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The effort investment theory of power

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Abstract

The powerful are often more successful in pursuing their goals, as shown in many studies. Does this mean that the powerful try harder? Current theories on power do not provide a clear answer to this question. Based on recent findings in the power literature and integrating theories from motivation psychology and neuroscience, the present paper presents the effort investment theory of power. The effort investment theory proposes that power determines the investment of effort following a resource conservation principle; that is, power affects people's evaluation of a goal in terms of its importance and feasibility, and based on their evaluation, they mobilize effort. Importantly, the theory also considers a time perspective. It highlights the role of experiences during the process of pursuing a goal (i.e., facing signals of success and failure) as well as previous experiences (i.e., performing a different task/goal before) in the power effect on effort investment, and argues that such experiences affect individuals' judgments of importance and feasibility. Finally, the theory discusses possible consequences of the power effect on effort investment for performance and efficiency. The relevance of these propositions for theory and practice are discussed, as well as ideas for future research.

1 | INTRODUCTION

There is a long tradition of research and theory in social psychology on how power affects the way we pursue our goals (Guinote, 2007a; Keltner et al., 2003; Magee & Smith, 2013). Past research suggests that the powerful are more capable of getting what they want than their powerless counterparts. However, if only the powerful are good at pursuing their goals, this leaves the powerless with no chances to climb the hierarchical ladder and likely reinforces existing power hierarchies (Magee & Galinsky, 2008). Understanding how exactly the powerful manage to attain their goals and what the obstacles are for the powerless is important. Firstly, it adds to the theoretical understanding of the power effect on behavior. Secondly, answers to these questions may inform interventions aiming to improve goal pursuit in the powerless, providing them with more chances to climb the hierarchical ladder.

Although evidence has accumulated supporting the view that power aids people in pursuing their goals effectively, questions remain open concerning how power affects the process of pursuing a goal, specifically in terms of the way people invest their effort. Do the powerful *try harder* and invest more effort into pursuing their goals than the powerless? Or do they *adapt* the investment of their resources to the requirements of a task more so than the powerless (i.e., are they more efficient)? What factors determine how much effort high-and low-power people put into a task? In this paper, we propose the effort investment theory of power to provide an integrative framework on how power affects people's effort investment during goal pursuit.

The effort investment theory of power proposes that power changes the way people perceive their goal (i.e., in terms of importance and feasibility), which in turn affects their effort investment. Moreover, the effort investment theory considers that perceptions of importance and feasibility may change during the process of pursuing the goal, in response to signals of success and failure in the environment. Past experiences such as the completion of previous tasks also affects the effort investment of powerful and powerless individuals differently. Finally, we discuss consequences for performance and efficiency and argue that the powerful need to invest less effort than the powerless for similar results, indicating that they are more efficient—although there may be boundary conditions to this effect.

In summary, the effort investment theory expands past literature by integrating findings and theories from motivation psychology and neuroscience to make novel and more precise propositions about how power influences effort investment. By doing so, the effort investment theory captures the complexities of goal pursuit, including subjective evaluations of a goal (i.e., goal perceptions), time aspects (i.e., goal pursuit as a process that is influenced by experiences during and before goal pursuit), and efficiency aspects (considering effort investment in the light of performance). This theory also brings attention to the opportunities that neuroscience methods provide in advancing our knowledge in the field of power. As such, the effort investment theory of power considerably expands theory on power, positions the literature on power in a broader and more interdisciplinary context (e.g., integrating insights from the neuroscience literature), and provides new avenues for empirical research. See Figure 1 for an overview of the theory; the concrete propositions will be detailed later.

2 | DEFINITIONS

2.1 | The concept of social power

Social power is defined as asymmetric control over valued resources (Galinsky et al. 2015; Keltner et al., 2003) and it defines relationships between people in all kinds of contexts. For instance, in the organizational context, a powerful person may have the ability to grant or withhold resources and to administer punishments and rewards. In private contexts, power plays a role when one is more knowledgeable or owns more money, and when two people have an asymmetric need for affection and closeness, giving the more distant partner greater power. Importantly, in relationships with others, people also differ in terms of how powerful they feel, to the extent to which they think they control the resources that another desires (Smith & Hofmann, 2016). Sense of power as a psychological state is not necessarily tied to an actual power position; it is the psychological state rather than one's position that influences the way we feel, think, and behave (Tost, 2015). Therefore, much research and theory on power, especially in the social psychology literature, has focused on the study of psychological processes and behaviors that are evoked

Measuring effort investment and efficiency. Mental aspects of effort investment, given their subjective nature, are typically assessed with self-reports (Dewey, 1897). Physical aspects of effort are often measured by means of electroencephalography (EEG) and electrocardiography (ECG). EEG methods allow for measurements of cortical activation, which reflect effort investment. An established index of cognitive resource investment is the event-related desynchronization (ERD), which can be derived from EEG (Neubauer & Fink, 2009). ERD compares the spectral power in a given frequency band during an event with baseline activity (Pfurtscheller & Lopes da Silva, 1999). Of special interest here is the ERD in the alpha band, which is thought to reflect the investment of cognitive resources during task completion (Klimesch, 1999; Neubauer & Fink, 2009; Nussbaumer et al., 2015). The neural efficiency hypothesis (Neubauer & Fink, 2009) proposes that people who are more intelligent are able to perform a task using fewer neural resources compared to less intelligent people, because intelligent people concentrate their resources on brain areas that are relevant to meet task demands. It was found that with increasing task difficulty, intelligent people showed increased cortical activation (Doppelmayr et al., 2005; Neubauer & Fink, 2009), possibly reflecting increased effort as an adaptation to the difficulty of the task, in line with the motivational intensity theory (Brehm & Self, 1989). In combination with performance assessments, ERD can indicate people's cognitive efficiency—more efficient people show relatively lower ERD for similar or better performance. ECG measurementsare informative for assessing effort investment because effortful engagement in a task is known to trigger the activation of the sympathetic nervous system (SNS), which corresponds with an increase in heart rate (HR) and systolic/diastolic blood pressure (SBP/DBP), and a decrease in the pre-ejection period (PEP) (Gendolla, 1999; Richter et al., 2008). All the above mentioned parameters can be assessed via ECG. Moreover, cardiovascular patterns such as the Threat-Challenge Index (TCI) provide information about individuals' efficiency in terms of the transporting of oxygenated blood through the system. The TCI is computed by calculating Z-scores of CO (cardiac output) and TPR (total peripheral resistance), multiplying TPR with -1, and summing the result with the CO Z-score (Blascovich et al., 2004; Scheepers et al., 2015). Higher TCI values indicate a stronger challenge motivational state, suggesting that people think that they possess the resources necessary to perform the task. Lower TCI values indicate a stronger threat motivational state, suggesting that people believe that they may not have the resources necessary to perform the task. The states of challenge and threat are both considered to be motivating; however, threat motivation is considered less efficient than challenge motivation in terms of transporting oxygenated blood through the system because threat causes stress, which in turn costs energy (Scheepers et al., 2012). When using the TCI to make inferences about However, a more efficient task completion, by definition, refers to investing less effort for similar or better performance also needs to be considered. Similar Therefore, similar to the ERD, one can only interpret higher TCI values could be used as indicating greater efficiency in task completion only when they are accompanied with similar or better performance. It is important to note that physiological and self-report measures of effort investment do not always correspond (Freydefont et al., 2012; Harper et al., 2016), possibly because self-report measures are subjective and may also be influenced by one's performance assessment. In other words, a person may have the subjective experience that they tried hard but this may not necessarily correspond to how much effort they invested in terms of muscular, brain, and heart activity. Nevertheless, our theoretical arguments do not differ for objective and subjective effort, and the empirical research we rely on includes both type of measures. As such, the propositions of this paper focus on effort investment as a broader concept and do not differentiate between physical objective and mental subjective effort mobilization.

by a sense of high versus low power. The present paper builds upon this research and theory.

2.2 | The concept of effort investment

Effort is defined as the expenditure of physical and mental energy in the service of a goal (Inzlicht et al., 2018). The investment of effort is costly, leading people to try to minimize it (Hockey, 1997; Kool et al., 2010). Physical aspects of effort can be defined in terms of muscular, brain, and heart activity, while mental aspects of effort investment are subjective in nature and refer to a conscious sensational experience (Dewey, 1897).

According to the motivational intensity theory (Brehm & Self, 1989), the investment of effort follows a resource conservation principle—people invest the minimal amount of effort that they deem necessary to attain a goal. Following this rationale, individuals increase their effort proportionally to task difficulty. They stop doing so, if (a) they deem demands too high and success appears impossible to them, or (b) they consider a goal not important enough to justify the greater investment of effort. Extensions of this model include the role of ability perception in effort investment (Gendolla & Wright, 2005; Wright & Franklin, 2004), stating that people who think that they have lower ability perceive tasks as more demanding for them. As a result, people with lower (vs. higher) perceived ability invest greater effort into their goals as long as they perceive goal attainment feasible and effort investment worthwhile. When tasks are difficult, people with lower perceived ability disengage earlier than people with higher perceived ability because they judge objectively difficult tasks as even harder and believe earlier that success is not possible for them. In contrast, people with higher perceived ability may find the same goal still possible to

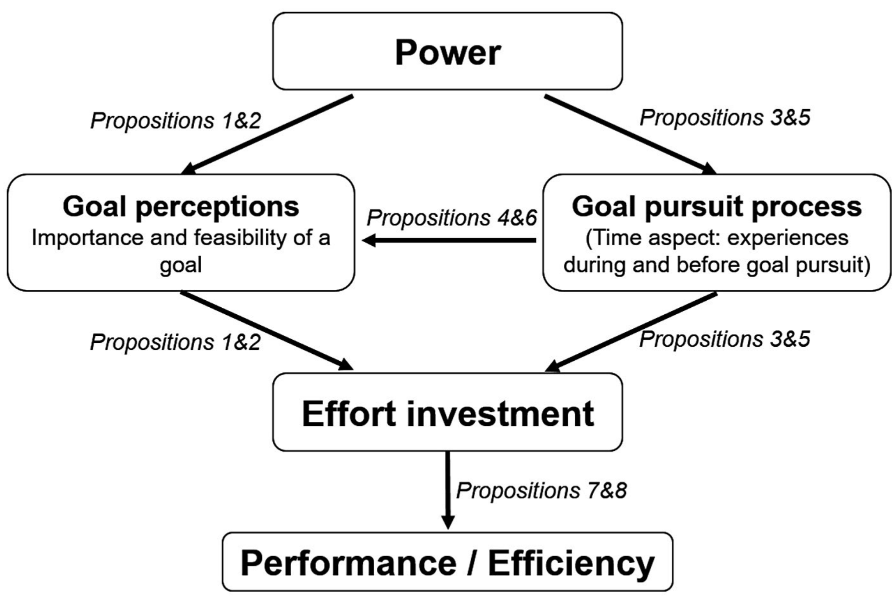

FIGURE 1 The effort investment theory of power proposes that power affects effort investment by changing perceptions of goals and responses to experiences during and before goal pursuit with consequences for performance and efficiency

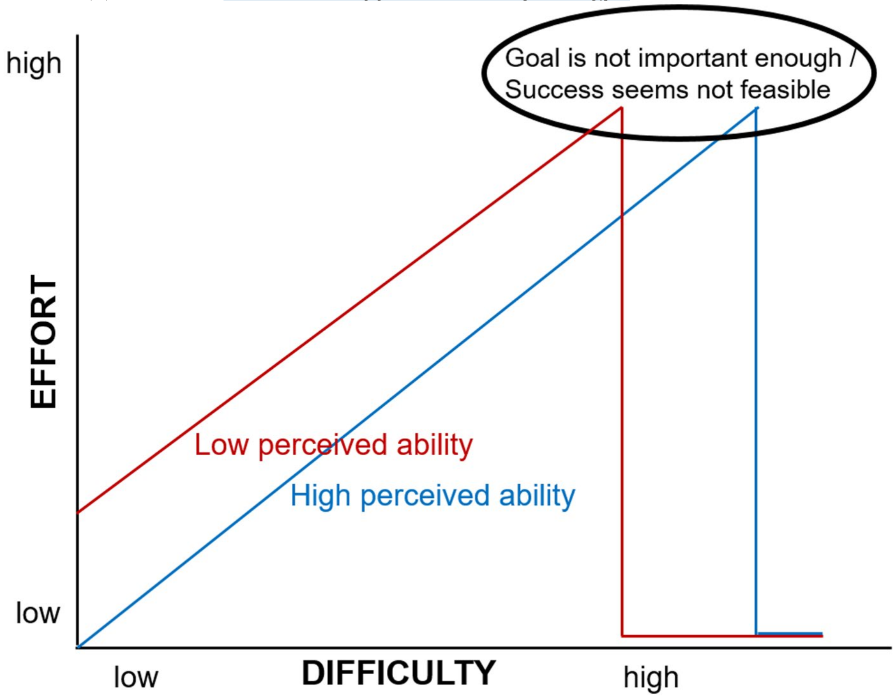

FIGURE 2 According to the motivational intensity theory and its extensions, individuals' effort investment is determined by task difficulty, goal importance, feasibility, and perceived ability. The graph is adapted and redrawn from Wright and Franklin (2004) [Color figure can be viewed at wileyonlinelibrary.com]

achieve and worthwhile to invest in (see Figure 2). In other words, individuals' perceived ability determines the point at which they consider a goal unfeasible for them to attain—the higher their perceived ability, the more difficult the goal must be for them to consider it unfeasible to attain. When the task is excessively difficult, people disengage regardless of their ability perception because when success becomes impossible, the mobilization of effort is a waste. Empirical research largely supports the claims of the motivational intensity theory (for a recent review, see Richter et al., 2016).

To summarize, research and theory of effort mobilization suggest that people are willing to increase their effort as task difficulty increases, but only as long as they deem the goal important and goal attainment feasible. This shows that people try to be efficient and conserve effort. It is important to consider that individuals differ in the extent to which they perceive a task difficult, goal attainment feasible, and a goal important, as well as in psychological states such as mood and fatigue, which influence such appraisals (Gendolla, 2000; Wright & Stewart, 2012). As we will detail later, the effort investment theory of power proposes that sense of power is another important predictor of one's goal perceptions in terms of goal importance, perceived ability and feasibility, and that these different perceptions explain how much effort powerful and powerless people invest into a goal at a given moment.

3 | PAST THEORIES ON POWER AND GOAL PURSUIT

Although effort investment is key to successful goal pursuit, past theory has been relatively silent with regard to the role of effort investment in the power effect on goal pursuit. While many theories of power propose that power and the psychological experience thereof affects goal pursuit, different claims have been made concerning how exactly this is the case, and through which mechanisms such effects may occur. In the discussion around such mechanisms, the role of effort investment has obtained little attention. Nevertheless, several theories of power make propositions that allow conclusions about how power should affect effort investment in goal pursuit, as outlined below. Because effort investment is not a core topic of these past theories, the propositions they include remain very broad and do not consider complexities such as differences in effort investment as one goes through the process of goal pursuit (i.e., the time and process aspects are neglected) and potential moderating factors. As a result, these theories also do not explain and may even be inconsistent with empirical results in this context. The effort investment theory of power is thus developed to provide a more comprehensive framework about how power influences effort investment by considering the complexities of goal pursuit.

A very influential modern theory of power is the approach/inhibition theory (Keltner et al., 2003). According to this theory, the experience of high power triggers the activation of the behavioral approach system (BAS), which by extension fosters automatic cognition and disinhibited behavior. Low power, in turn, is proposed to trigger the behavioral inhibition system (BIS), which leads the powerless to engage in controlled cognition and inhibited behavior. Controlled cognition and behavior is by definition more effortful than automatic cognition and disinhibited/uncontrolled behavior, as cognitive and behavioral control draw on executive functions. Thus, following this theory, one would postulate that the powerful invest less (cognitive) resources than the powerless. In support of this view, Weick et al. (2011) found that the powerful performed less well on psychophysical discrimination tasks, presumably because they are less vigilant. Moreover, several studies have shown that the powerful are more likely to express stereotypes and prejudice than the powerless (Guinote et al., 2010; Goodwin et al., 1998, 2000; Schmid & Amodio, 2017), likely because they lack the motivation to inhibit biased initial judgments in order to form more complex individuated impressions about others. However, in more neutral contexts that are not related to intergroup relations (i.e., classic cognitive control tasks), the powerful have been found to show greater cognitive control than the powerless (Schmid, Kleiman, et al., 2015; Smith et al., 2008), and these effects were due to high-power participants showing greater controlled processing compared to low-power participants, while no significant power effect was found for automatic processing (Guinote et al., 2009; Schmid, Kleiman, et al., 2015). These findings contradict the approach/inhibition theory and suggest that power does not always promote effortless, automatic cognition but may even lead to more effortful cognition in some contexts (e.g., cognitive control tasks).

The situated focus theory (Guinote, 2007a) makes different propositions. It argues that high power makes people focus their attention selectively and flexibly on what is relevant to them. In contrast, low power fosters attention to many people and things; they consider everything as potentially important. Applied to effort investment, this theory suggests that the powerful's effort investment is selective such that they devote more resources to their focal goal. In contrast, the powerless also expend effort on irrelevant tasks and thus, have fewer resources available for the focal task.

The social distance theory of power (Magee & Smith, 2013) makes similar predictions in terms of power effects on effort investment, although it suggests a different process. It postulates that high power leads to greater social distance than low power. Greater social distance facilitates abstract thinking, which helps people focus on superordinate, focal goals. Thus, similar to the situated focus theory, the social distance theory predicts that the powerful (compared to the powerless) prioritize their goals and invest relatively more effort into a focal goal compared to less relevant goals.

Thus, the social distance theory and the situated focus theory primarily make predictions about where (i.e., in what goal) high-power and low-power people invest but they do not make explicit predictions about how much effort people invest more generally. Empirical research has confirmed that the powerful indeed perform better on focal tasks than the powerless (e.g., Guinote, 2007a; Overbeck & Park, 2006; Schmid, Kleiman, et al., 2015; Slabu & Guinote, 2010). It is important to note that these findings reflect effectiveness in goal pursuit (i.e., performance); that is, they do not answer the question of how much effort high-power and low-power people invested while pursuing the goal.

4 | THE EFFORT INVESTMENT THEORY OF POWER

Past theory on power and goal pursuit suggests that the powerful either invest less effort than the powerless (i.e., approach/inhibition theory) or that they invest relatively more effort into a focal task as opposed to less relevant tasks (i.e., situated focus theory, social distance theory). These theories, however, do not cover the complexities of goal pursuit: First, past theories do not make predictions about the processes and mechanisms that underlie the power effect on effort investment. Second, they do not explicitly talk about the process of pursuing a goal (i.e., time perspective), although while pursuing the same goal, one's investment of effort does not necessarily remain stable and is often adapted. Third, they do not clearly distinguish between efficiency (i.e., mobilizing the minimum amount of effort needed to attain the goal) and effectiveness (i.e., performance/success in attaining the goal). Fourth, prior work neglected the role of effort investment as a key mechanism in the link between power and goal pursuit. Thus, a novel theory on power and effort investment is needed that addresses the effects of power on effort investment in more detail and that takes into account the complexities of the goal pursuit process. The effort investment theory provides a framework to close this gap in theory—it draws on theories from motivation psychology (i.e., the motivational intensity theory) and the neuroscience literature (i.e., the neural efficiency hypothesis) and makes novel and more specific propositions about the effects of power on effort investment.

4.1 | Goal perceptions

When predicting effort investment in goal pursuit, it is important to consider people's perceptions of the goal. The motivational intensity theory states that individuals increase their effort proportionally to task difficulty and as a function of their perceived ability, as long as they deem it feasible for them to attain the goal and consider the goal important enough to justify the investment of effort. Thus, effort investment is influenced by individuals' judgments of the goal's importance and feasibility, as well as their own perceived ability to pursue it. We argue that power greatly affects individuals' judgments of goal importance and feasibility, as well as their own perceived ability to pursue it. These judgments, in turn, affect their effort investment.

4.1.1 | Goal importance

The proposition that power affects individuals' judgments of a goal's importance is in line with the situated focus theory of power (Guinote, 2007a) and the social distance theory of power (Magee & Smith, 2013). Both theories postulate that power affects goal prioritization such that the powerful focus more on superordinate and focal goals. Empirical evidence supports this view. Many studies have shown that the powerful focus more on superordinate information and goals and inhibit subordinate/irrelevant information and goals while the powerless prioritize goals less and differentiate less between relevant and irrelevant information/goals (e.g., Guinote, 2007b; Lin & Schmid, 2020; Overbeck & Park, 2001; Schmid et al., 2018; Schmid, Kleiman, et al., 2015; Smith et al., 2008; Smith & Trope, 2006). It has been demonstrated that people experiencing high power (vs. low power) perform better on goals that are currently relevant (Guinote, 2008) and in line with their personality and values (Chen et al., 2001; Goodwin et al., 2000; Overbeck & Park, 2001, 2006).

Moreover, several authors have interpreted power effects on performance in tasks as evidence for regulated effort investment. For instance, DeWall et al. (2011) showed that high-power participants performed poorly on simple tasks compared to low-power participants, and argued that high-power participants likely withheld their effort because they deemed these tasks unworthy of them. In the intergroup context, it was found that the powerful process information about outgroup members in a way that supports existing stereotypes (i.e., they process stereotype-consistent information more deeply and stereotype-inconsistent information more superficially), possibly to maintain their own superiority and power (Fiske, 1993; Goodwin et al., 2000; see also Schmid & Amodio, 2017). Neuroscience research also suggests that the powerful might reduce effort investment into tasks they deem less relevant. For instance, Hogeveen et al. (2014) showed that when experiencing high power (compared to low power), people showed lower levels of resonance when observing others' actions, suggesting that spontaneously, they invested less effort into mirroring others, possibly because they care less about others.

Together, this research suggests that power affects goal prioritization, and as such, people's perception of goal importance. Following a resource conservation principle, we argue that the different priorities of the powerful and the powerless have consequences for effort investment. Specifically, to date we know that the powerful prioritize superordinate, focal goals. We therefore expect the powerful to invest greater effort into superordinate/focal goals as compared to subordinate/peripheral goals, while the powerless are expected to differentiate less in their effort allocation towards superordinate versus subordinate tasks. Moreover, the powerful seem to place greater importance on goals that pertain to their high-power roles; that is, they favor goals and tasks that they deem appropriate and worthy for their high-power roles as well as tasks that may help them maintain their high-power roles. This is in line with past work arguing that people should place more importance on tasks that are instrumental and relevant to their identities (Gendolla, 1998). Linking this to the motivational intensity theory, we argue that the powerful conserve their resources if they judge a task unworthy of their effort and invest greater effort when a task is relevant to them and their roles.

Proposition 1 *Power affects people's judgment of goal importance, which in turn affects how much effort they invest into a goal.*

For example,

Proposition 1a *The powerful invest greater effort in superordinate goals and less effort in subordinate goals than the powerless.*

Proposition 1b *The powerful invest greater effort into goals that are relevant to their identities and goals that help them maintain their high power.*

4.1.2 | Perceived ability/feasibility

How much effort people invest into a goal depends on individuals' perceptions of their own ability (Gendolla & Wright, 2005; Wright & Franklin, 2004), and ultimately, whether they believe that it is feasible for them to attain the goal (Brehm & Self, 1989). People's judgments of their own ability and feasibility to attain the goal depend on their personalities and psychological states (Gendolla, 2000; Wright & Stewart, 2012), including, as we argue, their sense of power. We base this argument on research showing that high-power individuals are more confident, more self-efficacious, and more optimistic about future outcomes and they feel more in control over situations than low-power individuals (Anderson & Galinsky, 2006; Fast et al., 2009; Fischer et al., 2011; Schmid & Schmid Mast, 2013; Weick & Guinote, 2010). Moreover, high-power (compared to low-power) people tend to experience demanding situations more as a challenge than a threat (Scheepers et al., 2012), suggesting that they have greater confidence in their ability to meet the demands of the tasks they face. According to the motivational intensity theory, perceived ability affects effort investment and shifts individuals' threshold concerning when they give up on a goal (i.e., when they judge a goal as not feasible). Because the powerful are more confident and optimistic than the powerless, they should invest less effort on easy goals, and greater effort on difficult goals (i.e., when the powerless already conclude that the task is too hard for them and goal attainment therefore not feasible). Thus, the powerful conclude at a later point that goal attainment is not feasible for them. Once the powerful reach the point where success seems unfeasible for them, they should also disengage—no difference in effort investment between high-power and low-power people is expected at this point.

Proposition 2 *The powerful have greater perceived ability and experience tasks/goals as more feasible than the powerless, with consequences for effort investment.*

Proposition 2a *The powerful have a higher perceived ability and therefore invest less effort into easy goals (to conserve effort) than the powerless.*

Proposition 2b *The powerful invest more effort into difficult goals (i.e., they persist longer) than the powerless. The powerless consider difficult goals as not feasible and disengage.*

Proposition 2c *When the powerful and the powerless both deem a goal as not feasible, there is no power difference in effort investment (i.e., both disengage).*

4.2 | The goal pursuit process (time aspect)

Goal pursuit is a process that evolves over time. Past experiences as well as experiences made during this goal pursuit process influence the power effect on effort investment, as detailed below.

4.2.1 | Signals of success and failure

When pursuing a goal, people typically face signals in the environment that indicate where they stand in the goal pursuit process (i.e., whether they are performing well or poorly toward their goal). People typically adapt their investment of effort in response to such signals and there is evidence that power moderates this effect. Specifically, Schmid (2020) found a classic goal gradient effect in the powerless; they were more motivated when the goal was closer and goal attainment more likely as compared to when goal attainment seemed far away and more uncertain. The powerful were already motivated when goal attainment appeared far away and kept being motivated to invest when the goals came closer. In a different series of studies, Schmid et al. (under review) showed that negative performance feedback increased motivation to invest effort in high-power participants, but decreased motivation to invest effort in low-power participants. Positive feedback, in turn, promoted motivation to invest effort in low-power participants but had little impact on high-power participants.

Together, it appears that the powerless are more motivated to invest into goal pursuit under circumstances that suggest that goal attainment is not very challenging (i.e., when they perceive a goal as close and receive positive feedback). The powerful in turn, may not be willing to increase their investment of resources under such optimistic circumstances and preserve their resources. When information in the environment signals that the goal is far or when they receive negative feedback, low-power people show decreased motivation to invest effort investment while the powerful increase their effort to enhance the probability of achieving the goal. Taking into account that people adapt their effort investment depending on information they receive during the goal pursuit process, we propose the following:

Proposition 3 *Power affects how people respond to signals of success and failure in the environment with consequences for effort investment.*

More specifically,

Proposition 3a *The powerful (compared to the powerless) are more likely to increase effort in response to signals in the environment that suggest insufficient progress on their goal.*

Proposition 3b *The powerless (compared to the powerful) are more likely to increase effort in response to signals in the environment that confirms that they are on the right track to attain their goal.*

We further argue that the powerful and the powerless use situational cues during the goal pursuit process as information about their ability to pursue a goal and feasibility of goal attainment. In other words, experiences during the goal pursuit process affect the goal perceptions of the powerful and the powerless. Specifically, the powerless typically have less confidence in their abilities and benefit from external confidence boosts. This may come in the form of positive feedback or feedback that suggests that goal attainment is close. Such feedback likely reassures the powerless that goal attainment is possible and justifies the investment of more effort. A far goal and negative feedback in turn signal that the task is not feasible for them and that failure is likely. The powerful are more confident and self-efficacious to begin with (Anderson & Galinsky, 2006; Fast et al., 2012; Schmid & Schmid Mast, 2013), and so take positive feedback and information about being close to goal attainment as signals that the goal can be achieved with less or maintained effort, and consequently conserve their resources. When the goal is far away or negative feedback is received, the powerful perceive the task as challenging and that more effort is needed to attain the goal, leading to increased effort.

Proposition 4 *Experiences during the goal pursuit process (i.e., signals of success and failure) affect the goal perceptions (i.e., ability/feasibility) of powerful and powerless people, with consequences for effort investment.*

4.2.2 | Past experiences

When considering a time perspective in goal pursuit, one should also take into account that individuals may not go "fresh" into the pursuit of a new goal; they may have invested effort into a different goal before. Many studies have demonstrated that when a person exerts self-control in a first task s/he performs less well on a second task, an effect that is known as ego depletion (for meta-analyses, see Blázquez et al., 2017; Carter & McCullough, 2014; Hagger et al., 2010). It seems that after investing effort in a first task, individuals try to conserve the remaining resources in order to not fully deplete them (Baumeister et al., 2000). There is initial evidence showing that the experience of high power may decrease depletion effects on the second task. Results showed that the powerful maintained a high performance on a second task after having completed a first self-control task, while the powerless showed a significant performance decrease on the second task (DeWall et al., 2011). However, this research further showed that such prolonged investment of effort over two demanding self-control tasks resulted in performance decreases at later stages (DeWall et al., 2011). Overall, this research suggests that the powerful invest greater effort over the pursuit of multiple tasks/goals than the powerless.

Proposition 5 *Compared to the powerless, the powerful invest greater effort into a task after having previously performed a demanding task.*

There is some debate in the literature concerning the mechanisms that underlie ego depletion and there may be multiple mechanisms that occur in parallel (Inzlicht & Schmeichel, 2012). Relevant for the context of this paper is that people sometimes lose the motivation to invest effort after performing a first cognitive control task (Inzlicht & Schmeichel, 2012), especially when the previous task demands high effort (Lin et al., 2020). In other words, the experience of pursuing a goal previously affects the importance one places on the next goal. Given that the powerful are able to sustain their effort investment for a second task (DeWall et al., 2011), it is possible that for the powerful, perceptions of goal importance are less dependent on past goal pursuits. The powerless in turn, may feel that they are owed a break after having expended effort to pursue a goal before, which reduces the importance they place on the pursuit of the next goal. Thus, we argue that past goal pursuits affect how much importance the powerful and the powerless place on their current goal with consequences for effort investment.

Proposition 6 *Past effort investments decrease the perception of goal importance of the powerless more so than of the powerful, with the consequence that the powerless invest less effort into the pursuit of subsequent goals.*

4.3 | Performance and efficiency

What are the consequences of the power effects on effort investment for performance? Past work outside the context of power suggests that effort investment is one amongst many other factors (e.g., personality, experience, skills) that promotes good performance (e.g., Motowidlo et al., 1997; Sonnentag & Frese, 2002). It is thus not surprising that in the power context, performance results often mirrored motivation and effort investment results (Schmid, 2020; Study 4; Schmid et al., under review). However, these studies did not provide evidence that greater motivation to invest effort causes greater performance. Although empirical evidence for a causal chain of effects from power to effort investment and performance is still missing, it is likely that power effects on both increased and decreased performance are at least in part due to its effect on effort investment.

Proposition 7 *Power effects on increased/decreased performance are at least in part due to greater/reduced effort investment.*

Importantly, the best possible performance is not always the goal, people often seek a balance between their effort investment and performance. An additional reason why the link between effort investment and performance is not always straightforward might be because people differ in how efficiently they pursue their goals; that is, how much effort they actually need to invest to attain a goal. We argue that both the powerful and powerless strive for efficiency; thus, they both wish to conserve resources in order to achieve their goals with the least effort possible. However, the powerful and the powerless differ in terms of their perceptions regarding their perceived ability and the feasibility of the goal, which has consequences for their actual, objective efficiency (i.e., whether they indeed achieve their goal using minimal resources). As noted above, the powerful invested less when goal pursuit is easy (probably to not waste effort) and increased their effort when they faced challenges in order to still achieve that goal, while the powerless disengaged (Schmid, 2020; Schmid et al., under review). In these studies, power effects on performance were parallel to the power effects on effort investment, which suggests that the powerful's effort investment was adapted to the challenges they faced during goal pursuit. In other words, it seems that in these studies, the powerful indeed used an efficient goal pursuit strategy that followed the resource conservation principle: They invested less when they received information that the task was easy and they invested more when they received information that the task was difficult/challenging.

More evidence that the powerful may use a more efficient task strategy comes from an experiment on power effects in dual task completion (Schmid, Schmid Mast, et al., 2015). Task performance of the powerful and the powerless across the two tasks was comparable; however, the powerful achieved this result by focusing on one task and neglecting the other, while the powerless dealt with two tasks simultaneously, which likely requires greater effort and is thus a less efficient way to achieve results. In a similar vein, research has shown that people are better able to concentrate on focal goals when they experience high (vs. low) power (Guinote, 2007b; Lin & Schmid, 2020; Smith et al., 2008), they inhibit irrelevant and invalid information (Guinote et al., 2009; Overbeck & Park, 2001; Schmid et al., 2018; Willis et al., 2011), show greater top down attentional control (Guinote et al., 2009; Schmid, Kleiman, et al., 2015), have lower decision thresholds (Guinote et al., 2009), and disengage from tasks they deem unworthy of their effort (DeWall et al., 2011). These studies further indicate that the powerful are more likely to regulate their effort investment in a way that prevents the waste of resources than the powerless. It is important to note, that all these findings were based on interpretations of accuracy or reaction time measures (performance outcomes) and there was no direct assessment of effort investment.

Efficiency is about investing the optimal effort needed to perform a task (Hoffman et al., 2012); thus, to make inferences about efficiency, we need separate indices of effort investment and performance. This is difficult to achieve with behavioral methods (Basten et al., 2012). However, neuroscience methods allow us to assess effort investment (e.g., indexed by activity of the brain and heart) during a task independently of performance, which allow inferences concerning efficiency when combined with performance indices, see Textbox 1.

The neural efficiency hypothesis (Neubauer & Fink, 2009) postulates that some people are able to perform a task with less neural resources than other people, presumably because they are able to activate only specific and relevant areas of the brain that are necessary to meet task demands. Because the experience of power enables people to focus and regulate their behavior (e.g., Guinote, 2007b; Schmid, Kleiman, et al., 2015), it is likely that it also helps them focus and regulate their brain activity (which guides behavior). Indeed, Schmid et al. (2018) showed in an EEG study that the powerful processed valid information more deeply than invalid information (indexed by the feedback-related negativity), which is first evidence that they use their neural resources more selectively. Another study tested the efficiency hypothesis more directly (Lin et al., 2021). Similar to the literature on the neural efficiency hypothesis, the study focused on event-related desynchronization (ERD) measured with EEG (Neubauer & Fink, 2009) as an index of individuals' use of cognitive resources during task performance. Results showed that high-power participants used less neural resources (i.e., had lower %ERD) than low-power participants for similar performance. These findings are direct evidence that high-power individuals utilize their cognitive resources more efficiently than low-power individuals, which is the basis of Proposition 8a.

Proposition 8a *The powerful invest effort more efficiently than the powerless.*

However, there may be a boundary condition to the power effect on efficiency. The powerful tend to be over-confident (Fast et al., 2012); it is thus possible that the powerful keep investing effort when tasks are excessively difficult and success not possible, because they wrongfully believe that they can do it if they just try hard enough. Indeed, in one study, high-power participants spend more time trying to solve an unsolvable puzzle than low-power participants (Guinote, 2007c). Such persistency on impossible tasks is inefficient.

Proposition 8b *When tasks are excessively difficult and success not possible, the powerful are more likely to waste effort (i.e., they are less efficient) than the powerless.*

5 | DISCUSSION

The effort investment theory presents several novel propositions concerning how power affects the amount of effort people invest into the pursuit of their goals. We based these postulations on insights from the motivational intensity theory and the neuroscience literature, which we integrated into the power literature. As a result of this integration, the effort investment theory proposes that power affects people's goal perceptions, which has consequences for their effort investment. The effort investment theory considers a time factor that reflects that one does not always keep one's effort investment stable in the process of pursuing a goal. It proposes that depending on their experienced power, people respond differently to events that happen during and before goal pursuit, which affects their goal perceptions and effort investment. Finally, the theory proposes that people are more efficient when experiencing high power compared to low power (at least as long as they are not overconfident and pursue impossible goals).

In a concrete example, the theory suggests that a person who experiences high power focuses on superordinate goals that are in line with the role of a high-power person. She is confident that she is able to pursue her goals, which means that she invests little effort in less challenging goals (to not waste effort) and invest more effort into a difficult goal (to still achieve it). She considers signals in the environment in order to reassess how much effort she needs to invest to attain her goal. Signals that point to possible failure encourage her to invest more effort while signals of success make her maintain or reduce effort, in order to not be wasteful. Her effort investment is mostly efficient; that is, she regulates effort according to situational affordances and she can achieve a certain performance level with minimal use of cognitive resources. However, when a goal is excessively difficult, she might still increase her effort, over-confident that she could attain the goal. Thus, she might be wasteful with her resources until she recognizes that the goal is not feasible for her, upon which she disengages. In contrast, a person who experiences low power is less selective in terms of the goals she invests in. She doubts her ability and invests effort in easy tasks but disengages early when tasks become more difficult. Signals in the environment that suggest possible failure make her disengage, while positive signals encourage her to increase effort (and possibly be wasteful). In general, she is less efficient.

The effort investment theory provides a new theoretical angle to how power affects goal pursuit. Past theories have discussed only in passing how power may affect the investment of resources and provided different proposals. The approach/inhibition theory (Keltner et al., 2003) proposed that the powerful generally engage in effortless cognition—a proposal that was supported with some empirical evidence but contradictory findings were also reported. Other theories such as the situated focus theory (Guinote, 2007a) and the social distance theory (Magee & Smith, 2013) suggested that the powerful invest greater resources into a focal goal, and as a result often perform better on that goal than the powerless. This aspect, that power changes people's goal prioritization, is implemented in the effort investment theory as part of Proposition 1. Integrating knowledge from different fields (e.g., motivation psychology, neuroscience), the effort investment theory is much more comprehensive than past theory. Based on this integration, eight different propositions (including sub propositions) were made that consider different complexities in the effect of power on effort investment, including boundary conditions and processes. Besides advancing theory on power, the effort investment theory also serves as a guideline that helps identify obstacles in the goal pursuit of the powerful and the powerless and ideas on how to overcome these obstacles can be built upon these insights.

5.1 | Relevance of the effort investment theory

The effort investment theory is relevant for applied contexts and can be used as a basis for designing interventions to facilitate goal pursuit and efficiency in several ways.

Propositions 1–6 may serve as a starting point for interventions in organizational settings, to increase employee motivation, effort, and efficiency in different contexts. For instance, the theory suggests that in the context of goal setting, low-power individuals may benefit from an explicit definition of sub-goals that appear close. On the other hand, high-power individuals likely work better if they keep focusing on a broader goal for a longer period. Moreover, in the context of performance feedback, it seems highly important to give positive feedback in meetings with low-power employees as it gives them the confidence they need to invest effort into goal pursuit with positive consequences for performance. High-power individuals (assuming they experience high power) seem to be better at dealing with negative feedback; it may even increase their effort investment and performance as it signals that they need to try harder if they want to achieve their goals. Of course, the tone of the negative feedback may be crucial here. If the tone of the negative feedback is such that the powerful perceive it as a threat to their power, effects may reverse (Tost, 2015). This would be a subject for future research. The propositions from the effort investment theory can also be applied to the health context, especially when it comes to medical interventions that include supervision such as sports programs, supervised dieting, or potentially also supervised drug withdrawal.

Proposition 8 of the effort investment theory of power (that power promotes efficiency) brings a new angle to the literature on power. So far, the social psychological literature has predominantly focused on the effects of power on effective goal pursuit (i.e., how to achieve a goal); efficiency aspects were either neglected completely or only touched on peripherally. Efficiency is highly relevant in the organizational context. If the powerful consistently invest more than the necessary cognitive resources, it would not sustainable in the long-term, especially not in a world where one typically pursues multiple goals and has many tasks and responsibilities. Negative consequences could then result in the long-term for the powerful themselves (e.g., stress, fatigue, burnout) and the organizations for which they lead (e.g., absences due to stress and burnout, poor decision-making as a result of depleted cognitive resources). Pursuing goals efficiently leaves the powerful with more resources to put into other tasks and responsibilities.

Finally, the effort investment theory also helps explain why power hierarchies often reinforce themselves. If the powerful are better at pursuing their goals in the face of challenges than the powerless and additionally need to invest less cognitive effort to obtain similar results, then this suggests that the powerful will more likely be successful and gain more power while the powerless are more prone to fail in their goal pursuit, which hampers their chances in climbing the hierarchical ladder. Importantly, it has been suggested that individuals' experience of power rather than their actual power affects cognitions and behaviors (Tost, 2015) and many studies have shown that transient feelings of power can be manipulated (e.g., Cesario & McDonald, 2013; Galinsky et al., 2003; Huang et al., 2011). This brings the possibility of inducing a higher sense of power in low-power individuals (e.g., through employee empowerment), in order to enhance their goal pursuit success.

5.2 | Future directions

The effort investment theory may also inspire future research. For instance, the theory builds on empirical evidence showing that by giving feedback about goal proximity and one's performance so far we can influence high-power and low-power individuals' effort investment, most likely because, with this feedback, we change how they think about a goal in terms of importance and feasibility. However, we need to gain further knowledge about the factors that influence how important and feasible high-power and low-power individuals judge a goal, as these judgments are the cornerstones to predicting power effects on the investment of effort. Such insights would be especially relevant in the context of Propositions 2 and 8, in that they would clarify when the powerful's effort investment is adaptive or wasteful. For example, given the powerful's greater confidence in their own ability, they may invest effort in difficult goals where the powerless already disengage. The powerful's behavior could therefore lead them to greater success on the goal; however, if they overestimate their ability, their invested effort may be wasted.

There are some contexts in which the powerful underperform compared to the powerless, and the role of effort investment needs to be clarified in these contexts. For example, in one study, low-power participants performed better on tasks that required sustained attention than high-power participants (Weick et al., 2011). It is possible that the powerful reduced their effort investment because they deemed the task as not important or inappropriate for their powerful role (cf. DeWall et al., 2011). It is also possible that the powerful simply perform some types of tasks (e.g., vigilance tasks) less efficiently; that is, they try hard but do not achieve good results. Future research is needed to identify more boundary conditions such as type of tasks/goals in the power effects on effort investment and efficiency.

One major reason why there is so little research on power effects on efficient goal pursuit might be due to the fact that it is difficult to dissociate effectiveness from efficiency in behavioral studies. Lin et al. (2021) were able to accomplish such a dissociation using neuroscience methods. Neuroscience methods have the potential to advance the field of power even more. For instance, future studies could investigate boundary conditions to the efficiency effect (i.e., include very easy and very hard tasks), using similar methods as Lin et al. did.

Moreover, in the context of the motivational intensity theory, cognitive effort investment is often indexed by the PEP, which can be assessed using ECG. Schmid et al. (under review) assessed individuals' PEP in their Study 4; however, results were somewhat inconclusive. It remained unclear to what extent PEP measures a similar or different construct than effort investment as indexed by time investment or via subjective reports. More research is needed in that context.

Past research also revealed interesting initial results regarding the threat/challenge index that can also be derived from participants' ECG. Findings suggested that positive feedback assured low-power participants that they could attain their goal (i.e., they had a higher threat/challenge index; Schmid et al., under review) and that when faced with a demanding task, high-power participants were in a state of challenge rather than a state of threat (Scheepers et al., 2012). These are initial results, and we need more research to know when exactly the powerful and the powerless experience a state of challenge versus a state of threat.

6 | CONCLUSION

The effort investment theory includes propositions about how power affects people's investment of effort. It addresses the broad and so far unanswered question of whether the powerful simply try harder when pursuing their goals, or, alternatively, whether they invest effort in a more adaptive and efficient way such that they invest the optimal amount of effort to attain a goal. The theory suggests that, for the most part, the powerful are more efficient, although there are some complexities in this effect. Specifically, the theory proposes that power affects how important and feasible individuals estimate goal attainment, with consequences for how much effort they invest into reaching that goal. When exposed to information that suggests insufficient goal progress, the powerful increase their effort because they believe that they can still attain the goal if they try hard enough while the powerless invest effort when they know that they are on a good track and disengage when they face obstacles. Generally, the powerful are more efficient than the powerless (as long as they do not over-estimate their ability). With greater confidence in themselves and greater efficiency, the powerful likely are more successful than the powerless and they may gain even more power. However, through increasing the sense of power of people in low-power positions (e.g., through the empowerment of employees), one may increase individual performance and break existing hierarchies.

CONFLICT OF INTEREST

There is no conflict of interest.

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