Implicit Motives and Decision Making:

Mechanism and Application

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Impliciete Motieven en Besluitvorming: Mechanisme en Toepassing.

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All we have to decide is what to do with the time that is given us.

-- J.R.R. Tolkien, The Fellowship of the Ring.

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Chapter 1

Background and Synopsis of the Thesis

Most, if not all, human beings are regularly confronted with situations that require them to make decisions to act. Some of these decisions are fairly easy and straightforward. For example, one may need to decide which key to press on a keyboard to produce the desired letter on the computer screen. Alternatively, one may need to decide what drink to order when being with friends in a bar. Other decisions appear to be more socially relevant and complex. For instance, when confronted with an election you may need to decide which person would be the best candidate for leading your country, or, when being proposed to, you may need to decide whether you would want to spend the rest of your life with that other person. Whether easy or difficult, straightforward or complex, the mission of psychology is to predict and explain which decisions people make and which behaviors they will perform. In other words, a systematic analysis of the potential behavioral markers of human social functioning is proposed to ultimately improve the understanding and examination of when and how people make decisions and perform behaviors that are, preferably, beneficial for themselves and society at large.

A general assumption underlying research in psychology is that human decision-making and behavior in general critically depend on social learning, in which inborn tendencies or propensities are nourished and cultivated during socialization. One area of research focuses on the skills that people develop and access when interacting with others, such as perspective-taking and empathy, keeping track of other people's intentions, encoding their emotions and traits and responding properly to rewards and punishments. Such social cognition skills are said to help people to understand each other and to predict what responses they may expect to face when interacting with others. Furthermore, the role of social learning in human behavior is also studied from a human need perspective, by examining how social motives and values that are shaped as a product of rearing can support or undermine one's own and others' behavior in social contexts. For instance, people might experience a strong

need to interact with others and to belong to a group as a function of their affiliation motivation. Additionally, some people have a strong need to influence and dominate others, especially when competing for resources or working in teams where specific patterns of actions are instrumental to gaining power (Winter, 1973). Furthermore, apart from this personalized power motive, people might also be nurtured to act in accordance with a socialized power motive, such that the group or institution as a whole, and not only the individual, benefits. In a more general sense, then, human decision-making and behavior is considered to rely on social learning as a function of the capacity and motivation to regulate each other's behaviors in simple as well as complex social structures based on past experiences.

The present thesis deals with the human need perspective on decision-making and behavior. Specifically, rooted in Murray's (1938) concept of needs and its role in personality, the present work addresses the question as to how implicit motives determine specific patterns of preferences and decision-making. Implicit motives are defined as motivational dispositions that operate outside of people's conscious awareness and are aimed at the attainment of specific classes of incentives (McClelland, Koestner, & Weinberger, 1989; Schultheiss, 2008). These motives are presumed to build on conditioned, or learned, affect-related experiences during socialization. Research on implicit motives has largely focused on three main needs, namely achievement (i.e., the desire to prosper and gain success), power (i.e., the desire to influence and control others), and affiliation (i.e., the desire for friendly social interactions). Once these motives are developed and established, they orient, select, and energize behavior (McClelland, 1985). Accordingly, implicit motives offer an intriguing and important window to individual's personalities and their motivation to act in specific ways, even though they might not be able to consciously access and report on their motives or how they operate.

Below, I will first elaborate on the conceptualization and measurement of implicit motives, and discuss how these implicit motives differ from other motive-related concepts that rely on more conscious processing (explicit motives). Furthermore, I will discuss the main evidence that has been reported in the literature showing that implicit motives predict specific classes of behavior, and how these predictions differ from those derived from explicit motives. Next, I will suggest that further research on implicit motives is facilitated by a better understanding of the mechanisms that render implicit motives predictive in action selection and decision-making. Specifically, I will point to the role of ideomotor learning and incentive learning, and the role of perceived instrumentality in understanding how implicit motives are translated into proper (i.e., motive-congruent) responses to incentivizing stimuli and situations. Finally, I will provide a brief overview of the empirical chapters in which I set out research to address the issues alluded to above.

Implicit motives versus self-attributed motives

The scientific study of human decision-making and behavior has a long and extensive tradition (Schultz & Schultz, 2015). Initially, the understanding of human behavior was mainly driven by biological approaches, such as the ethological study of instinct (Darwin, 1859; Tinbergen, 1951), the physiological study of action (Fearing, 1930), and the study of psychic energy to link biological processes to unconscious and conscious states of mind (Freud, 1920). Building on these initial steps, different schools of experimental research have developed that study the causes of human behavior, such as stimulus-response learning (Watson, 1913; Skinner, 1938), drive theory (Hull, 1943), and, more recently, motivational and cognitive approaches toward goal-directed behavior (Aarts & Elliot, 2012).

Whereas many detailed accounts have been advanced regarding the basis of human conduct, the last two decades or so seem to have seen researchers converge on the notion that

there are two general mechanisms or routes that shape the way people behave: a more intuitive, effortless and automatic route, and a more analytical, effortful and controlled route (Sherman, Gawronski, Trope, 2014). Models adhering to this distinction between two routes are generally referred to as dual process models. Most of these recent dual process models pertain to different modes of information processing (e.g., associative versus propositional learning, bottom-up versus top-down attention, heuristic versus systematic evaluation), whereas less attention has been given to the question of how motivational states that may operate underneath the radar of conscious awareness feed into the way people make decisions and select their actions.

One important reason for ignoring the role of unconscious motivation in decision-making and behavior derives from the cognitive revolution, with a special focus on the way motivational thoughts assessed by conscious self-reports are converted into action (Heckhausen & Kuhl, 1985; Weiner, 1986). Clearly, the cognitive revolution and the method of conscious introspection have taught us a lot about the content of people's intentions, goals, and reasons for action. However, the study of conscious intentions driving human decision-making and behavior might miss out on an important source of motivation that stems from implicit or unconscious processes that propel people to react to natural incentives that evoke affective experiences in the social context. This "motives as conditioned affect" phenomenon is central to a theory introduced by David McClelland and his associates (McClelland, Atkinson, Clark, & Lowell, 1953).

Starting with an interest in the domain of hunger (Atkinson & McClelland, 1948), McClelland and colleagues discovered that an implicit measure of hunger they had identified among a sample of human subjects in a Thematic Apperception Task (TAT; Morgan & Murray, 1935) was susceptible to subjects' state of food deprivation, thereby indicating that the measure was indicative of subjects' motivation to obtain food. This finding was then

generalized to the domain of achievement motivation, which McClelland and colleagues (1953) similarly operationalized like an animal drive, in the sense that it oriented, selected, and energized behavior. In other words, they showed that a motivational disposition for achievement selected behavior just as thirst or hunger would facilitate a rodent's behavior towards a liquid or food-related reward. Interestingly, when they examined a self-reported measure of achievement motivation, they observed that it did not facilitate behavior in the same way as the TAT-based measure of motivational disposition of achievement did (Decharms, Morrison, Reitman, & McClelland, 1954). Building on these and other findings, they concluded that self-reported motivation does not function like an energizer for behavioral activity, and hence unconscious forms of motivation should be distinguished from conscious forms of motivation in the quest to understand the causes of human decision-making and behavior (McClelland et al., 1953).

In a further revision of their theory (McClelland et al., 1989), they coined these two types of motivation *implicit motives* versus *self-attributed motives*. According to McClelland and colleagues (1989), implicit motives are built on evolutionarily old systems (midbrain structures) that appear to develop in a preverbal stage and are guided by what is pleasant and aversive during socialization experiences. Self-attributed motives are thought to depend on evolutionarily more recent systems (cortical structures) that develop later in childhood and are sensitive to language via verbal commands from others, self-instructions and explicit knowledge about norms and values (McClelland & Pilon, 1983). As a result of the early, non-verbal way in which they are acquired, implicit motives tend to develop independently from conscious awareness, and hence are difficult to articulate. Self-attributed motives, on the other hand, are suggested to rely on consciousness, and are therefore readily accessible to verbal reports. Accordingly, implicit motives have to be assessed indirectly, for example with projective instruments such as the TAT (Morgan & Murray, 1935) or its improved

descendant, the Picture Story Exercise (PSE; Winter, 1994). Self-attributed motives can be measured directly with instruments that rely on the capacity for introspection, such as self-report questionnaires (e.g., Jackson, 1974).

There is some debate (e.g., Entwisle, 1972; Lilienfeld, Wood, & Garb, 2000) about the reliability and validity of these projective measures (for an overview of different measures of implicit motives, see Schultheiss, 2007), as well as about whether measures of implicit motives versus self-attributed motives uniquely or interactively contribute to the prediction of behavior (see, Brunstein & Maier, 2005, for an instance in which implicit and explicit motives interactively influenced performance under specific circumstances). Importantly, however, research on the distinction between implicit motives and self-attributed motives has made a valuable contribution to the literature, as it has challenged the assumption that there is only one type of motivation (self-attributed or explicitly reported motives) underlying human behavior.

Evidence for the role of implicit motives in decision-making and behavior

One of the most remarkable and robust findings in motive research is the lack of correspondence between measures of implicit motives and explicit (self-attributed) motives in a given motivational domain. For instance, correlations between the implicit achievement motive and the explicit achievement motive were 0.02 in a sample of 323 American college students (Pang & Schultheiss, 2005) and 0.06 in a study with 195 German students (Schultheiss & Brunstein, 2001). Similarly low correlations between implicit and explicit motives have been consistently found for the power and affiliation domains (e.g., King, 1995; Pang & Schultheiss, 2005). A recent meta-analysis by Köllner and Schultheiss (2014) that included 49 papers, 56 independent samples, 6151 subjects, and 167 correlations found a very small but overall significant correlation between implicit and explicit motives, $\rho = 0.130$

(95% CI: 0.077–0.183). Whereas the correlations for the affiliation domain and the achievement domain were low but significant (ρ = 0.116 [95% CI: 0.050–0.182] and ρ = 0.139 [95% CI: 0.080–0.198], respectively), the correlation in the power domain was non-significant (ρ = 0.038 [95% CI: −0.055–0.131]).

Perhaps even more important than the lack of overlap between implicit and explicit motives, at least for the current purposes, is the finding that the two types of motives respond to different motivational stimuli and predict different classes of behavior. According to recent theorizing and findings (Schultheiss, 2008; Schultheiss & Brunstein, 2010), implicit motives respond to non-verbal cues and experiences (e.g., facial expressions of interaction partners, victory or loss in a competitive game), and they predict decisions and behaviors that are relatively impulse-driven, spontaneous and/or dissociated from a person's conscious intentions. Examples of this class of behaviors are physiological reactions aimed at the satisfaction of biological and social needs (e.g., the release of progesterone in affiliative contexts; Wirth & Schultheiss, 2006), performance in motive-congruent tasks (Brunstein & Maier, 2005), the instrumental learning of goal-directed behavior (Schultheiss & Rohde, 2002), and the spontaneous application of these learned behaviors in appropriate contexts (Schultheiss & Brunstein, 2005). The literature refers to this class of behavior as *non-declarative* (Schultheiss, 2008). In contrast, explicit motives are thought to respond to verbal and symbolic cues (e.g., explicitly stated rules or norms, the praise or disapproval of interaction partners), and predict behavior and decisions that are guided by a person's self-proclaimed attitudes, goals, and intentions. Examples of this class of behavior include explicit judgments of desire, goal-setting, deliberate choice, and exerting self-regulatory control. The literature refers to this class of behavior as *declarative* (Schultheiss, 2008).

An extensive body of studies supports the notion that implicit motives predict non-declarative behavior, whereas explicit motives predict declarative behavior. For example,

early work on the achievement motive found that participants with a relatively strong implicit achievement motive, but not those with a relatively strong explicit achievement motive, were better at recalling facts from a story, and they also showed superior performance on a scrambled-word task (deCharms et al., 1955). In contrast, participants with a relatively strong explicit achievement motive, but not those with a relatively strong implicit achievement motive, were relatively likely to adapt their evaluation of an artwork to the opinion of an ostensible expert, and they also tended to rate an unsuccessful target person more negatively.

More recently, Brunstein and Hoyer (2002; see also Brunstein & Maier, 2005) found that participants with a relatively strong implicit achievement motive performed better on an attention task than those with a relatively weak implicit achievement motive, but when they were offered the choice to continue with the task or do something else, they were not more likely to choose to continue with the task. In contrast, participants with a relatively strong explicit achievement motive were more likely to choose to continue with the task, but their actual performance on the task was not better than the performance of participants with a weaker explicit achievement motive.

Similar dissociations between implicit and explicit motives have been found for the affiliation and power motives (e.g., Craig, Koestner, & Zuroff, 1994; Koestner, Weinberger, & McClelland, 1991). For example, Schultheiss and Brunstein (1999) presented participants with a computer game in which players could enter their name in a high-score ranking list, thereby erasing the names of previous players. Their findings showed that participants with a relatively strong implicit power motive performed particularly well on this computer game compared to participants with a relatively weak implicit power motive. The explicit need for power, on the other hand, only predicted participants' self-reported commitment to head the high-score list (Schultheiss, 1996), but not their actual performance in the game.

In summary, the findings in motive research support the notion that explicit and implicit motives predict different classes of behavior. Explicit motives predict deliberate judgments and choices, as well as responses to explicit norms and verbal incentives (i.e., declarative behavior). Implicit motives, on the other hand, predict physiological responses, instrumental learning, and motive-congruent task performance (i.e., non-declarative behavior).

In this sense, the predictive validity of explicit motives for intentional behavior is largely in line with traditional models of motivation, which assumed that conscious motives drive human behavior. A perhaps more interesting and innovative contribution of motive research is the identification of the important role of implicit motives in guiding particular decisions and behaviors. In this dissertation, I want to examine the relationship between implicit motives and decisions more in-depth. Although motive research obtained valuable insight into the types of decisions and behaviors that implicit motives predict, little is known about the mechanism governing the correspondence between implicit motives and behavior. Hence, we know *that* implicit motives predict a certain class of decisions, but not much is known about *how* implicit motives come to predict them. An important aim of the present work, therefore, is to acquire a better understanding of the mechanism underlying the relationship between implicit motives and the selection of specific behaviors.

Further issues in understanding the role of implicit motives

In order to contribute to the examination of the mechanism underlying the relationship between implicit motives and the selection of specific behaviors I will build on two scientific advances. First, recent attempts have been made to integrate the role of motivation and rewards in action-effect learning to offer a more extensive model of human goal pursuit (e.g., Marien, Aarts, & Custers, 2013; 2015a). Furthermore, research on effective goal pursuit has highlighted the importance of instrumental learning (Dickinson & Balleine, 1994; 1995) and

the cognitive representation of goal-means structures (e.g., Kruglanski et al., 2002) in selecting actions that lead to goal attainment. Accordingly, I wish to focus my research attention on two main issues: (1) examining how implicit motives impinge on action-effect learning, and thus determine which specific behaviors are selected, and (2) examining how implicit motives are translated into motive-congruent goal-directed behavior as a function of the perceived instrumentality of motive-congruent actions. I will briefly elaborate on these two issues below.

How do implicit motives determine which specific behaviors are selected?

So far, relatively little research attention has been devoted to the mechanism underlying the relation between implicit motives and the selection of particular actions. To better understand this mechanism, I use insights from ideomotor theory and incentive learning. In brief, in an attempt to understand the basic nature of acquiring the capacity for goal-directed behavior, ideomotor theory (Greenwald, 1970; Shin, Proctor, & Capaldi, 2010) holds that repeated experiences of producing a specific outcome (e.g., a loud noise) by performing a specific action (e.g., pressing a button) cause the action and outcome to be bound together in memory. More specifically, the action and its respective outcome are thought to be stored in memory as a common code (Hommel, Müsseler, Aschersleben, & Prinz, 2001). Because of this common code, activating the representation of the outcome (e.g., by priming or thinking about it) automatically triggers the representation, and hence the execution of the action (Elsner & Hommel, 2001). Thus, anticipating or predicting the occurrence of an outcome can bias the selection of the associated action (an action decision-making mechanism that is suggested to form the basis for goal-directed action).

Through their actions, people do not only learn that certain actions predict certain outcomes, but also that the outcomes can differ in their desirability or incentive value. Some

outcomes become positive because their attainment is associated with a pleasurable affective experience, whereas other outcomes become negative because their attainment is associated with an aversive affective experience. Incentive learning (Berridge, 2001) predicts that the likelihood of selecting an action will be biased according to the desirability of the action's predicted outcome. More specifically, actions are selected in the service of approaching positive outcomes and avoiding negative outcomes (Eder & Hommel, 2013; Eder, Rothermund, De Houwer & Hommel, 2015; Marien, Aarts & Custers, 2015b).

Extending ideomotor theory and incentive learning to the domain of implicit motives and action selection, I hypothesize that implicit motives predict action selection when two criteria are met. First, implicit motives would need to predict affective experiences associated with action outcomes. There is strong evidence that implicit motives predict affective responses to certain classes of action or stimuli. For example, the implicit power motive predicts a positive affective response to faces signaling submissiveness (Schultheiss, 2007; Stanton, Hall, & Schultheiss, 2010). Accordingly, I predict that faces signaling submissiveness can bias action selection when they are presented as action-outcomes. Second, the action-outcome relationship needs to be learned through repeated experience. Accordingly, I predict that implicit motives can bias action selection, when the action-outcome relation has been learned through repeated experience and the action-outcome constitutes a motive-related incentive. This hypothesis is tested in Chapter 2.

How do implicit motives translate into motive-congruent goal-directed behavior?

Prior research into implicit motives identified specific classes of actions and stimuli that can function as motive-related incentives (Schultheiss, 2001; 2008). For example, autocratic decision-making (an action) and faces signaling submissiveness (a stimulus) are expected to function as power motive-related incentives. This identification of specific

motive-related incentives is valuable because it allows one to make clear predictions about people's action selection regarding or in response to these specific actions and stimuli. However, little research attention has been devoted to the question of whether action selection also depends on the perceived *instrumentality* in obtaining the motive-related incentive. From a functional perspective, it is likely that the perceived instrumentality should matter to people who select actions in the service of obtaining motive-related incentives and satisfying their implicit motives.

The potential role of perceived instrumentality in engaging in motive-congruent goal-directed behavior follows from several findings in studies with animals and humans. First, learning experiments with rats show that goal-directed control over behavior involves the acquisition of information about the relationship between an instrumental action and a need-related reward (e.g., food in the case of hunger). Such learning is sensitive to not just the contiguity between response and reward (i.e., classic S-R learning), but also to their contingency or causal relation (Dickinson & Balleine, 1994; 1995). Furthermore, research on human goal pursuit has discovered that successful goal achievement relies on the cognitive representation of goal-means structures. For example, several findings indicate that actions that are perceived to be more instrumental in obtaining highly desired goals are not only more likely to be selected, but also evoke a stronger motivation (e.g., effort) to engage in them (Custers & Aarts, 2005; Kruglanski et al., 2002; Zhang, Fishbach, & Kruglanski, 2007).

To illustrate the potential role of perceived instrumentality in translating implicit motives into motive-congruent goal-directed behavior consider, for example, people with a high implicit power motive. The presence of this motive means that they enjoy having influence over others. Based on their desire to gain power, they should only be propelled to select actions *towards* relatively submissive-looking persons when these persons are regarded as potential targets of their influence (e.g., when they are political candidates who want these

people to vote for them). However, the implicit power motive should predict action selection *away from* relatively submissive-looking persons when they are regarded as instruments through which they can gain influence (e.g., when people choose a political candidate who will represent them and their interests). After all, a submissive-looking person would be perceived as relatively likely to fail to be instrumental in increasing their influence over others. Thus, depending on the contextual meaning, perceived instrumentality might cause a person to appear strategic in preferences and decisions. In social settings, group membership and group roles may determine which persons are regarded as targets or instruments of power. Therefore, in Chapter 3 I test these ideas by experimentally varying group settings using the minimal group paradigm (Mullen, Brown, & Smith, 1992; Jetten, Spears, & Manstead, 1996). Furthermore, in Chapter 4 I test for the first time whether implicit motives actually predict preferences in the applied context of voting for a candidate in a political election.

Overview of the thesis

In *chapter two* I present two studies that test the hypothesis that the implicit power motive predicts action selection to the extent that the relationship between an action (i.e., pressing a button on the keyboard) and an outcome (e.g., the presentation of a submissive-looking face) is learned through repeated experience. For this purpose, I developed a new task (Decision-Outcome Task), in which people repeatedly choose between two actions. In Study 2.1, pressing one key is always followed by the presentation of a submissive-looking face, whereas pressing the other key is always followed by the presentation of a dominant-looking face, and I test whether key presses are predicted by participants' implicit power motive. In Study 2.2, to examine whether the implicit power motive predicts action *towards* submissive faces (as a result of approach motivation) and/or *away from* dominant faces (as a

result of avoidance motivation), I create conditions in which key presses result in either submissive versus neutral, dominant versus neutral, or dominant versus submissive faces.

In *chapter three* I investigate in three studies the presumed relationship between implicit motives and action selection based on perceived instrumentality, focusing again on the power motive. In Studies 3.1 and 3.2, I ask participants to repeatedly select individuals for roles perceived to differ in the extent to which they would allow the selected individual to be instrumental in their attainment of influence over others. Specifically, in Study 3.1 participants choose the leader of their *own* team versus the leader of the *competing* team in a competitive task setting. In Study 3.2, participants choose the *leader* of their own team versus a fellow *subordinate* in their own team in the same competitive task setting. In Study 3.3, I remove the instrumentality-related information to again examine the critical role of instrumentality.

In *chapter four* I examine in four studies whether participants are more likely to prefer political candidates who communicate their intent to provide people with matters that will satisfy their implicit motives. This chapter focuses on the implicit affiliation and achievement motives. In Studies 4.1 and 4.2, I test whether participants' preferences for political candidates who promise in their promotional speeches that their electoral victory will yield affiliation versus achievement outcomes are predicted by participants' implicit affiliation versus achievement motives. Study 4.3 tests whether this predictive value of implicit motives is found even when the candidate claims to possess traits that are opposite to the promised outcomes after being elected (e.g., candidates who claim they are warm-hearted (affiliation) and will improve the country's economic success (achievement)). Finally, Study 4.4 tests these effects in an ecologically valid setting by presenting Dutch participants with real policy proposals from Dutch political parties that were adapted to suggest affiliation- or achievement-related outcomes.

Note that although my focus is on implicit motives, I also measure explicit motives in almost all studies. This allows me to compare the predictive power of implicit and explicit motives under different circumstances and across various decision tasks.

General findings, conclusion and a final note

Overall, the findings of the series of studies described above can be summarized as follows: (1) Implicit motives predict the selection of specific actions to the extent that these actions have been learned to produce motive-congruent effects or incentives; (2) Implicit motives are translated into motive-congruent goal-directed actions to the extent that these actions are perceived to be instrumental in attaining motive-congruent incentives and satisfying the need underlying the motive; and (3) These effects mainly showed up for implicit motive measures, and not so much for explicit (self-attributed) motive measures. In conclusion, then, implicit motives seem to represent a deep-rooted motivational character of an agent's personal history that predict a specific class of behaviors as a result of incentive learning and strategic decision-making, even though the person might not be able to consciously access the motive operating in the social context at hand.

As a final note, I wish to stress that each chapter starts with an introduction and ends with a discussion that discusses the findings in the context of the extant literature on implicit motives and tries to address the potential merits and shortcomings of the findings for that literature. Furthermore, the chapters are presented in a specific order aimed at assisting the reader to follow the logic of the arguments and tests that I have performed to learn more about the role of implicit motives in human decision-making and behavior.

Chapter 2

The Implicit Power Motive Predicts Action Selection

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Abstract

Previous research has indicated that implicit motives can reliably predict which behaviors people select or decide to perform. However, so far, the question of how these motives are able to predict this action selection process has received little attention. Based on ideomotor theory, we argue that implicit motives can predict action selection when an action has become associated with a motive-congruent (dis)incentive through repeated experiences with the action-outcome relationship. This idea was investigated by examining whether the implicit need for power (*n*Power*)* would come to predict action selection (i.e., choosing to press either of two buttons) when these actions had repeatedly resulted in motive-congruent (dis)incentives (i.e., submissive or dominant faces). Both Studies 2.1 and 2.2 indicated that participants became more likely to select the action predictive of the motive-congruent outcome as their history with the action-outcome relationship increased. Study 2.2 indicated that this effect stemmed from both an approach towards incentives and an avoidance of disincentives. These results indicate that implicit motives (particularly the power motive) can predict action selection as a result of learning which actions yield motive-congruent (dis)incentives. Our findings therefore offer a model of how implicit motives can come to predict which behaviors people select to perform.

Keywords: implicit motives, action selection, motivation, ideomotor theory, facial dominance

A major part of everyday human behavior consists of making decisions. When making these decisions, people often rely on what motivates them most. Accordingly, human behavior generally originates from an action selection process that takes into account whether the effects resulting from actions match with people's motives (Bindra, 1974; Deci & Ryan, 2000; Locke & Latham, 2002; McClelland, 1985). Although people can explicitly report on what motivates them, these explicit reports tell only half the story, as there also exist implicit motives of which people are themselves unaware (McClelland, Koestner, & Weinberger, 1989). These implicit motives have been defined as people's non-conscious motivational dispositions that orient, select and energize spontaneous behavior (McClelland, 1987). Generally, three different motives are distinguished: the need for affiliation, achievement or power. These motives have been found to predict many different types of behavior, such as social interaction frequency (Wegner, Bohnacker, Mempel, Teubel, & Schüler, 2014), task performance (Brunstein & Maier, 2005), and emotion detection (Donhauser, Rösch, & Schultheiss, 2015). Despite the fact that many studies have indicated that implicit motives can direct and control people in performing a variety of behaviors, little is known about the mechanisms through which implicit motives come to predict the behaviors people choose to perform. The aim of the current article is to provide a first attempt at elucidating this relationship between implicit motives (particularly the power motive) and the selection of specific behaviors.

An important tenet underlying most decision-making models and expectancy value approaches to action selection and behavior is that people are generally motivated to increase positive and limit negative experiences (Kahneman, Wakker, & Sarin, 1997; Oishi & Diener, 2003; Schwartz et al., 2002; Thaler, 1980; Thorndike, 1898; Veenhoven, 2004). Hence, when someone has to select an action from several potential candidates, this person is likely to weigh each action's respective outcomes based on their to be experienced utility. This

ultimately results in the action being selected which is perceived to be most likely to yield the most positive (or least negative) result. For this process to function properly, people would need to be able to predict the consequences of their potential actions.

This process of action-outcome prediction in the context of action selection is central to the theoretical approach of ideomotor learning. According to ideomotor theory (Greenwald, 1970; Shin, Proctor, & Capaldi, 2010), actions are stored in memory in conjunction with their respective outcomes. That is, if a person has learned through repeated experiences that a specific action (e.g., pressing a button) produces a specific outcome (e.g., a loud noise) then the predictive relation between this action and respective outcome will be stored in memory as a common code (Hommel, Müsseler, Aschersleben, & Prinz, 2001). This common code thereby represents the integration of the properties of both the action and the respective outcome into a singular stored representation. Because of this common code, activating the representation of the action automatically activates the representation of this action's learned outcome. Similarly, the activation of the representation of the outcome automatically activates the representation of the action that has been learned to precede it (Elsner & Hommel, 2001). This automatic bidirectional activation of action and outcome representations makes it possible for people to predict their potential actions' outcomes after learning the action-outcome relationship, as the action representation inherent to the action selection process will prime a consideration of the previously learned action outcome.

When people have established a history with the action-outcome relationship, thereby learning that a specific action predicts a specific outcome, action selection can be biased in accordance with the divergence in desirability of the potential actions' predicted outcomes. From the perspective of evaluative conditioning (De Houwer, Thomas, & Baeyens, 2001) and incentive or instrumental learning (Berridge, 2001; Dickinson & Balleine, 1994; 1995; Thorndike, 1898), the extent to which an outcome is desirable is determined by the affective

experiences associated with the obtainment of the outcome. Hereby, relatively pleasurable experiences associated with specific outcomes allow these outcomes to serve as incentives for subsequent actions that are perceived as instrumental in obtaining these outcomes (Dickinson & Balleine, 1995). Recent research on the consolidation of ideomotor and incentive learning has indicated that affect can function as a feature of an action-outcome relationship. First, repeated experiences with relationships between actions and affective (positive vs. negative) action outcomes cause individuals to automatically select actions that produce positive and negative action outcomes (Beckers, de Houwer, & Eelen, 2002; Lavender & Hommel, 2007; Eder, Müsseler, & Hommel, 2012). Furthermore, such action-outcome learning eventually can become functional in biasing the individual's motivational action orientation, such that actions are selected in the service of approaching positive outcomes and avoiding negative outcomes (Eder & Hommel, 2013; Eder, Rothermund, De Houwer & Hommel, 2015; Marien, Aarts & Custers, 2015a).

This line of research suggests that people are able to predict their actions' affective outcomes and bias their action selection accordingly through repeated experiences with the action-outcome relationship. Extending this combination of ideomotor and incentive learning to the domain of individual differences in implicit motivational dispositions and action selection, it can be hypothesized that implicit motives could predict and modulate action selection when two criteria are met. First, implicit motives would need to predict affective responses to stimuli that serve as outcomes of actions. Second, the action-outcome relationship between a specific action and this motive-congruent (dis)incentive would need to be learned through repeated experience.

According to motivational field theory, facial expressions can induce motive-congruent affect and thereby serve as motive-related incentives (Schultheiss, 2007; Stanton, Hall, & Schultheiss, 2010). As people with a high implicit need for power (*n*Power) hold a

desire to influence, control and impress others (Fodor, 2010), they respond relatively positively to faces signaling submissiveness. This notion is corroborated by research showing that *n*Power predicts greater activation of the reward circuitry after viewing faces signaling submissiveness (Schultheiss & Schiepe-Tiska, 2013), as well as increased attention towards faces signaling submissiveness (Schultheiss & Hale, 2007; Schultheiss et al., 2008). Indeed, previous research has indicated that the relationship between *n*Power and motivated actions towards faces signaling submissiveness can be susceptible to learning effects (Schultheiss & Rohde, 2002; Schultheiss et al., 2005a). For example, nPower predicted response speed and accuracy after actions had been learned to predict faces signaling submissiveness in an acquisition phase (Schultheiss, Pang, Torges, Wirth, & Treynor, 2005). Empirical support, then, has been obtained for both the idea that (1) implicit motives relate to stimuli-induced affective responses and (2) that implicit motives' predictive capabilities can be modulated by repeated experiences with the action-outcome relationship. Consequently, for people high in *n*Power, an action predicting submissive faces would be expected to become increasingly more positive and hence increasingly more likely to be selected as people learn the action-outcome relationship, while the opposite would be true for actions predicting dominant faces as action outcomes.

The Present Research

In order to test the proposed role of implicit motives (here specifically the need for power) in predicting action selection after action-outcome learning, we developed a novel task in which an individual repeatedly (and freely) decides to press one of two buttons. Each button leads to a different outcome, namely the presentation of a submissive or dominant face, respectively. This procedure is repeated 80 times in order to allow participants to learn the action-outcome relationship. As the actions will not initially be represented in terms of their outcomes, due to a lack of established history, *n*Power is not expected to immediately

predict action selection. However, as participants' history with the action-outcome relationship increases over trials, we expect *n*Power to become a stronger predictor of action selection in favor of the predicted motive-congruent incentivizing outcome. We report two studies to examine these expectations.

Study 2.1 aimed to offer an initial test of our ideas. Specifically, employing a within-subject design, participants repeatedly decided to press one of two buttons that were followed by a submissive or dominant face, respectively. This procedure thus allowed us to examine the extent to which *n*Power predicts action selection in favor of the predicted motive-congruent incentive as a function of the participant's history with the action-outcome relationship. In addition, for exploratory purpose, Study 2.1 included a power manipulation for half of the participants. The manipulation involved a recall procedure of past power experiences that has frequently been used to elicit implicit motive-congruent behavior (e.g., Slabbinck, de Houwer, & van Kenhove, 2013; Woike, Bender, & Besner, 2009). Accordingly, we could explore whether the hypothesized interaction between *n*Power and history with the action-outcome relationship predicting action selection in favor of the predicted motive-congruent incentivizing outcome is conditional on the presence of power recall experiences.

Study 2.1

Method

Participants and design. Study 2.1 employed a stopping rule of at least 40 participants per condition, with additional participants being included if they could be found within the allotted time period. This resulted in eighty-seven students (40 female) with an average age of 22.32 years (*SD* = 4.21) participating in the study in exchange for a monetary compensation or partial course credit. Participants were randomly assigned to either the power (n = 43) or control (n = 44) condition.

Materials and procedure. The study started with the Picture Story Exercise (PSE); the most commonly used task for measuring implicit motives (Schultheiss, Yankova, Dirlikov, & Schad, 2009). The PSE is a reliable, valid and stable measure of implicit motives which is susceptible to experimental manipulation and has been used to predict a multitude of different motive-congruent behaviors (Latham & Piccolo, 2012; Pang, 2010; Ramsay & Pang, 2013; Pennebaker & King, 1999; Schultheiss & Pang, 2007; Schultheiss & Schultheiss, 2014). Importantly, the PSE shows no correlation with explicit measures (Köllner & Schultheiss, 2014; Schultheiss & Brunstein, 2001; Spangler, 1992). During this task, participants were shown six pictures of ambiguous social scenarios depicting, respectively, a ship captain and passenger; two trapeze artists; two boxers; two women in a laboratory; a couple by a river; a couple in a nightclub. These pictures have frequently been used to assess implicit motives and are the most strongly recommended pictorial stimuli (Pang & Schultheiss, 2005; Schultheiss & Pang, 2007). Pictures were presented in a random order for ten seconds each. After each picture, participants had two to four minutes to write an imaginative story related to the picture's content.

In accordance with Winter's (1994) *Manual for scoring motive imagery in running text*, power motive imagery (*n*Power) was scored whenever the participant's stories mentioned any strong and/or forceful actions with an inherent impact on other people or the world at large; attempts to control or regulate others; attempts to influence, persuade, convince, make or prove a point; provision of unsolicited help, advice or support; attempts to impress others or the world at large; (concern about) fame, prestige or reputation; or any strong emotional reactions in one person or group of people to the intentional actions of another. The condition-blind rater had previously obtained a confidence agreement exceeding .85 with expert scoring (Winter, 1994). A second condition-blind rater with similar expertise independently scored a random quarter of the stories (inter-rater reliability: $r = .95$). The

absolute number of power motive images as assessed by the first rater (M = 4.62; SD = 3.06) correlated significantly with story length in words (M = 543.56; SD = 166.24), $r(85) = .61$, $p < .01$. In accordance with recommendations (Schultheiss & Pang, 2007), a regression for word count was therefore conducted, whereby *n*Power scores were converted to standardized residuals.

After the PSE, participants in the power condition were given two to four minutes to write down a story about an event where they had dominated the situation and had exercised control over others. This recall procedure is often used to elicit implicit motive-congruent behavior (e.g., Slabbinck et al., 2013; Woike et al., 2009). The recall procedure was omitted in the control condition.

Subsequently, participants partook in the newly developed Decision-Outcome Task (see Figure 2.1). This task consisted of six practice and 80 critical trials. Each trial allowed participants an unlimited amount of time to freely decide between two actions, namely to press either a left or right key (i.e., the A or L button on the keyboard). Each key press was followed by the presentation of a picture of a Caucasian male face with a direct gaze, of which participants were instructed to meet the gaze. Faces were taken from the Dominance Face Data Set (Oosterhof & Todorov, 2008), which consists of computer-generated faces manipulated in perceived dominance with FaceGen 3.1 software. Two versions (one version two standard deviations *below* and one version two standard deviations *above* the mean dominance level) of six different faces were selected. These versions constituted the submissive and dominant faces, respectively. The decision to press left or right always led to either a randomly without replacement selected submissive or a randomly without replacement selected dominant face respectively. Which key press led to which face type was counter-balanced between participants.

Faces were shown for 2000 milliseconds, after which an 800 millisecond black and circular fixation point was shown at the same screen location as had previously been occupied by the region between the faces' eyes. This was followed by a randomly colored square or circle, shown for 1500 milliseconds at the same location. Color randomization covered the whole color spectrum, except for values too difficult to distinguish from the white background (i.e., too close to white). Squares and circles were presented equally in a randomized order, with participants having to press the G button on the keyboard for squares and refrain from responding for circles. This fixation element of the task served to incentivize properly meeting the faces' gaze, as the response-relevant stimuli were presented on spatially congruent locations. In the practice trials, participants' responses or lack thereof were followed by accuracy feedback. After the square or circle (and subsequent accuracy feedback) had disappeared, a 500-millisecond pause was employed, followed by the next trial starting anew. Having completed the Decision-Outcome Task, participants were presented with several 7-point Likert scale control questions and demographic questions (see Tables S2.1 and S2.2 respectively in the supplementary material).

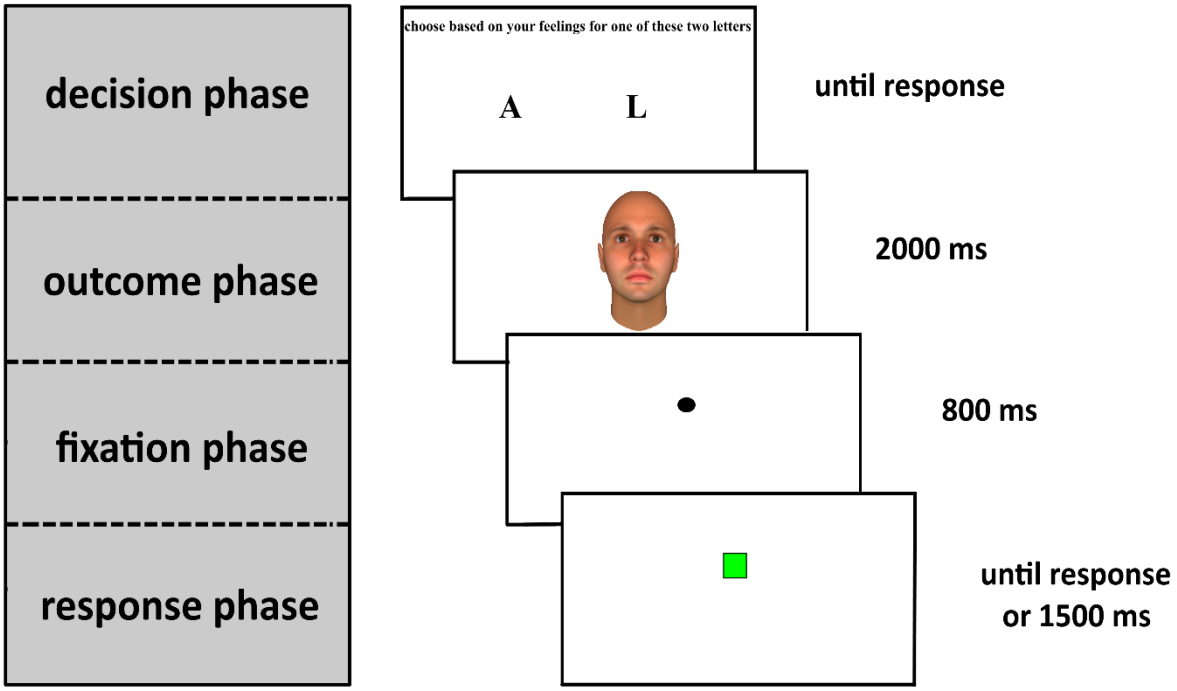

Figure 2.1. Procedure of one trial in the Decision-Outcome Task.

Preparatory data analysis. Based on a priori established exclusion criteria, eight participants' data were excluded from the analysis. For two participants, this was due to a combined score of three or lower on the control questions "How motivated were you to perform as well as possible during the decision task?" and "How important did you think it was to perform as well as possible during the decision task?", on Likert scales ranging from 1(*not motivated/important at all*) to 7(*very motivated/important*). The data of four participants were excluded because they pressed the same button on more than 95% of the trials, and two other participants' data were excluded because they pressed the same button on 90% of the first forty trials. Other a priori exclusion criteria did not result in data exclusion.

Results

Power motive. We hypothesized that the implicit need for power (*n*Power) would predict the decision to press the button leading to the motive-congruent incentive of a submissive face after this action-outcome relationship had been experienced repeatedly. In accordance with commonly used practices in repetitive decision-making designs (e.g., Bowman, Evans, & Turnbull, 2005; de Vries, Holland, & Witteman, 2008), decisions were examined in four blocks of 20 trials. These four blocks served as a within-subjects variable in a general linear model with recall manipulation (i.e., power versus control condition) as a between-subjects factor and *n*Power as a between-subjects continuous predictor. We report the multivariate results as the assumption of sphericity was violated, $\chi = 15.49$, $\varepsilon = .88$, $p = .01$. First, there was a main effect of *n*Power[1], $F(1, 76) = 12.01$, $p < .01$, $\eta_p^2 = .14$. Furthermore, in line with expectations, the analysis yielded a significant interaction effect of

[1] Conducting the same analyses without any data removal did not change the significance of these results. There was a significant main effect of *n*Power, $F(1, 81) = 11.75$, $p < .01$, $\eta_p^2 = .13$, a significant interaction between *n*Power and blocks, $F(3, 79) = 4.79$, $p < .01$, $\eta_p^2 = .15$, and no significant three-way interaction between *n*Power, blocks and recall manipulation, $F(3, 79) = 1.44$, $p = .24$, $\eta_p^2 = .05$.

*n*Power with the four blocks of trials[2], $F(3, 73) = 7.00$, $p < .01$, $\eta_p^2 = .22$. Finally, the analyses yielded a three-way interaction between blocks, *n*Power and recall manipulation that did not reach the conventional level of significance[3], $F(3, 73) = 2.66$, $p = .055$, $\eta_p^2 = .10$. Figure 2.2 presents the percentage of action choices leading to submissive (vs. dominant) faces as a function of block and *n*Power collapsed across recall manipulations (see Figures S2.1 and S2.2 in supplementary material for figures per recall manipulation).

Conducting the aforementioned analysis separately for the two recall manipulations revealed that the interaction effect between *n*Power and blocks was significant in both the power, $F(3, 34) = 4.47$, $p = .01$, $\eta_p^2 = .28$, and control condition, $F(3, 37) = 4.79$, $p = .01$, $\eta_p^2 = .28$. Interestingly, this interaction effect followed a linear trend for blocks in the power condition, $F(1, 36) = 13.65$, $p < .01$, $\eta_p^2 = .28$, but not in the control condition, $F(1, 39) = 2.13$, $p = .15$, $\eta_p^2 = .05$. The main effect of *n*Power was significant in both conditions, ps $\leq .02$. Taken together, then, the data suggest that the power manipulation was not required for observing an effect of *n*Power, with the only between-manipulations difference constituting the effect's linearity.

[2]As an alternative analysis, we calculated changes in action selection by multiplying the percentage of actions selected towards submissive faces per block with their respective linear contrast weights (i.e., -3, -1, 1, 3). This measurement correlated significantly with *n*Power, $R = .38$, 95% CI[.17,.55]. Correlations between *n*Power and actions selected per block were $R = .10$[-.12,.32], $R = .32$[.11,.50], $R = .29$[.08,.48], and $R = .41$[.20,.57], respectively.

[3] This effect was significant if, instead of a multivariate approach, we had elected to apply a Huynh-Feldt correction to the univariate approach, $F(2.64, 225) = 3.57$, $p = .02$, $\eta_p^2 = .05$

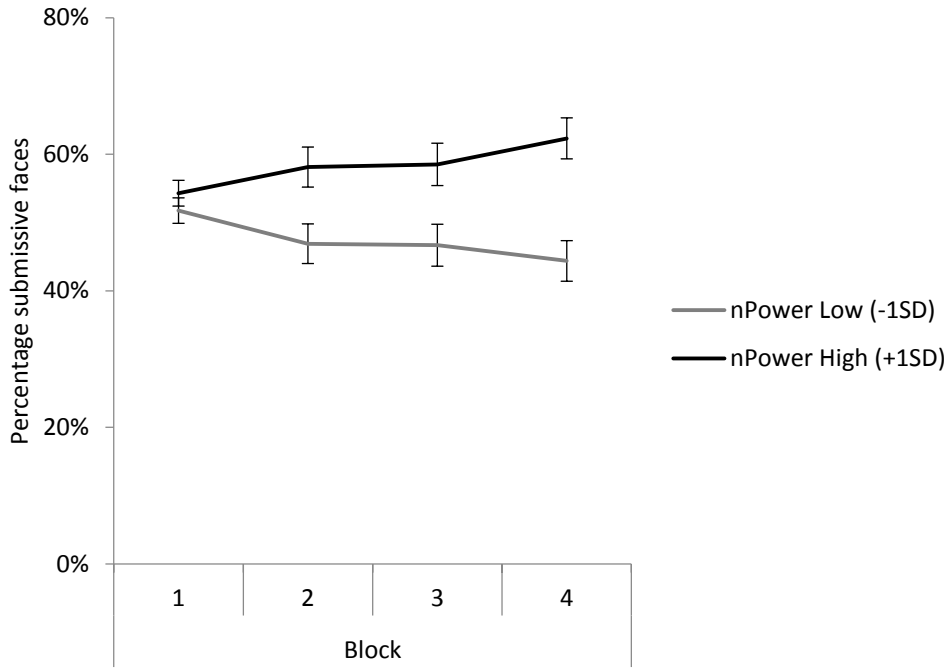

Figure 2.2. Estimated marginal means of choices leading to submissive (vs. dominant) faces as a function of block and *n*Power collapsed across recall manipulations. Error bars represent Standard Errors of the mean.

Additional analyses. We conducted several additional analyses to assess the extent to which the aforementioned predictive relations could be considered implicit and motive-specific. Based on a 7-point Likert scale control question that asked participants about the extent to which they preferred the pictures following either the left versus right key press (recoded depending on counterbalance condition), a linear regression analysis indicated that *n*Power did not predict people's reported preferences, $t = 1.05$, $p = .297$. Adding this measure of explicit picture preference to the aforementioned analyses did not change the significance of *n*Power's main or interaction effect with blocks (*p*s < .01), nor did this factor interact with blocks and/or *n*Power, *F*s < 1, suggesting that *n*Power's effects occurred irrespective of explicit preferences[4]. Furthermore, replacing *n*Power as predictor with either *n*Achievement or *n*Affiliation revealed no significant interactions of said predictors with blocks, Fs$(3, 75) \leq 1.92$, *p*s ≥ .13, indicating that this predictive relation was specific to the incentivized motive.

A prior investigation into the predictive relation between *n*Power and learning effects (Schultheiss et al., 2005b) observed significant effects only when participants' sex matched that of the facial stimuli. We therefore explored whether this sex-congruency effect was also present here. As we used only male faces, the sex-congruency effect would entail a three-way interaction between *n*Power, blocks and sex with the effect being strongest for males. This three-way interaction did not, however, reach significance, $F < 1$, indicating that the aforementioned effects, *p*s < .01, did not depend on sex-congruency. Still, some effects of sex were observed, but none of these related to the learning effect, as indicated by a lack of significant interactions including blocks and sex. Hence, these results are only discussed in the supplementary material.

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[4] A more detailed measure of explicit preferences had been conducted in a pilot study (n = 30). Participants were asked to rate each of the faces employed in the Decision-Outcome Task on how positively they experienced and attractive they considered each face on separate 7-point Likert scales. The interaction between face type (dominant vs. submissive) and *n*Power did not significantly predict evaluations, F < 1. *n*Power did show a significant main effect, $F(1,27) = 6.74$, $p = .02$, $\eta_p^2 = .20$, indicating that people high in *n*Power generally rated other people's faces more negatively. These data further support the idea that *n*Power does not relate to explicit preferences for submissive over dominant faces.

Discussion

Despite many studies indicating that implicit motives can predict which actions people choose to perform, less is known about how this action selection process arises. We argue that establishing an action-outcome relationship between a specific action and an outcome with motive-congruent (dis)incentive value can allow implicit motives to predict action selection (Dickinson & Balleine, 1994; Eder & Hommel, 2013; Schultheiss et al., 2005b). The first study supported this idea, as the implicit need for power (*n*Power) was found to become a stronger predictor of action selection as the history with the action-outcome relationship increased. This effect was observed irrespective of whether participants' *n*Power was first aroused by means of a recall procedure.

It is important to note that in Study 2.1, submissive faces were used as motive-congruent incentives, while dominant faces were used as motive-congruent disincentives. As both of these (dis)incentives could have biased action selection, either together or separately, it is as of yet unclear to which extent *n*Power predicts action selection based on experiences with actions resulting in incentivizing or disincentivizing outcomes. Ruling out this issue allows for a more precise understanding of how *n*Power predicts action selection towards and/or away from the predicted motive-related outcomes after a history of action-outcome learning. Accordingly, Study 2.2 was conducted to further investigate this question by manipulating between participants whether actions led to submissive versus dominant, neutral versus dominant, or neutral versus submissive faces. The submissive versus dominant condition is similar to Study 2.1's control condition, thus offering a direct replication of Study 2.1. However, from the perspective of the need for power, the second and third conditions can be conceptualized as avoidance and approach conditions, respectively.

Study 2.2

Method

Participants and design. Following Study 2.1's stopping rule, one hundred and twenty-one students (82 female) with an average age of 21.41 years (*SD* = 3.05) participated in the study in exchange for a monetary compensation or partial course credit. Participants were randomly assigned to either the approach (n = 41), avoidance (n = 41) or control (n = 40) condition.

Materials and procedure. Study 2.2 was used to investigate whether Study 2.1's results could be attributed to an approach towards the submissive faces due to their incentive value and/or an avoidance of the dominant faces due to their disincentive value. This study therefore largely mimicked Study 2.1's protocol[5], with only three divergences. First, the power manipulation was omitted from all conditions. This was done as Study 2.1 indicated that the manipulation was not required for observing an effect. Furthermore, this manipulation has been found to increase approach behavior and hence may have confounded our investigation into whether Study 2.1's results constituted approach and/or avoidance behavior (Galinsky, Gruenfeld, & Magee, 2003; Smith & Bargh, 2008).

Second, the approach and avoidance conditions were added, which used different faces as outcomes during the Decision-Outcome Task. The faces used by the approach condition were either submissive (i.e., two standard deviations *below* the mean dominance level) or neutral (i.e., mean dominance level). Conversely, the avoidance condition used either dominant (i.e., two standard deviations *above* the mean dominance level) or neutral faces. The control condition used the same submissive and dominant faces as had been used in Study 2.1. Hence, in the approach condition, participants could decide to approach an

[5] The number of power motive images ($M = 4.04$; $SD = 2.62$) again correlated significantly with story length in words ($M = 561.49$; $SD = 172.49$), $r(121) = .56$, $p < .01$, We therefore again converted the *n*Power score to standardized residuals after a regression for word count.

incentive (viz., submissive face), whereas they could decide to avoid a disincentive (viz., dominant face) in the avoidance condition and do both in the control condition.

Third, after completing the Decision-Outcome Task, participants in all conditions proceeded to the BIS-BAS questionnaire, which measures explicit approach and avoidance tendencies and had been added for explorative purposes (Carver, 1994). It is possible that dominant faces' disincentive value only leads to avoidance behavior (i.e., more actions towards other faces) for people relatively high in explicit avoidance tendencies, while the submissive faces' incentive value only leads to approach behavior (i.e., more actions towards submissive faces) for people relatively high in explicit approach tendencies. This exploratory questionnaire served to investigate this possibility. The questionnaire consisted of 20 statements, which participants responded to on a 4-point Likert scale ranging from 1(*not true for me at all*) to 4(*completely true for me*). The Behavioral Inhibition Scale (BIS) comprised seven questions (e.g., "I worry about making mistakes"; α = .75). The Behavioral Activation Scale (BAS) comprised thirteen questions (α = .79) and consisted of three subscales, namely the Reward Responsiveness (BASR; α = .66; e.g., "It would excite me to win a contest"), Drive (BASD; α = .77; e.g., "I go out of my way to get things I want") and Fun Seeking subscales (BASF; α = .64; e.g., "I crave excitement and new sensations").

Preparatory data analysis. Based on a priori established exclusion criteria, five participants' data were excluded from the analysis. Four participants' data were excluded because they pressed the same key on more than 95% of the trials. One other participant's data were excluded due to a consistent response pattern (i.e., minimal descriptive complexity of "40 times AL").

Results

Power motive. Study 2.2 sought to investigate whether *n*Power could predict the selection of actions based on outcomes that were either motive-congruent incentives

(approach condition) or disincentives (avoidance condition) or both (control condition). In order to compare the different stimuli manipulations, we coded responses in accordance with whether they related to the most dominant (i.e., dominant faces in avoidance and control condition, neutral faces in approach condition) or most submissive (i.e., submissive faces in approach and control condition, neutral faces in avoidance condition) available option. We report the multivariate results because the assumption of sphericity was violated, $\chi = 23.59$, $\varepsilon = .87$, $p < .01$. The analysis showed that *n*Power significantly interacted with blocks to predict decisions leading to the most submissive (or least dominant) faces[6], $F(3, 108) = 4.01$, $p = .01$, $\eta_p^2 = .10$. Furthermore, no three-way interaction was observed including the stimuli manipulation (i.e., avoidance vs. approach vs. control condition) as factor, $F(6, 216) = .19$, $p = .98$, $\eta_p^2 = .01$. Lastly, the two-way interaction between *n*Power and stimuli manipulation approached significance, $F(1, 110) = 2.97$, $p = .055$, $\eta_p^2 = .05$. As this between-conditions difference was, however, neither significant, related to nor challenging the hypotheses, it is not discussed further. Figure 2.3 displays the mean percentage of action choices leading to the most submissive (vs. most dominant) faces as a function of block and *n*Power collapsed across the stimuli manipulations (see Figures S2.3, S2.4 and S2.5 in the supplementary material for a display of these results per condition).

Behavioral inhibition and activation scales. Before conducting the explorative analyses on whether explicit inhibition or activation tendencies affect the predictive relation between *n*Power and action selection, we examined whether participants' responses on any of

[6] Conducting the same analyses without any data removal did not change the significance of the hypothesized results. There was a significant interaction between *n*Power and blocks, $F(3, 113) = 4.14$, $p = .01$, $\eta_p^2 = .10$, and no significant three-way interaction between *n*Power, blocks and stimuli manipulation, $F(6, 226) = .23$, $p = .97$, $\eta_p^2 = .01$. Conducting the alternative analysis, whereby changes in action selection were calculated by multiplying the percentage of actions selected towards submissive faces per block with their respective linear contrast weights (i.e., -3, -1, 1, 3), again revealed a significant correlation between this measurement and *n*Power, R = .30, 95% CI[.13,.46]. Correlations between *n*Power and actions selected per block were $R = -.01$[-.20,.17], $R = -.04$[-.22,.15], $R = .21$[.03,.38], and $R = .25$[.07,.41], respectively.

the behavioral inhibition or activation scales were affected by the stimuli manipulation. Separate ANOVA's indicated that this was not the case, Fs ≤ 1.23, ps ≥ .30. Next, we added the BIS, BAS or any of its subscales separately to the aforementioned repeated-measures analyses. These analyses did not reveal any significant predictive relations involving *n*Power and said (sub)scales, ps ≥ .10, except for a significant four-way interaction between blocks, stimuli manipulation, *n*Power and the Drive subscale (BASD), $F(6, 204) = 2.18$, $p = .046$, $\eta_p^2 = .06$. Splitting the analyses by stimuli manipulation did not yield any significant interactions involving both *n*Power and BASD, ps ≥ .17. Hence, although the conditions observed differing three-way interactions between *n*Power, blocks and BASD, this effect did not reach significance for any specific condition. The interaction between participants' *n*Power and established history regarding the action-outcome relationship therefore appears to predict the selection of actions both towards incentives and away from disincentives irrespective of participants' explicit approach or avoidance tendencies.

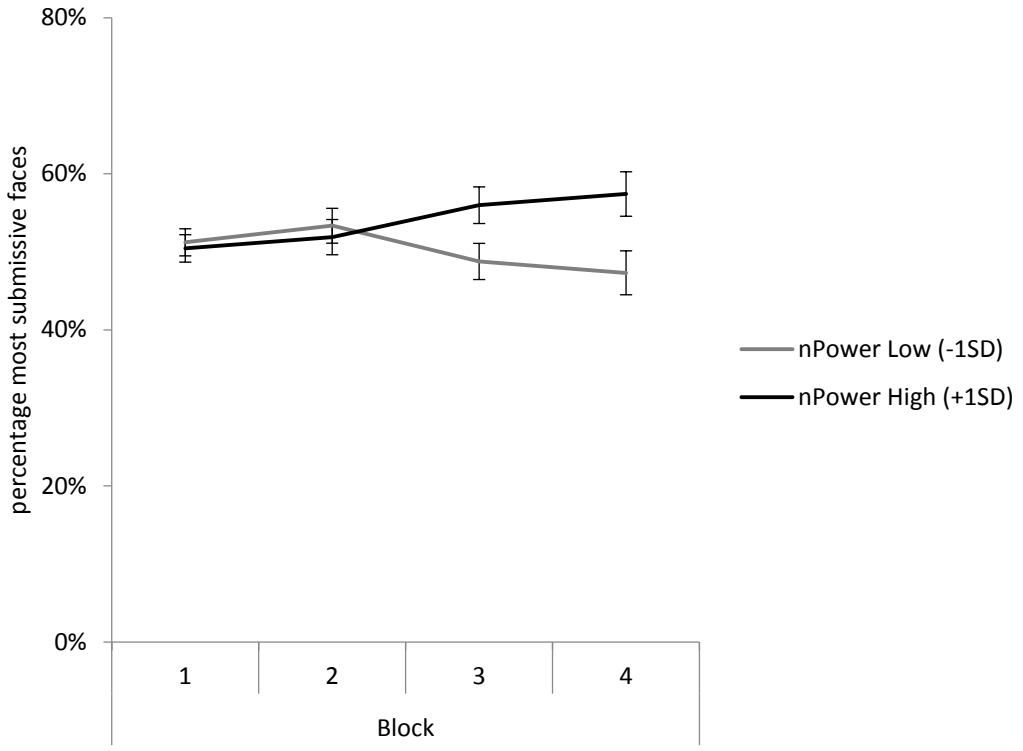

Figure 2.3. Estimated marginal means of choices leading to most submissive (vs. most dominant) faces as a function of block and *n*Power collapsed across the conditions in Study 2.2. Error bars represent Standard Errors of the mean.

Additional analyses. In accordance with the analyses for Study 2.1, we again employed a linear regression analysis to investigate whether *n*Power predicted people's reported preferences for pictures following the pressing of either button, which was not the case, $t < 1$. Adding this measure of explicit picture preferences to the aforementioned analyses again did not change the significance of *n*Power's interaction effect with blocks, $p = .01$, nor did this factor interact with blocks or *n*Power, Fs < 1, suggesting that *n*Power's effects occurred irrespective of explicit preferences. Furthermore, replacing *n*Power as predictor with either *n*Achievement or *n*Affiliation again revealed no significant interactions of said predictors with blocks, Fs(3,112) ≤ 1.42, ps ≥ .12, indicating that this predictive relation was specific to the incentivized motive. Lastly, we again observed no significant three-way interaction including *n*Power, blocks and participants' sex, $F < 1$, nor were the effects including sex as denoted in the supplementary material for Study 2.1 replicated, Fs < 1.

General Discussion

Building on a wealth of research showing that implicit motives can predict many different types of behavior, the present study set out to examine the potential mechanism by which these motives predict which specific behaviors people decide to engage in. We argued, based on theorizing regarding ideomotor and incentive learning (Dickinson & Balleine, 1995; Eder et al., 2015; Hommel et al., 2001), that previous experiences with actions predicting motive-congruent incentives are likely to render these actions more positive themselves and hence make them more likely to be selected. Accordingly, we investigated whether the implicit need for power (*n*Power*)* would become a stronger predictor of deciding to execute one over another action (here, pressing different buttons) as people established a greater history with these actions and their subsequent motive-related (dis)incentivizing outcomes

(i.e., submissive versus dominant faces). Both Studies 2.1 and 2.2 supported this idea. Study 2.1 demonstrated that this effect occurs without the need to arouse *n*Power in advance, while Study 2.2 showed that the interaction effect of *n*Power and established history on action selection was due to both the submissive faces' incentive value and the dominant faces' disincentive value. Taken together, then, *n*Power seems to predict action selection as a result of incentive processing of faces that are represented as action-outcomes.

The present demonstration that implicit motives predict actions after they have become associated, by means of action-outcome learning, with faces differing in dominance level concurs with evidence collected to test central aspects of motivational field theory (Stanton, Hall, & Schultheiss, 2010). This theory argues, amongst others, that *n*Power predicts the incentive value of faces diverging in signaled dominance level. Studies that have supported this notion have shown that *n*Power is positively associated with the recruitment of the brain's reward circuitry (especially the dorsoanterior striatum) after viewing relatively submissive faces (Schultheiss & Schiepe-Tiska, 2013), and predicts implicit learning as a result of, recognition speed of, and attention towards faces diverging in signaled dominance level (Donhauser, Rösch, & Schultheiss, 2015; Schultheiss & Hale, 2007; Schultheiss et al., 2005b; Schultheiss et al., 2008). The current studies extend the behavioral evidence for this idea by observing similar learning effects for the predictive relationship between *n*Power and action selection.

Furthermore, it is important to note that the present studies followed the ideomotor principle to investigate the potential building blocks of implicit motives' predictive effects on behavior. The ideomotor principle, according to which actions are represented in terms of their perceptual results, provides a sound account for understanding how action-outcome knowledge is acquired and involved in action selection (Hommel, 2013; Shin et al., 2010). Interestingly, recent research provided evidence that affective outcome information can be

associated with actions and that such learning can direct approach versus avoidance responses to affective stimuli that were previously learned to follow from these actions (Eder et al., 2015). Thus far, research on ideomotor learning has mainly focused on demonstrating that action-outcome learning pertains to the binding of actions and neutral or affect laden events, while the question of how social motivational dispositions, such as implicit motives, interact with the learning of the affective properties of action-outcome relationships has not been addressed empirically. The present research specifically indicated that ideomotor learning and action selection might be influenced by *n*Power, thereby extending research on ideomotor learning to the realm of social motivation and behavior. Accordingly, the present findings offer a model for understanding and examining how human decision-making is modulated by implicit motives in general.

To further advance this ideomotor explanation regarding implicit motives' predictive capabilities, future research could examine whether implicit motives can predict the occurrence of a bidirectional activation of action-outcome representations (Hommel et al., 2001). Specifically, it is as of yet unclear whether the extent to which the perception of the motive-congruent outcome facilitates the preparation of the associated action is susceptible to implicit motivational processes. Future research examining this possibility could potentially provide further support for the current claim of ideomotor learning underlying the interactive relationship between *n*Power and a history with the action-outcome relationship in predicting behavioral tendencies.

Beyond ideomotor theory, it is worth noting that although we observed an increased predictive relationship between *n*Power and action selection as the learning history increased, this does not necessarily mean that the establishment of a learning history is required for *n*Power to predict action selection. Outcome predictions can be enabled through methods other than action-outcome learning (e.g., telling people what will happen) and such

manipulations may, consequently, yield similar effects. The hereby proposed mechanism may therefore not be the only such mechanism allowing for *n*Power to predict action selection.

It is also worth noting that the currently observed predictive relation between *n*Power and action selection is inherently correlational. Although this makes conclusions regarding causality problematic, it does indicate that the Decision-Outcome Task (DOT) could be perceived as an alternative measure of *n*Power. These studies, then, could be interpreted as evidence for convergent validity between the two measures. Somewhat problematically, however, the power manipulation in Study 2.1 did not yield an increase in action selection favoring submissive faces (as a function of established history). Hence, these results could be interpreted as a failure to establish causal validity (Borsboom, Mellenberg, & van Heerden, 2004). A potential reason for this may be that the current manipulation was too weak to significantly affect action selection. In their validation of the PA-IAT as a measure of *n*Power, for example, Slabbinck, de Houwer and van Kenhove (2011) set the minimum arousal manipulation duration at five minutes, whereas Woike and colleagues (2009) used a ten minutes long manipulation. Considering that the maximal length of our manipulation was four minutes, participants may have been given insufficient time for the manipulation to take effect. Subsequent studies could examine whether increased action selection towards submissive faces is observed when the manipulation is employed for a longer period of time. Further studies into the validity of the DOT task (e.g., predictive and causal validity), then, could help the understanding of not just the mechanisms underlying implicit motives, but also the assessment thereof.

With such further investigations into this topic, a greater understanding may be gained regarding the ways in which behavior could be motivated implicitly to result in more positive outcomes. That is, important activities for which people lack sufficient motivation (e.g., dieting) may be more likely to be selected and pursued if these activities (or, at least,

components of these activities) are made predictive of motive-congruent incentives. Finally, as congruence between motives and behavior has been associated with greater well-being (Pueschel, Schulte, & Michalak, 2011; Schüler, Job, Fröhlich, & Brandstätter, 2008), we hope that our studies will ultimately help provide a better understanding of how people's health and happiness might be more effectively promoted by motivating individuals to selecting the actions that increase their well-being.

Chapter 3

The Implicit Power Motive Predicts Decisions in Line with Perceived Instrumentality

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Abstract

Implicit motives are non-conscious motivational dispositions aimed at the attainment of specific classes of incentives. The implicit power motive, for example, is considered to direct behavior towards the incentive of influence over others. It would therefore be expected that this motive would predict the selection of actions people perceive to be instrumental in the obtainment of this incentive. Accordingly, previous research has identified many different predictive relationships between the implicit power motive and specific actions and stimulus-responses that people are presumed to have previously learned to associate with increased influence over others. For the current article, we attempted to extend this understanding of implicit motives' predictive capabilities by more directly investigating the presumed relationship between implicit motives and action selection based on perceived instrumentality.

Across two studies, participants were tasked with selecting individuals based on the extent to which they would be perceived as being instrumental in participants' attainment of influence over others. Specifically, we expected that the implicit power motive would predict a preference for more dominant-looking individuals (who would be perceived as relatively capable of influencing others) when their influence would favor, rather than *disfavor,* the participant. This was indeed observed. For Study 3.3, the instrumentality-related information was removed and the previously observed predictive relationships no longer reached significance. These findings support the notion that implicit motives can predict decisions in line with perceived instrumentality.

When making a decision, it is generally wise to consider the potential results of the different decision options and how motivated you are to obtain them. Although people tend to have an idea of what motivates them, motivation also operates at a non-conscious level (Aarts, 2007; McClelland, Koestner, & Weinberger, 1989). As people cannot explicitly report on what tends to motivate them non-consciously, non-conscious motivation can only be measured implicitly (Koestner, Weinberger, & McClelland, 1991; Winter, 1994). Research shows that people have inherent non-conscious motives, so-called *implicit motives*, which are defined as motivational dispositions that operate outside of people's conscious awareness and are aimed at the attainment of specific classes of incentives (Schultheiss, 2008). The implicit power motive, for example, reflects the extent to which people unconsciously like gaining influence over others (Fodor, 2010). Consequently, said motive has been found to positively predict, for example, the extent to which people pick up and retain behaviors that helped them defeat others in competitive tasks (Schultheiss et al., 2005a) as well as corrugator activity in responses to displayed assertiveness by others (Fodor, Wick, & Hartsen, 2005).

These predictive relationships between motives and behavior are presumed to follow from people's desires to obtain motive-related incentives (McClelland et al., 1989; Schultheiss, 2001). In this sense, the relative attractiveness of potential actions is determined by the incentive value of their prospected outcomes, with implicit motives predicting (part of) this incentive value. People high in implicit power motivation, for example, will consider influencing others as relatively pleasurable, presumably making them more likely to select actions they perceive to be instrumental in the obtainment of influence over others (Dickinson & Balleine, 1995). For the current article, we attempt to test this assumption of implicit motives predicting action selection based on the potential actions' perceived instrumentality, specifically regarding the implicit power motive within a social influence context.

Instrumental learning

In order for people to be able to bias their action selection in accordance with potential actions' perceived instrumentality, people need to first be able to predict their actions' potential effects. Such predictions can follow from instrumental learning (Berridge, 2001; Dickinson & Balleine, 1994), whereby people can learn that specific actions (e.g., acting assertively) hold a predictive value of obtaining specific outcomes (e.g., influence) by establishing a history with the action-outcome contingency. Actions that previously reliability predicted specific outcomes will then be expected to continue to do so in the future.

According to ideomotor theory (Greenwald, 1970; Hommel, Müsseler, Aschersleben, & Prinz, 2001; Shin, Proctor, & Capaldi, 2010), these action-outcome relations are stored in memory as common codes. Activating the mental representation of the action, then, will automatically activate the mental representation of its associated outcome. Properties of these action outcomes, such as their incentive value, will then also become part of the mental representation of the action (Eder & Hommel, 2013). Consequently, actions (e.g., acting assertively) that people previously experienced to reliably cause outcomes with incentive value (e.g., influence) will themselves gain incentive value, making people more likely to want to repeat them (Custers & Aarts, 2005; Eder & Hommel, 2013; Eder, Rothermund, De Houwer & Hommel, 2015; Marien, Aarts & Custers, 2015).

Motive-related incentives

Based on the prior logic, it would be expected that the extent to which people are relatively implicitly power motivated, and hence are incentivized by gaining influence over others, would predict the extent to which they will select actions they previously experienced to be predictive of gaining influence over others. After all, instrumental learning will have turned these actions themselves into motive-related incentives (McClelland et al., 1989).

Accordingly, many studies have attempted to determine specific actions that can be predicted by implicit motives, such as, for the implicit power motive, using an autocratic decision-making style in groups (Fodor & Smith, 1982) and the frequent use of gestures when attempting to convince others (Schultheiss & Brunstein, 2002), based on the extent to which they can be expected to have previously resulted in motive-related incentives.

Similarly, attempts have been made to identify specific classes of stimuli that can function as motive-related incentives (Schultheiss, 2001; 2008). Faces signaling submissiveness (Stanton, Hall, & Schultheiss, 2010), for example, can be expected to function as power motive-related incentives, as people are likely to have previously encountered submissive-looking people and found them to be easier to influence and/or previously had successful attempts to influence others result in these others looking more submissive. In support of this idea, the implicit power motive has been found to predict response speed and accuracy for actions that had been learned to predict submissive-looking faces during an acquisition phase (Schultheiss, 2005b) as well as increased activation of the neural reward circuitry as a consequence of viewing submissive-looking faces (Schultheiss & Schiepe-Tiska, 2013). Indeed, Stoeckart, Strick, Bijleveld and Aarts (2016) observed that the implicit power motive became increasingly likely to predict the selection of initially motive-unrelated actions (i.e., pressing specific buttons on the keyboard) as people learned the predictive relationship between these actions and exposure to submissive faces.

Instrumentality

Although identifying specific actions and stimuli that can be operationalized as motive-related incentives allows for clear predictions regarding people's action selection (in response to stimuli) based on the extent to which these people hold specific implicit motives, it is questionable to which extent these predictive relationships truly follow from the extent to

which the actions are perceived to be instrumental in obtaining the motive-related incentive. After all, if the incentive guiding the implicit power motive is the obtainment of influence over others, then identified examples of actions (e.g., autocratic decision-making) and stimuli (e.g., submissive faces) of motive-related incentives serve, at best, as approximations of the actual incentive of influence over others. Seeing a submissive-looking person is not the same as actually influencing a person, and may therefore merely serve as a cue for whether the actual incentive (influence) can or is likely to be obtained. Although this cue, then, would prime goal pursuit towards the desired incentive, it would not necessarily function as a desired incentive itself (Eder & Hommel. 2013). People's implicit power motive may then only predict action selection towards, for example, submissive-looking persons, because people have learned to expect that such actions will generally lead to the actual incentive of influence over others in most contexts. Importantly, these contextual factors may well influence the instrumentality of specific actions and/or stimuli. Changes to contextual factors that affect perceived instrumentality, may then change people's action selection accordingly.

If, for example, the implicit power motive predicts action selection based on perceived instrumentality towards increased influence, it should only predict action selection *towards* relatively submissive-looking people when these people are regarded as potential targets of influence. If, however, these people are regarded as potential instruments through which people can express their own influence, then the implicit power motive should predict actions selection *away from* relatively submissive-looking people. After all, their lack of perceived dominance would indicate that they would likely fail to be instrumental in increasing influence for the person making the selection. If, instead, implicit motives are guided specifically by prior instrumental learning, irrespective of currently perceived instrumentality, then the implicit power motive should predict action selection favoring submissive-looking people irrespective of the aforementioned contextual factor. The current

article attempts to provide a first indication of whether the implicit power motive predicts action selection based on perceived instrumentality, using the aforementioned contextual factor as our manipulation.

The Present Research

In order to test the proposed role of perceived instrumentality on the relationship between implicit motives and action selection, we devised a task in which participants selected motive-unrelated actions (i.e., pressing the "A" or "L" button on the keyboard), based on stimuli identified in prior studies as implicit power motive-related incentives (i.e., submissive and/or dominant faces). These stimuli were stated to represent people who, if selected, would have diverging instrumentalities in providing people with the implicit power motive-related incentive of increased influence. Specifically, in Studies 3.1 and 3.2 participants were led to believe that they would have to perform a competitive between-groups task the following week. Prior to this, they would have to select an own-group leader who would be tasked with influencing the rival group's leader, thereby giving the participants' group a competitive advantage. Because this leader, then, would serve as an instrument through which people could increase their influence, we expected that the implicit power motive would predict more decisions favoring *dominant*-looking own-group leaders. Additionally, participants were tasked to select the rival-group leader (Study 3.1) or a regular own-group member (Study 3.2). Because these individuals would only serve as potential targets of participants' influence, we hypothesized that the implicit power motive would predict more decisions favoring *submissive*-looking individuals. For Study 3.3, the information regarding potential instrumentality of the different options was removed. We therefore expected the implicit power motive to hold no significant predictive value. Should, however, the relationship between implicit motives (here specifically the implicit power

motive) and action selection not depend on perceived instrumentality, but instead only on prior instrumental learning, the implicit power motive would be expected to predict action selection favoring *submissive*-looking individuals for all studies and conditions.

Beyond this main purpose of the studies, we took the opportunity provided by telling people that there would be a subsequent task the following week to assess the test-retest reliability of both our implicit (Picture-Story Exercise) and explicit (Personality Research Form) motive measures. For Study 3.1, the order of the different task elements was kept constant, whereas we re-randomized this order for Study 3.2.

Study 3.1

Method

Participants and design. All three studies employed a stopping rule of a minimum of 50 participants with more being recruited if they could be found in the allotted time period. 54 students (35 female) with an average age of 20.94 years (*SD* = 2.30) participated in Study 3.1 in exchange for a monetary compensation or partial course credit. The study used a within-subjects design.

Materials and procedure. The study was introduced as the first session of a two-part study, with the second session taking place the following week. Before starting the study, participants made an appointment for this second session by indicating a preferred date. Then, the study started with the Picture Story Exercise (PSE). The PSE has been found to be a reliable, valid and stable measure of implicit motives and constitutes the most commonly used task for measuring said motives (Latham & Piccolo, 2012; Pang, 2010; Ramsay & Pang, 2013; Pennebaker & King, 1999; Schultheiss & Pang, 2007; Schultheiss & Schultheiss, 2014; Schultheiss, Yankova, Dirlikov, & Schad, 2009). Importantly, the implicit power motive as measured by the PSE shows no correlation with explicit measures of the same construct

(Köllner & Schultheiss, 2014; Spangler, 1992). During this task, we presented participants with six pictures of ambiguous social scenarios showing, respectively, two boxers; two trapeze artists; two women in a laboratory; a couple by a river; a couple in a nightclub; a ship captain and passenger. These pictures constitute the most strongly recommended pictorial stimuli (Pang & Schultheiss, 2005; Schultheiss & Pang, 2007). Pictures were presented in a random order for ten seconds each. After each picture, participants had two to four minutes to write an imaginative story related to the picture's content.

In accordance with Winter's (1994) *Manual for scoring motive imagery in running text*, stories were scored for power motive imagery for every occurrence of any strong and/or forceful actions with an inherent impact on other people or the world at large; attempts to control or regulate others; attempts to influence, persuade, convince, make or prove a point; provision of unsolicited help, advice or support; attempts to impress others or the world at large; (concern about) fame, prestige or reputation; or any strong emotional reactions in one person or group of people to the intentional actions of another. The condition-blind rater had previously obtained a confidence agreement exceeding .85 with expert scoring (Winter, 1994). The absolute number of power motive images correlated significantly with story length in words, $r(54) = .55$, $p < .001$. In accordance with recommendations (Schultheiss & Pang, 2007), a regression for word count was therefore conducted, whereby power motive scores were converted to standardized residuals.

Participants were subsequently told that the rest of the study related to a competitive between-groups task. This task would take place in the second session. Before being able to conduct this task, however, groups needed to be formed and group leaders needed to be appointed. These leaders were purported to serve the role of influencing the other group's leaders to give their own group a competitive advantage. Consequently, the two subsequent

tasks were stated to have the purpose of first dividing participants into groups and secondly deciding who would be the leaders of these groups.

For the supposed distribution of participants into groups, we used the minimal group paradigm (Mullen, Brown, & Smith, 1992; Jetten, Spears, & Manstead, 1996). Across seven trials, participants were presented with numerous shapes on the screen and then had to indicate how many shapes they thought had been presented. These answers were stated to indicate people's perceptual tendencies, on which the group distribution would be based. We presented either 39, 48, 57, 66, 75, 84, or 93 randomly colored shapes in a random order. Each shape's position on the screen was randomly determined, while overlapping with other shapes was avoided. Shapes were either circular, rectangular or triangular in equal numbers. After three seconds, the shapes disappeared and participants had to estimate the number of shapes that had been present on the screen. The next trial started immediately after a response was given. After completing the task, participants were randomly distributed into either the group of "detailed-perceivers" (n = 28) or "global-perceivers" (n = 26). Detailed-perceivers were described as generally being more focused on details, whereas global-perceivers were described as generally being more focused on the bigger picture. These groups were then indicated to be the groups that would compete in the second session's competitive task and for which group leaders had to subsequently be selected.

Group leaders were said to be selected based on the subsequent decision task. This task used a 2(group: own vs. rival) by 2(left: submissive vs. dominant face) by 2(right: submissive vs. dominant face) design with each within-subjects condition constituting 10 trials[7] (80 in total). During each trial, participants would first see an instruction for two

[7]A coding error resulted in uneven distribution over the different within-subjects conditions for three participants. As our dependent variable constitutes a percentage of decisions for a specific face per within-subjects condition, we chose to maintain the data of these participants regardless of this confound. Excluding these participants did not change the significance of the main hypothesized result, $F(1, 46) = 10.05$, $p = .003$, $\eta_p^2 = .18$.

seconds in the middle of the screen. This instruction indicated whether the succeeding decision would relate to either the own or rival group. Then, two faces were presented on the left and right of the screen respectively and participants had to indicate which of these persons they would prefer to become the leader of the respective group. Faces were taken from the Dominance Face Data Set (Oosterhof & Todorov, 2008). Each face had been computer-generated with FaceGen 3.1 software, representing a Caucasian male face with a direct gaze. The fact that the faces had been computer-generated was explained to participants as following from the need to maintain potential leaders' anonymity. Hence, the faces were said to represent and be alike the actual potential leaders' faces, but not literally be their faces. We used 25 different face types, with the version two standard deviations *below* the mean dominance level constituting a submissive face and the version two standard deviations *above* the mean dominance level constituting a dominant face. After participants had indicated their decision, the faces disappeared. This was followed by a randomly determined 200 to 700 millisecond inter-trial interval, after which the next trial started anew. The different trials were presented in a random order, with randomization being limited to result in equal numbers of own or rival group trials per half of the task and each option within this group (i.e., submissive/submissive faces, submissive/dominant faces, dominant/submissive faces, dominant/dominant faces) being selected randomly without replacement. Participants were informed accordingly after having completed half the task.

The leader task was followed by a manipulation check, during which participants were first asked to indicate to which group (detailed-perceivers versus global perceivers) they had been allocated. Then, participants were asked to indicate to which extent they agreed with this allocation on a 7-point Likert scale ranging from 1(*not at all*) to 7(*very much*). The following eight randomly ordered questions used the same Likert scale, requesting of participants to indicate to which extend they identified [felt a connection with] the own

[rival/detailed-perceivers/global-perceivers] group. The questions relating to the group participants had been allocated to themselves showed a high reliability (α = .89) as did the questions relating to the group that participants had not been allocated to themselves (α = .83). We therefore collapsed these two groups of questions into two separate variables. A factor analysis across all these questions indicated a primary component explaining 48.00% of variance on which all the questions relating to the own group loaded positively and all questions regarding the rival group loaded negatively, as well as a component explaining 24.76% of variance on which all questions loaded positively.

Participants were then asked five 7-point Likert questions regarding how motivated they were to complete the tasks as well as possible and how difficult, important, fun and annoying they considered this to be. Subsequently, they were asked 36 randomly ordered questions from the Personality Research Form (Jackson, 1974). This questionnaire consists of three 12-item subscales relating to how achievement- (α = .75), power- (α = .83), and affiliation-motivated (α = .77) people consider themselves to be. Lastly, participants were asked several demographic and open questions.

Session 2. In line with the cover story of a second session occurring during which participants had to perform a competitive between-group task, participants were requested to come back to the lab on the indicated preferred date. 42 students (77.8% of the original sample) did so. Of these, 29 were female and the average age was 21.10 years (*SD* = 2.44). The average between-sessions temporal distance was 7.93 days (*SD* = 2.40).

We took the opportunity of this second session to assess the test-retest reliability of the Picture Story Exercise (PSE) and Personality Research Form (PRF). The study therefore again started with the PSE. Task procedures were unchanged, meaning that the order of pictures as used in the first session was kept constant here (i.e., if a participant saw the “two boxers” picture first in session 1 they would see the same picture first in session 2).

Participants then completed an unrelated task, after which they continued on to the PRF (achievement: $\alpha = .77$; power: $\alpha = .82$; affiliation: $\alpha = .75$). This questionnaire also used the same order of questions as had been randomly determined during the first session. We then employed the same demographic questions in order to also match participants on these variables. For six participants the demographic data did not match between the two sessions (e.g., male in first session, female in second), indicating either an error in determining returning participants' original participant numbers or a lack of serious answers being provided. We therefore excluded these participants from the analysis. Analyses across the remaining 36 participants indicated highly significant correlations for each implicit or explicit motive measure (see Table 3.1), indicating satisfactory test-retest reliability for the hereby employed measures.

Table 3.1

Means and standard deviations of and correlations between the PRF's motive measures (PRF), unstandardized PSE motive measures, activity inhibition and word count (PSE-U), and PSE motive measures and activity inhibition standardized for word count (PSE-Z) across the first and second session of Study 3.1.

motive	session 1		session 2			
	M	*SD*	*M*	*SD*	*R*	*p*
Achievement (PRF)	4.73	0.76	4.79	0.83	.862	.000
Power (PRF)	4.53	0.84	4.58	0.80	.885	.000
Affiliation (PRF)	5.08	0.75	5.17	0.70	.827	.000
Achievement (PSE-U)	5.69	3.68	5.76	3.57	.396	.009
Power (PSE-U)	5.46	2.87	5.26	3.66	.635	.000
Affiliation (PSE-U)	5.46	2.89	5.76	3.05	.717	.000
Activity Inhibition (PSE-U)	4.59	3.92	4.32	3.27	.644	.000
Word Count (PSE-U)	561.11	153.34	552.60	173.98	.844	.000
Achievement (PSE-Z)					.498	.002
Power (PSE-Z)					.631	.000
Affiliation (PSE-Z)					.566	.000
Activity Inhibition (PSE-Z)					.603	.000

Preparatory data analysis. One participant's data were excluded from the analyses. This participant first suffered a computer crash and upon re-doing the study was randomly distributed to what had originally been the rival group.

Results

Manipulation check. We first assessed whether participants' random allocation to the different groups (i.e., detailed- versus global-perceivers) had resulted in divergent feelings of group membership. Notably, all participants accurately recalled the group they had been allocated to. Furthermore, a one-sided t-test indicated that agreement with the group allocation ($M = 4.81$, $SD = 1.26$) differed significantly from the midpoint of the scale, $t(53) = 4.75$, $p < .001$. A repeated-measures ANOVA with the questions regarding the identification and connection with the own versus rival group as dependent variables and condition (i.e., detailed versus global perceivers) as independent variable indicated that participants significantly favored the own group over the rival group, $F(1, 52) = 38.86$, $p < .001$, $\eta_p^2 = .43$. This effect did not differ between-conditions, $F < 1$.

We also investigated whether the group distribution had truly been random and unrelated to performance or motives. Separate logistic regressions with either the implicit or explicit power motive as continuous predictor and condition as dependent variable observed no significant effects (ps $\geq .752$). Additionally, a repeated-measures ANOVA with the absolute difference between estimated and actual number of shapes per trial as dependent variables and condition as independent variable observed no significant effects (Fs ≤ 1.31, ps $\geq .257$), other than the main effect of trial, $F(6, 47) = 8.30$, $p < .001$, $\eta_p^2 = .51$, with the error rate increasing as more shapes were presented.

Main analyses. We hypothesized that the extent to which the implicit power motive predicts decisions for specific face types would depend on whether these faces were

construed as instrumental to the person's ability to influence others. This was operationalized by representing these faces as belonging to potential leaders of the own versus a rival group, within a competitive between-group setting. Specifically, it was hypothesized that the implicit power motive would predict decisions favoring relatively submissive faces when these faces were said to represent potential rival group leaders, but that this effect would disappear or even reverse for faces said to represent potential own group leaders. We therefore conducted a general linear model with the decisions on submissive/dominant and dominant/submissive trials collapsed per group (i.e., own versus rival) as dependent variables and the implicit power motive[8]. This analysis firstly observed a significant main effect of group, $F(1, 51) = 9.01$, $p = .004$, $\eta_p^2 = .15$. More submissive faces were selected in the rival ($M = 63.71\%$, $SE = 2.75$) than in the own group trials ($M = 49.11\%$, $SE = 3.10$). Additionally, the hypothesized interaction between group and the implicit power motive was significant, $F(1, 51) = 11.36$, $p = .001$, $\eta_p^2 = .18$. As can be observed in Figure 3.1, the implicit power motive positively predicted decisions favoring submissive faces for the rival group, but negatively for the own group. The main effect of the implicit power motive was not significant, $F < 1$.

One-sided t-tests comparing the proportion of decisions favoring submissive faces for the own and rival group with chance level (50%) indicated that the aforementioned main effect of group was specific to the rival group, $t(53) = 4.76$, $p < .001$ ($t < 1$ for own group). This effect indicates that people generally prefer leaders of rival groups to appear submissive. However, separate ANOVA's for these dependent variables with the implicit power motive as continuous predictor revealed that the significant predictive relationship between the

[8] Analyzing instead the 2(group: own vs. rival) by 2 (order: submissive/dominant vs. dominant/submissive) design revealed a main effect of group, $F(1, 51) = 9.02$, $p = .004$, $\eta_p^2 = .15$, and the hypothesized two-way interaction between group and the implicit power motive, $F(1, 51) = 11.26$, $p = .002$, $\eta_p^2 = .18$. No significant effects of order were observed, Fs < 1.

implicit power motive and decisions occurred for both the own, $F(1, 51) = 6.87$, $p = .012$, $\eta_p^2 = .12$, and rival group, $F(1, 51) = 8.95$, $p = .004$, $\eta_p^2 = 15$.

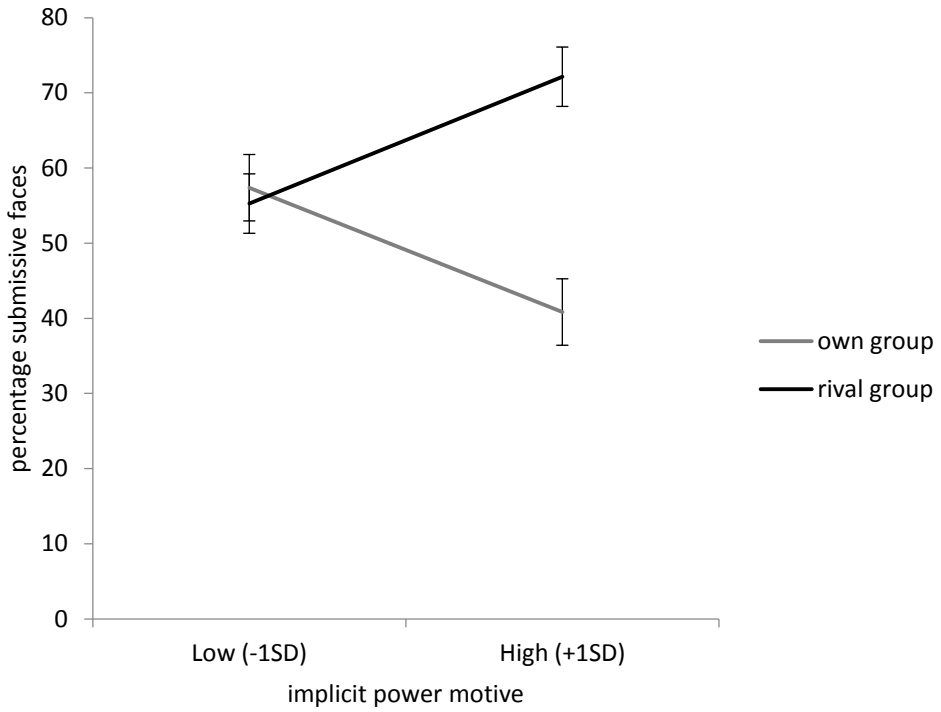

Figure 3.1. Estimated marginal means of choices leading to submissive (vs. dominant) faces as a function of the implicit power motive and group (own vs. rival) in Study 3.1. Error bars represent Standard Errors of the mean.

Other motives. In accordance with the general literature (Köllner & Schultheiss, 2014; Spangler, 1992), no significant correlation was observed between the implicit and explicit power motive, $r(53) = -.039$, $p = .783$. In order to investigate whether the aforementioned predictive relation between the implicit power motive and decisions as a function of group was specific to the implicit power motive, we replaced this motive for the explicit power motive as continuous predictor in the general linear model with the decisions on submissive/dominant and dominant/submissive trials collapsed per group (i.e., own versus rival) as dependent variables. This analysis revealed no main or interaction effect of the explicit power motive, Fs < 1. The same held true when we instead employed either the implicit achievement or affiliation motive. Hence, the predictive relation appears to have been specific to the implicit power motive.

Latency. A potential reason for why we observed effects of instrumentality, but no stimulus-response tendencies (whereby the implicit power motive would predict favorable responses for submissive faces irrespective of instrumentality), is that the hereby employed declarative decisions may be relatively likely to follow lines of deliberative reasoning, which may be more likely to account for instrumentality. We therefore also examined whether the implicit power motive may have predicted the less deliberate variable of response time. In accordance with Aarts, Dijksterhuis and De Vries (2001), who observed that thirsty participants responded faster to drinking-related items than non-thirsty participants, it might be expected that relatively implicitly power motivated participants would respond relatively fast to submissive faces if these faces automatically induced approach-related stimulus-response tendencies. Alternatively, it might be hypothesized that the motivational salience of the contrast between dominant versus submissive faces would arouse the implicit power motive, thereby making responses faster as a function of the implicit power motive in the conditions where the two face types diverged (i.e., submissive/dominant and

dominant/submissive conditions). In order to investigate these possibilities, we conducted an analysis across the full 2(group: own vs. rival) by 2(left: submissive vs. dominant) by 2(right: submissive vs. dominant) design with the implicit power motive as continuous predictor. In preparation, all responses faster than 100 milliseconds (0.1% of trials) and longer than four standard deviations from the mean response time (0.7% of trials, ≥ 10641 milliseconds) were removed to prevent outlying values or pre-meditated responses from affecting the results[9]. This analysis revealed a significant main effect of group, $F(1, 51) = 4.75$, $p = .034$, $\eta_p^2 = .09$, with responses being relatively fast for the own ($M = 2464.53$ milliseconds, $SE = 140.01$) versus rival ($M = 2593.97$, $SE = 146.09$) group. Additionally, there was a significant interaction effect between left and right, $F(1, 51) = 11.77$, $p = .001$, $\eta_p^2 = .19$, with responses being fastest when the two presented faces were of different face types. No significant effects were observed that included the implicit power motive, Fs ≤ 1.02, ps ≥ .317. Hence, the implicit power motive appears to have predicted decisions, but not the speed at which these decisions were made.

Discussion

The implicit power motive is defined as the extent to which people unconsciously like gaining influence over others (Fodor, 2010). Accordingly, many actions associated with social influence have been identified for which the implicit power motive holds a predictive value. Similarly, specific classes of stimuli have been identified in response or anticipation of which the implicit power motive holds a predictive value over behavior. These results, however, have left open the question of whether these actions or stimuli themselves function as incentives, or whether they function merely as instrumental cues for the ultimately incentive of influence over others.

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[9] Applying these same criteria to the analyses for decisions indicated that the interaction between role and the implicit power motive was still significant, $F(1, 51) = 11.04$, $p = .002$, $\eta_p^2 = .18$.

In order to test whether the implicit power motive predicts action selection based on action's perceived instrumentality towards influence over others, we conducted a study whereby the same action was either framed as instrumental or non-instrumental for gaining influence over others. Specifically, the instrumentality of the different options was manipulated based on the orientation of the to-be-selected individuals' influence (i.e., favoring or disfavoring the participant). Results supported our hypothesis, as the implicit power motive divergently predicted action selection based on the candidate's instrumentality. These results provide novel evidence that implicit motives, here the implicit power motive specifically, do not operate merely as predictors of spontaneous actions (McClelland et al., 1989) or of responses to specific stimuli (Schultheiss 2001; 2008), but instead operate in a way whereby the perceived instrumentality of the selection action is taken into account.

Although these results confirmed our prediction that implicit motives operate on the the basis of perceived instrumentality, several alternative explanations remain. For one, it is also possible that this predictive relationship occurred because people relatively high in the implicit power motive are more prone to ascribe the concept of dominance to themselves, and are therefore more likely to choose to match a dominant-looking person to a member of the own group. For Study 3.2, then, we chose to maintain group membership as a fixed factor in the design. That is, both roles for which participants had to select a person (previously own versus rival group leader) were own-group members. However, one half of the decisions was stated to relate to the group leader, whereas the other half was stated to relate to a regular group member. As only the leader was stated to be instrumental in the obtainment of influence over others, the implicit power motive should still divergently predict decisions favoring dominant versus submissive faces as a function of condition. In other words, whereas Study 3.1 investigated whether the predictive relationship between the implicit power motive and decisions would depend on the orientation of the power (i.e., favoring vs.

disfavoring own group), Study 3.2 investigates whether the predictive relationship between the implicit power motive and decisions would depend on the function of the individual (i.e., influential or not).

Study 3.2

Method

Participants and design. 50 students (36 female) with an average age of 21.94 years (*SD* = 2.88) participated in the study in exchange for a monetary compensation or partial course credit. The study used a within-subjects design.

Materials and procedure. Study 3.2 almost fully mimicked the procedure of Study 3.1. The first deviation occurred after the PSE[10], when it was first mentioned that participants would first be divided into groups and would then have to decide who would become their own group leader and who would become a own group member. It was specifically stated, and reiterated in the specific task instructions, that the selection process regarded people who would – dependent on decisions – be added to the group or not. Hence, the selection of one person as group leader would not automatically mean the selection of the other person as a regular group member, thereby confounding the two conditions. Instead, it was stated that the current group already consisted of nine people, including the participant him/herself. Based on the decisions for group leader, one person would be added to the group as group leader. Based on the decisions for group member, one person would be added to the group as group member. All potential candidates were stated to be of the congruent minimal group (i.e.,

[10] The number of power motive images again correlated significantly with story length in words, $r(50) = .52$, $p < .001$, We therefore again converted the implicit power motive score to standardized residuals after a regression for word count. For the PRF, the achievement ($\alpha = .70$), power ($\alpha = .85$), and affiliation ($\alpha = .73$) scales all showed at least acceptable reliability. The questionnaires regarding how connected people felt with the own ($\alpha = .93$) and rival ($\alpha = .85$) groups again showed high reliability. A factor analysis again indicated two factors, one explaining 44.64% of variance on which all questions regarding the own group loaded positively and all questions regarding the rival group loaded negatively. The other factor explained 32.19% of variance and all questions loaded positively here.

detailed- or global-perceivers). Note here that if prior results could be explained by a stronger (desired) association between "dominant" and the self for relatively highly implicit power motivated people, thereby resulting in more dominant-looking "own group leaders" being chosen by them, then this same motive should predict more decisions favoring dominant-looking own group members, as this would also be the role of the decision-maker.

For the decision task itself, the procedure remained the same, except for the condition wherein it was previously stated that the decisions would determine who would become the leader of the rival group now stating that the decisions would determine who would become an additional member of the own group.

Session 2. Participants again returned to the lab on the indicated preferred date. 48 students (96.0% of the original sample) did so. Of these, 35 were female and the average age was 22.00 years (SD = 2.93). The average between-sessions temporal distance was 6.71 days (SD = 1.64).

The second session again consisted of an investigation of the test-retest reliability of the Picture Story Exercise (PSE) and Personality Research Form (PRF). Again, participants started with the PSE. The absolute number of achievement, power, and affiliation motive images correlated significantly with story length in words, rs(48) ≥ .28, ps ≤ .050. This was followed by an unrelated task and the PRF (achievement: α = .65; power: α = .84; affiliation: α = .81). Contrary to the second session of Study 3.1, where the originally randomly determined order of pictures and questions was retained, we now re-randomized the pictures' and questions' order.

We then employed the same demographic questions in order to also match participants on these variables. For one participant the demographic data did not match between the two sessions, indicating either an error in determining returning participants' original participant numbers or a lack of serious answers being provided. We therefore

excluded this participant from the analysis. Analyses across the remaining 47 participants indicated highly significant correlations for each implicit or explicit motive measure (see Table 3.2), indicating satisfactory test-retest reliability for the hereby employed measures. Note that the implicit power motive included an outlier for the second session ($z > 3$). Excluding this participant revealed a significant correlation between the standardized implicit power motive scores of both sessions of, $r(45) = .471$, $p = .001$.

Table 3.2

Means and standard deviations of and correlations between the PRF's motive measures (PRF), unstandardized PSE motive measures, activity inhibition and word count (PSE-U), and PSE motive measures and activity inhibition standardized for word count (PSE-Z) across the first and second session of Study 3.2.

motive	session 1		session 2			
	M	*SD*	*M*	*SD*	*R*	*p*
Achievement (PRF)	4.65	0.66	4.66	0.59	.858	.000
Power (PRF)	4.13	0.92	4.16	0.86	.891	.000
Affiliation (PRF)	5.30	0.63	5.30	0.68	.877	.000
Achievement (PSE-U)	5.00	2.24	5.29	2.43	.700	.000
Power (PSE-U)	4.48	2.35	4.00	2.95	.499	.000
Affiliation (PSE-U)	5.98	2.78	5.79	2.67	.561	.000
Activity Inhibition (PSE-U)	4.54	3.59	4.06	3.52	.585	.000
Word Count (PSE-U)	560.52	160.55	558.42	166.54	.855	.000
Achievement (PSE-Z)					.628	.000
Power (PSE-Z)					.388	.007
Affiliation (PSE-Z)					.529	.000
Activity Inhibition (PSE-Z)					.494	.000

Results

Manipulation check. In accordance with Study 3.1, all participants had accurately recalled the group they had been allocated to. Furthermore, a one-sided t-test again indicated that agreement with the group allocation (M = 4.98, SD =1.02) differed significantly from the midpoint of the scale, $t(49) = 6.79$, $p < .001$. A repeated-measures ANOVA with the questions regarding the identification and connection with the own versus rival group as dependent variables and condition (i.e., detailed versus global perceivers) as independent variable indicated that participants again significantly favored the own group over the rival group, $F(1, 48) = 14.40$, $p < .001$, $\eta_p^2 = .23$. This effect did not differ between-groups, $F < 1$.

We also investigated whether the group distribution had truly been random and unrelated to performance or motives. Separate logistic regressions with either the implicit or explicit power motive as continuous predictor and condition as dependent variable observed no significant effects (ps ≥ .083). Additionally, a repeated-measures ANOVA with the absolute difference between estimated and actual number of shapes per trial as dependent variables and condition as independent variable observed no significant effects (Fs ≤ 1.05, ps ≥ .410), other than the main effect of trial, $F(1, 43) = 4.58$, $p = .001$, $\eta_p^2 = .39$, with the error rate increasing as more shapes were presented.

Main analyses. We hypothesized that the extent to which the implicit power motive predicts decisions for specific face types would depend on whether these faces were construed as instrumental to the person's ability to influence others. Accordingly, the implicit power motive should predict relatively more decisions favoring the submissive faces in the member condition than in the leader condition. We therefore conducted a general linear model with the decisions on submissive/dominant and dominant/submissive trials collapsed per role (i.e., leader versus member) as dependent variables and the implicit power motive as continuous predictor. This analysis first revealed a significant main effect of role, $F(1, 48)$ =

88.23, $p < .001$, $\eta_p^2 = .65$. One-sided t-tests comparing the decisions per role with chance level (50%) indicated that decisions for the leader ($M = 37.40\%$, $SD = 20.41$) were significant less likely to favor the submissive face, $t(49) = -4.37$, $p < .001$, with the opposite being true for the member ($M = 71.60\%$, $SD = 16.89$), $t(49) = 9.05$, $p < .001$. Note that the overall preference for submissive faces had previously also been found for rival leaders, but that this preference for dominant own leaders had not been significant in Study 3.1.

In accordance with the hypothesis, a significant interaction was observed between role and the implicit power motive, $F(1, 48) = 5.43$, $p = .024$, $\eta_p^2 = .10$, while no significant main effect of said motive occurred, $F < 1$. As can be observed in Figure 3.2, the implicit power motive positively predicted decisions favoring dominant looking leaders, but submissive looking members. Separate ANOVA's revealed a significant effect of the implicit power motive for the member condition, $F(1, 48) = 4.22$, $p = .045$, $\eta_p^2 = .08$, but not for the leader condition, $F(1, 48) = 1.70$, $p = .199$, $\eta_p^2 = .04$. Both effects, however, at least trended in the expected direction and as they differed significantly from each other, the manipulation still appears to have been successful.

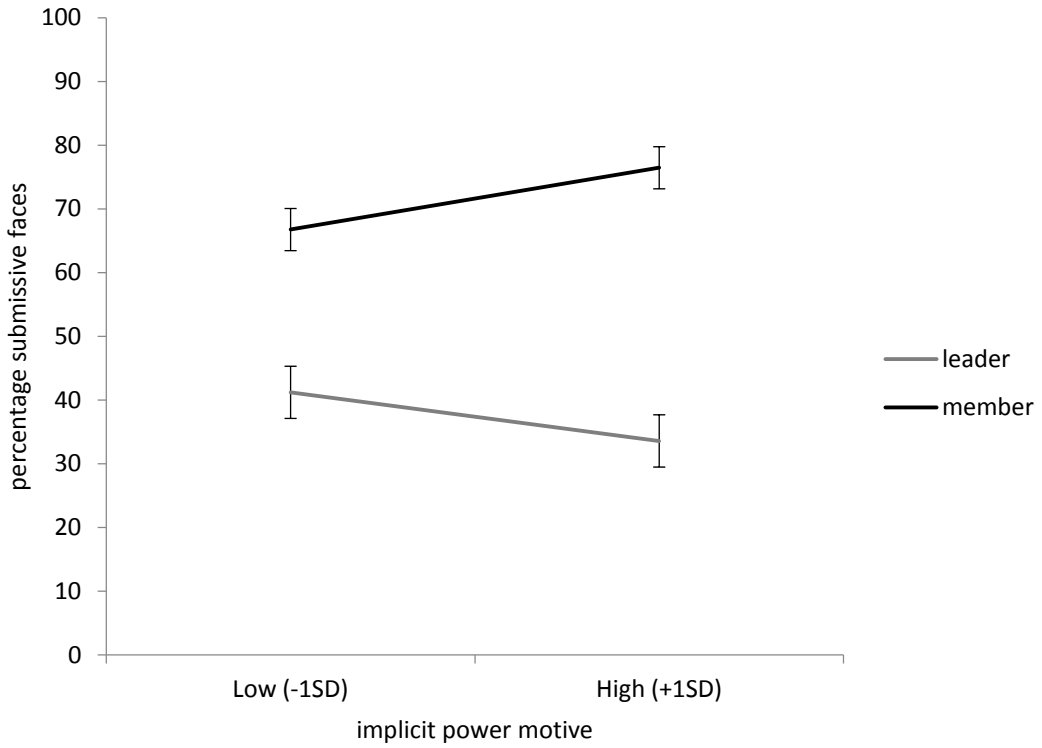

Figure 3.2. Estimated marginal means of choices leading to submissive (vs. dominant) faces as a function of implicit power motive and role (leader vs. member) in Study 3.2. Error bars represent Standard Errors of the mean.

*Collapsed analysis***.** Although both studies successfully indicated that the implicit power motive predicts decisions for dominant versus submissive looking people as a function of their instrumentality (orientation of influence in Study 3.1, existence of influence in Study 3.2), there appeared to be some inconsistencies in the data. Specifically, Study 3.1 observed no significant main effect in the own group condition, but did observe a significant predictive relationship of the implicit power motive in this condition. For Study 3.2, the opposite was true. We therefore conducted a collapsed analysis across both studies to investigate whether these results differed significantly from one another.

A general linear model with decisions for own leader versus rival leader or own member as dependent variables, study (Study 3.1 vs. Study 3.2) as independent variable and the implicit power motive as continuous predictor indicated a significant main effect of role/orientation, $F(1, 100) = 60.16$, $p < .001$, $\eta_p^2 = .38$. This effect was moderated by the implicit power motive, $F(1, 100) = 17.17$, $p < .001$, $\eta_p^2 = .15$, as well as study, $F(1, 100) = 16.31$, $p < .001$, $\eta_p^2 = .14$. As can be observed from Figure 3.3, the differences between decisions for own leaders versus rival leaders (Study 3.1) was smaller than the differences between own leaders versus own members (Study 3.2). It is possible that the focus on holding influence or not makes the concept of dominance more salient than the focus on the influence's orientation, thereby resulting in a greater main effect in the Study 3.2. No significant three-way interaction or main effects of the implicit power motive or study were observed, Fs < 1.

A univariate ANOVA with decisions for the own leader as dependent variable, study as independent variable and the implicit power motive as continuous predictor indicated significant main effects of the implicit power motive, $F(1, 100) = 8.33$, $p < .001$, $\eta_p^2 = .08$, as well as study, $F(1, 100) = 11.26$, $p = .001$, $\eta_p^2 = .10$, with no significant interaction between

the two, $F < 1$. Hence, it appears that the lack of a significant predictive relationship between the implicit power motive and decisions for own leaders in Study 3.2 was due to a lack of statistical power, rather than an actual between-studies difference. This difference did, however, occur for the overall effect, with participants being more likely to select a submissive looking own leader in Study 3.1 (M = 49.03%, SD = 23.55) than in Study 3.2 (M = 37.40%, SD = 20.41). Additionally, for the rival leader/own member decisions, there again were significant main effects for implicit power motive, $F(1, 100) = 13.03$, $p < .001$, $\eta_p^2 = .12$, as well as study, $F(1, 100) = 8.34$, $p = .005$, $\eta_p^2 = .08$, with no significant interaction, $F < 1$.

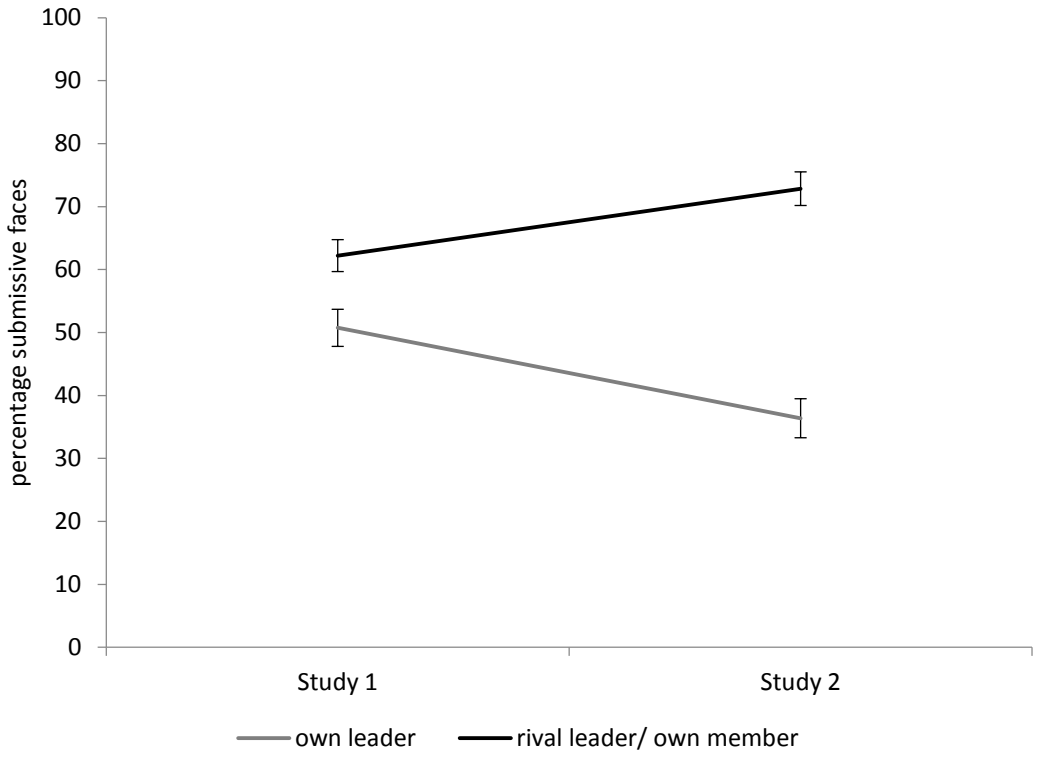

Figure 3.3. Estimated marginal means of choices leading to submissive (vs. dominant) faces as a function of implicit power motive and role (own leader vs. rival leader or own member). Collapsed analysis across Study 3.1 and Study 3.2. Error bars represent Standard Errors of the mean.

Other motives. Again, no significant correlation was observed between the implicit and explicit power motive, $r(50) = .00$, $p = .981$. In order to investigate whether the aforementioned predictive relation between the implicit power motive and decisions as a function of role was specific to the implicit power motive, we replaced this motive for the explicit power motive as continuous predictor in the general linear model with the decisions on submissive/dominant and dominant/submissive trials collapsed per role (i.e., leader versus member) as dependent variables. This analysis revealed no significant effects including the explicit power motive, Fs ≤ 1.03, ps $\geq .317$. The implicit affiliation and achievement motives showed no such predictive relationships either, Fs < 1, indicating that the aforementioned results were specific to the power motive. The exception to this was a significant main effect of the implicit affiliation motive, $F(1, 48) = 4.91$, $p = .031$, $\eta_p^2 = .09$. Estimated marginal means indicated that participants relatively high on affiliation (i.e., $M + 1SD$) were more likely to select submissive faces ($M = 58.52\%$, $SE = 2.54$) than participants relatively low on affiliation (i.e., $M - 1SD$; $M = 50.48\%$, $SE = 2.54$). As the submissive faces may have also been considered relatively friendly-looking, this may indicate that the implicit affiliation motive predicts more decisions favoring own-group members being friendly looking, irrespective of their power-related function within the group. Adding the implicit affiliation motive to the main analysis including the implicit power motive did not remove the significance of the latter motive's predictive relation in interaction with the role conditions, $F(1, 46) = 6.78$, $p = .012$, $\eta_p^2 = .13$.

Latency. In order to examine whether the implicit power motive may also have predicted response time, we conducted an analysis across the full 2(group: leader vs. member) by 2(left: submissive vs. dominant) by 2(right: submissive vs. dominant) design with the implicit power motive as continuous predictor. In preparation, all responses faster than 100 milliseconds (< 0.1% of trials) and longer than four standard deviations from the

mean response time (1.1% of trials, ≥ 11362 milliseconds) were removed to avoid outlying values or pre-meditated responses from affecting the results[11]. This analysis replicated the previously observed effect that decisions are faster for own leaders (*M* = 2489.36 milliseconds, *SE* = 127.24) versus the alternative (in this case own members; *M* = 2557.68, *SE* = 128.38), $F(1, 48) = 4.76$, $p = .034$, $\eta_p^2 = .09$. The effect of decisions being faster when the two faces differed from each other in type than when they were of the same type also replicated here, $F(1, 48) = 10.31$, $p = .002$, $\eta_p^2 = .18$. Most importantly, a significant interaction between the implicit power motive and role was discovered, $F(1, 48) = 7.64$, $p = .008$, $\eta_p^2 = .14$. As can be seen in Figure 3.4, the implicit power motive positively predicted decision speed to a greater extent for leaders than for members. This may be due to the leader condition providing information regarding instrumentality, on which basis the implicit power motive could predict the decisions, whereas no such information was provided in the member condition. This lack of motive-relevant information may have slowed the decision-making process.

[11] Applying these same criteria to the analyses for decisions indicated that the interaction between role and the implicit power motive was still significant, $F(1, 48) = 8.18$, $p = .035$, $\eta_p^2 = .09$.

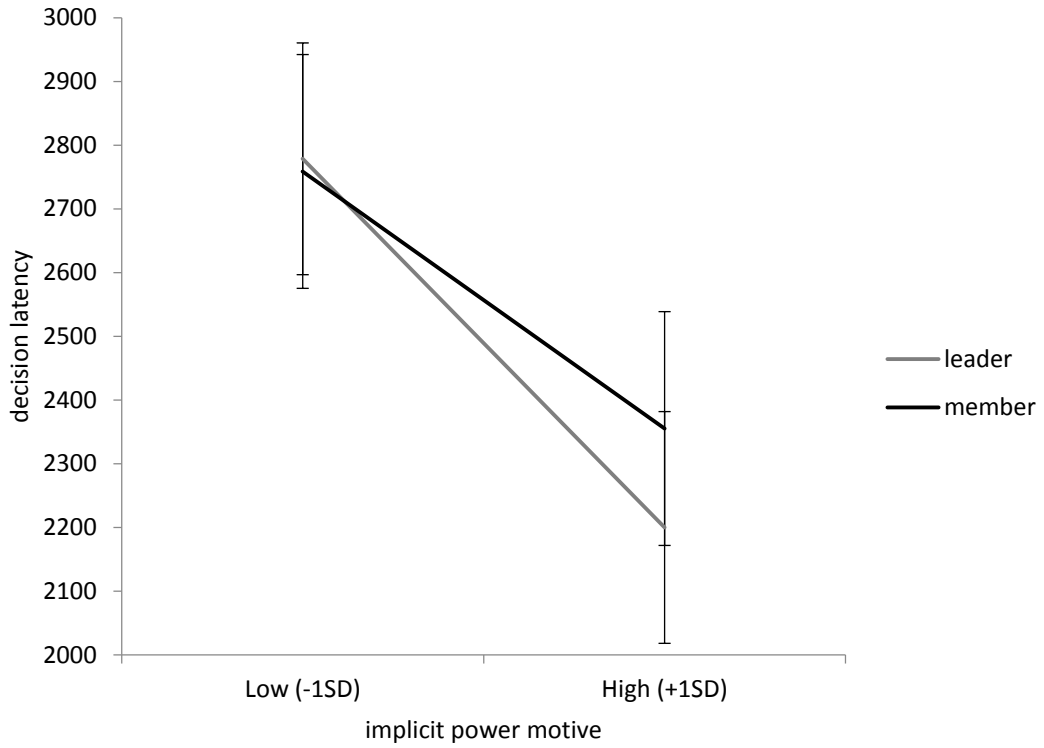

Figure 3.4. Estimated marginal means of decision latency in milliseconds for decisions in the leader and member conditions as a function of implicit power motive in Study 3.2. Error bars represent Standard Errors of the mean.

Discussion

Study 3.2 attempted to provide a conceptual replication of Study 3.1 by again testing whether the implicit power motive predicts action selection based on actions' perceived instrumentality towards influence over others. Specifically, the instrumentality of the different options was now manipulated based on the function of the to-be-selected individual (i.e., influential or not). The results again supported our hypothesis that people would select a more dominant-looking person for the instrumental function, and a more submissive-looking for the non-instrumental function, thereby providing a conceptual replication of Study 3.1. Although the first effect did not reach significance, an analysis collapsed over both studies indicated that the two studies overall did observe a significant effect in this condition that did not significantly differ between-studies. Additionally, the implicit power motive was found to positively predict response speed to a greater extent for decisions in the instrumental versus the non-instrumental condition. This effect may be explained by the instrumentality-related information of choosing a leader facilitating the decision-making process for people relatively high in the implicit power motive, whereas such information was absent in the member condition, as this person's purported role remained unclear.

A potential problem with interpreting the prior studies' results could be that it may be possible that the implicit power motive, by default, predicts action selection favoring submissive-looking people. Hence, the significant predictive relationships between the implicit power motive and action selection for candidates who would serve as rival group leaders (Study 3.1) or regular own-group members (Study 3.2) could have followed from their perceived instrumentality and/or because the implicit power motive predicts action selection favoring submissive-looking persons even when no instrumentality-related information is available. Hence, only one of the three conditions (viz., the own leader

condition) employed in Studies 3.1 and 3.2 actually provides unambigious support for the perceived instrumentality account.

In order to disentangle these competing explanations of prior studies' results, we conducted a third study, employing the same procedure except for all instrumentality-related information being removed. Because we hypothesize that the implicit power motive predicts action selection based on perceived instrumentality, we expected to no longer observe any predictive relationships between the implicit power motive and action selection in Study 3.3. Should, however, the previously observed condition-specific predictive relationships between the implicit power motive and action selection favoring submissive faces be replicated even without instrumentality-related information, the results would point to the implicit power motive predicting action selection both based on specific stimulus properties and perceived instrumentality

Study 3.3

Method

Participants and design. 51 students (28 female) with an average age of 22.61 years (*SD* = 3.38) participated in the study in exchange for a monetary compensation or partial course credit. The study used a within-subjects design.

Materials and procedure. The third study intended to investigate whether the implicit power motive would predict non-instrumental decisions favoring submissive faces. Accordingly, the study largely constitutes of a stripped down version of the prior studies, with all elements used to induce the suggestion of decision instrumentality (e.g., second session, minimal group paradigm) being removed. The study again started with the PSE. The absolute number of achievement (*M* = 5.29; *SD* = 2.77), power (*M* = 5.49; *SD* = 3.67), and

affiliation (M = 6.25; SD = 2.98) motive images correlated significantly with story length in words (M = 558.90; SD = 176.87), rs(51) ≥ .52, ps < .001.

The PSE was followed by the decision task. For this task, participants were now instructed to indicate for each trial which face they would prefer to choose. No mention was made of any potential decision outcomes. The task again consisted of 80 trials, that now followed a 2(left: submissive vs. dominant face) by 2(right: submissive vs. dominant face) design. Hence, there were twice as many trials per cell as there had been for the first two studies. Each trial consisted only of the decision moment, whereby participants were presented with the two faces and had to indicate which face they preferred to choose. This was followed by the variable inter-trial interval (200 to 700 milliseconds). After the decision task came the PRF (achievement: α = .72; power: α = .87; affiliation: α = .66), control, demographic and open questions.

Results

Preparatory data analysis. One participants' data were excluded from the analysis. This participant did not write a story for every PSE picture, made uncommonly fast decision in the decision task (M = 133 milliseconds, compared to M = 2209 milliseconds for others) and indicated to have been "totally not motivated to do this" in the open questions. One participants' decision data were excluded, as they constituted an outlier (z = -3.48). Including these participants' data did not change the significance of the main result, F < 1.

Main analysis. The current study attempted to investigate whether the implicit power motive would predict decisions favoring submissive faces when no indication was given of the decisions being instrumental. Before doing so, it was investigated whether participants actually made diverging decisions. That is, participants may have seen little reason to not always press the same button, as the decisions were non-instrumental. This would make a

consistent response pattern (e.g., always pressing "A") the most advantageous, due to requiring the least effort and time. No participant had an absolute difference between chance level and actually chosen keys higher than 13.75 percentage points, indicating that people generally varied their decisions between keys, despite a lack of an instrumental reason for doing so. Furthermore, a one-sided t-test indicated no significant difference from chance level (50%) for pressing either the left ("A") or right ("L") key (M = 48.67%, SD = 4.90), $t(48) = -1.90$, $p = .064$.

We conducted a univariate ANOVA with the implicit power motive as continuous predictor and decisions in the incongruent conditions (i.e., submissive/dominant faces and dominant/submissive faces) as dependent variable. As hypothesized, no significant effect was observed, $F(1,47) = .70$, $p = .407$, $\eta_p^2 = .02$. Pearson r-to-z transformations indicated that this non-significant effect of Study 3.3, $r = -.121$, 95% CI[-.386,.163], differed significant from the conditions of Study 3.1, $r = .386$, 95% CI[.130,.595], and Study 3.2, $r = .284$, 95% CI[.006,.521], where the implicit power motive was expected to positively predicted decisions favoring submissive faces (zs ≥ 2.00). Hence, it appears that these observed predictive relationships in prior studies did indeed occur as a function of perceived instrumentality.

Although Study 3.3 observed no significant predictive relationship between the implicit power motive and decisions, a one-sided t-test did indicate a significant overall tendency for decisions favoring submissive faces (M = 70.71%, SD = 14.18), $t(48) = 10.23$, $p < .001$. These results indicate that non-instrumental biases in decision-making do occur and could be observed using the current paradigm, but that the implicit power motive did not modulate this effect.

Latency. We again investigated the potential predictive relationships between the implicit power motive and decision latency. In preparation, we excluded all responses faster

than 100 milliseconds (0.1% of trials) and longer than four standard deviations from the mean response time (0.8% of trials, ≥ 9048 milliseconds)[12]. Then, we conducted a general linear model with the implicit power motive as continuous predictor and decision latency across the full 2(left: submissive vs. dominant) by 2(right: submissive vs. dominant) design as dependent variables. This analysis replicated the previously observed two-way interaction between left and right, $F(1,47) = 13.55$ $p = .001$, $\eta_p^2 = .22$, again indicating that responses were faster when the pictures were incongruent (i.e., submissive/dominant or dominant/submissive). Additionally, there was a significant interaction between the left picture and the implicit power motive, $F(1,47) = 8.47$ $p = .006$, $\eta_p^2 = .15$ ($F < 1$ for interaction between right picture and implicit power motive). As can be observed in Figure 3.5, the implicit power motive positively predicted decision speed when the left picture was that of a dominant face to a greater degree than when that pictures was that of a submissive face. This effect could be construed as instrumental if perceiving dominant faces is construed as a disincentive related to the implicit power motive, as faster responses make the face disappear. The fact that this effect occurred only for the left picture might indicate that participants' attention oriented from the left to the right, making the implicit power motive only predict responses to the first perceived picture.

[12]Applying these same exclusion criteria to the analyses for decisions still revealed no significant predictive relationship with the implicit power motive, $F < 1$.

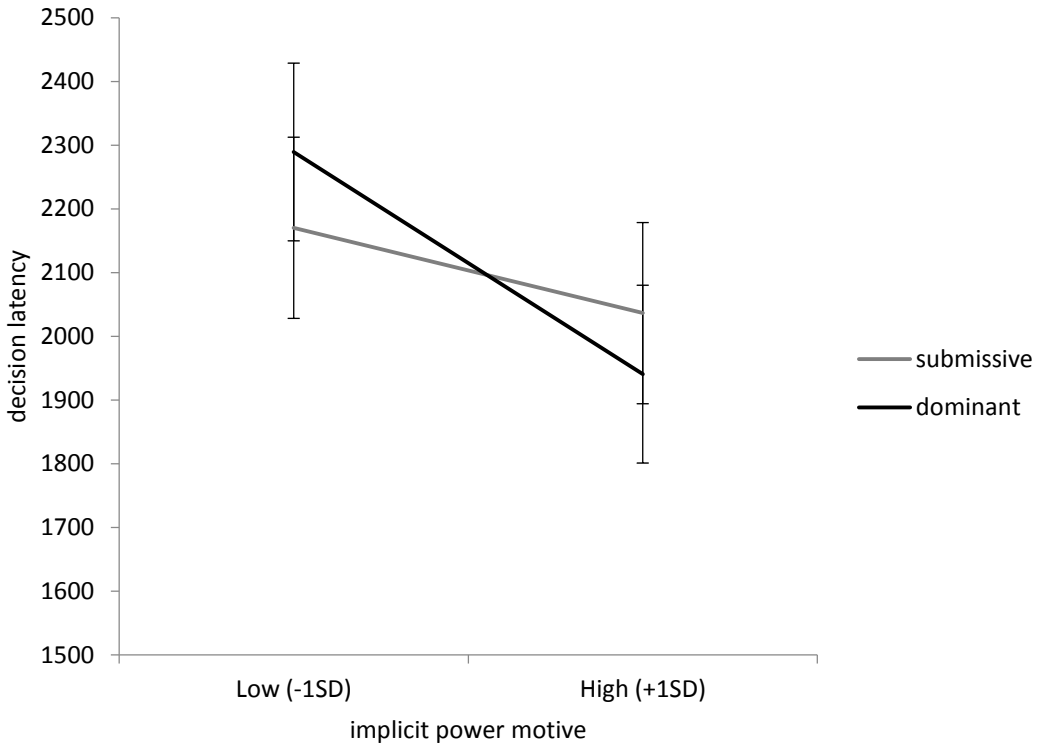

Figure 3.5. Estimated marginal means of decision latency in milliseconds for decisions with either submissive or dominant faces on the left as a function of implicit power motive in Study 3.3. Error bars represent Standard Errors of the mean.

Discussion

Study 3.3 was conducted in order to examine whether the instrumentality-related information as provided in Studies 3.1 and 3.2 may have induced the significant predictive relationships between the implicit power motive and action selection for candidates who would serve as rival group leaders (Study 3.1) or regular own-group members (Study 3.2), or whether these predictive relationships would have followed from the implicit power motive predicting the selection of submissive faces by default. We therefore removed all suggestions of people's selected actions holding any instrumental value. Results indicated that the implicit power motive did not modulated peoples' general preference for submissive faces. It therefore appears that the previously employed manipulation of instrumentality was necessary for the implicit power motive to predict action selection.

Indeed the only significant predictive relationship including the implicit power motive that was observed was for response speed, with said motive predicting relatively faster responses when the face presented on the left of the screen was dominant. This result could be interpreted as following from the instrumental value of making the dominant-looking person disappear as quickly as possible. The fact that this predictive relationship was only observed in one of the studies and only for the picture on the left of the screen should, however, warrant caution for interpreting this predictive relationship.

General Discussion

Implicit motives are defined as motivational dispositions that operate outside of people's conscious awareness and are aimed at the attainment of specific classes of incentives (Schultheiss, 2008). The implicit power motive, for example, is considered to direct behavior towards the incentive of influence over others (Fodor, 2010). Accordingly, it would be expected that the implicit power motive would predict the selection of actions people

perceive to be instrumental in the obtainment of influence over others. Whereas prior research has attempted to identify specific actions and/or classes of stimuli that people would have learned to be predictive of greater influence over others (McClelland et al., 1989; Stanton et al., 2010; Schultheiss & Brunstein, 2010), the current studies attempted to more directly investigate the assumed relationship between implicit motives and action selection based on perceived instrumentality.

Specifically, we devised a task in which participants selected motive-unrelated actions (i.e., pressing the "A" or "L" button on the keyboard) based on stimuli identified in prior studies (Stanton et al., 2010) as implicit power motive-related incentives (i.e., submissive and/or dominant faces). In Studies 3.1 and 3.2, we manipulated, respectively, whether the stimuli were perceived as belonging to individuals whose influence could favor or *disfavor* the participant – thereby being instrumental in the obtainment of greater or *lesser* influence - or whether or not the potentially candidates would be able or *unable* to exert influence favoring the participant. Both studies indicated that the implicit power motive predicted action selection in line with perceived instrumentality. For Study 3.3, we removed any instrumentality-related information, which resulted in the previously observed predictive relationships no longer reaching significance. Although such null-effects should be interpreted with caution, these studies together appear to point to the implicit power motive predicting action selection specifically based on the potential actions' perceived instrumentality.

Notably these results appear to support a basic assumption - that action selection is generally predicted by perceived instrumentality - held by many theoretical models regarding implicit motives (Atkinson, Bastian, Earl, & Litwin, 1960; McClelland, 1985; McClelland et al., 1989; Schultheiss, 2001; 2008; Stanton et al., 2010) and motivation in general (Baumeister, 2016). However, they also appear to indicate that the predictive relationship

between implicit motives and action selection is not as restricted as previously believed. For one, theoretical models presume that a prior learning history between specific actions (McClelland et al. 1989) or stimuli (Schultheiss, 2001; 2008), on the one hand, and motive-related incentives, on the other hand, must have been established prior to implicit motives becoming predictive of action selection. As the current studies used actions not associated previously – or as a function of the task itself – with power motive-related incentives and demonstrated divergent action selection tendencies to power motive-related stimuli as a function of their perceived instrumentality, this prior learning history does not appear to be a necessary condition for implicit motives to become predictive of action selection. Instead, implicit motives seem to be able to predict action selection directly based on perceived instrumentality.

Secondly, it has often been argued (e.g., Biernat, 1989; McClelland et al. 1989; Spangler, 1992; Slabbinck, De Houwer, & Van Kenhove, 2013; Schultheiss, 2001) that implicit motives do not predict explicit (or *declarative*) decisions, whereby people are able to directly report on what they decide to do. As the current studies, however, employed an explicit decision-making paradigm, this restriction, similarly, does not appear to always apply. Notably, several prior studies (Job & Brandstätter, 2009; Schultheiss & Brunstein, 1999) did observe predictive relationships between implicit motives and explicit goal setting, but only after participants had been instructed to imagine the outcomes of their set goals. This moderating role of mental imagery on the predictive relationships between implicit motives and explicit goal setting is attributed to implicit motives relying on an experiential information processing system (Job & Brandstätter, 2009; Schultheiss & Brunstein, 1999; Schultheiss, 2001). This system enables information to first be processed in a non-verbal and associative way, before becoming accessible to more rational, explicit processes (Epstein, 1994). As implicit motives are argued to operate in associative ways, the mental imagery

process can enable implicit motives to become predictive of subsequent explicit processes. However, this mental imagery manipulation is confounded by an increased emphasis on the goal's outcomes and hence their instrumentality. After all, participants are tasked to imagine their set goals' outcomes. Consequently, these results could similarly be interpreted as supportive of the idea that implicit motives predict action selection based on perceived instrumentality, without necessary relying on a mechanism between the experiential and rational information processing systems, such as mental imagery.

In summary, the current article attempted to extend the understanding of implicit motives' predictive capabilities in relation to action selection, based on the idea that implicit motives stimulate behaviour in accordance with these actions' perceived instrumentality towards the attainment of motive-related incentives. By doing so we hope to have contributed to a generally improved understanding of how implicit motives operate. Furthermore, we hope that this knowledge will be able to contribute to establishing ways in which people's behavior can be guided to more effectively promote their health and happiness by framing the instrumentality of related behaviors in line with people's implicit motives.

Chapter 4

Implicit Motives Take Part in the Democratic Process

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Abstract

The founding principle of democracy is that it can promote prosperity and social harmony by giving the people what they want. Notably, what people want comprises not just what they *say* they want, but also implicit motivational desires that people are themselves unaware of. These implicit motives are non-conscious tendencies to experience particular incentives as rewarding and operate as important predictors of what people are likely to enjoy. The implicit affiliation motive, for example, relates to a preference for social harmony, whereas the implicit achievement motive is more related to a preference for prosperity. Here, we examine whether the democratic process takes these implicit motives into account. Four studies indicated that the answer to this question is yes, as people are more likely to positively evaluate, agree with and vote for politicians intent on providing people with those matters which will satisfy their implicit motives. Explicitly measured motives, conversely, did not predict these outcomes. These results indicate that what people want on an implicit level affects the democratic process through the evaluation and selection of politicians and policies intent on giving the people what they ultimately want, even (or particularly) when they don't know they want it.

Significance

A democratic government must represent, promote and appeal to what the people want. Notably, what people want comprises not just what they *say* they want, but also implicit motivational wants which operate non-consciously. Considering these implicit motives' strong relation to what people enjoy, it is worth examining whether the democratic process takes implicit motives into account. Four studies indicated that implicit – but not explicit – motives are indeed accounted for in the democratic process, as they predicted people's votes for, evaluations of, and agreement with politicians intent on fulfilling these motives. These results indicate that the democratic process is susceptible to what the people want, even (or particularly) when they don't know they want it.

Introduction

Since its inception, the purpose of democracy has been to promote prosperity and social harmony by giving the people what they want (Olson, 1993; Vlastos, 1983). To do so, a democratic government must regard the population's core motivational desires that determine what they would want to see come about (Bartels, 1991; Fiske, 2004; Gilens, 2005; Manza & Cook, 2002; Miller & Stokes, 1963), such as their desires to achieve prosperity and affiliate with others (Baumeister, & Leary, 1995; Decharms, Morrison, Reitman, & McClelland, 1954; Maslow, 1943; Nicholls, 1984; Schwartz & Bilsky, 1987; Ryan & Deci, 2000; White, 1959). Accordingly, a key characteristic of a free and democratic people is its power to proclaim what it wants from the government and the government's subsequent responsiveness to these indicated motivations (Schmitter & Karl, 1991). But can people actually indicate what they want, and would these indications even be the most effective basis of governmental policy (Bartels, 1991; Miller & Stokes, 1963)?

Consciously reflecting on desires and actions is a uniquely human ability (Masicampo & Baumeister, 2013; Suddendorf, 2006). Still, the reasons behind actions often elude even humans' conscious awareness, as they are processed only unconsciously (Dijksterhuis, Aarts, & Smith, 2005; Hassin, 2013; Kihlstrom, 1987; McClelland, Koestner, & Weinberger, 1989; Wegner, 2003). Notably, theoretical models imply that conscious and unconscious processes represent two largely separate systems (e.g., Epstein, 1994; Greenwald & Banaji, 1995; Kahneman, 2003; McClelland, Koestner, & Weinberger, 1989; Smith & DeCoster, 2000; Strack & Deutsch, 2004), allowing them to yield markedly different results (Brunstein & Maier, 2005; Decharms, Morrison, Reitman, & McClelland, 1954; Greenwald, Poehlman, Uhlmann, & Banaji, 2009). This means, for example, that people can unconsciously desire to affiliate with others and can act accordingly, while still consciously thinking and explicitly expressing desires for entirely different things (Aarts, 2007; McClelland et al., 1989). As

explicit indications of what people want, then, do not represent *all* they want (i.e., people also have unconscious or implicit motives), it would be worth examining whether these implicit motives are represented in the democratic process, thereby indicating that the democratic process more fully accounts for what the people want than previously believed.

Whether unconsciously represented motives' role in the democratic process would be advantageous, however, is another matter. After all, unconscious influences on behavior are traditionally frowned upon (Dijksterhuis, Bos, Nordgren, & van Baaren, 2006; Strack, & Deutsch, 2004). Certainly, unconscious stereotypes and heuristics can easily lead one astray (Kahneman, 2003; Greenwald & Banaji, 1995; Nosek et al., 2007). This traditional view holds particularly for important decisions, which are argued to benefit from deliberate, conscious processes (Dijksterhuis et al., 2006; Kahneman, 2003; Miller, 1992). Recent findings and theorizing, however, indicate that unconscious processes can yield equally - sometimes even more - satisfying decisions (Bechara, Damasio, Tranel, & Damasio, 1997; Dijksterhuis et al., 2006; Dijksterhuis & Nordgren, 2006; Dijksterhuis & van Olden, 2006; Dijksterhuis & Strick, 2016; Strack & Deutsch, 2004; Wang, Chan, Chen, Chen, & Wang, 2015; Wilson & Schooler, 1991; Winkielman & Berridge, 2003). This is, in part, due to unconscious processes' greater information processing capacity (Dijksterhuis & Nordgren, 2006), which makes them particularly valuable for complex decisions such as who to vote for (Lau & Redlawsk, 1997). Additionally, unconscious processes show stronger relations to affect and emotions (Dijksterhuis & van Olden, 2006; Dijksterhuis & Nordgren, 2006; Kahneman, 2003; Strack & Deutsch, 2004; Wang et al., 2015). As affective, emotional processes are inherently related to what people want, unconscious processes might make for more fitting representations of people's desires (McClelland et al., 1989). Consequently, the traditional view of basing important decisions such as who to vote for purely on conscious processes may be too restrictive.

In the present research we investigated to what extent conscious and unconscious motivational processes played a role in the democratic process, using the framework of motive disposition theory as a guide (McClelland et al., 1989; Sheldon & Schüler, 2011). Research in this area distinguishes firstly between *explicit motives*, which are motivational desires that people consciously attribute to themselves, and *implicit motives*, which are motivational desires that people cannot consciously access (McClelland et al., 1989). These implicit motives are generally divided into the implicit achievement (i.e., the desire to prosper and gain success), power (i.e., the desire to influence and control others), and affiliation (i.e., the desire for friendly social interactions) motives (McClelland et al., 1989). Implicit motives are measured with projective tests (Winter, 1994) that show no correlation with explicit measures of the same construct (McClelland et al., 1989; Spangler, 1992), while still being indicative of what people are likely to enjoy and strive for (Brunstein & Maier, 2005; Brunstein, Schultheiss, & Grässmann, 1998; Hofer & Busch, 2013; Job, Bernecker, & Dweck, 2012; Kordik, Eska, & Schultheiss, 2012; Pueschel, Schulte, & Michalak, 2011).

Although explicit motives can be assessed directly and are therefore easier to measure, they are not without their limitations. Notably, explicit motives are predictive for only a short period of time and are susceptible to social desirability and demands (Koestner, Weinberger, & McClelland, 1991; McClelland et al., 1989; Schultheiss, Dargel, Rohde, 2003; Ziegler, Schmidt-Atzert, Bühner, & Krumm, 2007). This means that people's explicit indications of what they want may quickly lose their meaning and may not even have stemmed from what they truly wanted in the first place, but instead from what they believed they *ought* to want. Considering the long-term nature of most political policies, legislators' attempts to please the people through adherence to people's explicitly expressed motives may quickly backfire when people change their minds over what they believe they want, while never having truly reflected their actual motivations to begin with.

Importantly, implicit motives do not suffer the same caveats. Their implicit nature reduces the impact of social desirability (Fisher, 1993; Schultheiss et al., 2003), their basis in early life experiences and early-developed neurobiological mechanisms means they remain relatively consistent and predictive over time (Lundy, 1985; McAdams & Vaillant, 1982; McClelland & Pilon, 1983; Schultheiss & Rohde, 2002; Schultheiss & Schiepe-Tiska, 2013; Schultheiss, Wiemers, & Wolf, 2014; Stanton, Hall, & Schultheiss, 2010; Wang, Liu, & Yan, 2014) and their strong relation with affective responses to particular incentives makes it relatively easy to directly and effectively satisfy and appeal to them (Brunstein & Maier, 2005; Koestner et al., 1991; Kordik, Eska, & Schultheiss, 2012; Stanton et al., 2010). Consequently, people's implicit motives are important predictors of what people will be likely to enjoy and may therefore be valuable for the democratic process to take into account. Despite this, prior research has relied heavily on explicitly measured motivation as predictive of what people's political judgments and decisions will (and should) be (e.g., Duckitt, 2001; Jost, & Amodio, 2012; Krosnick & Berent, 1993; Redlawsk, 2002; Sunstein, 1991), assuming that voters have sufficient knowledge of their own preferences (Lau & Redlawsk, 1997).

Considering that implicit motives are not reflected in explicit measures of motivation, but are still strong predictors of what people are likely to enjoy, it would be worth examining whether implicit motives are accounted for in the democratic process. That is, are people more likely to positively evaluate, vote for and agree with politicians who express intentions that match with people's implicit motives? Four studies were conducted in an attempt to answer this question. If successful, these studies would indicate that the democratic process is susceptible to implicit motives and hence provides a meaningful basis for governmental policies intent on giving the people what they want, even when they don't know they want it.

Studies 4.1 and 4.2

Studies 4.1 and 4.2 investigated whether people's implicit motives play a role in the democratic process by predicting evaluations of and votes for political candidates who promise that their electoral victory will yield outcomes matching a specific motive. We assessed implicit motives with a projective measure whereby respondents write imaginative stories based on pictorial stimuli (Picture Story Exercise). Stories were content coded for terminology reflective of the implicit achievement or affiliation motive based on frequently validated criteria (Pang, 2010; Pang & Schultheiss, 2005; Pennebaker & King, 1999; Ramsay & Pang, 2013; Schultheiss & Brunstein, 2001; Schultheiss & Pang, 2007; Schultheiss, & Schultheiss, 2014; Spangler, 1992; Winter, 1994). The achievement motive represents the extent to which people want to do well according to a standard of excellence and the affiliation motive represents the extent to which people want to establish, maintain, or restore close, friendly relationships (Winter, 1994).

Across three election rounds, Dutch respondents read speeches by presidential candidates. We used fictional candidates supposedly from distant nations to rule out effects of pre-existing knowledge and/or party affiliations and thereby isolate the relationship between implicit motives and political behavior. In their speeches (one per candidate), candidates (one per motive) indicated that their electoral victory would result in outcomes matching the specific motive, such as an improved (achievement candidate) or more socially harmonious (affiliation candidate) nation. Respondents voted for either candidate and evaluated them on how competent, sympathetic and likely to improve the nation they considered them. Explicit motives were measured by asking respondents to which extent each motive applied to them (Slabbinck, De Houwer, & Van Kenhove, 2011).

Results. As hypothesized, the extent to which respondents were relatively implicitly achievement motivated (i.e., the difference between the implicit achievement motive score and the implicit affiliation motive score) predicted evaluations, R = .250[.055,.426][13], and votes, R = .323[.134,.489], favoring achievement candidates over affiliation candidates in Study 4.1. These effects occurred irrespective of whether respondents had been instructed to imagine their votes' consequences, Rs ≤ .044[≥ -.155, ≤ .239]. Study 4.2 replicated these significant results for both evaluations, R = .330[.054,.560], and votes, R = .294[.014,.531]. Additionally, in Study 4.2, relatively explicitly achievement motivated respondents were more likely to evaluate the achievement candidate relatively negatively, R = .435[.175,.638] (R = .196[-.001,.379] in Study 4.1). These results indicate that implicit motives play a role in the democratic process, while explicit motives' role is less clear.

Study 4.3

Study 4.3 examined whether implicit motives' aforementioned ability to predict evaluations and votes would be observed even when politicians' personality trait descriptions were always incongruent with their promised electoral victory outcomes. As implicit motives relate to what people themselves ultimately enjoy and strive for, they were expected to predict votes and evaluations based on to-be-enjoyed outcomes, rather than candidates' trait descriptions. Speeches were rewritten so that achievement candidates used personality trait descriptions related to the affiliation motive (e.g., "I am friendly") while promising achievement-related outcomes (e.g., "I will improve this country"). The opposite was true for affiliation candidates (e.g., "I am competent" and "I will bring our people closer together"). We also included an explicit motive questionnaire (Jackson, 1974) to investigate whether the negative

[13]All numbers between brackets represent the lower and upper bounds of the 95% confidence interval respectively.

predictive relationship between explicit motives and evaluations as observed in Study 4.2 stemmed from methodological details of the prior measure.

Results. The extent to which respondents were relatively implicitly achievement motivated again predicted evaluations, R = .345[.122,.535], and votes, R = .305[.078,.503], favoring achievement candidates over affiliation candidates. These results suggest that implicit motives predict votes for and evaluations of politicians based on the utility these politicians hold (i.e., the outcomes they suggest), rather than the mere usage of motive terminology. Neither explicit measure observed any significant effects, Rs ≤ .207[≥ -.028, ≤ .420].

Collapsed data analysis

Studies 4.1 to 4.3 indicated that people positively evaluate and vote for political candidates who promise that their electoral victories will result in outcomes matching people's implicit – but not explicit – motives. As these predictive relations were observed for each study regardless of between-studies differences, we collapsed the data across studies for a more detailed investigation with higher statistical power. Both the implicit achievement, R = .235[.106,.357], and affiliation, R = .217[.087,.340], motives separately predicted evaluation of political candidates. Similarly, the implicit achievement, R = .231[.101,.353], and affiliation, R = .216[.086,.339], motives separately predicted votes for political candidates.

Although both implicit motives, then, held a predictive value, this value depended on whether the candidate matched with the implicit motive. The implicit achievement motive only predicting evaluations for achievement candidates, R = .208[.078,.332], and the implicit affiliation motive only for affiliation candidates, R = .188[.057,.313]. These results support the idea that implicit motives' predictive capabilities depend specifically on the (utility-related) terminology related to the same motive. That is, the implicit achievement motive, for

example, is incentivized by terminology related to the achievement motive, not disincentivized by terminology related to other motives.

The difference between the explicit achievement and affiliation motives – but not the separate explicit motives – predicted evaluations of political candidates in a negative direction, R = .216[.085,.339]. This predictive relation should be interpreted with caution, as it was only observed for the relative explicit motive score, had only been significant in Study 4.2 and did not extend to votes. None of the reported predictive relations showed any significant between-studies differences.

Study 4.4

Study 4.4 aimed to extend the aforementioned results by examining whether implicit motives predict agreement with ecologically valid policy proposals. Dutch respondents were presented with real policy proposals from Dutch political parties (Christenunie, 2012; Christen-Democratisch Appèl, 2012; Democraten 66, 2012; 2015; Groenlinks, 2012; Partij van de Arbeid, 2012; Partij Voor de Vrijheid, 2012; ProDemos, 2012; Socialistische Partij, 2012; Socialistische Partij, 2015; Volkspartij voor Vrijheid en Democratie, 2012; 2015; e.g., “we must invest more into public transport”). These policy proposals were provided without any indication of a motive-related outcome (neutral proposals; see prior example), an indication of an achievement-related (achievement proposals; e.g., “to increase the quality of public transport”) or an affiliation-related (affiliation proposals; e.g., “to make public transport more beloved”) outcome. Study 4.4 differed from prior studies, then, in that it was hypothesized to show implicit motives’ predictive capabilities for real policy proposals that are relevant to those who judge them (as they are real and relate to the same nation).

Results. It was expected that the higher respondents' relative implicit achievement motive was, the more they would agree with achievement proposals and the less they would agree with affiliation proposals. Accordingly, relative implicit achievement motive predicted differences in agreement depending on the proposal type, R = .381[.141,.579]. Explicit measures showed no significant results, Rs ≤ .223[≥ -.033, ≤ .452].

To examine these results in more detail, separate analyses were conducted for each proposal type with the other proposal types, each separate implicit and explicit motive measure and their within-measure interactions as predictors. The implicit achievement motive predicted agreement with achievement proposals only, R = .291[.040,.507], while the implicit affiliation motive predicted agreement with affiliation proposals only, R = .330[.083,.539]. The explicit questionnaire's affiliation measure positively predicted agreement with achievement proposals, R = .326[.078,.535]. These results supplement the prior studies' findings by indicating that implicit motives also predict the extent to which people agree with real policy proposals framed to fit specific motives that are directly relevant to respondents, as they applied to their own nation.

Discussion

In order for democracy to function properly, it must take into account what the people want (Burstein, 1998; 2003; Kingdon, 1989; Monroe, 1998; Page & Shapiro, 1983). Notably, what people want includes not just what they *say* they want, but also what they want on an implicit level. Although explicit processes are generally held in higher regard and explicit measures of motivation may therefore appear to suffice, implicit processes can yield better and more satisfying decisions than explicit processes (Bechara et al., 1997; Dijksterhuis, & Nordgren, 2006; Dijksterhuis & van Olden, 2006; Wilson & Schooler, 1991; Winkielman & Berridge, 2003). This is particularly true when the topic at hand is complex and relates to affective

values, such as what people want from their government (Dijksterhuis, & Nordgren, 2006; Dijksterhuis & van Olden, 2006; Wilson & Schooler, 1991; Winkielman & Berridge, 2003; Wang et al., 2015). Accordingly, we tested whether people's implicitly held motives play a role in the democratic process. Four studies indicated that both the implicit achievement and affiliation motive play a role in the democratic process as respondents' evaluations of, agreement with and votes for political candidates were predicted by the congruence between respondents' implicit motives and political candidates' expressed intent to provide outcomes matching said motives. Namely, candidates who advocated for achievement-related outcomes gained more support from people high in implicit achievement motivation, while candidates who advocated for affiliation-related outcomes gained more support from people high in implicit affiliation motivation. These results indicate that people support the politicians who are most likely to provide them with what they are motivated to obtain, even though people are themselves not aware of these motives.

Notably, explicitly expressed motives did not show similar results. Most importantly, no effects were observed for voting behavior. Additionally, the relative explicit achievement motive predicted lower evaluations of and the explicit affiliation motive predicted higher agreement with achievement-related politicians and policies, respectively, although the former result was not observed consistently. These results suggest that explicitly measured motives do not relate as directly to the wanting of motive-related outcomes as implicit motives do, or at least do not express themselves accordingly in the democratic process. Indeed, politicians attempting to represent and appeal to people based on explicitly expressed motives may well gain negative rather than positive reactions as the only predictive relations including explicit motives were for suggested utilities incongruent with the explicit motives.

Together, our findings indicate that the democratic process accounts for what the people want, even (or particularly) when they are themselves not aware of these motives.

Presuming that politicians can be trusted to deliver on their promises, it can therefore be extrapolated from these results that democratic governments are likely to effectively heed people's implicit motives. Governments are more likely to stimulate initiatives intend on increasing social harmony in relatively implicitly affiliation-motivated constituencies, whereas initiatives intend on increasing performance and prosperity would receive relatively greater stimulation in relatively implicitly achievement-motivated constituencies. The outcomes of these initiatives would then be enjoyed by the people who were motivated to obtain them, indicating that the democratic process may adhere to its founding principle of giving the people what they want in a more effective way than had been the case if implicit motives had not been accounted for.

Beyond the realm of politics, the hereby introduced technique of framing messages in line with implicit motives could be applied to manipulations intent on evoking behavioral change. Greater adherence to dietary or medical guidelines or other forms of desirable behavior could be induced when the prospected outcomes of these behaviors are framed in line with the implicit motives of the to-be-influenced population. Hence, the future implications of these results may reach beyond the scope of the democratic process. For the moment, however, the conclusion remains that what implicit motivates people predicts their political support, thereby stimulating the government to give the people what they ultimately really want, even though they do not know they want it.

Methods and Additional Results

Respondents. Studies 4.1 to 4.4 used, respectively, 100 (52 female[14], M_{age} = 21.48[20.91,22.05]), 52 (35 female, M_{age} = 21.94[21.07,22.81]), 72 (51 female, M_{age} = 21.52[20.74,22.30]), and 64 (49 female, M_{age} = 20.84[20.21,21.48]) Dutch respondents. All studies used a within-subjects design, with Study 4.1's respondents being randomly assigned to either the control or imagination condition.

Measures. *Implicit Motives.* Implicit motives were measured with the Picture Story Exercise (Winter, 1994). This task is the most common and most validated and reliable implicit motives measure (Pang, 2010; Pang & Schultheiss, 2005; Pennebaker & King, 1999; Ramsay & Pang, 2013; Schultheiss & Brunstein, 2001; Schultheiss, Liening, & Schad, 2008; Schultheiss & Pang, 2007; Schultheiss & Schultheiss, 2014). During this task, respondents were shown six pictures of ambiguous social scenarios depicting either a ship captain and passenger; two trapeze artists; two boxers; two women in a laboratory; a couple by a river; or a couple in a nightclub. These pictures have frequently been used to assess implicit motives and are the most strongly recommended pictorial stimuli (Pang, 2010; Schultheiss & Pang, 2007). Pictures were presented in a random order for ten seconds each. After every picture, respondents had two to four minutes to write an imaginative story related to said picture's content. It was requested (but not demanded) that these stories contain some indication of what happened before, during and/or after the moment depicted as well as an indication of who the depicted persons were, what they thought, felt and wanted.

Achievement motive terminology was scored whenever respondent's stories mentioned positive performance evaluation, victories over or competitions with others, unique accomplishments or negative responses to failure (Winter, 1994). Affiliation motive terminology was scored whenever respondents' stories mentioned positive, friendly or

[14]Due to a technical error, 19 respondents were not presented with questions regarding age and gender.

intimate feelings towards other persons or groups, affiliative or companionate activities, friendly nurturing acts or negative feelings about separation or disruption of a friendly relationship (Winter, 1994). Motive terminology scores were regressed for word count with the standardized residuals being converted to z-scores to ensure that implicit motive measures were not confounded by word count (Pang, 2010; Schultheiss & Pang, 2007). Scoring was conducted by a trained expert blind to respondents' other data. This scorer was sufficiently experienced with coding implicit motives not to require an additional scorer (Pang, 2010; Schultheiss & Pang, 2007). Regardless, we tested said scorer's reliability by conducting the scoring for Study 4.3 with an additional trained expert. The inter-rater reliability was high for both achievement, R = .946[.915,.966], and affiliation, R = .920[.876,.950]. Average scores were calculated for any scoring differences.

Election rounds. Studies 4.1 to 4.3 contained three election rounds. These rounds allowed respondents to evaluate and vote for political candidates allegedly from different Polynesian countries (Tonga, Nauru or Tuvalu) based on one speech per candidate. The different election rounds appeared in a random order. Each round started with basic encyclopedia-style information regarding the relevant country, allowing for an understanding of topics introduced by the fictional candidates in their subsequent speeches. Then, respondents read two sequentially presented speeches, each stemming from one of the candidates.

Speeches shown to respondents were based on a single speech per election round that was subsequently manipulated in miscellaneous details and the extent to which motive terminology related to either achievement or affiliation. The differences in miscellaneous details consisted of the use of different synonyms for the same concepts, alternate word, sentence and topic order and a singular difference in policy proposal (e.g., investing more in healthcare versus education). These divergences in miscellaneous details were introduced to

make the speeches appear to diverge in more than just the motive-related concepts and it was randomly determined which candidate (i.e., first or second, named “candidate A” or “candidate B” respectively) used which miscellaneous details.

Importantly, speeches were manipulated to include promises of the candidates’ electoral victories resulting in outcomes related to the achievement or affiliation motive. For example, the achievement candidate might state that “it is time for our country to be governed in a better way” where “better” relates to the achievement motive (Winter, 1994). The affiliation candidate would state that “it is time for our country to be governed in a more friendly way”, whereby “friendly” relates to the affiliation motive. Additional achievement- and affiliation-related imagery included terms such as “improvements” and “striving for success” versus “showing sympathy” and “caring for others”. It was randomly determined which candidate (i.e., speech with one or the other type of miscellaneous details) included either achievement- or affiliation-related imagery.

For Study 4.3, speeches were rewritten around the same principles so that for the achievement candidate’s speech the achievement motive terminology exclusively related to promised outcomes following an electoral victory (this exclusivity had not originally been the case), while affiliation motive terminology related to personality traits descriptive of the self, the audience and/or the country, such as “I am a friendly candidate”. The opposite was true for the affiliation candidate (e.g., “I am an excellent candidate”). Speeches were written in such a way that terminology related to each motive was always present twelve times per speech, once in both the first and last sentence, at least once in each paragraph and that there were no sequences of the same motive terminology longer than three.

Each speech was split into six (Tonga in Studies 4.1 and 4.2) or seven (Nauru and Tuvalu in all studies and Tonga in Study 4.3) paragraphs which were presented sequentially at a pace of 220 words per minute with only two successive paragraphs visible concurrently.

This meant that if, for example, the second and third paragraph were both shown, the second paragraph would disappear the moment the fourth paragraph appeared. The last paragraph always lasted three seconds longer than the aforementioned rate would dictate to ensure that relatively slow respondents could finish reading the whole speech. This method of presenting the speeches allowed for a consistent temporal length per speech ($M_{Studies1\text{-}2}$ = 54.70 seconds, $SD_{Studies1\text{-}2}$ = 5.46; M_{Study3} = 62.73 seconds, SD_{Study3} = 4.65).

For half of Study 4.1's respondents, speeches were followed by an instruction to imagine as vividly and concretely as possible what their life would be like under the reign of the first candidate for one minute, after which they had another minute to imagine the same for the second candidate. This task was omitted in the other studies and condition.

Respondents could then indicate which candidate they would prefer to vote for by pressing one of two black boxes presented on the screen depicting either the letter "A" (for candidate A) or "B" (for candidate B). Voting was followed by six 7-point Likert scale questions regarding each candidate's expected competency, how sympathetic each candidate was considered and the extent to which each candidate was expected to improve people's lives in the respective country.

In order to avoid between-conditions differences in protocol length in Study 4.1, respondents in the control condition ended each election round with a filler task. For two minutes, circles were presented sequentially in random locations in the middle of the screen for 1500 milliseconds or until a response was given. Circles were either black or randomly colored (i.e., any color sufficiently different from white or black), with these options occurring in a random order and in equal amounts. Respondents were instructed to press the G button on the keyboard when the circle was colored and refrain from responding when the circle was black. This task was omitted in the other studies and condition.

*Proposal agreement***.** Study 4.4 used a questionnaire comprised of 60 different policy proposals to which respondents had to indicate their agreement on a 7-point Likert scale ranging from 1(*disagree completely*) to 7(*agree completely*). Proposals had been derived from the political manifestos of several nationally elected Dutch political parties or movements spanning the political spectrum (Christenunie, 2012; Christen-Democratisch Appèl, 2012; Democraten 66, 2012; 2015; Groenlinks, 2012; Partij van de Arbeid, 2012; Partij Voor de Vrijheid, 2012; Socialistische Partij, 2012; Socialistische Partij, 2015; Volkspartij voor Vrijheid en Democratie, 2012; 2015) and an online survey which serves to indicate to which extent the respondents' preferences match with Dutch political parties by means of testing the agreement with different policy proposals from said parties (ProDemos, 2012). All proposals were to be implemented on the national level.

Each original proposal was adapted to produce a neutral (i.e., no achievement or affiliation motive imagery), achievement-related or affiliation-related variant. For the neutral proposals, any potentially present achievement or affiliation motive terminology was removed. These neutral statements were then supplemented with achievement or affiliation motive terminology to form the achievement and affiliation proposals respectively. Originally present achievement or affiliation motive terminology was continued to be used for these proposals.

For both motive-related proposal types, motive terminology always related to a utility derived from implementing the stated proposal. For example, the neutral proposal "we must further professionalize the education system" gained achievement-related utility through the addition of "to improve education", whereas it gained affiliation-related utility through the addition of "to make education more beloved". Proposals were presented in a random order and it was randomly determined which of each proposal's three variants (i.e., neutral, achievement or affiliation) was presented. This randomization was restricted so that each

proposal type was presented five times per block of fifteen proposals, thereby ensuring that no substantial order effect impacted the results.

Explicit motives. Explicit motives were measured in all studies with a point allocation measure (Slabbinck et al., 2011). Respondents read descriptions of each of the implicit motives (i.e., achievement, power and affiliation) and were then asked to indicate the extent to which each description fitted them by dividing 100 points over the three descriptions. In Study 4.1, 37 respondents failed to divide exactly 100 points (all exceeding this amount). The absolute scores per explicit motive were therefore converted to standardized residuals expressed in z-scores after regression for the total number of points divided. In Studies 4.2 to 4.4, failure to divide exactly 100 point resulted in the question being repeated.

Studies 4.3 and 4.4 also used an explicit questionnaire measure (Jackson, 1974). This questionnaire consisted of three subscales, each comprising twelve randomly ordered statements measuring the explicit achievement ($\alpha = .73$), power ($\alpha = .84$) and affiliation motive respectively ($\alpha = .73$). For each statement, respondents indicated to which extent the statement was true for them on 7-point Likert scales ranging from 1(*not true at all*) to 7(*very true*).

Data analysis. For Study 4.1, one respondent's data were excluded from the analyses as the written stories indicated an insufficient commandment of the Dutch language. Two stories included a substantial number of errors and four stories were written in English. For Study 4.2, the data of three respondents were excluded, two for mentioning that the PSE measures personality and the other for mentioning that – due to dyslexia – the speeches were presented at too rapid of a pace to comprehend. Two and four respondents were excluded for Studies 4.3 and 4.4 respectively due to dyslexia. Where applicable, effect sizes derived from analyses

of variance (ANOVA's) or *t*-tests were transformed to Pearson's *R*'s (Rosenthal, Rosnow, Rubin, 2000). *R*'s confidence intervals were calculated after Fisher transformations.

Additional results. In order to establish the statistical independence of the implicit and explicit motive measures, correlations were calculated between the relevant counterparts of each measurement type collapsed across the four studies. Neither the implicit affiliation nor achievement motive correlated significantly with their counterparts of the explicit motive, *R*s ≤ -.033[≥ -.117, ≤ .118], or explicit questionnaire measures, *R*s ≤ .095[≥ -.077, ≤ .263], while the explicit achievement, *R* = .384[.227,.521], and affiliation measures did correlate, *R* = .183[.012,.344]. Hence, these results support previous findings that implicit and explicit motives are uncorrelated (e.g., Köllner & Schultheiss, 2014; Schultheiss & Brunstein, 2001; Spangler, 1992).

Evaluations. In Studies 4.1 to 4.3, respondents showed an above chance likelihood of voting for an achievement candidate (M = 55.66%[51.72,59.60], *R* = .189[.057,.314]). Additionally, they rated achievement candidates as relatively competent (ΔM = .34[.21,.48], *R* = .323[.198,.437]) and relatively likely to improve the nation (ΔM = .18[.02,.34], *R* =.146[.013,.274]). Affiliation candidates were rated as relatively sympathetic (ΔM = .34[.20,.48], *R* = .304[.178,.420]). These results are unsurprising as both "competent" and "improve" constitute achievement-related terminology, while "sympathetic" constitutes affiliation-related terminology. Hence, these results can be considered successful manipulation checks. All evaluation types predicted votes, *R*s ≥ .266[≥ .138, ≥ .385].

Gender. Women tend to score higher on the implicit affiliation motive (Pang & Schultheiss, 2005; Schultheiss & Brunstein, 2001). An analysis across all four studies' collapsed data supported this claim, *R* = .270[.154,.379]. Hence, it could be suggested that the aforementioned correlations including the implicit affiliation motive were spurious results stemming from a gender effect. Adding gender as a factor to aforementioned analyses for the

separate motives across Studies 4.1 to 4.3's collapsed data revealed that gender, the implicit achievement motive and implicit affiliation motive all predicted votes and evaluations in the expected direction, *R*s ≥ .157[≥ .018, ≤ .289]. Men (M = 65.31%[57.56,73.06]) were more likely to vote for achievement candidates than women were (M = 52.71%[47.51,57.90]), and were more likely to rate them positively (ΔM = .35[.13,.58]) than women were (ΔM = -.02[-.18,.13]). Hence, gender did predict votes for and evaluations of candidates, but this did not (fully) explain the prior results.

Adding gender as a predictor in Study 4.4 did not change the significance of either implicit motive predicting agreement with their congruent policy proposals, *R*s ≥ .300[≥ .049, ≤ .514]. Indeed, gender showed no significant effects here, *R*s ≤ .139[≥ -.119, ≤ .379], indicating that it neither replaced nor contributed to the previously discussed results.

Explicit motives. A potential counterargument against the analyses for Studies 4.3 and 4.4 is that it included two explicit motive measures. As these measures represent the same concept, a lack of effects could stem from explicit motives' explained variance being split between the measures, thereby reducing the odds of significant results. Conducting the analyses for each explicit motive measure separately indicated that neither relative explicit achievement motive measure significantly predicted votes for or evaluations of politicians in Study 4.3, *R*s ≤ .158 [≥ -.079, ≤ .377], nor differences in agreement between the proposal types in Study 4.4, *R*s ≤ .094 [≥ -.164, ≤ .340].

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Supplementary material

General control and demographic questions for Chapter2

Table S2.1

Questions and Anchors of the Control Questions with 7-point Likert Scales

Question	Anchors
How motivated were you to perform as well as possible during the decision task?	*not motivated at all - very motivated*
How important did you think it was to perform as well as possible during the decision task?	*not important at all - very important*
How difficult did you think it was to perform as well as possible during the decision task?	*not difficult at all - very difficult*
How did you decide which button to press?	*mostly by thinking rationally - mostly based on feelings*
Did you prefer pressing the A or L button?	*much preferred A – no preference – much preferred L*
Did you more frequently press the A or L button?	*A lot more frequently – no difference – L a lot more frequently*
Did you, during the first element of the decision task, prefer watching the pictures that appeared after the A or after the L button?	*much preferred those after A– no preference – much preferred those after L*
Did you, during the decision task, press the G button with your left or right hand?	*(almost) always left hand – both equally – (almost) always right hand*

Note. If three anchors are mentioned, the second anchor related to the neutral option on the 7-point Likert scale ("4").

Table S2.2

Questions and Answering Options of the Demographic and Other Questions

Question	Answering options
Did you previously partake in an experiment using the decision task with faces?	*1: yes* *2: no* *3: not sure*
What is your age (in years)?	*max. three characters*
Are you male or female?	*1: male* *2: female*
Are you a student at a university?	*1: yes* *2: no, at an applied university* *3: no, not a student (anymore)*
What kind of compensation will you receive for taking part in this experiment?	*1: money* *2: partial course credit*
Is Dutch your native language?	*1: yes* *2: no*
Are you left- or right-handed?	*1: left* *2: right* *3: both*
What do you think or suspect this research attempted to measure?	*max. 500 characters*
Do you have any further remarks about the experiment or suggestions for improvement?	*max. 500 characters*

Note. The numbers before the answering options represent the order of appearance and were not shown in the study.

Additional Figures Chapter 2

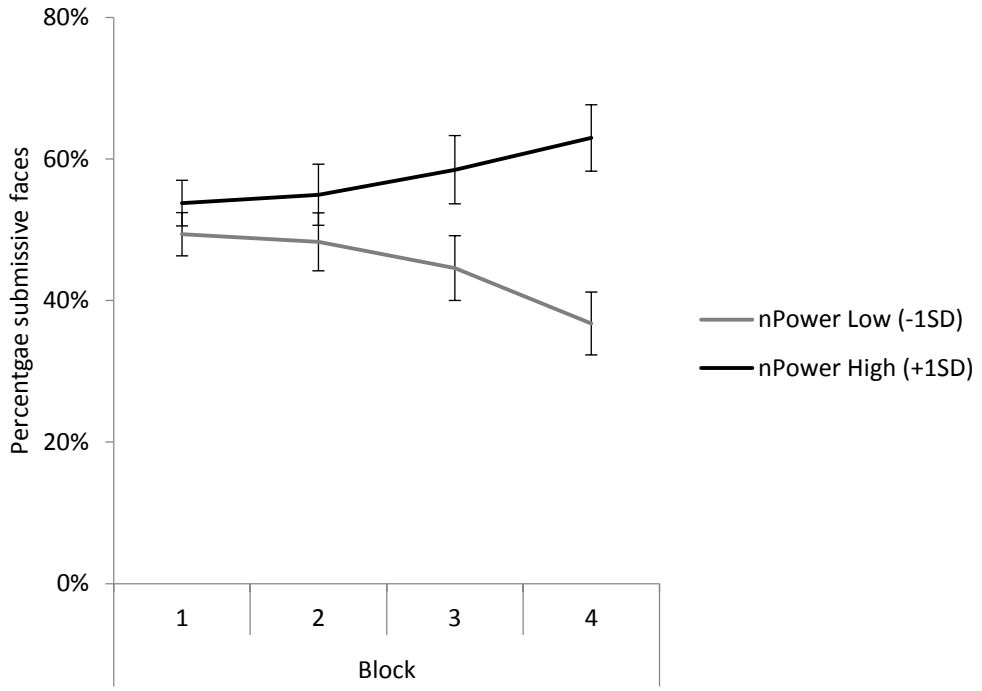

Figure S2.1. Estimated marginal means of choices leading to submissive (vs. dominant) faces as a function of block and *n*Power in the power condition. Error bars represent Standard Errors of the mean.

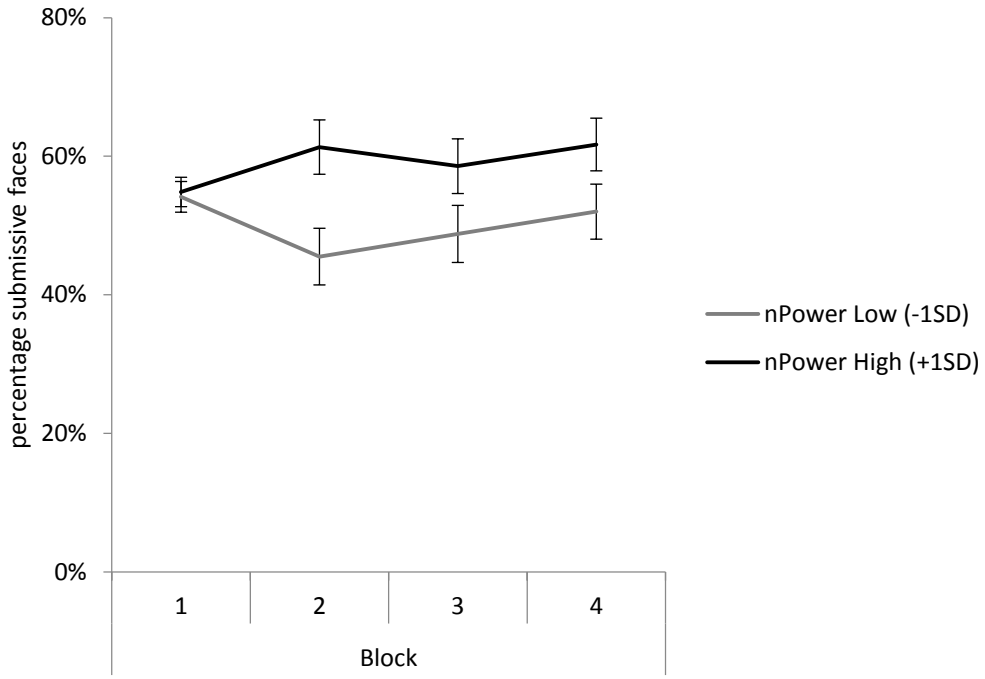

Figure S2.2. Estimated marginal means of choices leading to submissive (vs. dominant) faces as a function of block and *n*Power in the control condition. Error bars represent Standard Errors of the mean.

Additional Analyses Study 2.1

An analysis including participants' sex as an independent variable indicated a significant main effect of sex, $F(1, 71) = 7.69$, $p = .01$, $\eta_p^2 = .10$, with women ($M = 57.21\%$, $SE = 2.04$) being more likely to select actions predictive of submissive faces than men ($M = 49.28\%$, $SE = 2.05$). This main effect was qualified by a significant two-way interaction between sex and *n*Power, $F(1, 71) = 4.21$, $p = .04$, $\eta_p^2 = .06$, and a significant three-way interaction between said factors and recall manipulation, $F(1, 71) = 5.13$, $p = .03$, $\eta_p^2 = .07$. Splitting the analyses by recall manipulation revealed a main effect of sex only in the power condition, $F(1, 34) = 8.01$, $p = .01$, $\eta_p^2 = .19$ ($F < 1$ in control condition), and a significant interaction between sex and *n*Power only in the control condition, $F(1, 37) = 13.62$, $p < .01$, $\eta_p^2 = .27$ ($F < 1$ in power condition). Splitting the analyses instead by sex revealed a significant interaction between recall manipulation and *n*Power only for women, $F(1, 33) = 5.47$, $p = .03$, $\eta_p^2 = .14$, with this effect being non-significant for men, $F(1,38) = 1.02$, $p = .32$. Based on these analyses, it could be expected that women would show a stronger main effect of *n*Power specifically in the control condition. This effect was indeed observed, $F(1, 15) = 22.25$, $p < .01$, $\eta_p^2 = .60$ ($F < 1$ for men in same condition), with women low in *n*Power (i.e., $M - 1SD$) selecting the action towards a submissive faces less ($M = 44.20\%$, $SE = 3.60$) than women high in *n*Power (i.e., $M + 1SD$; $M = 70.21\%$, $SE = 4.07$). Note that the sample for which this effect was observed is relatively small, making conclusions regarding its generalizability relatively problematic.

Additional Figures Study 2.2

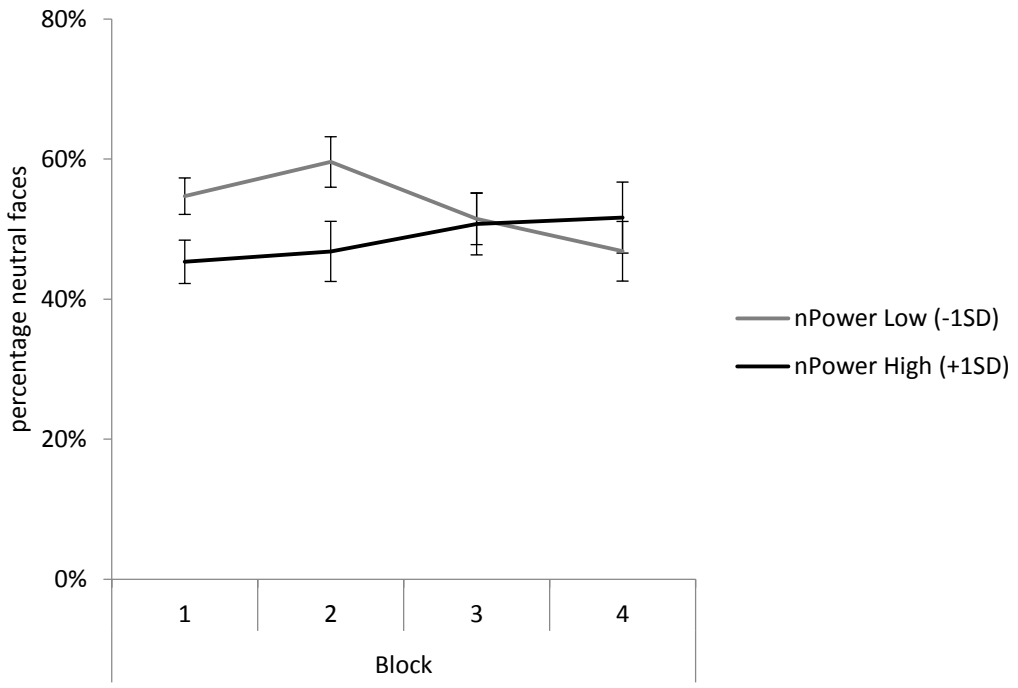

Figure S2.3. Estimated marginal means of choices leading to neutral (vs. dominant) faces as a function of block and *n*Power in the avoidance condition. Error bars represent Standard Errors of the mean.

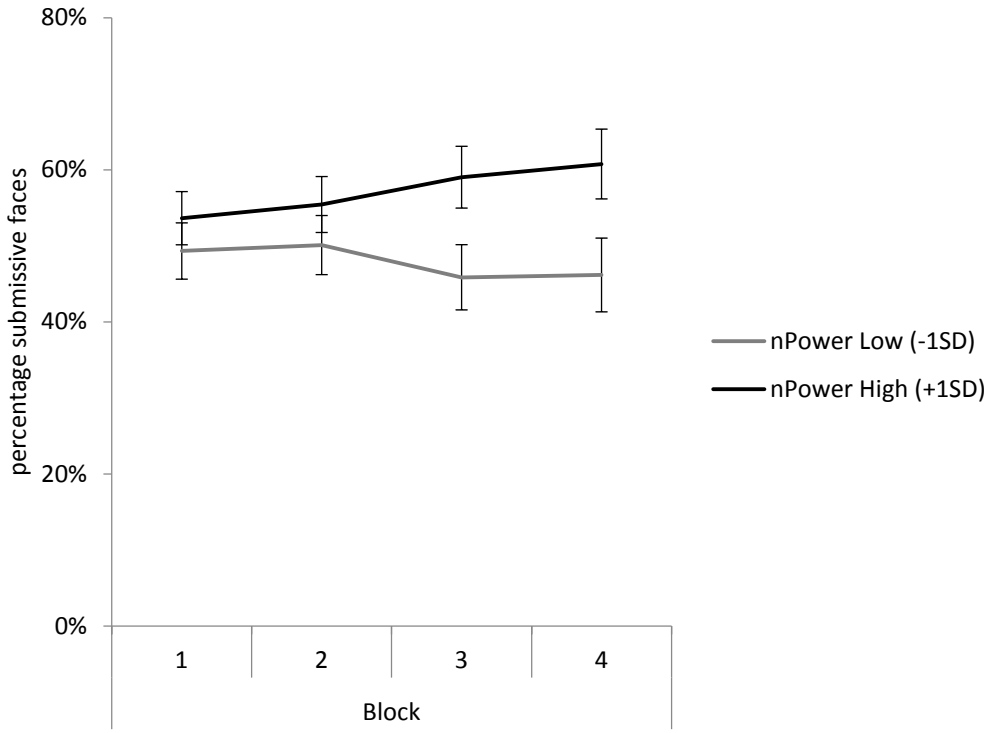

Figure S2.4. Estimated marginal means of choices leading to submissive (vs. neutral) faces as a function of block and *n*Power in the approach condition. Error bars represent Standard Errors of the mean.

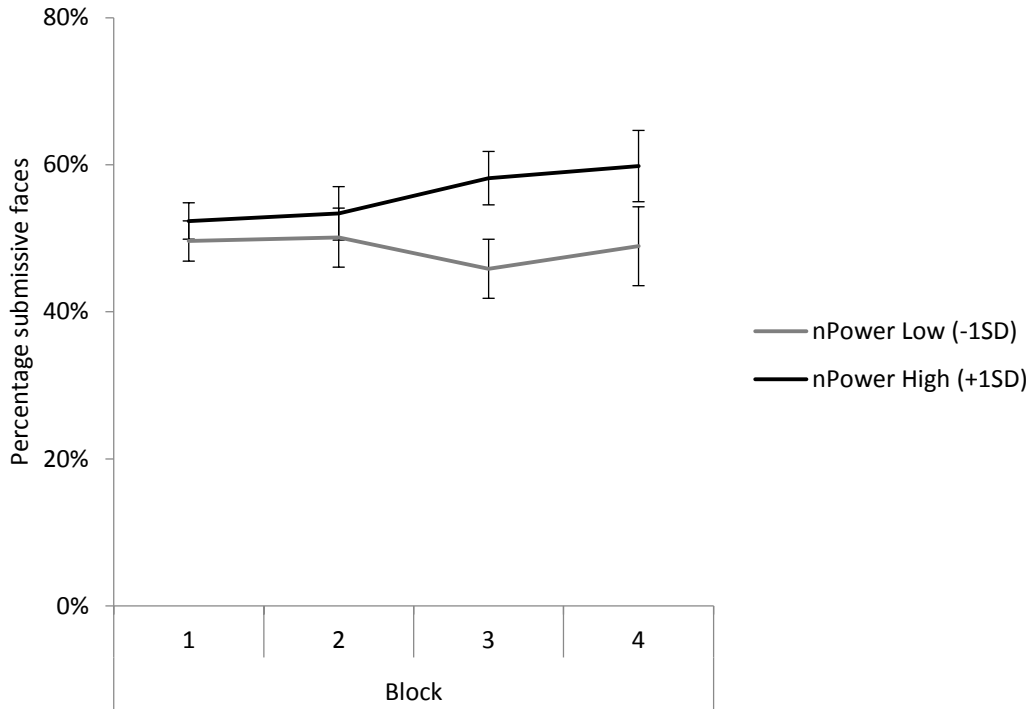

Figure S2.5. Estimated marginal means of choices leading to submissive (vs. dominant) faces as a function of Block and *n*Power in the control condition. Error bars represent Standard Errors of the mean.