., 2009).

For example, researchers suggest that multitasking practice is only beneficial for performance when goals have well-structured components that can be automatized and routinized, and not when tasks require novel responses, constant monitoring, and are mutually interfering (Ball et al., 2002; Dux et al., 2009; Mackay-Brandt, 2011; Willis et al., 2006). Nevertheless, it is important to consider the fact that if powerless individuals engage more in multitasking, then they may have more experience with dual-tasking and task-switching situations. This could, in the long-run, offset the detrimental effect of powerlessness on multitasking ability in situations where performance can be improved over time through practice. Whether power affects multitasking ability on highly practiced tasks remains to be shown.

In sum, the major strengths of the current thesis were measuring various confounds of power, establishing the directionality of the effects, and increasing reliability and validity of the results by applying a diversity of power manipulations and methods to measure multitasking tendency and ability. These methodological considerations strengthened the inferences made by ruling out alternative explanations and established a causal link between power and multitasking. However, the effect of social power on multitasking may underlie certain limitations that depend on the situation. Therefore an important question to address in the future is when will the effect of power on multitasking be exaggerated and when will they be mitigated. Potential factors that could be investigated include features of the power relation (e.g., the stability of one’s power position), potential benefits of multitasking, and the effects of practice.

5.5 Conclusions

Social power is an omnipresent feature of our social relations and can fundamentally alter the way people feel, think, and act. The present theses demonstrated, for the first time, that social power can impact how people approach multiple goals and how capable they are of multitasking. First it showed a general relationship between power and the strategies that people use when pursuing multiple goals, with reduced power instilling higher multitasking intention and behavior, and high power encouraging single-tasking and prioritization. Moreover, these studies illustrate that focusing on a single task does not indicate that powerful individuals have lower aspirations and want to pursue fewer goals than powerless individuals. Instead, it is merely *how* individuals balance between various goals (i.e., the strategy of approach) that is different between powerful and powerless participants. Second, powerlessness was found to decrease multitasking ability by reducing the amount of WM capacity needed for executive control, which includes coordination, manipulation, and storage of information. Together, the current thesis demonstrated an ironic effect of power: the less power individuals have, the more they engage in multitasking behavior but the less able they are to multitask.

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Appendix

Appendix 1: Power manipulation used in Experiment 2

This study focuses on organizational roles. Your task is to read information about the role of a person in a given organizational context, and imagine yourself in that role. You will then be asked to describe what a typical day in your life would be if you would be in that particular role.

Please imagine yourself in this role and describe in detail what a typical day in your life would be, what you would do, how you would feel, and what you would think. You can describe the whole day from morning to the evening. There are no right or wrong answers, we are simply interested in people's roles in everyday life. Please use the space below to describe your day, and imagine yourself in this role as vividly as possible.

Control Condition

Please imagine you work in an organization with a team of 20 people. The organization promotes various products to the public, and your role is to complete tasks, and help implement marketing initiatives that are a priority for the firm. You keep records and prepare paperwork for ongoing projects and new clients, and you work largely independently on the tasks that were assigned to you. You receive a basic pay and a project-based bonus, and therefore can decide on the total salary and workload.

Powerful Condition

Managing Director in a Marketing Organization.

The managing director in this marketing organization has 20 employees working under him/her. The organization promotes various products to the public, and the role of the director is to **distribute the work** that subordinates must complete, **set priorities** for the team, **approve project proposals,** and **accept or decline new clients**. The managing director knows the work well and makes all decisions within the company**.** He/she **manages a large amount of money**, sets priorities and determines the salary and the workload of the employees.

Powerless Condition

Employee in a Marketing Organization.

The employee in this marketing organization works in a team of 20 people. The organization promotes various products to the public, and the role of the employee is to **complete any task** that the manager assigns to him/her, and to **follow instructions** regarding priorities in this marketing organization. The employee must also **keep records and prepare paperwork** for projects and new clients that were approved by the manager. The employee knows the work well and strictly follows the procedures and priorities set by the manager. His or her salary and workload are determined by the manager.

Appendix 2: Instructions for Experiment 2

This experiment is interested in how well people plan future events.

Please imagine that you don't need to go to lectures/work for two weeks, but you need to hand in two 1000 words essays at the end of the two weeks (Essay 1 and Essay 2). Both essays will be due on the same day. We would like you to plan how you will work on the two essays. Please consider the following steps:

1.) When will you start thinking about the essay
2.) When will you pick the essay topic
3.) When will you start researching and reading for your essay (and where will you go to do that, e.g., library, computer rooms, etc.) and when will you stop researching and reading.
4.) When will you start brainstorming your ideas and when will you finish brainstorming
5.) When will you start outlining your essays and when will you finish outlining the essay
6.) When will you start writing the introduction and when you will finish the introduction
7.) When will you start writing the next few paragraphs of the essays, and when will you finish writing these paragraphs (please state how many paragraphs are you planning to write and when you will start/finish writing them).
8.) When will you start writing the conclusion and when will you finish the conclusion
9.) When will you finish the essay as a whole
10.) When will you re-read and edit the essays and when will you finish re-reading and editing
11.) When will you start writing the references/bibliography and when will you finish the reference/bibliography?
12.) When will you submit the final essay

<u>Please consider these 12 steps regarding both Essay 1 and Essay 2. That is, if you say "reading for the essay", please indicate whether you are reading for "Essay 1" or "Essay 2", or "Essay 1 and 2". For all activities, please indicate its length/duration.</u>

You do not have to plan your essay in the particular order given nor do you need to complete each of the steps sequentially. Just imagine how *you* would like to plan your time.

Although you won't need to go to lectures/work during these 2 weeks, but please plan other activities that you may pursue in a normal 2 week period. Some examples include:

1.) Socializing
2.) Hobbies (e.g., reading, drawing, etc.)

3.) Cooking/eating
4.) Exercising
5.) Leisure (e.g., Watching TV/movies)
6.) Other (sleeping, checking e-mails, cleaning)

Please try your best to plan your days as precisely and accurately as possible, while taking into consideration that you will need to submit two essays by the end of the two weeks.

Appendix 3: Power manipulation used in Experiments 3-4 and 6-9

Control Condition

We would like you to write a narrative essay about the last time you went to the supermarket. Please recall the last time you went to the supermarket. Please describe your experiences in the supermarket - what did you buy, what you did, and how you felt. It is important that you imagine your day as vividly as possible. This study is completely anonymous and confidential, and there is no right or wrong answers. Please use the space below to describe the last time you went to the supermarket.

Powerful Condition

This study focuses on people's recollections of personal versus factual events. You have been allocated to the 'personal events' scenario, and hence we would like you to write a narrative essay about a particular incident in your life. Please recall a particular incident in which you had power over another individual or individuals. By power, we mean a situation in which you controlled the ability of another person or persons to get something they (or you) wanted, or were in a position to evaluate those individuals. Please describe this situation in which you had power—what happened, how you felt, etc.

It is important that you imagine this situation as vividly as possible. This study is completely anonymous and confidential, and there are no right or wrong answers. You can write whatever incident comes to your mind that made you feel really powerful – no matter how others would feel or think about this incident. Please use the space below to describe the incident.

Powerless Condition

This study focuses on people's recollections of personal versus factual events. You have been allocated to the 'personal events' scenario, and hence we would like you to write a narrative essay about a particular incident in your life. Please recall a particular incident in which someone else had power over you. By power, we mean a situation in which someone had control over your ability to get something you (or they) wanted, or was in a position to evaluate you. Please describe this situation in which you did not have power—what happened, how you felt, etc.

It is important that you imagine this situation as vividly as possible. This study is completely anonymous and confidential, and there are no right or wrong answers. You can write whatever incident comes to your mind that made you feel really powerless – no matter how others would feel or think about this incident. Please use the space below to describe the incident.

Appendix 4: Questionnaire used in Experiment 3

This study concerns decision-making and planning. You will be given a few scenarios to read and then a few questions to answer.

Please carefully read the following description and answer the follow-up questions.

Imagine that you work at an organization and you begin your workday by inspecting the production line. As you inspected the line, someone asks you to explain the company's retirement policy. Would you prefer to (A) ask him/her to make an appointment and see you about that later, (B) ask him/her to walk with you while you inspect the line so that you can explain the policy at the same time, or (C) stop your inspection for the moment in order to explain the policy.

1	2	3	4	5	6	7	8	9
definitely A				*definitely B*				*definitely C*

You then returned to your inspection and received a call on your mobile phone. The call was from one of the company's sales representatives, who is asking about a product manufactured in your unit. Would you prefer to (A) ask the representative to make an appointment to discuss the matter later, （B） provide the information as you continue your inspection of the production line, or (C) stop your inspection of the of the line in order to provide the information to the representative.

1	2	3	4	5	6	7	8	9
definitely A				*definitely B*				*definitely C*

You then continued your inspection, when you noticed a machine had been left running, which created an extremely dangerous safety hazard. Would you prefer to (A) stop your inspection to turn off the machine or (B) wait until you have finished your inspection?

1	2	3	4	5	6	7	8	9
definitely A								*definitely B*

After you finished your inspection, you examined your to-do list and found that it contained three projects: (1) developing a new company website; (2) preparing an oral presentation for next week; and (3) writing a request for new machines and equipment.

You will not have time to finish everything in one day, as **each project requires 4 hours** to complete and you only have 8 more hours of work left. Please think about how you would like to schedule your time around these 3 projects. In the space below, write out a realistic plan for the day (e.g., take into account breaks and lunchtimes) based on your personal preferences.

10:00 – 10:30 10:30 – 11:00	
11:00 – 11:30 11:30 – 12:00	
12:00 – 12:30 12:30 – 13:00	
13:00 – 13:30 13:30 – 14:00	
14:00 – 14:30 14:30 – 15:00	
15:00 – 15:30 15:30 – 16:00	
16:00 – 16:30 16:30 – 17:00	
17:00 – 17:30 17:30 – 18:00	

Which of the following strategies would you prefer to undertake when faced with the 3 projects?

Strategy A: You would choose one of the projects and work on it first, neither working on nor thinking about the other 2 projects. You prefer to complete at least one of the projects and leave the other 2 projects untouched until you have finished the first one.

Strategy B: You would develop ideas for other projects while you work on one of them, therefore frequently switching back and forth among the projects. You prefer to make significant progress on several of the projects even though you might need more work on all of them the next day.

1	2	3	4	5	6	7	8	9
definitely A								*definitely B*

Appendix 5: Example instructions for Experiments 4 and 5

This study focuses on problem solving. You will be presented with questions from 3 different tasks. Each correct answer to a question will be worth one point. Your goal is to attain as many points as possible in a given amount of time. You will be given 3 different tasks to perform, which are judged, (on average) of equal difficulties by most people. However, the questions within each task can vary in their respective difficulties.

Below are the instructions and examples of each of the tasks:

<u>Arithmetic task:</u>

You will receive simple additions and subtractions, and your task is to calculate the answers by hand and write it down.

Example:

Question #: 1

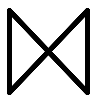
$$\begin{array}{r} 68 \\ \underline{-\ 13} \end{array}$$

<u>Geometric shapes task:</u>

For this task, you will see a few geometric figures. Your task is to roughly copy the outlines of these geometric figures.

Example:

Question #: 1



<u>Picture naming task:</u>

You will receive pictures of everyday objects, and your task is to write down what the object is on the back of the card.

Example:

Question #: 1

Please take note of the following rules:

- You can work on the 3 tasks in any order that you prefer and return to each of the tasks as often as you like.
- Within the allocated period of time, you must attempt part of all the 3 tasks.
- You can only move on to the next question once you have answered the previous one (if you don't know the answer to a question within a given task, then you can make a guess).

Appendix 6: Power manipulation used in Experiment 5

Participants in the control condition were told the following:

You will be building something called a Tanagram from a set of Legos. There will be 2-3 participants in this room working on the same task, but you will each have your own part to work on. So although you will all be building the Tanagram, you will be working independently with your own set of Legos. You will be paid a fixed amount of £3 for your participation.

Participants in the power conditions were told the following:

In order to simulate real-world organizational settings, we will assign you to different roles. People have one of two interpersonal styles: some people have the style of a manager; these people are good at telling others what to do. Other people have more the style of a subordinate. These people can easily work on tasks and follow instructions. You will be working in small groups of 2-3, with one participant being the manager and the rest subordinates. We will assign you to different roles according to how you scored on the on-line questionnaire.

Powerful Condition

As a manager, you are in charge of directing the subordinates across the hall in building something called a Tanagram from a set of Legos. You will decide on how to structure the process for building the Tanagram and the standards by which the work is to be evaluated. In addition, you will also evaluate the builders at the end of the session in a private questionnaire—that is, the builders will never see your evaluation. These evaluations will help determine how much bonus money subordinates will earn (up to an extra £3). As a manager you will automatically receive a bonus of £3. The builders will not have the opportunity to evaluate you. Thus, as a manager, you be in charge of directing the building, evaluating your subordinates, and determining the rewards your subordinates will receive.

Powerless Condition

As a builder, you will have the responsibility of carrying out the task of building a Tanagram according to the instructions given to you by your manager. Your manager will call you in to give you instructions when ready. Your manager will decide how to structure the process for building the Tanagram and the standards by which the work is to be evaluated. Which tasks you complete will be decided by the manager. In addition, you will be evaluated by the manager at the end of the session. This evaluation will be private; that is, you will not see your manager's evaluation of you. These evaluations will help determine how much bonus money (up to £3) you will receive. You will not have an opportunity to evaluate your manager. Only the manager will be in charge of directing production, evaluating your performance, and determining the rewards you will receive.

Appendix 7: Scenario used in Experiment 6

For the second experiment, you will read a scenario and then answer a few questions related to the excerpt. Please imagine that you are the character in the story and answer the questions based on what you would do if you were in this situation:

Imagine that, given your running talent, you are part of the University's track and field team and will compete in the 100-m sprint. You have been training hard for this year's competitive season which is due to start in two weeks, because you are eager to win a race. In fact, you have been spending all your free time training which adds up to 18 hours per week. On your way home, you keep thinking about your goals and aspirations. Your mind shifts between thoughts about your chances of winning the 100-m sprint and thoughts about how good it would be to find a way to earn extra money. Later that day, you get a call from the Modern Art Museum offering you a part-time job as a museum tour guide. These positions do not open often and are highly sought after. You would like to accept this job because of your goal to earn extra money. Besides, you have been interested in modern art for many years now. The tour guide job is, for now, on a trial basis. The decision of whether or not to hire you permanently as a part-time tour guide will be based on the quality of your work on visitors' satisfaction. Given your previous experience, you expect to be a good tour guide, if you try your best. The job is due to start in 3 days, and you may choose to work between 6 to 18 hours each week. At the back of your mind, you are thinking that accepting this job would mean training less hours per week. The museum needs an answer today, and you promise that you will call back soon. You only have a few minutes to think about this, and then make a decision.