

**Implicit Motives in Childhood and Adolescence – Findings on
Developmental and Psychological Correlates**

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IMPLICIT MOTIVES IN CHILDHOOD AND ADOLESCENCE

Abstract

Abstract

The role of implicit motives for affective, cognitive and behavioral processes has been a focal part of psychological research for decades. Yet, the majority of research in this field has been concentrated on processes involving implicit motives in adulthood. The systematic investigation of developmental correlates of implicit motives remains largely uncharted. The studies cumulated in this thesis aim to add to the sparse research on implicit motives in childhood and adolescence. Specifically, the development of the implicit power motive in the transition of middle to late childhood as a function of parenting behavior (Chapter 4), the predictive value of the implicit achievement motive for objective swimming performance in children and adolescents (Chapter 5) and the role of motive congruence for successful goal realization in adolescent samples across two cultures (Chapter 6) were investigated. Results of Study 1 (Chapter 4) indicate a negative longitudinal association of authoritarian parenting with the implicit power motive in children that is moderated by children's perception of psychologically controlling parenting. Study 2 (Chapter 5) extends existing research on the assumed positive association of the implicit achievement motive and sports performance and demonstrates the moderating role of competitive anxiety on this association. Finally, Study 3 (Chapter 6) illustrates a moderating effect of implicit motives on the association of goal commitment and successful goal realization in German and Zambian adolescents, however, this effect was only observed in the domain of power motivation. Findings from all three studies are discussed in the context of the significance of implicit motives for psychological research.

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List of Abbreviations

ANOVA.....	<i>Analysis of variance</i>
APQ.....	<i>Alabama Parenting Questionnaire</i>
CAT.....	<i>Children's Apperception Test</i>
CSAI-2.....	<i>Competitive State Anxiety Inventory-2</i>
FINA.....	<i>Fédération Internationale de Natation</i>
GE-APQ.....	<i>German version of the Alabama Parenting Questionnaire</i>
ICC.....	<i>Intraclass correlations</i>
JARS.....	<i>Journal article reporting standards</i>
<i>n</i> Achievement.....	<i>Implicit achievement motive</i>
<i>n</i> Affiliation.....	<i>Implicit affiliation motive</i>
<i>n</i> Power.....	<i>Implicit power motive</i>
PSE.....	<i>Picture Story Exercise</i>
TAT.....	<i>Thematic Apperception Test</i>
WEIRD.....	<i>Western educated industrialized rich democratic</i>
ZKE.....	<i>Zurich brief questionnaire for the assessment of parental behavior</i>

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1. Introduction

“Trying to gain direct introspective access to an implicit motive would be like turning on a light in the attic in order to see what is in the basement,” wrote Thrash et al. (2010, p.323). Although this dissertation does not focus on the concept of introspection per se, this quote on implicit motives can also be applied to psychological research. Attempting to measure and comprehend implicit motives through direct respondent methods would be analogous to turning on a light in the attic in order to see what is in the basement. Consequently, psychological research on implicit motives utilizes operant measures that allow insights into a psychological construct that is not accessible through introspection. For decades, researchers have made use of individuals’ associations to ambiguous picture cues to infer individuals’ underlying implicit motives. Building on the Thematic Apperception Test (TAT, Morgan & Murray, 1935), the Picture Story Exercise (PSE, Pang, 2010; Schultheiss & Pang, 2007) was developed and has since been widely used in research on implicit motives. But why would one even want to rummage through the metaphorical basement if it involves a rather tedious process of measuring and analyzing? Is it not sufficient to focus on what the light in the attic can illuminate?

As is often the case in psychology, the response to this question varies depending on the researcher consulted. In the course of preparing the studies compiled in this dissertation, one reviewer with a particularly skeptical outlook was prompt in his rejection of one of the studies. The prevailing sentiment was one of distrust in the validity of the PSE, leading to the assertion that the investigation of implicit motives would be a futile endeavor. Admittedly, this statement took me aback, given the predominant focus of my research on implicit motives. Conversely, it has led to the recognition of the importance of further scrutinizing findings on implicit motives in order to shed light on their incremental validity. Decades ago, McClelland (1984) already observed that there is frequently a significant disparity between individuals’ self-reported values and their actual behavior. He advanced the notion that the values (or motives) that drive

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human behavior are often not consciously represented. Subsequent to this initial observation, a substantial body of empirical evidence has been documented that accentuates the notion that implicit and explicit motives elicit reactions to different stimuli and predict different classes of behavior (cf. McClelland et al., 1989; Schultheiss, 2021). Furlong and colleagues (2000) emphasized the importance of researching behavioral and affective correlates for the validation of a construct. Regarding implicit motives, this research on affective, behavioral, cognitive, and even developmental correlates has mostly been carried out on adult samples. In light of recent research (e.g., Raihala & Hansen, 2019; Raihala & Kranz, 2019; Spengler et al., 2020a, 2020b), the present dissertation aims to enhance the understanding of psychological processes involving implicit motives by focusing on their significance in childhood and adolescence.

The structure of this dissertation is the following: Firstly, the theoretical background including relevant empirical findings on implicit motives in both adulthood, adolescence, and childhood is outlined. Then, a brief overview of the three empirical studies compiled in this dissertation is given. Chapters 4 to 6 represent the three empirical studies. Lastly, a general discussion is provided that summarizes and discusses the findings of the three studies, including the discussion of limitations, implications and directions for future research on implicit motives in childhood and adolescence.

2. Theoretical Background

Implicit motives are the core concept upon which all three empirical studies compiled in this dissertation are based. Thus, in the following, the theoretical background including empirical findings relevant to the concept of implicit motives is outlined, beginning with a conceptualization of implicit motives. Moving on, their measurement as well as their development is charted. Then, correlates of implicit motives as well as motive congruence are presented. Lastly, the (proposed) universality of implicit motives is outlined.

2.1 Conceptualization of Implicit Motives

Implicit motives are defined as trait-like dispositions to experience certain classes of incentives as rewarding or disincentives as aversive, respectively (McClelland, 1985; Schultheiss & Köllner, 2014). With their affective character, they are posited as motivational needs that select, energize, and orient spontaneous behavior towards contexts that are anticipated to entail positive affective experiences or away from contexts that are anticipated to entail negative affective experiences (McClelland, 1985; Schultheiss & Köllner, 2014). For instance, people high in a given implicit motive tend to orient their spontaneous behavioral tendencies towards situations that entail opportunities to satisfy the respective motive. Furthermore, a congruence of incentive and motive (e.g., successfully influencing others and the implicit power motive) fosters learning of the respective behavior (Stoekart et al., 2017). Consequently, implicit motives predict behavioral trends over rather long periods of time and in rather unstructured situations (cf. McClelland et al., 1989).

Research on implicit motives conventionally distinguishes between three different implicit motives (e.g., McClelland, 1985; Murray, 1938). The implicit achievement motive (*n*Achievement) is defined by the recurring preference to compete with a standard of excellence, to improve one's skills, or, generally, to seek incentives positively related to one's performance (McClelland et al., 1953; Pang, 2010). Individuals high in *n*Achievement tend to derive feelings

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of gratification from autonomously mastering moderately challenging tasks (McClelland et al., 1953; McClelland, 1987). Secondly, the implicit affiliation-intimacy motive (*nAffiliation*) is defined by the recurring preference to (re-)establish and maintain interpersonal relationships (Heyns et al., 1958). Individuals high in *nAffiliation* tend to derive feelings of gratification from spending time with others and to experience their relationships as more relaxing and satisfying than individuals low in *nAffiliation* (Job et al., 2012; Weinberger et al., 2010). Lastly, the implicit power motive (*nPower*) is defined by the recurring preference to have an impact on others and/or experiencing the impact of others on oneself as aversive (McClelland, 1975; Winter, 1973). Individuals high in *nPower* tend to derive feelings of gratification from influencing or, at times, dominating others (Schultheiss et al., 2005; Winter, 1973). These so called “Big Three” motives are well established in research and have been focal to studying human motivation for decades (e.g. Denzinger et al., 2016; McClelland et al., 1989; Schultheiss & Köllner, 2021). In addition, the implicit autonomy motive (*nAutonomy*), that is, the recurrent preference to experience freedom of choice and freedom to be oneself, has gained interest in recent years (e.g., Baum & Baumann, 2018; 2021; Vansteenkiste et al., 2010). Individuals high in *nAutonomy* tend to derive feelings of gratification from situations and behavior that foster self-integration, self-esteem and self-growth (Alsleben & Kuhl, 2011).

Whilst this distinction concerns the content of motives, there is also a distinction that concerns their internal representation, that is, whether they are unconsciously or consciously represented (McClelland et al., 1989). In essence, each individual possesses both implicit and explicit representations of the three motives of achievement, affiliation and power. Hence, two distinct motive systems are postulated that typically show little to no overlap (cf. Köllner & Schultheiss, 2014; McClelland et al., 1989). They develop independently from each other and predict different outcomes (McClelland et al., 1989). Development of implicit motives begins in the preverbal stages of ontogenesis and is mostly fostered by affective learning experiences (see 2.3 for details on the development of implicit motives), while explicit motives develop

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later and are primarily transmitted through verbal nurturing strategies (McClelland et al., 1989). Implicit motives predict spontaneous behavior in unstructured situations and over longer periods of time, while explicit motives predict respondent behavior in rather structured situations (Koestner et al., 1991; McClelland et al., 1989). Explicit motives are conceived of as conscious goals or, more abstractly represented, values or guiding principles in life that are part of an individual's self-concept (McClelland, 1980; McClelland et al., 1989). Although self-report measures of motives usually do not correlate with operant measures of motives (Köllner & Schultheiss, 2014; McClelland et al., 1989), research on the congruence of respective implicit and explicit motives has repeatedly shown beneficial effects on constructs such as psychological well-being (e.g., Baumann et al., 2005), successful goal striving (e.g., Brunstein et al., 1998) and work performance (Lang et al., 2012), as further elaborated in section 2.4.4.

2.2 Measurement of Implicit Motives

As described in previous sections, implicit motives are not accessible to introspection and therefore, cannot be measured using self-report questionnaires (McClelland et al., 1989). Hence, research on implicit motives has relied on apperceptive measures to gain insights into individuals' implicit motives. First attempts of measuring implicit motives with the TAT as a fantasy-based measure date back almost a century now (Morgan & Murray, 1935). Since then, the method of inferring individuals' implicit motives from stories written in response to ambiguous picture cues has been further developed, with measures such as the PSE (Pang, 2010; Schultheiss & Pang, 2007) and the Operant Motive Test (OMT, Kuhl et al., 2003) now in widespread use. In detail, following standard recommendations for applying the PSE (Smith et al., 1992; Schultheiss & Pang, 2007), individuals are presented with optimally at least four (for the assessment of one implicit motive) or five to six (for the assessment of multiple implicit motives) picture cues and are instructed to imagine stories to them. Each picture cue is presented separately and for a fixed amount of time. For adults, this time frame is between 15 to 30 seconds. The picture cues ought to be ambiguous enough in order to stimulate individuals'

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imagination while at the same time entailing a strong enough pull for the respective implicit motive, that is, the potential to arouse the respective implicit motive (Schultheiss & Pang, 2007). Recently, Schönbrodt et al. (2020) published an extensive overview of statistics regarding traditional and newer picture cues as well as updated methodological considerations. After looking at the picture cue for the given amount of time, individuals are given five minutes to imagine and write down a story about the picture, guided by a standard set of questions (e.g., “What are the people thinking about and feeling?”, “What will happen next?”). After the time is up, they are instructed to continue to the next page, where the following picture cue is presented. Afterwards, the content of the stories is analyzed and coded for motive imagery by trained coders using standardized manuals (e.g., Winter, 1994).

Taken together, the PSE has been established as a reliable and valid method for assessing implicit motives in research, at least in adult samples. Empirical research on its usage in samples of children or adolescents, however, is sparse. Notably, most evidence comes from implementations of TAT-based method in the clinical context, for instance, the Children’s Apperception Test (CAT, Bellak & Adams, 1997; Bellak & Bellak, 1949). Due the CAT’s lack of coherent scoring criteria and normative data (Kroon et al., 1998), however, it has not been viable for use in research on implicit motives in children (for an exception, see Schroth, 1979). However, recently, the pioneering work of Raihala and colleagues (Raihala & Hansen, 2019; Raihala & Kranz, 2019) as well as Spengler and colleagues (Spengler et al., 2020a, 2020b) has led to advancements in the implementation of TAT-based measures of implicit motives in children using an adapted version of the PSE (for an extensive overview of developing a valid instrument for measuring implicit motives in children see Raihala, 2018). Following Pang’s suggestions (2010), picture cues were developed and implemented that resemble everyday life situations of children, for instance, children at school or children and a ball. Since there are significant differences in penmanship levels between primary school children, and to ensure an economical way of measuring implicit motives, the children are usually asked to recount the

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stories verbally instead of writing them down (see Schulte im Busch, 2021, for more information on the assessment of implicit motives in children and information on the stimulus pull of the adapted picture cues). These recent empirical findings provide a promising avenue for establishing the adapted version of the PSE as a valid method of assessing children's implicit motives.

2.3 Stability and Development of Implicit Motives

Concerning the stability of implicit motives, Denzinger and Brandstätter (2018) have provided a comprehensive overview of the relevant literature albeit mostly relying on cross-sectional data. They summarize available findings and conclude that, like personality traits, implicit motives remain relatively stable across the lifespan. Nevertheless, they emphasize the adaptability of implicit motives in reaction to life events and circumstances. This is in line with the notion of (dis-)incentive driven learning processes (Schultheiss & Köllner, 2014), whereby positive or negative reinforcement of certain behavior should eventually lead to a consolidation of affectively charged needs (see also McClelland, 1985). These learning processes initially take place in preverbal developmental stages; however, they persist throughout the lifespan (Schultheiss & Köllner, 2014).

Systematic longitudinal research on the development and stability of implicit motive is still sparse. An important step for inspiring research on the development of implicit motives could be made by establishing a valid method for assessing them in children (for overviews, see Raihala, 2018; Schulte im Busch, 2021). Hopefully, future research will make use of this method to add to the findings on processes related to the development and stability of implicit motives that are presented in the following.

2.3.1 The Role of Bio-Psychological Markers

Recent empirical evidence highlights the role of bio-psychological markers for the development of implicit motives (e.g., Schultheiss & Zimni, 2015). In a comprehensive overview, Schultheiss (2021) summarizes both long- and short-term effects of hormones on

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implicit motives. Long-term or organizational effects of hormones on implicit motives are based on early changes, both pre- and postnatally determined, in the nervous system and brain's morphology (e.g., McCarthy, 2010). For instance, regarding *nPower*, an association with the exposure of hormones during the first trimester of pregnancy could be identified (Schultheiss & Zimni, 2015). This hormonal exposure is manifested in the ratio between the pointer and index fingers (2D:4D digit ratio). When measured in young adults, this ratio has been found to correlate with elevated levels of *nPower* (see also Köllner et al., 2019). Similarly, recent evidence demonstrates a sex-dimorphic correlation of ulna-to-fibula ratio and an inhibited *nPower*, hinting at pubertal organizational hormone effects on the development of *nPower* (Köllner et al., 2022). Further research is required to identify (potential) effects of organizational hormones for the development of *nAchievement* and *nAffiliation*.

Due to practical considerations, studies on short-term effects of hormones on changes in implicit motives are more feasible and include findings on all three implicit motives. Notably, though, due to ethical reasons, levels of bio-psychological markers are typically not manipulated but rather measured in pre-post designs that cover relatively short time spans. Therefore, causal inferences ought to be drawn with caution. Nevertheless, findings point to an association of basal levels of the gonadal steroid hormones of progesterone in women and testosterone in men with *nPower* (e.g., Schultheiss et al., 2004; Stanton & Schultheiss, 2009). Additionally, for both men and women, testosterone has been linked to arousal in dominance challenges and power-arousing circumstances in general (e.g., Schultheiss et al., 2005; for an overview, see Schultheiss, 2013). Furthermore, progesterone has been associated with elevated levels of *nAffiliation* (e.g., Schultheiss et al., 2004). Regarding *nAchievement*, the identification of specific underlying bio-psychological markers seems less distinct. There are findings that illustrate an association of arginine-vasopressin release, a neuropeptide promoting learning and memory (Engelmann et al., 1996), with lowered cortisol levels in response to mastery cues (McClelland, 1995). Schultheiss and colleagues (2014) found an increased stress

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reaction (attenuated release of cortisol) of individuals high in *n*Achievement compared to individuals low in *n*Achievement to achievement-related stress situations.

2.3.2 The Role of Early-Life Learning Experiences

Concerning the role of early-life learning experiences for the development of implicit motives, research has mainly focused on (dis-)incentive fueled conditioning (cf. Schultheiss & Köllner, 2014). In essence, the positive affect that arises from need satisfaction, for example, successfully mastering a task, eventually becomes intrinsically rewarding and forms the basis of the respective implicit motive (cf. Pang, 2010).

Since early-life affective learning experiences are commonly made in interaction with primary caretakers, the pioneering work of McClelland and Pilon (1983) on the impact of parenting behavior must be noted. They identified certain parenting strategies when children were 5 years old that correlated with implicit motives 26 to 27 years later. They found a positive link of strict toilet training and scheduled feeding with adult levels of *n*Achievement. It was concluded that these early experiences of gratification upon successfully and ultimately autonomously mastering tasks were related to the development of *n*Achievement. The same reasoning was already applied in earlier studies on the development of *n*Achievement. Precisely, mothers' reinforcement of children's independence, mastery and behavioral control was associated with elevated levels of *n*Achievement (Moss & Kagan, 1961; Winterbottom, 1958). In the same notion, two studies identified links of boys' *n*Achievement with a family environment that enforces standards of excellence, affectively reacts to boys' performance (Rosen & D'Andrade, 1959) as well as a family environment that rewards or at least does not punish children's striving for independence and autonomy (Rosen, 1962). Furthermore, parents of children with high levels of *n*Achievement tend to provide their children with age-appropriate challenges, which might be a precursor of the preference for moderately challenging tasks that individuals high in *n*Achievement typically show (McClelland, 1961;

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Veroff, 1969). Generally, it can be noted that individuals high in *n*Achievement have learned to associate the investment of effort with the positive affect that comes with mastering a task, which eventually leads to a generalized expectation of mastery and subsequent positive affect upon encountering cues associated with task difficulty (cf. McClelland et al., 1953; Schultheiss & Brunstein, 2005).

Concerning *n*Affiliation, McClelland and Pilon (1983) identified mothers' unresponsiveness to children's crying as a predictor of high *n*Affiliation 26 to 27 years later. This is in line with traditional findings on the development of an anxious-avoidant attachment style (Ainsworth et al., 1978; 2015). Both individuals high in *n*Affiliation (but not high in *n*Intimacy, cf. Weinberger et al., 2010) and individuals with an anxious-avoidant attachment style are characterized by an underlying fear of rejection that might be rooted in their primary caretakers' unresponsiveness (Ainsworth et al., 1978; 2015; McClelland et al., 1989). However, systematic (longitudinal) research on the roots of *n*Affiliation and the connection to parenting style or parenting behavior is still an underresearched topic (Edelstein et al., 2010).

Regarding *n*Power, an association of mothers' permissiveness regarding sexual and aggressive behavior and adults' elevated levels *n*Power could be identified (McClelland & Pilon, 1983). Since children's aggressive behavior was not punished, children made the positive experience of successfully asserting their own interests, which might eventually lead to a manifestation of these classes of behavior.

2.3.3 Integration of Bio-Psychological Markers and Early-Life Learning Experiences

Concerning the integration of bio-psychological markers such as hormones and early-life learning experiences, for instance made in interaction with caretakers, Köllner and colleagues (2019) recently provided a framework in which they postulate the two mediating processes of *pruning* and *tuning*. In their reasoning, implicit motives stem from predispositions that are determined by bio-psychological markers, in essence, hormonal effects, that are in turn

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modulated by affective learning experiences. They illustrate their reasoning with an example of a child displaying aggressive behavior. This behavior is punished by caretakers, creating an aversive experience for a child with elevated levels of *n*Power, since the child's need for having an impact through aggressive behavior is thwarted. The link of aggressive behavior with the averseness of punishment will likely lead to a decrease in aggressive behavior in the future (pruning). In turn, the child might learn to take situation-specific predictive cues into account that call for more elaborated and contextualized strategies for satisfying their need to have an impact. If these strategies are successful, the power-motivated child will be rewarded with the positive affect of having an impact and is thereby conditioned to apply them in future social interactions (tuning). In essence, biological predispositions are posited to determine levels of implicit motives while affective learning experiences, that is, conditioning through rewards or punishments, are posited to determine the tuning or shaping of these implicit motives.

2.4 Correlates of Implicit Motives

Taking up the introductory metaphor, implicit motives cannot be accessed by turning on a light in the attic, which would be equivalent to using self-report questionnaires (see McClelland, 1984; McClelland et al., 1989). Since descending into the basement requires operant measures that are widely considered to be less economical than respondent measures (see 2.2 on the measurement of implicit motives), the question of the usefulness of measuring implicit motives for research purposes arises. In the following, affective and behavioral correlates of the three implicit motives are outlined that demonstrate the importance of assessing implicit motives for psychological research.

2.4.1 Correlates of *n*Achievement

One of the most researched correlates of *n*Achievement in both children and adults is the preference for moderately challenging tasks, that is, individuals high in *n*Achievement tend to choose tasks of medium difficulty over tasks of low or high difficulty (e.g., Heckhausen &

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Wagner; McClelland, 1958; Smith, 1969). Tasks of medium difficulty pose feasible challenges, while at the same time requiring a certain degree of effort mobilization, thus providing incentives for successful task mastery (cf. DeCharms & Carpenter, 1968). In general, individuals high in *n*Achievement tend to engage in tasks with more persistence and engagement, as they are more concerned with mastery than individuals low in *n*Achievement (Brunstein & Heckhausen, 2008; McClelland, 1985).

Furthermore, several studies highlight the role of *n*Achievement for performance in various contexts. Early findings on the association of *n*Achievement and performance demonstrate a positive link of *n*Achievement with performance in tasks such as solving anagrams or math exercises (e.g., Lowell, 1952; Wendt, 1955). Recent findings demonstrating a positive association of *n*Achievement and performance in team competitions underline the importance of *n*Achievement for tasks in sports contexts (e.g., Wegner & Teubel, 2014).

There are also intriguing findings on correlates of *n*Achievement on a societal rather than an individual level. Scoring manuals for coding motive imagery cannot only be applied to stories produced in reaction to picture cues presented in operant research methods, but to a wide array of written or transcribed text, for instance, political speeches (for an overview, see Winter, 2005). Following McClelland (1961), this has inspired researchers to take a look at children's books and analyze them with regards to their motivational content and, in turn, the relation of motivational content with markers on a societal level (e.g., Bataeva, 2018; DeCharms & Möller, 1962; Engeser et al., 2009; 2013). Most of this research focused on the domain of achievement. For instance, DeCharms and Möller illustrate a positive relationship of achievement imagery in children's books with patents issued in a given amount of time as a marker of economical innovation and growth, while Engeser and colleagues (2009; 2013) demonstrate a positive association of achievement imagery in German schoolbooks with academic performance in large-scale assessments.

2.4.2 Correlates of *nAffiliation*

Given the two components of *nAffiliation*, that is, affiliation and intimacy, the existing body of research on correlates of *nAffiliation* is rather heterogeneous (cf. McAdams, 1992; Weinberger et al., 2010).

Negative correlates are typically identified for the affiliation rather than the intimacy component of *nAffiliation* (cf. Schultheiss & Köllner, 2021; Weinberger et al., 2010). For instance, both adults and children with high levels of *nAffiliation* exhibited increased levels of aggression, envy and social cynicism as a reaction to social isolation (Hofer & Busch, 2011; Hofer et al., 2017). Similarly, women with high levels of *nAffiliation* exhibited psychological and physical abuse towards their partners in face of relationship threat (Mason & Blankenship, 1987).

Strikingly, though, children with high levels of *nAffiliation* showed a less pronounced physiological stress reaction to a social stressor than children with low levels of *nAffiliation*, which the authors reasoned might be a result of a disposition to perceive heightened levels of social support (Spengler et al., 2020b). This is in line with findings that individuals high in *nAffiliation* are more likely than those low in *nAffiliation* to seek social support (e.g., Dufner et al., 2015; Zygar et al., 2018). Moreover, *nAffiliation* could be identified as a predictor for correct intuitive judgements in a remote associates task (Quirin et al., 2013).

Notably, researchers also took interest in correlates of *nAffiliation* in contexts that might not typically be associated with affiliation, such as sports. For instance, in a field experiment with a sample of swimmers, Sorrentino and Sheppard (1978) found that when competing in a group setting, individuals high in *nAffiliation* performed better than in an individual setting. This adds to early research on the importance of *nAffiliation* for successfully mastering tasks that require cooperation (e.g., Atkinson & O'Connor, 1966). Tapping into the increased social attentiveness of individuals high in *nAffiliation*, recent findings illustrate a positive association of *nAffiliation* with effective management in work contexts (e.g., Steinmann et al., 2016).

Furthermore, highlighting the link of implicit motives with operant rather than respondent behavior, an association of *nAffiliation* with pleasant nonverbal behavior towards opponents in a competition could be identified (Wegner et al., 2014).

2.4.3 Correlates of nPower

Similarly to *nAffiliation*, *nPower* is associated with positive as well as negative outcomes, as it has both a rather dominant and a rather prosocial component (McClelland, 1970). On one hand, *nPower* is associated with elevated levels of uncooperative and aggressive behavior (e.g., Hofer, Busch, Bond, Campos, Li, & Law, 2010), on the other hand, it is associated with elevated levels of prosocial behavior (e.g., Baumann et al., 2015). Whether *nPower* is realized in the one way or the other seems to depend partly on moderating personality dispositions such as activity inhibition (cf. Langens, 2010; Schultheiss & Köllner, 2021) or the ability to self-regulate affect (e.g., Baumann et al., 2015).

In general, individuals high in *nPower* tend to be sensitive to nonverbal facial cues that signal surprise (Donhauser et al., 2015) or nonverbal cues that signal submissiveness in sports (Furley et al., 2019). Furthermore, individuals high in *nPower* are able to quickly direct their attention towards and effectively memorize these cues or signals, even if they are subliminally presented (e.g., Schultheiss & Hale, 2007; Wang et al., 2017). Overall, individuals high in *nPower* seem to be equipped with a high sensitivity for social cues which enables them to successfully detect opportunities for fulfilling their need to have an impact (cf. Schultheiss & Schiepe-Tiska, 2013). Furthermore, it has been demonstrated that individuals high in *nPower* are proficient in negotiating advantageous agreements for themselves (Raihala & Kranz, 2018; Schnackers & Kleinbeck, 1975). Hence, individuals high in *nPower* tend to be successful in reaching advanced positions in corporate hierarchies (McClelland & Boyatzis, 1982; McClelland & Burnham, 2003) and to be effective leaders once they reach those positions (Steinmann et al., 2015). Moreover, it was reported that women high in *nPower* experience high levels of job satisfaction in power-relevant careers (Jenkins, 1994).

When their need to have an impact is thwarted or merely anticipated to be thwarted, individuals high in *n*Power tend to experience elevated levels of stress, so-called *power stress* (McClelland, 1976). Empirical evidence on power stress includes an increase in frowning as a reaction to an assertive potential dating partner in men that are high in *n*Power (Fodor et al., 2012), elevated levels of negative affect and attitudes towards a dominant target person in women (Hofer & Busch, 2019), elevated levels of negative affect towards a dominant character in a video-game in children (Spengler et al., 2020a) and elevated levels of negative affect towards a non-compliant puppet in children (Raihala & Hansen, 2019).

2.5 Congruence of Implicit and Explicit Motive Systems

As outlined in section 2.1, the implicit and explicit motive systems are two distinct motive systems that typically show little to no overlap (cf. Köllner & Schultheiss, 2014; McClelland et al., 1989). For instance, an individual with high levels of *n*Power but low levels of the explicit power motive may show power-related spontaneous behavioral tendencies and experience situations that entail power incentives as intrinsically rewarding but may fail to actively set power goals for themselves that provide sufficient opportunities to satisfy their *n*Power. On the other hand, an individual with low levels of *n*Power but high levels of the explicit power motive may set power goals for themselves but lack the intrinsically rewarding experience that comes with pursuing and accomplishing them (cf. Brunstein et al., 1998).

The interplay of both motive systems has inspired an extensive body of research. For instance, Brunstein and colleagues (1998) demonstrated the importance of a congruence of implicit motives and explicit goals for subjective well-being. In detail, goal progress was only positively related to individuals' subjective well-being if the goal was undermined by the respective implicit motive. Schultheiss and colleagues (2008) replicated these findings and extended them by highlighting the facilitating role of corresponding implicit motives for goal progress as well as the protective role of implicit motives for goal rumination in the absence of a strong commitment to goals.

Moreover, regarding performance in the work domain, Lang and colleagues (2012) were able to show a positive effect of achievement motive congruence on task and contextual performance. Among a sample of managers, Kehr (2004) found a decrease in volitional strength as a function of motive incongruence. This decrease in volitional strength was also identified as a mediator in the negative association of motive incongruence and subjective well-being.

In the domain of interpersonal relationships, a congruence of the implicit and explicit affiliation motive in conjunction with a large amount of affiliation behavior was associated with high levels of life satisfaction and low levels of negative affectivity (Schüler et al., 2008). Furthermore, recent evidence from a longitudinal cross-cultural study demonstrates that the link of social life events with life satisfaction is qualified by individuals' underlying *nAffiliation*, that is, positively evaluated social life events only led to an increase in life satisfaction for those individuals high in *nAffiliation* (Hofer et al., 2022).

Since motive congruence appears to be linked to a vast variety of positive outcomes, researchers aimed to identify predictors of motive congruence or strategies to enhance motive congruence. For instance, regarding predictors of motive incongruence, Baumann and colleagues (2005) were able to illustrate the role of an affect regulation \times stress interaction. In detail, state- but not action-oriented individuals that experienced stress or threat showed decreased levels of motive congruence. In turn, they also showed decreased levels of subjective well-being. In a similar notion, Thrash and Elliott (2002) identified self-determination, that is, the ability to self-regulate in accordance with one's personal core needs and values (Deci & Ryan, 2002), as a moderator of the association of *nAchievement* with the explicit achievement motive. As specific aspects among self-determination, high levels of private body consciousness (Miller et al., 1981), that is, a sensitivity to bodily processes, high levels of self-monitoring (Snyder & Gangestad, 1986), that is, an adjustment of one's own behavior or attitudes in accordance with one's social environment and a high preference for consistency among cognitions (Cialdini et al., 1995) were identified as moderators enhancing congruence

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between the implicit and explicit achievement motive (cf. Thrash et al., 2007). Moreover, Schultheiss and Brunstein (1999) identified imagery of goal pursuit and successful goal realization as a strategy to enhance motive congruence by “building a bridge” between the two distinct motive modalities.

2.6 Universality of Implicit Motives

As outlined in the previous sections, implicit motives are an important part of an individual’s personality with various affective, behavioral and cognitive correlates not only across different domains of life, but also across the lifespan. Still, most research on implicit motives focuses on samples from Western cultures. This raises the concern of generalizability, since a transfer of findings from one population to the other requires systematic empirical testing in both populations to avoid misinterpretation (Henrich et al., 2010). Thus, researchers have set out to study similarities as well as differences in psychological processes between different cultural contexts (e.g., Van de Vijver, 2013). Since implicit motives are posited to be universal to human nature (cf. Hofer & Chasiotis, 2022), they have been predominantly studied from a cross-cultural rather than a cultural perspective, that is, with an underlying assumption of universalism (e.g., Lonner, 2011). Still, the cultural context might determine conditions for the manifestation of these processes, for instance of implicit motives, into behavior (cf. Van de Vijver et al., 2013). Furthermore, cross-cultural research on implicit motives has led to an advancement in understanding the universality of operant methods like the PSE and the OMT, while taking important methodological considerations into account (cf. Hofer & Chasiotis, 2022).

Nevertheless, more research is needed in order to gain a comprehensive understanding of both the universality and culture-specific aspects of implicit motives. For instance, the development of *n*Achievement has been shown to be linked to parenting strategies like reinforcement of independent task mastery across cultures (e.g., Rosen, 1962; Rosen & D’Andrade, 1959). However, the extent of these parenting strategies may differ between

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cultures, thereby leading to different levels of implicit motives across cultures. In a study on parenting behavior, for instance, Chasiotis and colleagues (2006) demonstrated cross-cultural universalities in the development of prosocial motivation. Although research on cultural differences regarding levels of implicit motives is still sparse, empirical findings point to systematic mean differences in *n*Achievement (Busch et al., 2013), *n*Affiliation (van Emmerik et al., 2010) and *n*Power (Hofer et al., 2008) across samples from different cultures. Yet, research on behavioral and affective correlates of implicit motives across cultures generally shows that processes are universal across cultural contexts (e.g., Hofer et al., 2008; Lehmann et al., 2021).

3. Overview of the Present Studies

Arranged in an order roughly following the course of the lifespan, the first study deals with the development of implicit motives in middle to late childhood, the second study addresses the role of implicit motives for objective performance in childhood and adolescence and lastly, the third study focuses on the facilitating effect of implicit motives on goal pursuit in adolescents. Consequently, the focus of this dissertation is twofold: it lies both on the development and on functions of implicit motives.

The primary objective of Study 1 was to examine the role of parenting behavior for the development of *nPower* in middle to late childhood. In essence, parents' report of authoritarian and positive parenting at children's age of 6/7 (t1) were hypothesized to predict levels of children's *nPower* roughly 3.5 years later (t2). Furthermore, children's perception of the respective parenting behavior was assumed to moderate this association. No effects of positive parenting, neither from parents' nor from children's point of view, could be identified. However, in conformity to our hypothesis, authoritarian parenting (parent report) at t1 was significantly negatively associated with children's *nPower* at t2. This negative association was qualified by children's perception of psychologically controlling parenting behavior: a significant negative association of authoritarian parenting and children's *nPower* could be identified only at high and medium, but not at low levels of perceived psychological control.

The focal point of Study 2 was to examine the association of *nAchievement* and objective swimming performance in a sample of children and adolescents with a mean age of roughly 13 years. Although no significant direct positive association of *nAchievement* and swimming performance could be identified, there was a significant moderation effect of competitive anxiety. In detail, there was a significant positive association of *nAchievement* and swimming performance only at low levels of cognitive and somatic competitive anxiety, respectively. At high levels of cognitive and somatic competitive anxiety, findings point to a negative

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association of *n*Achievement and performance, while there was no significant association of *n*Achievement and swimming performance at mean levels of cognitive or somatic competitive anxiety, respectively. Furthermore, the positive association of *n*Achievement and swimming performance was only significant at high levels of self-confidence, while there was a significant negative association of *n*Achievement and swimming performance at low levels of self-confidence and no significant association of *n*Achievement and performance at mean levels of self-confidence.

Finally, in Study 3, all three implicit motives as well as their corresponding explicit motives, that is, self-reported goal dimensions, were taken into consideration. In detail, in a longitudinal design, it was examined whether implicit motives strengthen the association of goal commitment and successful goal realization in German and Zambian adolescents. The assumed moderation was found for *n*Power, but not for *n*Achievement or *n*Affiliation. In detail, commitment to power goals only led to successful power goal realization if individuals exhibited high (vs. mean or low) levels of *n*Power. For the domains of achievement and affiliation, there was only a significant main effect of goal commitment on goal realization, but no significant moderation effect of the corresponding implicit motive. Nevertheless, the results contribute to the understanding of the interplay between implicit and explicit motives, as well as the cross-cultural universality of processes involving implicit motives.

As discussed in the introduction and theoretical background, implicit motives ought to be measured using operant methods. In the three studies at hand, the PSE (Schultheiss & Pang, 2007; Smith et al., 1992) was implemented to measure implicit motives. As the ages of the samples differed significantly, different picture cues adapted for the respective age range were used. In Study 1, children were 6/7 years old at t1 and around 10 years old at t2 while in Study 3, the sample consisted of adolescents that were up to 19 years old. Consequently, the PSE implemented in Study 1 consisted of six picture cues depicting situations resembling everyday

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life of children, for example, three school-aged children sitting at desks.¹ Since Study 2's sample involved older participants, a mixture of age-appropriate traditional PSE picture cues as well as new picture cues were used. As the focal implicit motive for Study 2 was *nAchievement*, picture cues were sampled not only with respect to age appropriateness but also with respect to their achievement pull (see Pang, 2010, for considerations on picture cue use and Schönbrodt et al., 2020, for a comprehensive overview of picture cues including their stimulus pulls). In Study 3, six picture cues were implemented in order to measure *nAchievement*, *nAffiliation* and *nPower*. Hence, two picture cues with respective motive pulls were used for each implicit motive. Since Study 3 examined adolescent samples of different cultural origin, selection of picture cues was also based on methodological considerations relating to cross-cultural research, for instance, potential item bias (cf. Van de Vijver & Leung, 1997; see also Hofer, 2005, for considerations on cross-cultural applicability of the PSE). Therefore, six picture cues were implemented that have already successfully been used in Western as well as sub-Saharan samples (e.g. Hofer & Busch, 2011; Hofer, Busch, Bond, Li, & Law, 2010).

In essence, the present dissertation aims to provide empirical answers to the following three questions concerning implicit motives in childhood and adolescence: How do they develop as a function of parenting behavior? How do they predict objective sports performance in conjunction with competitive anxiety? And (how) do they facilitate the successful realization of congruent goals?²

¹ All picture cues used in the three studies can be found in the appendix.

² In order to ensure consistency and enhance readability of this dissertation, the following minor changes were made to the published/submitted articles: consecutive numbering of footnotes, tables, and figures throughout the dissertation, correction of typographical errors in the published versions that were present despite thorough proofreading, and finally, alignment of nomenclature (e.g., T1 was changed to t1).

4. The Role of Parenting Style for the Development of the Implicit Power Motive in Children

Abstract. Findings show that both parents' reported parenting and children's perception of parenting play a role in predicting a vast number of developmental outcomes. Available research on the development of implicit motives in children, for example, shows a link to early parenting strategies. However, research on effects of parenting on the development of implicit motives is sparse. In the present study, we examined the role of authoritarian and positive parenting (parents' reports) for the development of the implicit power motive (*nPower*) in children, along with the moderating role of perceived parental psychological control and warmth/support (children's report). We hypothesized that authoritarian parenting shows a negative longitudinal association with *nPower* in children, particularly when children also perceive the parenting as psychologically controlling. In contrast, we assumed a positive longitudinal association of positive parenting with *nPower* in children, particularly when children also perceive the parenting as warm/supportive.

Data of 66 German children (25 girls) and parents were assessed at two measurement points. Children were 6/7 years old at t1. Analyses partially support our hypotheses. The higher parental reports of authoritarian parenting were, the lower was children's *nPower* 3.5 years later. This association was only significant among children perceiving high or medium levels (vs. low) of parental psychological control. We found neither significant effects of parents' nor children's reports of positive/warm parenting nor a significant interaction of the two. Findings are discussed with respect to existing models of the development and stability of implicit motives and the role of parenting for implicit motive development

Keywords: implicit power motive, parenting, childhood, picture story exercise

When it comes to what drives human behavior, implicit motives have been an important factor in research for a long time and are experiencing a revival in recent years (e.g., Schultheiss & Köllner, 2021). Among other characteristics, their affective character is important when examining their orienting and directing function on behavior across the lifespan (McClelland et al., 1989; Schultheiss & Köllner, 2014). Developmental antecedences of implicit motives, however, remain largely uncharted since McClelland and Pilon's pioneering study (1983), in which the role of certain child-rearing practices for implicit motive development were longitudinally studied. In the present study, we aim to contribute to a better understanding of the development of implicit motives by focusing on the motive domain of power. In detail, we investigated effects of parenting styles reported by parents and children on the strength of the implicit power motive in children over the course of approximately 3.5 years.

4.1 Theoretical background

Implicit Motives

Traditionally, most motivational research focusses on the so-called “Big Three” (e.g., McClelland, 1985): the achievement motive, that is, striving for a standard of excellence (McClelland et al., 1953), the affiliation-intimacy motive, that is, preoccupation with (re-)establishing and maintaining interpersonal relationships (Heyns et al., 1958), and the power motive, that is, desire for having an impact or influencing others (McClelland, 1975; Winter, 1973). Implicit motives are assumed to develop rather early in the preverbal stages of ontogenesis and are represented in an unconscious manner, thus, they are not accessible to self-reflection and self-report (e.g., McClelland et al., 1989). Implicit motives are closely linked to affects and, more precisely, can be understood as rather stable dispositions to experience certain classes of incentives as rewarding or disincentives as frustrating, respectively (Schultheiss & Köllner, 2014).

Parenting Style and Development of Implicit Motives

To this day, systematic and longitudinal research on the development of implicit motives is lacking, but there are hints at the role of certain parenting characteristics. The combination of certain parenting characteristics, as well as parenting behaviors or attitudes, can be subsumed under parenting styles (Durbin et al., 1993; Reichle & Franiek, 2009). An authoritarian parenting style, for instance, is characterized by restrictive adult-oriented control and lack of warmth and support, as well as rigorous punishments (e.g., Chang et al., 2003). A positive parenting style, on the other hand, is often described as a warm, supportive and child-centered parenting approach that ensures the child feels accepted and understood (e.g., Reichle & Franiek, 2009). It has to be noted, however, that the absence of an authoritarian parenting style cannot per se be equated with a positive parenting style (Reichle & Franiek, 2009). Likewise, positive parenting does not per se reflect an authoritative parenting style, as its conceptualization does not include the implementation of rules but focuses on the warmth component.

While it is argued that parenting styles remain largely stable across stages of children's development (e.g., Patterson, 1998), there are clear differences in parenting styles between parents (e.g., Durbin et al., 1993). Findings show that parenting styles are associated with numerous behavioral outcomes in children. For example, children's early experiences of psychological control relate to negative outcomes such as adult delinquent and antisocial behavior (for an overview of detrimental effects of parental psychological control on children, see for example Barber & Harmon, 2002).

Despite the postulate of the early shaping of implicit motives, research examining effects of childhood experiences on motive development is almost nonexistent. To our knowledge, there are only very few studies examining effects of early childhood experiences on strength of implicit motives and most of them focus on implicit achievement motivation. McClelland and Pilon (1983) found an association of certain parenting techniques with the

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implicit achievement and power motive in adult participants about 26 to 27 years later. Concerning the domain of power, the authors found the following link: Those participants with a high implicit power motive (*nPower*) in their adult life had parents that dealt leniently with children's aggressive and sexual behavior at the time of the initial interview. Even though the authors did not specify a particular parenting style, it seems plausible that those parents were not only tolerant concerning these specific behaviors, but overall displayed a parenting style lacking overly strict and authoritarian characteristics. Examples for characteristics of authoritarian parenting include particular assertive strategies, that is, rigid rules, frequent commands, high parental authority, overriding or disregarding children's needs and interests, and high control (e.g., Reichle & Franiek, 2009). Rosen and D'Andrade (1959) studied parenting practices as predictors of the implicit achievement motive. For example, they found that boys high in implicit achievement motivation had parents that were more likely to set up standards of excellence for them and tended to react affectively stronger to their sons' performance. In a similar notion, Rosen (1962) found that the relatively low levels of implicit achievement motivation in Brazilian boys could partly be attributed to a family environment that punishes (or at least does not reward) children's striving for independence and autonomy.

In recent years, there has been a growing interest in the stability of implicit motives across the lifespan (see Denzinger & Brandstätter, 2018). The authors report relatively inconsistent correlations of age and implicit motive scores across various cross-sectional studies with adults. Studies with more than one measurement usually look at retest reliabilities of implicit motive measurements but only span over a relatively short period of time. However, Denzinger and Brandstätter (2018) highlight the importance of many different learning experiences and environmental influences over the lifespan for the plasticity of implicit motives. Hence, it seems crucial to implement multiple measurement points over a longer period of time, that is, an individual's lifespan, to identify possible (longitudinal) influences on the strength of a given implicit motive. It is postulated that implicit motives have both a

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dispositional, trait-like character, that is, stability over time and across situations, and at the same time are prone to situation-specific cues (McClelland, 1985; Schultheiss & Köllner, 2014). This is in line with the notion that implicit motives develop through the repeated linkage of incentives or rewards, for instance, positive affect, and certain behaviors or situational cues, for instance, exerting influence (McClelland & Pilon, 1983; Schultheiss & Köllner, 2014; see also Denzinger & Brandstätter, 2018, for an overview). On the other hand, the repeated punishment of behavior, especially in a non-responsive and non-child-oriented way, should lead to frustration and eventually to a decrease in behavior. In line with the notion of (dis-)incentive fueled conditioning, we hypothesize that parenting style plays an important role when it comes to the development of *nPower* in children. Arguably, a parenting style minimizing children's autonomy and independence might generally inhibit the development of implicit motives irrespective of motive domain; however, authoritarian parenting might be of particular importance when it comes to *nPower*, since it is the only motive characterized by the need to have an impact on other people's emotions and behavior. The repeated frustration of the child's need for impact is a focal factor in both authoritarian or controlling parenting and *nPower*: children repeatedly experience that any attempts at influencing (both consciously and unconsciously) their parents fail, as parents do not tolerate any negotiations. Thus, situational cues for successfully realizing *nPower* are lacking. Over time, any attempts to have an impact or to be included in discussions or decisions may become associated with negative affect or the absence of positive affect. Given the (persisting) lack of situational cues for successfully realizing *nPower*, a low motive disposition emerges, as the child should eventually orient their behavior away from these attempts.

On the other hand, positive parenting typically lacks strict enforcement of rules and is characterized by a responsive way of dealing with children's basic needs (Reichle & Franiek, 2009; even with sexual and aggressive behavior, see McClelland & Pilon, 1983). Hence, children's needs will be satisfied, leading to the experience of positive affect and over time,

possibly to a consolidation of the association of incentive (i.e., power-themed behavior) and reward (i.e., positive affect). Children of parents characterized by low authoritarian or controlling parental strategies should experience many situational cues for realizing *nPower* as rules are negotiable and influence on parents is feasible. Hence, power-related needs (i.e., exerting influence, having an impact) can be met when children grow up in an environment characterized by positive parenting. Consequently, power-related behavior is repeatedly associated with positive affect/rewards, that is, reinforcing the orientation towards power-related behavior as an important aspect of *nPower* (McClelland, 1985). Drawing from research regarding operant conditioning, a reinforcement of certain behaviors by repeated (affective) rewards should lead to a consolidation of behavior and, in the case of implicit motives, a consolidation of affectively charged needs (McClelland, 1985; Schultheiss & Köllner, 2014).

Parenting Styles: Parent- vs. Child-Report

For many years, research has focused on parents' reports of their parenting or relied on observation of parental behavior. When examining effects of parenting, however, it seems obvious that the recipients' perception also matters. The perception of parenting as well as its interpretation often differs between parents and children or adolescents. Typically, only a modest correlation between both measurements is observed (e.g., Dimler et al., 2017; Taber, 2010). More specifically, parents tend to report less negative and more positive parenting behavior than their children (Guastafarro et al., 2021).

Moreover, findings indicate that recipients' and parents' perception of parenting uniquely contribute to explain differences in adolescents' problem behavior (e.g., Mackenbach et al., 2014). Dimler and colleagues (2017) report that not only different perceptions of parenting style, but also the direction of discrepancy matters, that is, the effects on adolescent behavior were particularly pronounced if adolescents rated their parents' behavior as less warm and more negative than parents did.

The Present Research

Building on aforementioned findings on the development of implicit motives, we expect a link between authoritarian parenting and *nPower* in children. Precisely, we assume that a strict parenting style overruling children's needs for autonomy and independence (reported by parents) at the first measurement point when children were aged between 6 and 7 years is associated with a less pronounced *nPower* in children approximately 3.5 years later. In other words, a higher *nPower* in children is supposed to be associated with a parenting style characterized by low (psychological) control and an overall rather flat family hierarchy.

Furthermore, we expect that the effect of authoritarian parenting on children's *nPower* is moderated by children's perception of parenting. Specifically, we hypothesize a significant association of authoritarian parenting with *nPower* in children only if children also perceive their parents to exert high psychological control on them. Psychological control is assumed to have a significant conceptual overlap with authoritarian parenting, as both are characterized by strict rule enforcement, high parental authority, and a lack of responsiveness to children's needs (Reichle & Franiek, 2009; Reitzle et al., 2001).

Regarding positive parenting, we assume a positive association with children's *nPower* approximately 3.5 years later. Precisely, a parenting characterized by a positive and responsive style should foster the development of *nPower*. Again, we expect this association to be moderated by perceived warm/supportive parenting reported by the children. Specifically, we assume a significant association of positive parenting with children's *nPower* only if children also perceive their parents to be responsive and supportive (to their needs).

4.2 Method

Procedure

Our sample was drawn from a pool of participants that had previously taken part in a longitudinal project focusing on implicit motives in childhood and their developmental correlates (see Spengler et al., 2020a, 2020b, also for details on sample recruitment). After

completion of the project, 120 parent-child dyads agreed to be contacted for future studies. Among those, 66 agreed to take part in the present study (t2). The first measurement point of the present study (t1, i.e., first measurement point of the original project) took place in late 2016 to early 2017; the second measurement point (t2 of the present study) took place approximately 3 years and 8 months later in fall 2020. The rather large drop-out was mostly due to the ongoing Covid-19 pandemic: a lot of parents expressed their concern about coming to the lab as they wanted to keep the number of social contacts as low as possible. Other families were not available due to changes in everyday life (e.g., moving to another region) that did not allow them to accept the invitation.

The conduction of the study was approved by the ethics committee of Trier University. Before each of the data assessments, parents signed an informed consent form. Furthermore, children gave their verbal consent after being informed about the procedure. Participants voluntarily took part in the study and were guaranteed that any information given would be treated confidentially. At the end of t2, parents were asked to indicate their willingness to participate in future data assessments. Participants received monetary compensation (approximately 11 \$ for each measurement point) as well as a small gift.

Sample

In total, 66 German children (25 females) and their respective parent provided sufficient data at both measurement points and thus were included in the study sample. At both measurement points, children were mostly accompanied by their mothers ($n_{t1} = 60$; $n_{t2} = 57$).

At the first measurement point, children were between 6 and 7 years of age ($M = 6.74$; $SD = 0.42$). At the second measurement children were aged between 9 and 11 years ($M = 9.95$; $SD = 0.48$). At both measurement points, girls were significantly older than boys. On average, at t1 girls were 0.23 years [$F(1, 64) = 5.174$, $p = .026$] and at t2 0.27 years [$F(1, 64) = 5.123$, $p = .027$] older than boys. At the first measurement point, all participants attended primary schools; at the second measurement point, 10 children still attended primary schools (Grade 4),

while 56 children attended the first grade of secondary school (Grade 5). A post-hoc power analysis using G*Power version 3.1.9.7 yielded a power of $1 - \beta = .849$. To obtain a power of $1 - \beta = .900$, with an expected $f^2 = .256$ (for similar effect sizes reported in research on implicit motives in childhood, see, e.g., Schattke et al., 2011; Spengler et al., 2020a, 2020b; Raihala & Hansen, 2019), 75 participants would have been needed.

Measurements

Trained research assistants supervised all assessment sessions. At both measurement points, the strength of the *nPower* in children was assessed at first. Next, children provided data on psychological constructs not relevant to the present study (e.g., indices of subjective well-being). Only at t2, children provided data on how they perceive their parents' parenting style.

At both measurement points, the accompanying parent provided data on parenting style and other constructs not relevant to the study at hand (e.g., critical life events). The parents took the questionnaire simultaneously but spatially separated from their children. Assessment of data took approximately one hour for the children and 30 minutes for their parent at both measurement points.

Implicit power motive

The strength of children's *nPower* was assessed by a Picture Story Exercise (PSE; Schultheiss & Pang, 2007; Smith et al., 1992). However, an adapted version for children was implemented, using picture cues depicting situations closer to the children's everyday life (e.g., two children playing with an empty cardboard box; three children with a soccer ball; for details see Spengler et al., 2020a). This picture set has been previously used in studies as a valid and reliable measure to assess the implicit power and affiliation motive in children. Spengler and colleagues (2020a), for example, found both a satisfactory stimulus pull for the aforementioned implicit motives as well as a predictive validity comparable to adult PSE measures (i.e., power stress). At t1 and t2, respectively, children were asked to verbally produce stories instead of

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writing them down. This procedure was chosen to rule out effects of children's penmanship and to keep procedures consistent across measurement points.

The recommended standard instruction for PSE (Smith et al., 1992) was implemented in a slightly adapted form: Children were told that they would see six pictures. They were asked to imagine a story for each of the pictures and were reminded that there were no right or wrong stories. At the second measurement point, they were also told that they might remember a story they had told before and that they could either retell the same story or produce a different one. In contrast to the standard assessment procedure of implicit motives among adults, children were shown the respective picture card for the duration of their story telling. This practice was chosen to support fluency of children's story telling due to children's young age. Only if children hesitated or stopped during their story telling, they were asked supplementary questions similar to the ones used in standard PSE instructions (e.g., "what has led up to this situation?", "what are the people thinking about?", "how do they feel?"). Most (n_{t1} : 66; n_{t2} : 49) children received at least one supplementary question to support proper story-telling. Number of supplementary questions was not correlated with children's *nPower* scores at $t1$ ($r = -.10$, $p = .420$) or $t2$ ($r = .020$, $p = .876$), respectively. Children had 3 minutes to tell their story for each of the picture cards. Since story-production was verbal, this timeframe seemed appropriate and has proven to be sufficient in previous research with children and to approximate story length produced by adults (see, e.g., Spengler et al., 2020a, 2020b). If children finished their story before the time was up, the next picture card was shown. If children had not finished their story after 3 minutes, they were gently instructed ("And how does the story end?") to wrap up their story. Pictures were presented in the same order for all children at both measurement points to keep possible interferences between picture cues constant (see e.g., Veroff et al., 1960). For instance, expressing a given motive in one story can temporarily reduce the likelihood of its expression in a subsequent story (Atkinson, 1981; see also Schultheiss & Schultheiss, 2014).

The children's PSE stories were coded by two student assistants at t1 and two different student assistants at t2 using Winter's (1994) manual. Both coding dyads were blind to the study's aims and well-trained in coding adult and children PSE stories and reached at least 85% agreement with training material coded by experts (Winter, 1994). Additionally, all six stories of ten participants were double-coded at each measurement point to calculate inter-rater reliability. Two-way random, absolute-agreement, single measure intraclass correlation coefficients (ICCs, see Shrout & Fleiss, 1979) for *nPower* were calculated. At both measurement points, good ICC scores (t1: .81; t2: .82) were obtained (Koo & Li, 2016). Thus, the remaining stories were coded individually. Coding disagreements were discussed and resolved in regular team meetings.

The story length aggregated for all six stories ranged from 85 to 1686 words ($M = 606.13$; $SD = 404.12$) at t1 and from 197 to 1800 words ($M = 606.55$; $SD = 287.12$) at t2. Since research on implicit motives in childhood is limited and, at least to our knowledge, there are no conventions regarding minimum protocol length for their age group, we did not exclude any children that did not produce a certain amount of words (e.g., an average of 30 words per story).³ The total number of power motive imageries across all six stories ranged from 0 to 28 ($M = 6.06$; $SD = 5.24$) at t1 and from 0 to 18 ($M = 3.62$; $SD = 3.02$) at t2. The number of motive imageries was significantly correlated with word count at both measurement points (t1: $r = .501$, $p = .002$; t2: $r = .395$, $p < .001$). Therefore, to control for confounding effects of story length on motive scores, we used regression analysis to calculate residualized motive scores.

Parenting Style Reported by Children

Children reported on perceived parenting styles by responding to a selection of items taken from the short version of the Zurich Brief Questionnaire for the Assessment of Parental Behavior (ZKE; Reitzle et al., 2001). The ZKE consists of 27 items which are assigned to three

³ Yet, 85 words at t1 appeared to be rather moderate. Thus, we performed the main analyses with and without the respective child. There was no indication of any differences in the pattern of results. Hence, we report results including all 66 participants.

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scales, that is warmth/support (e.g., “teaches me things I want to learn”), rules (e.g., “always wants to be asked before I go out”), and psychological control (e.g., “thinks I am ungrateful when I do not obey her/him”). For the study at hand, only the scales warmth/support and psychological control are relevant. The subscale “rules” was excluded as it does not fit into either category of positive (i.e., responsive) or negative (i.e., authoritarian) parenting. Due to time constraints, we did not administer all items of the ZKE to measure warmth/support and psychological control but selected a subset of items that are most characteristic for a given scale (items with highest discriminatory power and factor loadings on the respective scale; Reitzle et al., 2001). Thus, seven items were selected for warmth/support (Cronbach’s $\alpha = .819$) and three items for psychological control (Cronbach’s $\alpha = .508$). The mean of the respective items was used as an index for warmth/support and psychological control, respectively. Items were rated on a 4-point Likert scale ranging from 1 (*not true*) to 4 (*absolutely true*). When working on the questionnaire, children were asked to think of the parent accompanying them at t2. To ensure children understood the questions properly, a student assistant read all questions aloud and then asked the child to mark their answer with a cross on the questionnaire by their own. Children did not report difficulties understanding any of the items.

Parenting Style Reported by Parents

At both measurement points, parents indicated their parenting style using the German extended version (GE-APQ; Reichle & Franiek, 2009) of the Alabama Parenting Questionnaire (APQ; Frick, 1991). The GE-APQ consists of 40 items measuring the following parenting dimensions: authoritarian parenting (six items; e.g., “when your child wants you to make an exception, you insist on your rules to make it clear who is in charge in your family.”), positive parenting (six items; e.g., “you praise your child for behaving well.”), responsible parenting (e.g., “you discuss activities with your child that he/she could do in his/her free time.”), inconsistent parenting (e.g., “how strict the punishment for your child will be depends on your current mood.”), involvement (e.g. “you help your child with homework.”), corporal

punishment (e.g., “you give your child a smack when he/she did something wrong.”), and poor monitoring/supervision (e.g., “your child is out and you do not know exactly where he/she is.”). Parents indicated on a scale from 0 (*never*) to 4 (*always*) how often parenting techniques described by each item occur in their family, that is, how often they or their partner use these techniques. For the present study, only the scales authoritarian parenting and positive parenting are relevant and yielded good reliabilities (t1: Cronbach’s $\alpha = .793$ and $\alpha = .721$, t2: Cronbach’s $\alpha = .806$ and $\alpha = .743$, respectively).

As outlined above, children’s perception of parents’ parenting was assessed via a subset of items of the ZKE due to time constraints. Thus, different measurements were used to assess parenting among parents and children, respectively. However, authoritarian and psychologically controlling parenting are both characterized by high parental control, low responsivity and strict rule enforcement. Hence, a significant conceptual overlap between both parenting dimensions can be concluded (see for example Reichle & Franiek, 2009; Reitzle et al., 2001). Likewise, positive parenting (GE-APQ; Reichle & Franiek, 2009) and warmth/support (ZKE; Reitzle et al., 2001) are both characterized by child-centered and responsive features.

Transparency and Openness

We report on how we determined our sample size, all data exclusions, and all measures in the present study, and we follow JARS (Kazak, 2018). All data, analysis code and research materials are publicly available at the Open Science Framework and can be accessed at https://osf.io/muxtq/?view_only=8478b5cf50384e51a45da53ec0ac780e. Due to copyright infringement, children’s PSE pictures cannot be made publicly available but can be obtained upon reasonable request from the first author. All analyses were executed using IBM SPSS Statistics version 28.0.1.0. The PROCESS macro version 4.0 (Hayes, 2018) was used to test the moderation hypothesis. The study’s design and its analyses were not pre-registered.

4.3 Results

First, we will outline results of preliminary analyses. Next, general descriptive statistics and correlations of the relevant variables as well as correlations with possible covariates will be presented. In the following section, main inferential analyses will be presented examining the hypothesized moderating effects of a) perceived psychological control (parenting style reported by children) on the relationship of authoritarian parenting (parent report, t1) and children's *nPower* (t2) and b) perceived warm/supportive parenting (children report) on the relationship of positive parenting (parent report, t1) and children's *nPower* (t2).

Preliminary Analyses

To test the possibility of a systematic dropout, we ran ANOVAS to compare participants at t1 who also took part in t2 and those who did not. Analyses indicate no significant mean differences in positive [$F(1, 118) = 1.577; p = .212; \eta^2 = .013$] or authoritarian [$F(1, 118) = 2.613; p = .109; \eta^2 = .022$] parenting style or *nPower* [$F(1, 118) = 0.202; p = .654; \eta^2 = .002$], respectively. However, the relation of boys to girls was slightly lower in the drop-out sample [$F(1, 118) = 5.608; p = .020; \eta^2 = .045$; boys : girls drop outs = 32 : 22; boys : girls at t2 = 41 : 25].

To investigate associations between hypotheses-relevant constructs and to identify possible covariates of our main analyses, we ran two-tailed t-tests for dependent samples and found a significant mean difference of 0.128 [$T(65) = -2.094; p = .040; d = 0.498$] between authoritarian parenting at t1 ($M = 2.255; SD = 0.612$) and t2 ($M = 2.127; SD = 0.681$). Likewise, we found a significant mean difference of 0.084 [$T(65) = 2.047, p = .045; d = 0.332$] between positive parenting at t1 ($M = 3.644; SD = 0.393$) and t2 ($M = 3.561; SD = 0.403$).

To investigate whether combining reports of mother's and father's parenting style for our main moderation analyses was legitimate, we ran respective one way ANOVAs. We did not find significant differences between fathers ($M = 2.167; SD = 0.691$) and mothers ($M = 2.264; SD = 0.609$) concerning the level of authoritarian parenting at t1 [$F(1,64) = 0.138; p =$

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.712; $\eta^2 = .002$]. Likewise, we did not find differences between fathers ($M = 2.037$; $SD = 0.551$) and mothers ($M = 2.142$; $SD = 0.703$) at t2 [$F(1,64) = 0.181$; $p = .672$; $\eta^2 = .003$] nor differences in perceived psychological control reported by the children for fathers ($M = 1.444$; $SD = 0.289$) and mothers [$M = 1.468$; $SD = 0.440$; $F(1,64) = 0.024$; $p = .878$; $\eta^2 = .000$]. Likewise, there were neither significant differences between fathers ($M = 3.556$; $SD = 0.486$) and mothers ($M = 3.561$, $SD = 0.393$) concerning the level of positive parenting at t2 [$F(1, 64) = 0.002$; $p = .968$; $\eta^2 = .000$] nor differences in perceived warmth/support reported by the children for fathers ($M = 3.571$; $SD = 0.371$) and mothers [$M = 3.694$; $SD = 0.401$; $F(1, 64) = 0.743$; $p = .392$; $\eta^2 = .011$]. There were, however, significant mean differences between mothers ($M = 3.684$; $SD = 0.362$) and fathers ($M = 3.250$; $SD = 0.514$) at t1 [$F(1, 64) = 7.264$; $p = .009$; $\eta^2 = .102$] regarding positive parenting. However, given that only very few fathers accompanied their child at t1, parents' relation to the child was not included as a covariate in either of the main analyses.

To investigate whether children's gender plays a role in the parenting style reported by parents or children and would therefore classify as a covariate in the moderation analyses, we ran respective one way ANOVAs. At t1, we did not find a significant difference between boys ($M = 2.283$; $SD = 0.618$) and girls ($M = 2.212$; $SD = 0.610$) regarding parent report of authoritarian parenting [$F(1, 64) = 0.214$; $p = .645$; $\eta^2 = .003$]. Likewise, there were no significant differences between boys ($M = 2.221$; $SD = 0.645$) and girls ($M = 1.973$; $SD = 0.716$) regarding parent report of authoritarian parenting at t2 [$F(1, 64) = 2.089$; $p = .153$; $\eta^2 = .032$]. However, there was a significant effect of children's gender on perceived psychological control [$F(1,64) = 13.686$; $p < .001$; $\eta^2 = .176$]: Boys ($M = 1.602$; $SD = 0.456$) reported significantly more psychological control than girls ($M = 1.240$; $SD = 0.226$). Hence, children's gender was included as a covariate in the first moderation analysis. Regarding parents' reports of positive parenting, we did not find significant differences between boys ($M = 3.628$; $SD = 0.410$) and girls ($M = 3.671$; $SD = 0.371$) at t1 [$F(1,64) = 0.180$; $p = .673$; $\eta^2 = .003$] or t2 [$F(1,64) = 0.040$ $p = .843$; $\eta^2 = .001$; boys: $M = 3.553$, $SD = 0.412$; girls: $M = 3.573$; $SD = 0.394$]. Moreover, we

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did not find significant differences between boys ($M = 3.645$; $SD = 0.463$) and girls ($M = 3.731$; $SD = 0.252$) regarding perceived warmth/support [$F(1,64) = 0.742$; $p = .392$; $\eta^2 = .011$].

Correlations

In Table 1, descriptive statistics as well as correlations among variables and with sociodemographic variables are shown. Surprisingly, the correlation between indices of *nPower* at t1 and t2 are close to zero. Furthermore, analyses do not indicate a significant association between parents' and children's reports of (perceived) parenting at both measurement times. However, parental reports of both authoritarian and positive parenting at t1 were highly correlated with corresponding parenting scores at t2 (see preliminary analyses for details).

Main Analyses

We hypothesized a negative association of authoritarian parenting (t1, parent report) and children's *nPower* (t2). This association is furthermore hypothesized to be moderated by children's perception of parental psychological control.

For both moderation analyses, the template for simple moderation analyses (model 1) was used with parenting (parent report) at t1 as the predictor, children's *nPower* at t2 as the dependent variable and children's perceived parenting at t2 as the moderator. All variables were transformed into standardized *Z*-scores. The number of bootstrap samples was set to 10000. Results are presented in Table 2.

The first moderation model explains a significant amount of variance in children's *nPower* (t2). The main effect of authoritarian parenting at t1 reported by the parents on children's *nPower* at t2 was significant ($B = -0.278$; $p = .018$). There is no significant association of children's reports of psychological control at t2 and their *nPower* at t2 ($B = 0.189$; $p = 0.105$). However, the interaction term of authoritarian parenting (t1) and perceived psychological control (t2) reached statistical significance [$F_{\text{change}}(1, 62) = 6.878$; $R^2_{\text{change}} = .090$; $p = .011$].

Table 1

Descriptive Statistics and Correlations among Measures

	1	2	3	4	5	6	7	8	9	10	M (SD)
1 nPower (t1)	---										0 (4.61)
2 nPower (t2)	.023	---									0 (2.78)
3 Psychological Control (t2)	-.096	.150	---								1.46 (.42)
4 Authoritarian Parenting (t1)	-.030	-.267*	.090	---							2.26 (.61)
5 Authoritarian Parenting (t2)	.071	-.281*	.142	.709***	---						2.13 (.68)
6 Warmth/Support (t2)	-.184	-.042	-.383*	.205	-.009	---					
7 Positive Parenting (t1)	.116	-.046	.057	.269*	.091	.205	---				
8 Positive Parenting (t2)	.217	-.025	-.068	.312*	.202	.117	.653*	---			
9 Age (t2)	.212	-.165	-.148	.018	-.013	.061	-.053	-.065	---		9.95 (.48)
10 Gender ^a	.03	-.05	-.420***	-.058	-.178	.107	.053	.025	.272*	---	---

Note. N = 66. Variables 4, 5, 7 and 8 are parents' reports; all other variables are children's reports.

^a gender coding: 1 = boy. 2 = girl

Table 2

Effects of Parenting (Parents' and Children's Report) on Children's nPower

outcome	<i>B (S.E.)</i>	<i>t-value (p)</i>	<i>F-value (p)</i>	<i>R²</i>	<i>BF₁₀</i>
nPower (t2)			4.901 (.004)	0.192	8.948
			df = 3, 62		
Authoritarian Parenting (t1)	-0.278 (.115)	-2.423 (.018)			1.968
Psychological Control (t2)	0.189 (.115)	1.644 (.105)			0.470
Auth. Parenting × Psych. Control	-0.350 (.134)	-2.622 (.011)			3.303
			0.436 (.728)	0.021	0.067
			df = 3, 62		
Positive Parenting (t1)	0.014 (.138)	0.103 (.918)			0.267
Warmth/Support (t2)	-0.037 (.128)	-0.289 (.774)			0.264
Positive Parenting × Warmth/Support	0.144 (.137)	1.052 (.297)			0.430

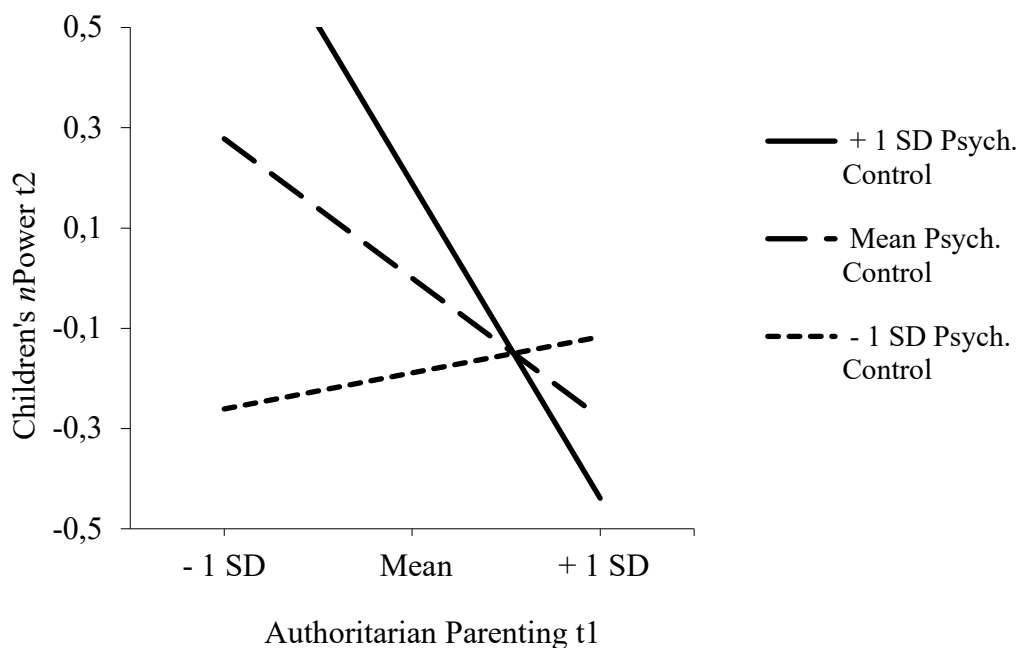
Note. *N* = 66

Conditional effects at three values of the moderator, that is, at the mean, at one below and at one standard deviation above the mean, were calculated. A significant association of authoritarian parenting (parent report, t1) and children's nPower at t2 could be identified at

high levels of the moderator ($B = -0.628$; $SE = 0.175$; $t = -3.600$; $p = .001$; 95% CI $[-0.977, -0.279]$) and at medium levels of the moderator ($B = -0.278$; $SE = 0.115$; $t = -2.423$; $p = .018$, 95% CI $[-0.507, -0.049]$). In contrast, at low levels of perceived psychological control, no statistically significant effects could be identified ($B = 0.073$; $SE = 0.178$; $t = 0.409$; $p = .684$, 95% CI $[-0.282, 0.428]$). The moderation effect is visualized in Figure 1, that is, only at high and medium levels of perceived psychological control, there is a significant negative association of authoritarian parenting (parent report, t1) and children's nPower at t2.

Figure 1

Interaction of Authoritarian Parenting (Parent Report) and Perceived Psychological Control (Children's Report) on Children's nPower



For our second model, we hypothesized a positive association of positive parenting (parent report, t1) and children's nPower at t2. This association is furthermore hypothesized to be moderated by children's perception of parental warmth/support. The second moderation model does not explain a significant amount of variance in children's nPower (t2). Neither the

main effect of positive parenting at t1 reported by the parents nor the main effect of perceived warmth/support reported by the children at t2 reached statistical significance. Furthermore, the interaction term of positive parenting (t1) and warmth/support (t2) did not reach statistical significance ($F_{\text{change}} = 1.165$; $R^2_{\text{change}} = .019$; $p = .285$).

To control for potentially confounding effects and to further scrutinize our findings, we reran our moderation analyses including parents' parenting reports at t2, children's t1 *nPower* scores and children's gender (only in the model including psychological control). There were no significant differences in the patterns of results. Thus, we report results without covariates to adhere to the principle of parsimony.⁴

4.4 Discussion

In the present study, we investigated longitudinal effects of parenting on the development of *nPower* in children. Specifically, we were interested in the role of authoritarian parenting, which seems to be the most tangent to *nPower*. Moreover, we investigated the role of positive parenting on development of *nPower*. Furthermore, we assumed that children's reports on the respective perceived parenting style (i.e., psychological control and warmth/support) moderates the link between parenting style (parental report) and *nPower* approximately 3.5 years.

Results partially support our hypotheses. Our first hypothesis, that is, a negative association of authoritarian parenting at the first measurement point with children's *nPower* approximately 3.5 years later is supported by our data. In detail, higher levels of parents' authoritarian parenting were associated with lower levels of children's *nPower*. Moreover, as hypothesized, children's perceptions of perceived psychological control moderated this association. Only for children that perceived a high controlling parenting style, a significant

⁴ Details on regression analyses including covariates can be accessed here: https://osf.io/muxtq/?view_only=8478b5cf50384e51a45da53ec0ac780e

negative association of authoritarian parenting and *nPower* was present. In contrast, we did not find a significant association of authoritarian parenting and *nPower* when children perceived medium or low levels of psychological control. Regarding positive parenting, results do not support our hypotheses, that is, there is neither a positive association of positive parenting at the first measurement point and children's *nPower* approximately 3.5 years later nor a significant moderation effect of children's report of warm/ supportive parenting on this link.

Generally, our findings are in line with McClelland and Pilon's pioneering study (1983). Even though parenting style was operationalized in a different way, in both studies, child-rearing characterized by lower control was longitudinally associated with a higher *nPower* in children. In contrast to McClelland and Pilon (1983), we did not solely focus on parental control concerning sexual and aggressive behavior, but relied on a broader measure of authoritarian parenting, that is, parents' strictness and control over their children in a general sense. Furthermore, we examined a positive parenting style as an influence on the development of *nPower* that is characterized by need-responsiveness and child-orientation.

Parents' vs. Children's Report of Parenting

Additionally, we broadened the scope of the findings by including children's perception of parental control as well as the dimension of positive, that is, responsive, parenting. In line with findings regarding parents' reports on and children's perception of parenting, we did not find a significant correlation of both measurements in the domain of authoritarian/controlling parenting or the domain of positive parenting (e.g., Dimler et al., 2017; Taber, 2010). Recent research states that effects of parenting on adolescent (problem) behavior were stronger if adolescents rated their parents' behavior as more negative than parents themselves did (Dimler et al., 2017). Following this notion, even though this was not the central point of our moderation hypothesis, we found the highest *nPower* scores at t2 in children with high perceived psychological control and low parental reports of authoritarian parenting. Although *nPower*

can evidently not be equated with deviant or problematic behavior per se, effects of negative parenting, often including controlling or authoritarian behavior, seem to be particularly pronounced when parents' reports and children's perception do not match, that is, when parents perceive their parenting to be less negative than their children do (Dimler et al., 2017). It also seems plausible that children high in *nPower* perceive more psychological control in parenting than children low in *nPower*, that is, that they are more sensitive to assertive/authoritarian cues. Findings regarding *nPower* in adults show that individuals high in *nPower* are characterized by enhanced sensitivity to social cues of dominance compared to those low in *nPower* (Donhauser et al., 2015).

Stability and Development of Implicit Motives

Compared to McClelland and Pilon's (1983) study, the present study covers a much shorter period of time. Thus, more research is needed to closer investigate the distinct mechanisms underlying the development of implicit motives, both during and beyond childhood and early adolescence. However, our findings might be a first hint that the effects of parenting could manifest even over a relatively short time span.

In literature, it is postulated that implicit motives are primarily shaped in preverbal stages of ontogenesis (McClelland et al., 1989). However, there was no significant cross-sectional association of authoritarian or positive parenting style and *nPower* in children at t1. In contrast, we found a significant cross-sectional association of authoritarian parenting and children's *nPower* at t2, in addition to the longitudinal effects of parenting at t1. Albeit unexpected, this finding suggests that (authoritarian) parenting, at least in our sample, might not have immediate effects on *nPower* in younger children, but that the effects of parenting take some time to unfold their effect on (older) children's *nPower*. This appears to be inconsistent with assumptions on the preverbal development of implicit motives, at least in the domain of power (McClelland & Pilon, 1983). Additionally, children's *nPower* was not stable

over the course of 3.5 years in our sample. This finding contradicts arguments on the trait-like stability of implicit motives (e.g., McClelland et al., 1989; Schultheiss et al., 2008) and again, challenges the notion that development of implicit motives is limited to the preverbal stages of ontogenesis (McClelland & Pilon, 1983). More recent findings point to a less pronounced stability of implicit motives (e.g., Denzinger & Brandstätter, 2018; Busch & Hofer, 2012). As children transition from early to late childhood, more and more opportunities, that is, situational cues or incentives, for realizing the *nPower* arise. Since it is postulated that implicit motives are elicited by situational cues or incentives, respectively, these short-term arousals might foster long-term change in implicit motives' strength (e.g., Schultheiss & Schultheiss, 2014). Types or styles of parenting, both verbally and non-verbally transmitted, affect children's exposure to incentives and thereby, also (indirectly) affect children's future behavior. Thus, parents' reactions to children's behavior might play a crucial role in shaping implicit motives even through late childhood and adolescence.

Parenting Shifts throughout Children's Development

Especially from early to late childhood, there might be a shift in parenting style, because parents also react to children's behavior, resulting in a bidirectional dynamic course of interaction (e.g., Patterson, 1982). In our sample, both authoritarian and positive parenting significantly decreased during the observed time span (albeit the high positive correlation between the measures has to be noted, see also Reichle & Franiek, 2009, for similar results). Due to the nature of implicit motive scores, we cannot make mean level comparisons between both measurement points, hence, we cannot rule out the possibility that a change in children's power-motivated behavior might have had an effect on the shift in parenting style. Interestingly, albeit not statistically significant, we found a positive correlation of positive parenting at *t*₁ and *nPower* at *t*₂, however, almost a zero correlation of positive parenting at *t*₂ and *nPower*. As positive parenting is characterized by a responsive and child-centered style

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(e.g., Reichle & Franiek, 2009), one might argue that this parenting style is particularly influential for *nPower* in the early stages of motive development. More precisely, in the preverbal or early verbal stages, a positive parenting style might be associated with the development of *nPower*, as children's needs are dealt with in a responsive way and antecedents of power-motivated behavior could be enforced (McClelland & Pilon, 1983; McClelland et al., 1989). Later on, there might be a shift in children's power-motivated behavior as the child becomes increasingly aware of its possible impact on others through bargaining and more distinguished persuasive strategies (e.g., Veroff & Veroff, 1971). The role of authoritarian parenting might increase, as authoritarian (vs. non-authoritarian) parents try to suppress and punish power-motivated behavior that increasingly challenges their rules. Furthermore, the importance of rules might also shift through childhood, as options for actively organizing their leisure time increase for children, for instance, spending more time with friends or taking on different hobbies (Ryan et al., 1995). Another important developmental task in the transition from early to late childhood is achieving personal independence (Havighurst, 1953). Common examples include testing authority figures (e.g., parents or teachers) as well as identifying and following interests and goals that might differ from their parents'. Furthermore, children learn to progressively understand and self-regulate their emotions, therefore decreasingly relying on parents. Hence, parents are faced with children's increasing need for autonomy regarding more and more life domains, which might, in turn, encourage authoritarian parents to increase psychological control in order to assert their authority. Moreover, during the transition to early adolescence, children increasingly express their own ideas and thoughts, possibly posing a threat to authoritarian parents' framework of controlling children's interests and choices that might differ from theirs (e.g., Wray-Lake et al., 2010).

Another difference worth mentioning between the study at hand and McClelland and Pilon's study (1983) is the time of data collection. While McClelland and Pilon (1983) obtained

parents' child-rearing practices in the late 1950s, data on parenting in the study at hand was obtained between 2016 und 2020. General norms or mean levels of parenting might have changed over the past decades yet effects of authoritarian and controlling parenting seem to persist, enhancing the generalizability of findings. In contrast to McClelland and Pilon (1983), we did not rely on retrospective measures of parenting. Furthermore, their rather small sample size as well as the single-study design should be noted.

Limitations and outlook

We hope to add to the understanding of the development of implicit motives with our study. We believe studying developmental correlates of implicit motives in childhood is an important research topic given the possible incremental and predictive nature of implicit motives for various outcomes across the lifespan, for instance, career paths (McClelland & Franz, 1992) or preferences in social interactions (e.g., Stoeckart et al., 2018). Yet, some limitations of the current study ought to be addressed. Firstly, we only obtained children's perception of parenting style at t2, but not at t1. We decided to refrain from assessing children's reports at t1 due to their young age. Findings point to a relatively low validity of children's report of parenting styles in elementary school aged children (Shelton et al., 1996). Also, Frick et al. (1999) report an increase in predictive validity as a function of children's age. Still, the longitudinal effect of parenting on *nPower* needs to be replicated taking both parents' and children's reports at both measurement points into account.

Moreover, we did not use the same measure for children's and parents' reports of parenting styles. As we were concerned about test length, we decided to use a subset of items taken from the ZKE as a reliable, valid and particularly economic instrument among children (Reitzle et al., 2001). Furthermore, the dimensions authoritarian parenting and psychological control are both characterized by high control/pressure and low responsiveness (Reitzle et al., 2001; Reichle & Franiek, 2009). In the same notion, both positive parenting (GE-APQ-

dimension, Reichle & Franiek, 2009) and perceived warmth/support (ZKE-dimension, Reitzle et al., 2001) are characterized by high responsiveness and a child-centered parental approach. Unfortunately, the psychological control scale did not yield a high reliability in our sample. This might be due to the shortness of the three-item scale used in this study. Applying the Spearman-Brown formula for test extension and using the empirical reliability obtained in our study, we would obtain a hypothetical reliability of $\alpha = .756$ when triplicating the number of items in the scale. This corresponds to the subscale's number of items in the longer ZKE version, as well as the reliability obtained by Reitzle and colleagues (2001).

In our study, measures of parenting styles were mostly obtained from mothers who primarily accompanied their children. More recent research emphasizes the importance of taking both mothers' and fathers' parenting style into account, as there are often significant differences between their parenting styles. In general, fathers usually display a more authoritarian parenting style than mothers who in turn usually show a more authoritative style (for a recent review, see Yaffe, 2023). In our sample, we did not find significant differences in parental (authoritarian) control between mothers and fathers, neither in parents' nor in children's reports. Regarding positive parenting, we only found significant mean differences in parental reports at t1, that is, mothers reported higher scores than fathers. However, as stated earlier, most data were assessed from mothers. Although instructions for the GE-APQ refer to parental styles prevalent in the family (as opposed to a specific parent's style), future research should include fathers' parenting reports to examine different effects of fathers' and mothers' parenting on motive development.

Moreover, recent research highlights the importance of considering biological factors when studying the development of implicit motives (e.g., Köllner et al., 2019; Schultheiss & Köllner, 2021). Unfortunately, we did not measure biological markers of nPower (e.g., 2D:4D scans; see also Schultheiss & Zimni, 2015). Future research ought to take both biological

markers and (socio-) environmental factors, like parenting style, and especially their interaction into account when examining the longitudinal development of *nPower*.

Furthermore, our findings are limited to a Western individualistic sociocultural context. Cross-cultural research points to the generalizability of many findings in the domain of implicit motives and their correlates (see, Hofer & Chasiotis, 2022, for an overview) as well as the domain of parenting style (Lehmann et al., 2021). Therefore, future studies ought to take into consideration that the association of certain parental styles and the development of implicit motives might differ as a function of cultural context.

Finally, we did not test for effects of response styles (e.g., social desirability) on data assessed by parents and children. Findings regarding the GE-APQ and social desirability postulate effects only on responses in the domains of extremely positive (i.e., positive parenting) or extremely negative (i.e., corporal punishment) parenting (Reichle & Franiek, 2009). One possibility to work around this issue is the use of observational data regarding parenting style. Research regarding the APQ has demonstrated positive associations of observational data and self-report measures regarding parenting style (Hawes & Dadds, 2006). Yet, there are reports on a decrease in the (ecological) validity of behavioral observation of parenting style as children grow older (Keller, 1986). Taken together, findings suggest that assessing parenting style in a sample of school-aged children via self-report is a reliable and economic measure. We assume that effects of social desirability on our significant moderation results are negligible, however, we cannot rule out the possibility that social desirability led to an exaggeration of positive characteristics.

Summing up, our study adds recent evidence to the literature concerning the development and stability of the implicit power motive in childhood by highlighting the role of parenting. Of course, given the tentative character of our findings, future research based on pre-registered hypotheses is needed to replicate these findings and to examine the development

of implicit motives in more detail, starting even earlier in childhood and continuing into adulthood to gain more insight into the stability of implicit motives and identify possible developmental windows.

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Data availability. Due to copyright infringement, children's PSE pictures cannot be made publicly available but can be obtained from the first author upon reasonable request. The data and all other research materials that the analyses are based upon are available at https://osf.io/muxtq/?view_only=8478b5cf50384e51a45da53ec0ac780e.

Declarations

Conflict of interest. The authors have no relevant financial or non-financial interests to disclose.

Compliance of ethical standard. The Research Ethics Committee of the Trier University approved the study. The study was conducted in accordance with the declaration of Helsinki.

Informed consent. Parents were asked for permission and prior to data assessments signed an informed consent form. Verbal informed consent was obtained from children prior to data

assessments. Both parents and children voluntarily participated in the study and were guaranteed that any information given would be treated confidentially.

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5. Beneath the Surface – the Implicit Achievement Motive Interacts with Competitive Anxiety in Predicting Adolescent Swimmers' Performance

Abstract. The implicit achievement motive (*nAchievement*) typically shows positive effects on individuals' performance in different achievement contexts. Recent findings suggest that this association is furthermore qualified by other personality traits. Still, research on achievement-related moderators of the effect of *nAchievement* on objective performance parameters remains sparse, specifically in children and adolescents. In the present study, we examined the relationship of *nAchievement* on swimming performance by considering effects of competitive anxiety. We hypothesized a positive link between *nAchievement* on swimming performance, but only at low and medium (vs. high) levels of cognitive and somatic competitive anxiety and high and medium (vs. low) levels of self-confidence.

We assessed data of 139 German children and adolescents (75 girls) aged between 7 and 18 years. Results mostly support our hypotheses. There was no significant main effect of *nAchievement* on swimming performance. However, competitive anxiety interacted significantly with *nAchievement* in predicting sports performance: *nAchievement* showed a positive association with objective swimming performance only in participants either low in cognitive anxiety, somatic anxiety, or high in self-confidence. Findings are discussed with respect to existing models of *nAchievement* and competitive anxiety as well as their conjoint significance for performance in sports contexts.

Keywords: implicit achievement motive, competitive anxiety, performance

“Pressure forms a coal into a diamond.” This widely cited quote by an unknown author is often applied in competitions across various contexts from academia to sports. Whether (perceived) strain actually has beneficial effects on performance, however, remains controversial and may depend on individual personality traits. For instance, individuals high in the need to achieve (*nAchievement*) may experience detrimental effects of increased tension or anxiety, since achievement-relevant contexts are particularly important to them (e.g., McClelland, 1985).

A widely studied context of performance is sports. To predict performance in sports, psychological constructs have gained interest in the last decades (cf. Lochbaum et al., 2022). For instance, implicit motives as important predispositions driving human behavior, including sports performance, have moved into the focus of researchers (e.g., Sieber & Mempel, 2015; Wegner & Teubel, 2014). Additionally, further personality traits, like competitive anxiety, have been a focal part of research in the sport context for decades (Lochbaum et al., 2022).

We intend to contribute to existing literature on performance in the context of sports by considering conjoint effects of *nAchievement* and competitive anxiety in our present study. More specifically, we examined the moderating effects of three components of competitive anxiety on the association of *nAchievement* and swimming performance.

5.1 Theoretical Background

The Implicit Achievement Motive

Implicit motives are theorized to be shaped during the preverbal stage of ontogenesis and are characterized by their unconscious nature, which renders them inaccessible to introspective analysis (e.g., McClelland et al., 1989). These motives can be understood as relatively stable dispositions to experience certain classes of incentives as rewarding or disincentives as dissatisfying (Schultheiss & Köllner, 2014). It is proposed that their affective quality is the basis for their role in energizing, orienting, and directing behavioral tendencies, particularly in unstructured contexts (McClelland et al., 1989; Schultheiss & Köllner, 2014).

*5. The Role of *n*Achievement and Competitive Anxiety for Performance*

Research on implicit motives generally focuses on the Big Three (e.g., McClelland, 1985): the affiliation-intimacy motive, in essence, the concern with establishing and maintaining interpersonal relationships (Heyns et al., 1958), the power motive, in essence, the desire to have an impact on others (McClelland, 1975; Winter, 1973) and the achievement motive, in essence, the pursuit of a standard of excellence (McClelland et al., 1953). More precisely, the implicit achievement motive (*n*Achievement) is characterized by a desire to master challenges, improve skills, or seek incentives positively related to one's performance (McClelland et al., 1953; Pang, 2010). Generally, individuals high in *n*Achievement tend to be more concerned with succeeding in tasks and therefore engage in tasks more persistently and more intensely (Brunstein & Heckhausen, 2008; McClelland, 1985). Consequently, researchers have postulated a direct positive effect of *n*Achievement on performance-based outcomes (Biernat, 1989; Atkinson & Litwin, 1960). However, early findings of the positive association of *n*Achievement and performance were limited to tasks such as addition exercises or anagrams (e.g., Lowell, 1952; Wendt, 1955). More current research has extended these findings on more complex tasks, for instance in the context of sport, in which *n*Achievement predicted performance in a team tournament (Wegner & Teubel, 2014).

Recent findings, however, call the notion of a singular main effect of *n*Achievement on performance into question (e.g., Mazeris et al., 2019, 2021). Researchers have identified factors that define conditions under which *n*Achievement impacts behavioral outcomes. For instance, low task difficulty extenuated the positive effect of *n*Achievement on effort mobilization (Mazeris et al., 2019). In other words, when task difficulty was high or unclear, people high in *n*Achievement exhibited increased effort mobilization, while those low in *n*Achievement exhibited decreased effort mobilization (Mazeris et al., 2019, 2021). Similarly, negative feedback on individuals' performance has been identified as a moderating variable that bolsters the positive association of *n*Achievement and performance (Brunstein & Hoyer,

2002). In the context of extreme endurance sports, Schüler and colleagues (2014) identified a moderating effect of the need for competence on the positive association of *n*Achievement and flow experience.

Analogously to such task-inherent moderators, intraindividual factors seem to determine whether or how *n*Achievement affects performance. Corresponding explicit achievement motives, for instance, have been identified as a channeling factor that foster the expression of implicit motives into behavior (Bing et al., 2007; Brunstein & Maier, 2005). Similarly, personality traits can function as factors through which implicit motives are expressed (Winter et al., 1998). For instance in work contexts, extraversion has been identified as an amplifying factor for the association of performance and *n*Affiliation and *n*Power, respectively (Lang et al., 2012). Furthermore, neuroticism has been identified as a moderating factor constraining the realization of *n*Affiliation and *n*Power (Hofer et al., 2015). Notably, the moderating role of extraversion and neuroticism has only been identified for the expression of the two social motives, namely *n*Affiliation and *n*Power (Hofer et al., 2015; Lang et al., 2012). Concerning *n*Achievement, so far, only the explicit achievement motive has been found to be a moderator on the association of *n*Achievement and performance (Lang et al., 2012).

Competitive Anxiety and the Context of Swimming

The individual zones of optimal functioning model (Hanin, 1997) focuses on the relationship of emotions and performance. It is postulated that certain emotional states might be detrimental to performance (see also Hanin, 2007). In general, anxiety is typically characterized as a stable tendency to perceive specific circumstances as distressing and to respond to them with heightened levels of state anxiety (Spielberger, 1966). Heightened levels of trait anxiety might entail a higher number of situations that are perceived as distressing and thus, are connected to a more intense stress reaction (Martens et al., 1983; Spielberger, 1966). Regarding potential detrimental effects on the association of *n*Achievement and performance,

a form of achievement-related anxiety could act as a moderator. Competitive anxiety, for instance, is delineated as a distinct performance-related aversive psychological state that arises in response to perceived pressure (Cheng et al., 2009). Thus, competitive anxiety is considered to reflect a stable tendency to experience heightened levels of distress in competitions to show more pronounced aversive reactions in such situations. Competitive anxiety is divided into three distinct components that describe reactions to competitive contexts: cognitive anxiety, that is, the mental component of competitive anxiety, somatic anxiety, that is, the physiological component of competitive anxiety, and self-confidence, that is, the general perception of one's confidence regarding the competition (Martens et al., 1983).

In the past, researchers have criticized the construct of competitive anxiety for failing to measure the direction or personal relevance of the symptoms of competitive anxiety. Specifically, competitive anxiety primarily focuses on the intensity of symptoms, but does not allow conclusions on whether or not they have detrimental or facilitative effects on performance (Burton & Naylor, 1997). This direction might depend on the value individuals place on a given competition, which, in turn, might depend on certain individual predispositions. Implicit motives, for instance, with their affective character, pose a predisposition to seek out competitive situations because they entail opportunities to attain positive achievement-related affect (e.g., Schultheiss & Köllner, 2014).

There are different ways to objectively measure performance in sports. In swimming, a common procedure is measuring the time it takes to complete a given track in a given swimming style. Swimming is defined as a closed skill, in essence, a self-paced and relatively predictable skill and is often practiced as an individual sport (Brady, 1995). Considering the high responsibility of the individual, the relevance of competitive anxiety should be increased in comparison to team sports (Martens et al., 1990b; Terry et al., 1996). Generally, competitions pose an opportunity to demonstrate competence in relation to peers. They also

pose an opportunity to compete with a standard of excellence, a characteristic specifically relevant to individuals high in *nAchievement* (McClelland et al., 1953). Researchers argued that moderately strong situational cues (e.g., demonstrating competence in a swimming task) may elicit a motivational state particularly for those individuals with a pronounced corresponding motive (McClelland, 1987; Schultheiss, 2001).

In line with the channeling hypothesis (Winter et al., 1998), we propose that competitive anxiety plays an important role in determining whether *nAchievement* has a beneficial effect on swimming performance.

The Present Research

We aim to add to existing research concerning the association of *nAchievement* and performance in sport by examining moderation effects of competitive anxiety on this association. Since earlier research on motives and sports performance often studied task choices or academic performance (for exceptions see Gabler & Lenk, 1972; Wegner & Teubel, 2014), we hope to extend existing literature by applying an objective sports performance measure as the dependent variable. Furthermore, by focusing on a sample of children and adolescents, we aspire to enhance the understanding of developmental processes underlying performance. We expected a positive association of *nAchievement* and objective performance, that is, the higher *nAchievement*, the faster the swimming time. However, we predicted a moderating effect of competitive anxiety on this positive association. Precisely, we hypothesized the aforementioned link should only be present in participants with low or medium (vs. high) levels of cognitive and somatic competitive anxiety and participants with high or medium (vs. low) levels of self-confidence.

5.2 Method

Procedure

Data of youth competitive swimming club members were collected in the southwestern part of Germany on training days. Before data assessment, participants signed an informed consent

form. For participants under the age of 14, parents gave their written consent in advance. Participants voluntarily took part in the study and received no monetary compensation. The study was conducted in accordance with the declaration of Helsinki (World Medical Association, 2013) and the ethical guidelines of the German Society for Psychology (Berufsverband Deutscher Psychologinnen und Psychologen & Deutsche Gesellschaft für Psychologie, 2022).

Measurements were administered in a group setting before the training sessions in their training facility (local swimming halls). First, participants' *nAchievement* was assessed. Next, participants answered questions on competitive anxiety, their training duration and frequency, sociodemographic variables, as well as psychological constructs not relevant to the study at hand (e.g., perceived parental pressure). Data assessment took approximately 45 minutes. Finally, the individual objective swimming performance was measured.

Sample

An a priori power analysis using G*Power version 3.1.9.7 (Faul et al., 2007) was conducted. Drawing on prior research on *nAchievement* and moderating variables in the prediction of performance (see, e.g., Sieber & Mempel, 2015), we expected a medium effect size of $f^2 = .150$ (Cohen, 1988). A minimum sample size of $N = 116$ was calculated to obtain a power of $1 - \beta = .900$ with a significance criterion of $\alpha < .05$. We expected a rather large amount of missing data due to participants' age and the implementation of a projective method to measure *nAchievement*. Hence, we planned to oversample by roughly 20 percent. In total, we collected data from 151 children and adolescents. Due to missing data on the objective performance measure and the competitive anxiety measure, we had to exclude 12 participants. The remaining 139 participants (75 female, 64 male) were between 7 and 18 years of age ($M = 12.770$; $SD = 2.494$). 22 participants attended primary schools; 113 attended secondary schools and 4 were studying at a university or doing an apprenticeship. Participants have been

practicing swimming as a competitive sport for an average training duration of 6.155 years ($SD = 2.896$). On average, participants indicated a training frequency of roughly 3 times per week ($SD = 0.895$). A post-hoc power analysis using G*Power version 3.1.9.7 yielded a power of $1 - \beta = .850$ for our model with the smallest effect size (model 2 with $f^2 = .108$).

Measurements

Implicit Achievement Motive

A Picture Story Exercise (PSE; Schultheiss & Pang, 2007; Smith et al., 1992) was implemented to measure participants' implicit motives. Since our research focused on nAchievement in children and adolescents, we chose four picture cues with both a high pull for nAchievement (see Schönbrodt et al., 2020) and a fit for a younger sample: *Trapeze Artists*, *New Pic 09* (Arm Wrestling), *Bicycle Race* and *New Pic 17* (Running Track) were administered in the respective order.

Following the standard instruction for PSE (Smith et al., 1992), participants were told that the following pages would contain four pictures. They were instructed to come up with a story for each of the pictures and to write it down on the empty page following the respective picture. They had 30 seconds to look at each picture and an additional 4 minutes to write down the respective story. They were reminded that there were no right or wrong stories and that it was not mandatory to finish the story. If children finished their story before time was up, they were told to remain silent until the supervisor instructed them to go to the next picture.

The PSE stories were coded using Winter's (1994) manual by a well-trained [at least 85% agreement with training material coded by experts (Winter, 1994)] student assistant that was blind to the study's hypotheses.

The four stories' word count came up to a total of 38 to 739 words ($M = 211.755$; $SD = 94.348$). Since conventions for protocol length in children's or adolescents' PSEs are still to be implemented, we did not exclude any participants based on the criteria of story length (e.g., an

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average of 30 words per story). The sum of achievement motive imageries across all four stories ranged from 0 to 10 ($M = 3.748$; $SD = 2.120$). Since the sum of achievement motive imageries was significantly correlated with word count ($r = .468$; $p < .001$), we calculated residualized nAchievement scores to control for effects of story length.

Competitive Anxiety

Competitive anxiety was measured with the German version (Stöber & Pescheck, 2004) of the Competitive State Anxiety Inventory-2 (CSAI-2; Martens et al., 1990b). The CSAI-2 consists of three subscales with nine items, respectively: *cognitive anxiety* (e.g., “I am concerned about losing.”, $\alpha = .897$), *somatic anxiety* (e.g., “My body feels tense.”, $\alpha = .847$) and *self-confidence* (e.g., “I am confident.”, $\alpha = .903$). Participants indicated on a scale from 0 (*never*) to 5 (*always*) how often they generally feel or think this way in competitive situations.

Objective Swimming Performance

After completing the questionnaire, participants were told to warm up by swimming 300 meters. Then, they were instructed to pick their preferred swimming style, that is, the one they felt the most confident in, and to swim a given number of tracks as fast as possible. The supervisor recorded the time with a stopwatch. To account for effects of gender and to ensure comparability, FINA (Fédération Internationale de Natation; World Aquatics, n.d.) scores were calculated from the raw time scores using the official transformation formula $P = 1000 * (\text{Base time} / \text{Swim time})^3$. The base time is defined by the current world record and is separated by gender, style and length (e.g., men, 50m, backstroke; women, 50m, butterfly; etc.). Swim time is the actual time measured in our study for each participant. All measurements are in seconds. Since FINA scores are used for comparing adult swimming performance, it seemed inappropriate to compare children’s and adolescents’ scores to them. As expected, age was highly correlated ($r = .755$; $p < .001$) with FINA scores. To account for this, we decided to calculate standardized residual scores using regression analysis.

Transparency and Openness

We report on how we determined our sample size, all data exclusions, and all measures in the present study, and we follow JARS (Kazak, 2018). All data, analysis code and research materials (in German) are publicly available at the Open Science Framework and can be accessed at https://osf.io/qcbnt/?view_only=ea61fd6b66bd4a349e6901ac24fe42b7. All analyses were executed using IBM SPSS Statistics version 28.0.1.0. The PROCESS macro version 4.0 (Hayes, 2022) was used to test the moderation hypotheses. Neither the study's design nor its analyses were pre-registered.

5.3 Results

First, we will report general descriptive statistics and correlations of relevant variables as well as correlations with possible covariates. Next, main inferential analyses will be presented testing the hypothesized moderation effects of components of competitive anxiety on the association of *nAchievement* and objective swimming performance.

Correlations

Correlations among *nAchievement* and the components of competitive anxiety as well as with other relevant variables are shown in Table 3. All three components of competitive anxiety were significantly intercorrelated. FINA score correlated significantly negatively with somatic anxiety and positively with training duration and training frequency. Furthermore, girls exhibited a lower FINA score than boys. There were no significant correlations of *nAchievement* with any other variable.

Main Analyses

We hypothesized a positive association of *nAchievement* and objective swimmers' performance only at low or medium (vs. high) levels of somatic or cognitive anxiety or high or medium (vs. low) levels of self-confidence, respectively. For all three moderation analyses, the Hayes' (2022) template for simple moderation analyses (Model 1) was used with *nAchievement* as the predictor, objective performance (FINA scores) as the dependent variable

and the respective component of competitive anxiety as the moderator. We ran all moderation analyses including gender, training duration and training frequency as covariates as they were all significantly correlated with FINA scores.

Since the components of competitive anxiety were highly intercorrelated, the two components not central to the respective analysis were also entered as covariates to control for their effects on objective performance. All variables (except gender) were transformed into standardized *Z*-scores. The number of bootstrap samples was set to 10000.⁵

The first moderation model with competitive cognitive anxiety as a moderator explains a significant amount of variance in participants' FINA scores (see Table 4). Neither the main effect of *nAchievement* nor the main effect of competitive cognitive anxiety on FINA score was significant. However, the interaction of *nAchievement* and cognitive competitive anxiety was significant [$F(1, 130) = 9.042$; $R^2_{\text{change}} = .049$; $p = .003$].

⁵ We reran main analyses excluding participants that, in sum, produced less than 80 words. Furthermore, we reran main analyses excluding all covariates except the other two competitive anxiety scales not tested for moderating effects in respective analyses. For the respective regression coefficients, see: https://osf.io/qcbnt/?view_only=ea61fd6b66bd4a349e6901ac24fe42b7. Results indicated no significant differences in result patterns in either case. Thus, we report results obtained by the total sample considering all relevant covariates.

Table 3

Descriptive Statistics and Correlations

	1	2	3	4	5	6	7	8	9	<i>M (SD)</i>
1 Performance (FINA)	---									0.000 (73.022)
2 <i>n</i> Achievement	.014	---								0.000 (1.874)
3 Cognitive Anxiety	.051	.087	---							1.811 (1.199)
4 Somatic Anxiety	.187*	.079	.747**	---						1.922 (1.072)
5 Self-Confidence	-.039	.027	-.728**	-.634**	---					2.861 (1.111)
6 Age	.000	.068	.076	.064	.149	---				12.770 (2.494)
7 Gender ^a	-.272**	.063	-.302**	-.246**	.271**	.051	---			0.460 (0.500)
8 Training Duration	.214*	-.032	.052	.044	.138	.722**	-.116	---		6.155 (2.896)
9 Training Frequency	.327**	.015	-.006	.058	.073	.317**	.109	.312**	---	2.770 (0.895)

Note. *N* = 139.

^a gender coding: 0 = female, 1 = male.

p* < .05. *p* ≤ .001

Table 4*Effects of nAchievement and Cognitive Competitive Anxiety on Performance*

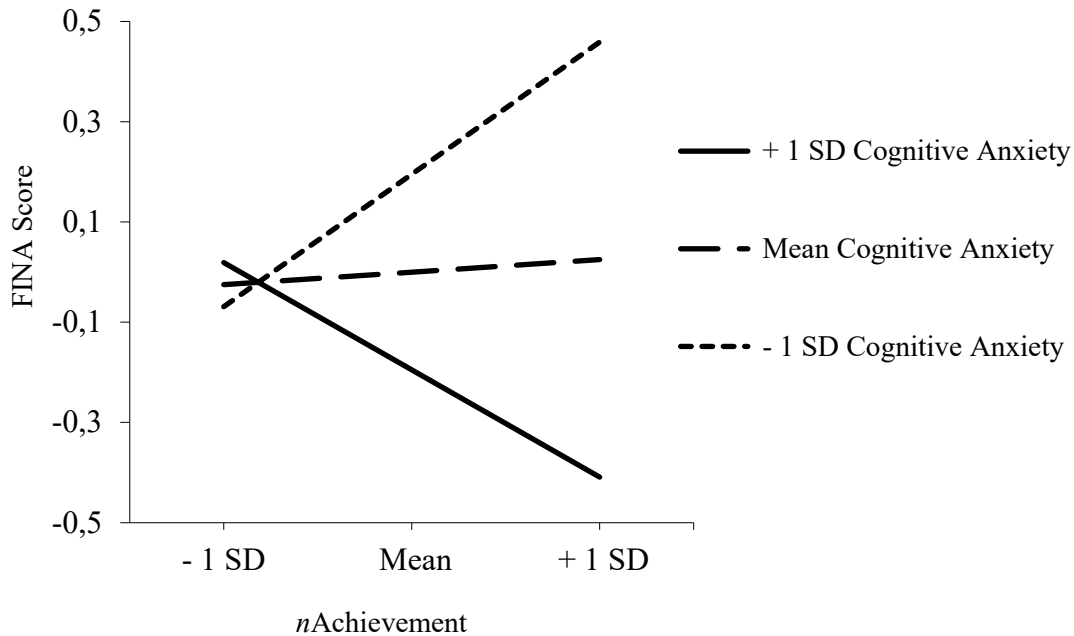
outcome	β (S.E.)	<i>t</i> -value (<i>p</i>)	<i>F</i> -value (<i>p</i>)	<i>R</i> ²
Performance			6.734 (.000)	.293
			df = 8, 130	
<i>n</i> Achievement	0.025 (0.075)	0.336 (.738)		
Cognitive Anxiety	-0.195 (0.132)	-1.478 (.142)		
<i>n</i> Achievement × Cognitive Anxiety	-0.239 (0.080)	-3.007 (.003)		
Somatic Anxiety	0.250 (0.114)	2.187 (.031)		
Self-Confidence	0.041 (0.115)	0.357 (.722)		
Gender	-0.599 (0.158)	-3.781 (.000)		
Training Duration	0.085 (0.081)	1.049 (.296)		
Training Frequency	0.292 (0.079)	3.685 (.000)		

Note. *N* = 139; gender coding: 0 = female, 1 = male.

Conditional effects at the mean, at one below and at one standard deviation above the mean revealed a significant positive association of *n*Achievement and FINA score only at low ($\beta = 0.264$; *SE* = 0.108; *t* = 2.449; *p* = .016; 95% CI [0.051, 0.478]) levels of cognitive competitive anxiety. There was no significant effect of *n*Achievement on FINA score at mean levels of competitive cognitive anxiety ($\beta = 0.025$; *SE* = 0.075; *t* = 0.336; *p* = .738; 95% CI [-0.124, 0.174]). At high levels of competitive cognitive anxiety, there was a marginally significant negative effect of *n*Achievement on FINA score ($\beta = -0.214$; *SE* = 0.111; *t* = -1.927; *p* = .056, 95% CI [-0.433, 0.006]). The moderation effect is visualized in Figure 2.

Figure 2

Interaction of nAchievement and Cognitive Competitive Anxiety on Performance



The second moderation model with somatic competitive anxiety as a moderator explains a significant amount of variance in participants' FINA scores (see Table 5). Again, the main effect of *n*Achievement was not significantly associated with sports performance. However, somatic competitive anxiety showed a significant positive association with individuals' FINA score. The interaction of *n*Achievement and somatic competitive anxiety was also significant [$F(1, 130) = 7.640$; $R^2_{\text{change}} = .042$; $p = .007$].

Analyses on conditional effects revealed a significant positive association of *n*Achievement and FINA score only at low levels of somatic competitive anxiety ($\beta = 0.246$; $SE = 0.108$; $t = 2.272$; $p = .025$; 95% CI [0.032, 0.461]).

Table 5*Effects of nAchievement and Somatic Competitive Anxiety on Performance*

outcome	β (S.E.)	<i>t</i> -value (<i>p</i>)	<i>F</i> -value (<i>p</i>)	<i>R</i> ²
Performance			6.502 (.000)	.286
			df = 8, 130	
<i>n</i> Achievement	0.039 (0.076)	0.518 (.605)		
Somatic Anxiety	0.275 (0.114)	2.400 (.018)		
<i>n</i> Achievement \times Somatic Anxiety	-0.207 (0.075)	-2.764 (.007)		
Cognitive Anxiety	-0.229 (0.132)	-1.741 (.084)		
Self-Confidence	0.048 (0.117)	0.410 (.682)		
Gender	-0.615 (0.159)	-3.864 (.000)		
Training Duration	0.098 (0.082)	1.194 (.235)		
Training Frequency	0.302 (0.079)	3.809 (.000)		

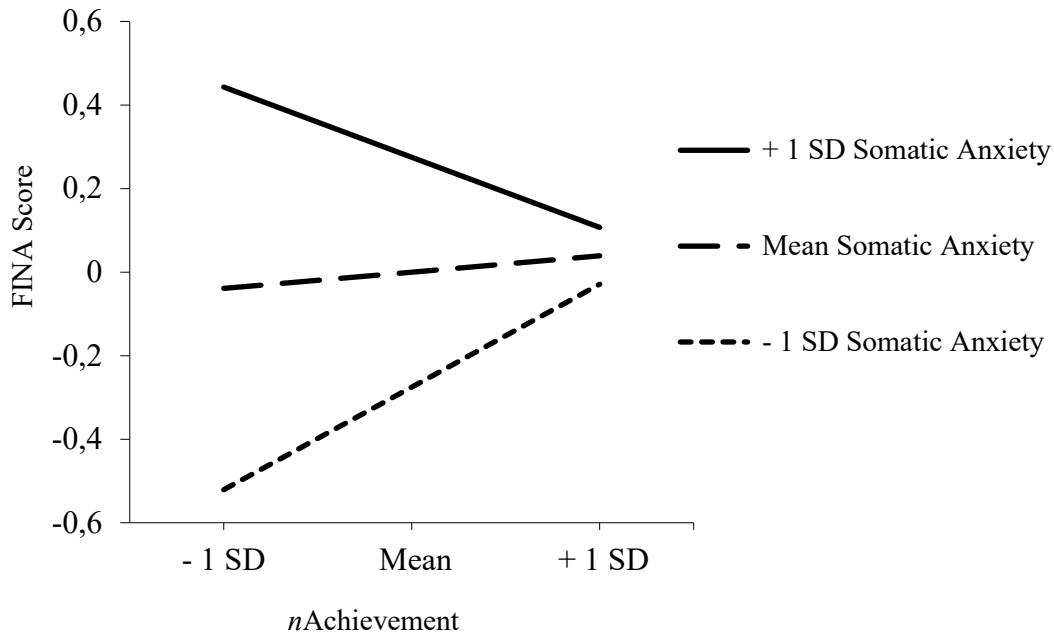
Note. *N* = 139; gender coding: 0 = female, 1 = male.

There was no significant association at mean levels of somatic competitive anxiety ($\beta = 0.039$; *SE* = 0.076; *t* = 0.518; *p* = .605; 95% CI [-0.111, 0.189]), while at high levels of somatic competitive anxiety, the association of *n*Achievement and performance was negative and fell just short of meeting the criterion of marginal significance ($\beta = -0.168$; *SE* = 0.105; *t* = -1.608; *p* = .110; 95% CI [-0.375, 0.039]). The moderation effect is visualized in Figure 3.

Finally, the third moderation model with self-confidence as a moderator explains a significant amount of variance in participants' FINA scores (see Table 6).

Figure 3

*Interaction of *n*Achievement and Somatic Competitive Anxiety on Performance*



Again, the main effect of *n*Achievement on FINA score was not significant. Also, the main effect of self-confidence on FINA score was not significant. Yet, the interaction of *n*Achievement and self-confidence was significant [$F(1, 130) = 12.406$; $R^2_{\text{change}} = .066$; $p = .001$].

Conditional effect analyses showed a significant negative association of *n*Achievement and FINA score at low ($\beta = -0.230$; $SE = 0.105$; $t = -2.187$; $p = .031$; 95% CI [-0.437, -0.022]) and a significant positive association at high levels of self-confidence ($\beta = 0.282$; $SE = 0.103$; $t = 2.743$; $p = .007$; 95% CI [0.079, 0.486]). There was no significant effect of *n*Achievement on FINA score at mean levels of self-confidence ($\beta = 0.026$; $SE = 0.074$; $t = 0.354$; $p = .724$; 95% CI [-0.121, 0.173]). The moderation effect is visualized in Figure 4.

Table 6

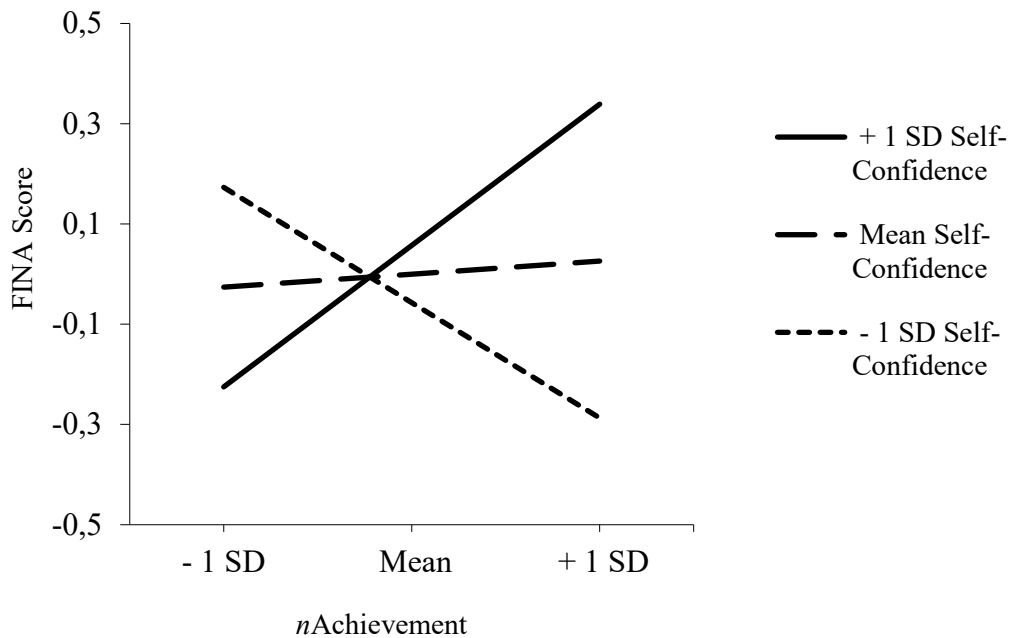
Effects of nAchievement and Self-Confidence on Performance

outcome	β (S.E.)	t-value (p)	F-value (p)	R ²
Performance			7.290 (.000)	.310
			df = 8, 130	
<i>n</i> Achievement	0.026 (0.074)	0.354 (.724)		
Self-Confidence	0.057 (0.115)	0.496 (.621)		
<i>n</i> Achievement × Self-Confidence	0.256 (0.073)	3.522 (.000)		
Cognitive Anxiety	-0.183 (0.131)	-1.402 (.163)		
Somatic Anxiety	0.226 (0.113)	1.993 (.048)		
Gender	-0.564 (0.157)	-3.595 (.001)		
Training Duration	0.066 (0.080)	0.825 (.411)		
Training Frequency	0.311 (0.078)	3.998 (.000)		

Note. *N* = 139; gender coding: 0 = female, 1 = male.

Figure 4

*Interaction of *n*Achievement and Self-Confidence on Performance*



5.4 Discussion

In the present study, we investigated the association of *n*Achievement and swimming performance in children and adolescents and the moderating role of competitive anxiety. More precisely, we hypothesized a positive association of *n*Achievement and swimming performance only at low or medium (vs. high) levels of somatic and cognitive competitive anxiety and high or medium (vs. low) levels of self-confidence.

Results mostly support our hypotheses. Firstly, in line with our hypotheses, the positive association of *n*Achievement and performance was only present at low levels of both cognitive and somatic anxiety and high levels of self-confidence, respectively. Surprisingly, however, there was no significant association of *n*Achievement and performance at medium levels of any of the competitive anxiety components. Interestingly, exceeding our initial hypothesis, there was a significant negative association of *n*Achievement and performance at low levels of self-confidence. In a similar notion, the negative association of *n*Achievement and performance at

high levels of cognitive anxiety was marginally significant. Analogously, although not significant, results point to a negative association of *n*Achievement and performance at high levels of somatic anxiety.

Taken together, findings largely support existing research on the association of *n*Achievement and objective performance in sports (e.g. Sieber & Mempel, 2015). In the respective models, the highest performance was obtained by those adolescents high in *n*Achievement and low in cognitive anxiety or high in *n*Achievement and high in self-confidence, respectively. This is in line with research on the channeling role of predispositions such as extraversion and neuroticism for the expression of implicit motives into behavior (e.g., Hofer et al., 2015; Winter et al., 1998). More precisely, our finding that competitive anxiety inhibits the association of *n*Achievement and performance mirrors traditional findings of the inhibiting characteristic of neuroticism (Winter et al., 1998). Moreover, competitive anxiety could be identified as an anxiety measure that is specific to achievement-related contexts.

The Main Effect of *n*Achievement

However, some unexpected results emerged. Firstly, the hypothesized direct association of *n*Achievement and performance was not significant. Differing from prior research postulating a direct association of *n*Achievement and objective performance (Wegner & Teubel, 2014), in the current study, participants performed individually and were told to do their best. On the one hand, researchers have argued that the direct positive association of *n*Achievement and performance diminishes when individuals are explicitly pressured to do well (McClelland et al., 1953). On the other hand, the rather vague instruction to “do their best” might not have been an adequate incentive for adolescents high in *n*Achievement, since it does not unequivocally entail an opportunity to improve one’s competence or learn new things (Brunstein & Heckausen, 2008). Findings on flow experience demonstrate the importance of an interaction of motive disposition (*n*Achievement) and environment. Specifically, when environmental incentives for the realization of competence in a given context are lacking, individuals high in

nAchievement do not differ from those low in *nAchievement* regarding flow experience (Schüler & Brandstätter, 2013). Therefore, in a context that is not specifically high in achievement specific incentives, adolescents high in *nAchievement* might not feel more (intrinsically) motivated than those low in *nAchievement* to perform their best (see Spangler, 1992, for a meta-analysis on the importance of activity achievement incentives for performance). This might also be enforced by the use of verbal cues to perform better in the present study. Prior findings demonstrate an activation of the explicit rather than the implicit achievement motive as a function of verbal achievement cues (Engeser & Baumann, 2014).

The Interaction of *nAchievement* and Somatic Anxiety

Strikingly, in the somatic anxiety model, the highest performance was obtained by those adolescents low in *nAchievement* and high in somatic anxiety. In the other two models, the differences in performance due to competitive anxiety were most pronounced among individuals high in *nAchievement*. In contrast, in the somatic model, the differences in performance were most pronounced among participants low in *nAchievement*. As described above, somatic anxiety is posited to be the least stable over time, indicating an arousal component (Lochbaum et al., 2022; Martens et al., 1983). It might be that for those individuals low in *nAchievement*, the optimal level of functioning requires high somatic arousal while for those individuals high in *nAchievement*, the optimal level of functioning requires low somatic arousal. This might be due to the fact that for adolescents high in *nAchievement*, competitive contexts entail a sufficient amount of potential (dis-)incentives and thereby personal relevance, so that any further arousal might be detrimental to performance (see Hanin, 1997, for an overview of the individual zones of optimal functioning model). Those adolescents low in *nAchievement*, on the other hand, seem to benefit from a high somatic arousal. Somatic arousal might act as a marker signaling personal relevance or importance for this group, leading to an increased engagement and effort mobilization (Brehm & Self, 1989; Wright, 2008). Cognitive

anxiety and self-confidence might not act in the same way, since they have a less arousal-based character (Lochbaum et al., 2022; Martens et al., 1983).

Competitive Anxiety and Performance

Since findings are rather heterogeneous regarding the association of competitive anxiety and performance (cf. Lochbaum et al., 2022), we made no a priori assumptions on the association of any of the competitive anxiety components with performance. Notably, though, the bivariate correlation of somatic anxiety with performance was positive and significant while the correlations of cognitive anxiety and self-confidence with performance were not significant. Somatic anxiety is posited to increase in the lead up of a competition while cognitive anxiety and self-confidence are posited to remain relatively stable over time (Gould et al., 1984). Therefore, somatic anxiety's effect on performance should be smaller than those of cognitive anxiety or self-confidence (Martens et al., 1990a). Previous findings on somatic and cognitive competitive anxiety claim a delayed association with performance, that is, somatic and cognitive competitive anxiety predicted negative performance only at a later point in a match (Martens et al., 1983).

It is worth noting that not only swimming performance but also competitive anxiety may be affected by the subjective value placed on the respective competition. Martens et al. (1983) theorize that, while trait anxiety impacts the individual perception of threat, state anxiety is a result of the interaction of objective situation (competition) and the individual perception of threat. In the present study, the task was not framed as a competition but was similar to a training situation. Therefore, the perceived threat of the task at hand might not compare to the one in a real competition, leading to overall decreased levels of reported anxiety. However, it is important to note that, unlike in the originally designed questionnaire (Martens et al., 1983), where participants were asked how they felt *at that moment*, in the current study, participants were asked how they *typically* respond to competitions, since there was no real competition coming up, thereby placing a stronger focus on the trait component of competitive anxiety.

Moreover, none of the components of competitive anxiety was significantly correlated with training duration. This is in contrast to existing findings that training experience in years is a strong predictor of cognitive anxiety (Gould et al., 1984). Notably, in our sample participants' age range was rather large and, unsurprisingly, age correlated with training duration in years. Due to this confounding, we cannot make any assumptions on the association of training duration and competitive anxiety.

The Role of *n*Achievement for Training Frequency

Interestingly, we did not find an association of *n*Achievement with training frequency. Previous research suggests that *n*Achievement predicts sports participation both in amateur and elite performers (Gröpel et al., 2016; see also Schütz & Schultheiss, 2020). Notably, variance of training frequency was rather small in our sample and roughly 80 percent of participants indicated they trained four times a week or less. A more detailed scale for measuring training frequency, that is, hours per week, might have been able to better differentiate between participants in our study. Furthermore, in contrast to most existing research concerning the role of *n*Achievement for behavioral outcomes in the training context, our sample consists of children and adolescents. Thus, parental expectations might play a crucial role in training frequency, mitigating the influence of *n*Achievement.

The practical implications, especially with respect to somatic anxiety, should be highlighted. Trainers should consider that, for some adolescents, somatic anxiety may facilitate performance, while for others, it may hinder it. This knowledge could help trainers provide individualized support and take advantage of the malleability of competitive anxiety.

Limitations and Outlook

By implementing an implicit measure for the achievement motive along with an objective performance measure, we hope to add valuable insights to the research regarding sports performance in childhood and adolescence. Still, there are a few limitations to the present study. Firstly, only the implicit achievement motive was assessed, hence, we cannot compare

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the predictive value of our findings to the explicit achievement motive. Previous studies demonstrate a positive association of the explicit achievement motive with task choices rather than actual performance (e.g., Elbe et al., 2005; Wegner & Teubel, 2014). Importantly, however, the congruence of the implicit and explicit achievement motive seems to play an important role in the prediction of performance (Lang et al., 2012) and motivation for future sport activities (Schüler & Wegner, 2015). Therefore, future studies ought to take the explicit achievement motive into account when investigating the role of *n*Achievement and competitive anxiety for performance outcomes.

While traditional research regarding implicit motives primarily postulates long-term predictions of *n*Achievement on behavioral outcomes (e.g., McClelland et al., 1989), performance in the current study was measured only once, therefore, no claims regarding long-term effects of *n*Achievement can be made. Future studies should take a longitudinal perspective not only on the association of *n*Achievement and swimming performance, but also on the possible malleability of competitive anxiety. It seems plausible that repeated experiences of success or failure in competitions affect expectations of future performance in competitions (Feather, 1966). These expectations might, in turn, affect levels of competitive anxiety (Pekrun, 2000). Analogously, even though implicit motives are theorized as rather stable predispositions (cf. Denzinger & Brandstätter, 2018), repeated experiences of failure or success might eventually lead to a decrease or increase in *n*Achievement, respectively (Schultheiss & Köllner, 2014).

Lastly, we did not differentiate between the hope of success and fear of failure components of *n*Achievement (McClelland et al., 1953). On the one hand, fear of failure is posited to have detrimental rather than beneficial effects on performance (e.g., Seligman, 1975). On the other hand, fear of failure might have the potential to increase effort mobilization and, consequently, have beneficial effects on performance (Brunstein & Maier, 2005). Previous research has identified fear of failure as a correlate of the severity of competitive anxiety

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symptoms (Amjad et al., 2018; Correia & Rosado, 2018). Consequently, competitive anxiety could act as a mediator rather than a moderator for the association of the fear of failure component of *nAchievement* and swimming performance. Future studies ought to differentiate the two components of *nAchievement* in order to test this possibility.

In conclusion, the present study contributes to existing literature by providing recent empirical evidence on the association between *nAchievement* and objective performance in adolescents, with competitive anxiety acting as a moderating factor. It is imperative that future research based on pre-registered hypotheses replicates these findings and examines this association in more detail to further scrutinize the present findings.

6. Successful Goal Attainment: Longitudinal Effects of Goal Commitment and Implicit Motives Among German and Zambian Adolescents

Abstract. Goal commitment typically relates to successful goal realization. Yet, individuals differ in how much their goals correspond to their implicit motives. We hypothesized that for those adolescents high in a given implicit motive, goal commitment and goal success in the corresponding motive domain (i.e., achievement, affiliation, power) are more closely related than for those low in the implicit motive. Data were assessed in an individualistic (Germany) and a collectivistic cultural context (Zambia) on two measurement occasions (i.e., t1: Picture Story Exercise for implicit motives; t1 and t2: GOALS questionnaire for goal commitment and success, respectively). Goal success at t2 was reliably predicted by goal importance and goal success at t1, respectively. The hypothesized interaction was found only for the implicit power motive but not for the implicit needs of achievement and affiliation, respectively. Results were equivalent across adolescents' cultural backgrounds. Findings are discussed with respect to motive-specific effects on goal dimensions.

Keywords: implicit motives, goal commitment, goal success, culture

6.1 Introduction

The question of what motivates human behavior has been central in research for many decades. Motives are a substantial personality dimension that can determine how we select and experience situations over our lifespan. They do not have to be consciously accessible to influence an individual's behavior or affects; they can also be unconsciously represented, that is, in the form of an implicit motive. The realization of explicit goals that are aligned with the respective implicit motive has a variety of beneficial correlates, such as subjective well-being. However, research on the importance of motive-congruent goal commitment for the successful goal realization of goals is lacking. Hence, the present study proposes that goal commitment predicts goal success particularly when the explicit goal is underpinned by a strong implicit motive. We examine this research question using a longitudinal approach. Beyond that, fostering the validity of our findings, we test our hypotheses in a sample of adolescents from two different cultural settings, namely, Germany and Zambia.

Two Distinct Motive Systems

Traditionally, research on (implicit) motives focuses on the so-called "Big Three" of motivation: the achievement motive (i.e., striving for a standard of excellence), the affiliation-intimacy motive (i.e., preoccupation with (re-)establishing and maintaining interpersonal relationships), and the power motive (i.e., desire for having an impact or influencing others; for more information on motive definitions, see corresponding chapters in, for example, Brunstein & Schultheiss, 2010; Heckhausen & Heckhausen, 2018). Moreover, when examining the role of motives for individuals' behavior, two distinct motive systems are postulated: the implicit and explicit motive systems (McClelland et al., 1989). These two motive systems are assumed to develop independently from one another at different stages in life. The implicit motive system is assumed to develop rather early, in the preverbal stages of ontogenesis (e.g., McClelland et al., 1989). Implicit motives are defined as rather stable, trait-like personality dispositions that entail positive (incentive) or negative (disincentive) affective responses to

specific situational cues (e.g., Schultheiss & Köllner, 2021). In line with this notion, they enable individuals to experience certain categories of incentives as rewarding (McClelland, 1987; Schultheiss & Köllner, 2021), that is, to enjoy a specific characteristic of a situation that satisfies the respective implicit motive. Thus, implicit motives are assumed to energize, select, and orient individuals' spontaneous behavioral trends over time (McClelland, 1987). Indeed, behavior is more quickly learned when it brings about a motive-specific incentive (Stoeckart et al., 2017).

In contrast, explicit motives develop later in life, mainly through socialization processes (McClelland et al., 1989). Especially parents' and caretakers' verbally transmitted child-rearing practices play a crucial role in the development of explicit motives. Thus, they are highly influenced by socially and culturally shaped norms (e.g., McClelland et al., 1989). Therefore, explicit motives are verbally represented and hence are, in contrast to implicit motives, accessible for both self-reflection and self-report. Explicit motives, such as goals, predict respondent, short-term behavior in line with an individual's self-concept.

Goals can be defined as targets or desired end states that people strive to achieve or avoid (Elliot & Fryer, 2008). They can differ widely concerning various goal characteristics. For example, goals can be either short- or long-term (e.g., Austin & Vancouver, 1996). The present research addresses rather long-term goals. In addition, there are individual differences in the commitment to any given goal but also the success in goal pursuance. Yet, goal commitment is typically positively related to successful goal realization (for metaanalytical evidence see, for example, Klein et al., 1999). Furthermore, successful goal realization is associated with subjective well-being, whereas unsuccessful goal realization tends to be associated with higher levels of depressive symptoms (e.g., Brunstein, 1993; Brunstein et al., 1999). Thus, successful goal realization has beneficial effects on subjective well-being.

Implicit Motives and Goal Success

Implicit and explicit motives typically show little or no significant overlap with each other (Köllner & Schultheiss, 2014). Thus, a match between both types of motives is not

preprogrammed; rather, many individuals commit to values and goals that are not aligned to their implicit motives (e.g., Brunstein et al., 1998). This motive incongruence relates to decreased psychological well-being and increased psychosomatic symptoms (Baumann et al., 2005; Schultheiss et al., 2008). In contrast, commitment to and particularly successful realization of motive-congruent goals, that is, goals that satisfy implicit motives by enabling individuals to make positive, maybe motive-specific, affective experiences, are associated with enhanced levels of well-being among individuals recruited in diverse cultural contexts (e.g., Hofer & Chasiotis, 2003; Schultheiss et al., 2008).

Findings consistently show that success in a given motivational domain of goals can be predicted by the importance assigned to that goal domain (e.g., Klein et al., 1999). This is because goal commitment increases the motivation to adjust behavior toward goal success (Koo & Fishbach, 2008). However, the association between goal importance and goal progress is subject to the impact of moderator variables (e.g., Beattie et al., 2015; Klein et al., 1999). For example, implicit motive strength might moderate this association. Those who consider a given goal important might be more likely to initiate corresponding goal pursuit. If they have a strong corresponding implicit motive, goal pursuit might provide them with the opportunity to consummate motive-specific affective incentives. This should help to maintain goal pursuit and eventually result in increased goal success. In this context, research demonstrates that goals that are not supported by the respective implicit motive require greater (cognitive) effort, as they lack the implicit motive's affective support (e.g., Rawolle et al., 2016; see also Wagner et al., 2016).

To summarize, there is substantial evidence of the beneficial effects of commitment to goals that match an individual's implicit motive. Those positive effects on, for example, well-being may ultimately be a result of goal success, which is based on goal importance and the moderating role of implicit motives.

The Role of the Cultural Context

To extend the scope and validity of our findings, the present research is conducted cross-culturally: Adolescent samples were recruited in two different cultural contexts, namely an individualistic (Germany) and a collectivistic one (Zambia). Values are often viewed as an important factor in a given culture that shapes individual and group beliefs, behavior, goals, and norms, and they take a leading function in emphasizing what is (morally) good or desirable (e.g., Hofstede, 2001; Schwartz, 2006). The value of autonomy, for instance, is more important in individualistic cultures in comparison to collectivistic cultures. For the two cultural contexts under consideration, striking differences in cultural markers (i.e., openness to change and conservation values) have been reported in the present samples (Lehmann et al., 2021).

There is ample evidence that psychological phenomena significantly differ across cultures (e.g., Brouwers et al., 2004). However, there is also a remarkable body of research focusing on basic universal principles in human functioning (e.g., Allik & McCrae, 2002; Chirkov et al., 2003; Kashima et al., 2005). Concerning implicit motives, various studies have provided evidence that how implicit motives relate to other variables is comparable across cultural contexts. For example, Hofer and Chasiotis (2003) showed an association of motive-goal congruence with elevated levels of life satisfaction in a sample of Zambian adolescents, a finding that is also well established in individualistic cultural contexts (e.g., Baumann et al., 2005; see also Hofer et al., 2006, on value-motive congruence). Furthermore, a link between power goal-motive congruence and well-being could be identified in samples recruited in Western and non-Western cultural contexts (Hofer et al., 2010). Similarly, there are cross-culturally equivalent effects of *n*Affiliation on the relationship between need frustration and social cynicism (Hofer et al., 2017) and between the evaluation of social life events and life satisfaction (Hofer et al., 2022). Thus, research across diverse cultural contexts (including the ones in the study at hand) clearly points to universal basic principles of implicit and explicit motives and their interaction (see e.g., Hofer & Bond, 2008). Consequently, we hypothesized

that the moderation of the link of goal importance with goal success by implicit motives is not qualified by participants' cultural backgrounds.

The Present Research

Given the aforementioned findings on the links between goal commitment and goal success, we hypothesized that individuals' goal commitment (t1) predicts their goal success (t2) across time. Moreover, we assumed implicit motives to moderate this relationship: That is, goal importance (t1) was assumed to predict goal success (t2) only when the corresponding implicit motive (i.e., *nAchievement*, *nAffiliation*, *nPower*) is well pronounced. A high implicit motive provides motive-specific incentives during goal pursuit, thus making goal pursuit more pleasant and goal progress more likely. Given findings on universal effects of motive congruence on individuals' well-being and behavior, we hypothesized that the moderating effects of implicit motives are found irrespective of adolescents' culture of origin.

6.2 Materials and Method

The data that the present analyses are based upon are available at osf.io/e6tu7.

Sample

Cultural Samples

Data relevant for the analyses of the present hypotheses were assessed within a larger longitudinal cross-cultural project on development in adolescence in German and Zambian adolescents (see, for example, Hofer et al., 2021; Lehmann et al., 2021). In the paper at hand, we present data collected in 2017/2018 at the first and second measurement points.

Samples recruited in (individualistic) Euro-American and (collectivistic) sub-Saharan cultural contexts differ in socialization strategies, cultural norms, and beliefs (e.g., Keller, 2007). With respect to value orientations (e.g., Schwartz, 1992), despite dramatic social and cultural changes in sub-Saharan Africa that affect the life of local communities, Zambians emphasize values reflecting social stability, obedience, and a strong sense of community significantly higher than Germans who in turn emphasize values reflecting autonomy and

readiness for change significantly higher than Zambian participants (e.g., Hofer & Chasiotis, 2003). This pattern has been confirmed in the present samples (Lehmann et al., 2021).

According to ethnic (tribal) and/or linguistic affiliations, Zambia is typically described as a multi-ethnic nation of mostly Bantu-speaking groups. In the 2000 census, more than 70 groups are listed, yet most Zambians belong to nine main ethnolinguistic groups (Posner, 2005). In rural areas, each ethnic (linguistic) group is concentrated in a particular geographic region. In contrast, in Lusaka (the capital), where data collection took place, all ethnic groups are present (Kula & Lutz, 2008). As ethnic groups of Bantu origin share cultural orientations that typically reflect a collectivistic pattern of norms and values, we did not restrict recruitment to any specific group. With respect to the German subsample, all adolescents were born and raised in Germany.

Participants

When determining the required sample size for the present research project that assures adequate power to detect the statistical significance of assumed effects, we based our calculation on the hypothesized moderation effects of implicit motives. The moderation effects of implicit motives tend to be small ($f^2 = .02$; see e.g., Hofer & Busch, 2011; Hofer, Busch, Bond, Campos et al., 2010; Hofer, Busch, Bond, Li, & Law, 2010). Thus, we used a more liberal Type I error rate of $p < .10$ in power analyses. The sample size was determined by use of the statistical tool G*Power: Alpha was set to .10 and power to .95 resulting in a power of .90 (i.e., $.95 \times .95$) in the current analyses as we were simultaneously testing two moderation effects (two-tailed testing). Analyses recommended assessing data from at least 543 participants.

In total, 615 adolescents participated at both assessment times. However, due to missing data on implicit motives (missing stories; stories too short to be coded; $n = 17$) or goals ($n = 41$), only 557 data sets could be considered in analyses. Adolescents who had to be excluded from the analyses did not differ in distributions of age, sex, and class level from participants in the final sample. However, a significantly higher percentage of Zambian adolescents (15.2%;

$n = 42$) compared with German adolescents (4.7%; $n = 16$) had to be excluded ($\chi^2_{615} = 19.38$; $p < .001$).

Consequently, data from 322 German (178 females) and 235 Zambian (113 females) participants were included in the study sample. Gender distribution did not differ significantly between cultural samples. Participants were between 11 and 21 years of age ($M = 14.72$; $SD = 1.58$). Female and male participants as well as German and Zambian participants did not significantly differ in age. All participants were students at secondary schools in grades seven to eleven. In detail, students were recruited at three secondary schools in the southwestern part of Germany and two secondary schools in Lusaka, Zambia.

Procedure

The research was conducted in accordance with the declaration of Helsinki. Before data collection, the Research Ethics Committee of the University of Zambia and the local school authority in Rhineland Palatinate (Germany) approved the study. In the following, administrators of secondary schools and parents were informed about the study. Parents of younger adolescents were asked for permission and prior to data assessments, all participants signed an informed consent form. Students voluntarily partook in the study and were assured that any information given would be treated confidentially and processed anonymously. At the end of the questionnaire, students were asked to indicate their willingness to participate in subsequent data assessments. In both research regions, participants received monetary compensation.

At the first measurement point, German and Zambian students took the questionnaire during free periods on school premises. Trained local research assistants supervised sessions. The second data assessment took place approximately 7.5 months ($SD = 1.38$; range 6–10 months) after the first data assessment. In Zambia, students took the questionnaire again during free lessons on school premises. In contrast, German students were informed about the second leg of the study during school lessons and received a link to respond to an online version of the

questionnaire. In Germany, measures were administered to adolescents in German. In Zambia, English is one of the official languages, predominantly used in administration, business, and higher education. Thus, measures were administered to Zambian adolescents in English. English and German versions of all measurements were at hand.

Measures

At the first measurement point, the strength of the implicit power motive was assessed. Next, adolescents provided data on personal goal dimensions but also on psychological constructs not relevant to the analyses at hand (e.g., dimensions of identity development). In the second leg of the study, adolescents provided data on personal goals and, again, on other variables not relevant for the study at hand.

Implicit Motives

The implicit achievement (*nAchievement*), affiliation (*nAffiliation*), and power motives (*nPower*) were assessed by a Picture Story Exercise (PSE; McClelland et al., 1989), the standard measure for implicit motives. A standard instruction for PSE recommended by Smith and colleagues (1992) was used in the present study: Participants were informed that they would see a number of pictures. They were asked to imagine what is going on in the depicted situation and write a story about the people shown in the picture. In the instruction, it was emphasized that there are no right or wrong stories. After showing each picture card for 30 seconds, the participants were given 5 minutes to write a story on it. On each story sheet, four questions reminded participants to compose a complete story: (a) What is happening? Who are the people?, (b) What has led up to this situation? That is, how did the story begin?, (c) What are the people thinking about, what do they want, and how do they feel?, and (d) What will happen? How will the story end? (see Smith et al., 1992, for details on instructions for PSE measurements).

We used six picture cards that have proven to be applicable in research on implicit motives across cultural groups (e.g., Hofer, Busch, Bond, Campos, et al., 2010; Hofer, Busch,

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Bond, Li, & Law, 2010) in the following order: *couple by a river*, *ship captain*, *women in a lab*, *night club scene*, *boxer*, and *four men seated at a table* (for reprints see McClelland, 1975; McClelland & Steele, 1972; Smith, 1992). The picture set possessed an adequate pull for the three target motives to provide a valid measure of motive strengths (Smith et al., 1992; see also Schultheiss & Brunstein, 2001).

According to Winter's (1994) well-established manual, *nAchievement* is scored for any indication of a standard of excellence, usually expressed in references to successful competition with others, unique accomplishments, disappointment about failure, descriptions positively evaluating performances, and/or successful realization of goals. Any response indicating friendly relationships as expressed by positive feelings toward others, regret about the disruption of a relationship, friendly companionate activities, or friendly nurturant acts is coded for *nAffiliation*. Finally, *nPower* is scored in the following instances: strong, forceful actions (i.e., doing something that intentionally has an impact on another person), control (i.e., monitoring another person's behavior), unsolicited help (i.e., voluntarily helping somebody else), influencing or persuading (i.e., trying to convince somebody of one's opinion), mentioning of fame or reputation (i.e., worrying about how one is viewed by other people), and strong emotional reactions (i.e., reacting with strong affect to something somebody else has done).

Picture stories were coded by four well-experienced German assistants who all achieved percentage agreements of 85% or higher with training material prescored by experts (Winter, 1994). In addition, all four assistants initially coded 20 full sets of picture stories: By applying a two-way, random effects model with absolute agreement, intraclass correlations (ICCs; see Shrout & Fleiss, 1979) were calculated to scrutinize interrater reliability. ICCs were .760 (*nAchievement*), .852 (*nAffiliation*), and .764 (*nPower*), indicating good interrater reliabilities for implicit motives (single measure reliability). Thus, each assistant independently coded a

different set of the remaining picture stories. Yet, scoring problems were resolved by discussion in regular team sessions.

The number of motive imageries totaled across stories ranged from 0 to 12 ($M = 2.58$; $SD = 1.77$) for achievement, 0 to 16 ($M = 4.74$; $SD = 2.54$) for affiliation, and 0 to 14 ($M = 3.58$; $SD = 2.62$) for power. Protocol length ranged from 186 to 786 words ($M = 423.39$; $SD = 105.73$). As the number of motive images was significantly correlated with word count (achievement: $r = .192$, affiliation: $r = .437$, power: $r = .475$; $ps < .001$), confounding effects of protocol length on motive scores were corrected by regression across cultural groups.

Goals

A slightly adapted version of the questionnaire GOALS (Pöhlmann & Brunstein, 1997) was administered to assess commitment to (operationalized through the GOALS importance scale; t1) and successful realization (t1 and t2) of goals. Items assigned to the agency-related goal dimensions of achievement and power were slightly rephrased to better depict adolescents' everyday life. First, achievement items were assigned to the school context, and second, power items to the community in which adolescents presently live in. With respect to the present analyses, three goal domains, which are measured by four items each, were relevant, that is, the domains of achievement (e.g., "continuously improve myself *at school*"), affiliation (e.g., "spend a lot of time with friends"), and power (e.g., "be able to exert influence *in my community*").

Participants rated each of the goals on a 5-point Likerttype scale ranging from 1 to 5 with higher scores indicating higher importance and success in realization, respectively. In the total sample, Cronbach's alphas for achievement goals were .757 for goal importance at t1 (German sample: .787, Zambian sample: .387), .845 for successful goal realization at t1 (German sample: .888, Zambian sample: .722), and .886 for successful goal realization at t2 (German sample: .924, Zambian sample: .762). With respect to affiliation goals, Cronbach's α s were .805 (German sample: .791, Zambian sample: .739) for goal importance at t1, .829

(German sample: .843, Zambian sample: .777) for successful goal realization at t1, and .850 (German sample: .834, Zambian sample: .840) for successful goal realization at t2. Finally, alphas for power goals were .682 for goal importance at t1 (German sample: .748, Zambian sample: .603), .783 for successful goal realization at t1 (German sample: .864, Zambian sample: .672), and .829 for successful goal realization at t2 (German sample: .859, Zambian sample: .791). Given the low internal consistency of the achievement goal scale (importance) in the Zambian sample, additional analyses indicated a low item-scale correlation for the item “broaden my (intellectual) horizons at school.” ($r_{it} = .163$). Moreover, the respective item also showed the lowest item-scale correlations in scales measuring success in goal realization ($\leq .397$). Thus, the respective item was not used for measuring achievement goal dimensions at both measurement times in the Zambian sample. Dropping the item enhanced Cronbach’s α s to .534 (importance), .799 (realization t1), and .809 (realization t2) among Zambian participants. Due to missing data, one German participant did not receive a score for the realization of affiliation goals at the first measurement point.

Measurement Invariance

In research across cultural contexts, the measurement equivalence of instruments has to be examined. In the present study, however, we could refrain from an examination of measurement equivalence as the cross-cultural applicability of GOALS has repeatedly been demonstrated in different cultural groups including Zambians (e.g., Hofer & Chasiotis, 2003). Moreover, internal consistencies of self-report scales assessing goals indicate that sets of items can be treated as measuring single latent variables in the German and Zambian samples.

With respect to implicit motives, it was not possible to examine its construct equivalence in the present study. Yet, there is conclusive evidence for the construct’s applicability and meaningfulness in various cultural contexts (see e.g., Hofer et al., 2005). Moreover, most picture stimuli used for the assessment of implicit motive strengths have been successfully applied in cross-cultural research on implicit motives (e.g., Hofer & Busch, 2011; Hofer, Busch,

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Bond, Li, & Law, 2010). Given, however, that cross-cultural research on implicit motives is still scarce, the picture set used in the present PSE was screened for item/picture bias (i.e., differential item functioning) by use of analysis of variance (Van de Vijver & Leung, 1997).

In analyses, the single item/picture score for a given implicit motive (e.g., *nPower*) was the dependent variable. Cultural group (two levels) and score level (three levels) were entered as the two independent factors. Based on adolescents' totaled score for a given implicit motive (e.g., *nPower*) across the six picture cues score level was determined by splitting the total sample into three score-level groups of equal size (low-medium-high). A significant effect of score level is expected to be found in analyses as individuals at higher score levels ought to score higher on a given picture cue. In contrast, significant effects of a cultural group and the interaction of a cultural group and score level would indicate bias. Uniform bias is indicated by a significant effect of culture, that is, across all score levels individuals from one group score higher (or lower) than individuals from other groups, even if they have similar total test scores. In addition, a significant interaction term (cultural group by score level) indicates non-uniform bias, that is, the difference between cultural groups depends on the level of the underlying trait (Van de Vijver & Leung, 1997).

As expected, score level (i.e., motive strength) significantly predicts scoring of *nAffiliation* and *nPower* for each of the six picture cards and of *nAchievement* for five of the six picture cards ($F_{s2, 551}$ ranges from 8.48 to 164.15; $ps < .001$; η^2 s ranges from .030 to .373). Only, the score level of picture card 1 (*couple by a bridge*), which has a strong pull for *nAffiliation*, does not significantly predict the strength of *nAchievement* ($F_{2, 551} = 1.68$; $p = .188$; $\eta^2 = .006$). Moreover, analyses indicated the absence of non-uniform bias for *nAchievement* and *nPower* as well as for four picture cards with respect to the assessment of *nAffiliation*: In none of the analyses, the interaction term showed a significant effect ($F_{s2, 551} \leq 2.80$; $ps \geq .061$; $\eta^2 \leq .010$). Two picture cues showed a significant effect of the cultural group by score level: *couple by a bridge* ($F_{2, 551} = 3.07$; $p = .047$; $\eta^2 = .011$) and *four men seated at a*

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table ($F_{2, 551} = 3.89$; $p = .021$; $\eta^2 = .014$). Finally, uniform bias could not be identified in analyses on *nAffiliation* for five picture cards and four picture cards in analyses for *nAchievement* and *nPower*, respectively ($F_{s1, 551} \leq 3.50$; $ps \geq .062$; $\eta^2s \leq .006$). In detail, analyses suggest uniform bias, as indicated by a significant effect of cultural group, for the following picture cards: *ship captain* ($F_{1, 551} = 5.88$; $p = .016$; $\eta^2 = .011$) and *night club scene* ($F_{1, 551} = 4.49$; $p = .035$; $\eta^2 = .008$) for *nAchievement*; *women in a lab* ($F_{1, 551} = 6.48$; $p = .011$; $\eta^2 = .012$) and *night club scene* ($F_{1, 551} = 5.21$; $p = .023$; $\eta^2 = .009$) for *nPower*; *four men seated at a table* ($F_{1, 551} = 9.05$; $p = .003$; $\eta^2 = .016$) for *nAffiliation*. However, all effects potentially pointing to uniform and non-uniform bias, respectively, were not large enough to be practically important ($\eta^2 \geq .06$; see Meiring et al., 2005). Given these findings, we could refrain from removing either picture cue that showed slight indications of bias.

To conclude, analyses on measurement invariance indicated that psychological constructs used in the study greatly overlap between cultural samples allowing us meaningful examinations of (structural) relationships among constructs across cultural groups.

6.3 Results

Before presenting the main analyses on the moderating effect of implicit motives on the relationship between goals' importance and successful realization of goals across cultural samples, general statistics of the measures and correlations among variables as well as with participants' age and sex are presented.

Correlations and Covariates

In Table 7, descriptive statistics of measures for both cultural samples are given. Table 8 presents correlations among psychological constructs as well as with age and gender for the total sample. As usually reported, implicit motives show a nonsignificant (motivational domain of power) or, although significant, a rather moderate overlap with measurements of explicit goal importance and success (domains of achievement and affiliation). Both goal dimensions

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are significantly associated with each other within each of the three motivational domains of achievement, affiliation, and power.

Table 7*Descriptive Statistics of Measurements in Both Cultural Subsamples*

Measurement	<i>M (SD)</i> (GER)	<i>M (SD)</i> (ZAM)
<i>n</i> Achievement	-0.11 (1.69)	0.15 (1.79)
<i>n</i> Affiliation	0.37 (2.52)	-0.51 (1.79)
<i>n</i> Power	0.29 (2.47)	-0.39 (1.99)
Achievement goals (importance t1) ^a	4.07 (0.62)	4.82 (0.34)
Achievement goals (success t1) ^a	3.59 (0.76)	4.23 (0.73)
Achievement goals (success t2) ^a	3.61 (0.78)	4.34 (0.68)
Affiliation goals (importance t1)	3.73 (0.81)	2.82 (0.89)
Affiliation goals (success t1)	3.50 (0.84)	2.92 (0.91)
Affiliation goals (success t2)	3.39 (0.84)	2.78 (1.05)
Power goals (importance t1)	3.10 (0.81)	3.30 (0.85)
Power goals (success t1)	2.80 (0.87)	3.03 (0.84)
Power goals (success t2)	2.72 (0.86)	3.05 (0.97)

^aThree-item scale used for Zambian adolescents.

Moreover, achievement goal dimensions show significant positive correlations with power goal dimensions and significant negative associations with affiliation goal dimensions. The latter two are significantly positively correlated with each other. With respect to sociodemographic characteristics, analyses indicate the following pattern of results: Male adolescents ascribe significantly higher importance to power goals and report being more successful in realizing their power goals than female adolescents. Moreover, male adolescents score higher for *n*Achievement and lower for *n*Affiliation than do female participants.

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Table 8

Correlations among Measurements in the Total Sample.

	1	2	3	4	5	6	7	8	9	10	11	12
1 <i>n</i> Achievement	---											
2 <i>n</i> Affiliation	-.01	---										
3 <i>n</i> Power	.06	-.05	---									
4 Achievement (importance t1) ¹	.08(*)	-.16***	-.05	---								
5 Achievement (success t1) ¹	.10*	-.13**	-.11**	.55***	---							
6 Achievement (success t2) ¹	.10*	-.09*	-.14***	.47***	.64***	---						
7 Affiliation (importance t1)	.00	.17***	.06	-.25***	-.19***	-.20***	---					
8 Affiliation (success t1)	.04	.17***	.07(*)	-.17***	-.04	-.06	.71***	---				
9 Affiliation (success t2)	.06	.20***	.01	-.21***	-.10*	-.01	.58***	.65***	---			
10 Power (importance t1)	-.01	-.06	-.02	.24***	.16***	.13**	.28***	.18***	.11*	---		
11 Power (success t1)	.06	-.01	-.05	.20***	.34***	.26***	.20***	.37***	.26***	.53***	---	
12 Power (success t2)	.13**	-.02	-.06	.12**	.23***	.34***	.14***	.28***	.36***	.38***	.58***	---
13 Age	.01	-.04	-.15***	.01	.00	.00	-.11*	-.11**	-.08(*)	.04	.03	-.04
14 Sex ²	.15***	-.14**	.03	.07(*)	.04	.06	.07(*)	.06	.08(*)	.18***	.22***	.16***

(*) $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

Notes. 1: Three-item scale used for Zambian adolescents. 2: Sex coded 1 = female, 2 = male.

Sex differences in both achievement and affiliation goal dimensions are unremarkable. Concerning participants' age, a relation of higher scores of *n*Power with younger age was found. In addition, higher age was consistently associated with significantly lower evaluations of affiliation goal dimensions. Accordingly, adolescents' sex was entered as a covariate in analyses on power and age in analyses on affiliation goal dimensions.

At this stage of the analyses, we did not test whether corresponding pairs of correlations significantly differed from one another in cultural subsamples, as it was examined in the following analyses whether culture moderates model paths.

Test of Model on Moderation Across Cultural Groups

In our basic model, we assume that the importance of goals at t1 predicts the successful realization of goals at t2. In the second step, it is tested whether culture moderates the assumed relationships between psychological constructs. In analyses, success in realizing goals at t1 is included as a covariate. In addition, culture is included as a covariate in the first leg of analyses but is used as a possible moderator in subsequent analyses. Given findings on associations between sociodemographic characteristics and goal success, age was entered as a covariate in analyses on affiliation and sex in analyses on power goal success.

The hypothesized models were tested by applying PROCESS macro for SPSS (version 4.0; see Hayes, 2022). In the first leg of analyses, the template for moderation (Model 1) was used with the importance of goals at t1 (predictor), goal success at t2 (dependent variable), and implicit motive strength at t1 (moderator). In addition, age and sex, respectively, culture, and goal success measured at t1 were entered as covariates. All variables included in interaction terms were mean-centered. The findings of first leg analyses are presented in Table 9. We will comment on the models' findings in the following order: achievement, affiliation, and power.

Table 9

Longitudinal Effects of Goals (Importance) and Implicit Motives on Goal Success

outcome	B (S.E.)	t-value	F-value	R ²
Success of achievement goals (t2)			90.618***	.451
			df = 5, 551	
Importance of achievement goals (t1)	.090 (.055)	1.657(*)		
<i>n</i> Achievement (t1)	.015 (.015)	.981		
Importance of achievement goals (t1)	-.007 (.023)	-.304		
* <i>n</i> Achievement (t1)				
Culture	.310 (.065)	4.765***		
Success of achievement goals (t1)	.520 (.038)	13.661***		
Success of affiliation goals (t2)			78.361***	.461
			df = 6, 549	
Importance of affiliation goals (t1)	.206 (.049)	4.177***		
<i>n</i> Affiliation (t1)	.030 (.014)	2.147*		
Importance of achievement goals (t1) *	-.015 (.014)	-1.017		
<i>n</i> Affiliation				
Culture	-.097 (.071)	-1.366		
Success of affiliation goals (t1)	.517 (.048)	10.765***		
Age	.004 (.020)	.221		
Success of power goals (t2)			51.403***	.359
			df = 6, 550	
Importance of power goals (t1)	.100 (.045)	2.242*		
<i>n</i> Power (t1)	-.005 (.014)	-.349		
Importance of power goals (t1) *	.032 (.016)	2.000*		

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<i>n</i> Power		
Culture	.178 (.065)	2.739**
Success of power goals (t1)	.551 (.043)	12.685***
Sex	.042 (.065)	.655

(*) $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

The model on achievement goal success was significant; however, neither a significant main nor a moderation effect of *n*Achievement could be verified ($R^2_{\text{change}} = .000$; $F_{\text{change}} = .093$; $p = .761$). Level of achievement goal success at t2 point was significantly predicted by reported success in goal realizations at t1, culture, that is, Zambian adolescents reported to be more successful than German participants, and, marginally significant, by the importance of achievement goals at t1. Also, the model on affiliation goal success at t2 became significant. As expected, goal success at t2 was significantly related to success at t1. Moreover, goal success was predicted by goal importance at t1 as well as strength of *n*Affiliation. Yet, no significant moderation effect of *n*Affiliation was found ($R^2_{\text{change}} = .001$; $F_{\text{change}} = 1.033$; $p = .310$). Participants' age and cultural background did not significantly predict affiliation goal success at t2. Finally, a significant amount of variance was explained by predictor variables in the model on power goal success at t2. In detail, no evidence of significant effects of participants' sex was verified. However, cultural background, that is, Zambian adolescents were reported to be more successful in realizing their power goals than did German students and success in realizing power goals at t1 significantly predicted successful realization of power goals at t2. While no significant main effect of *n*Power could be identified, the importance of power goals at t1 significantly predicted the successful realization of power goals at t2. However, this main effect of goal importance was qualified by adolescents' *n*Power ($F_{\text{change}} = 4.000$; $R^2_{\text{change}} = .005$; $p = .046$: At high [$B = .174$; $SE = .059$; $t = 2.952$; $p = .003$; 95% confidence interval: [.058, .289]] and medium [$B = .092$; $SE = .045$; $t = 2.065$; $p = .039$; 95% confidence interval: [.005, .180]]) levels of *n*Power, there is a significant association between power goal importance at t1 and

success in power goal realization at t2. In contrast, no significant relationships between both goal dimensions were found at low levels of *nPower* ($B = .030$; $SE = .056$; $t = .533$; $p = .594$).^{6,7}

Effects of Culture on Model Relationships

Finally, it was examined whether culture affects relationships between variables in the assumed model (PROCESS Model 3). As findings in Table 10 show for motivational domains of achievement, affiliation, and power, culture does not qualify findings derived by analyses across both cultural subsamples: None of the higher-order interaction terms including culture reaches the level of significance. Only a few minor changes could be identified: With respect to the domain of achievement, the main effect of the importance of power goals (t1) on the realization of power goals at t2 becomes significant whereas it was marginally significant in prior analyses. Moreover, the main effect of *nAchievement* on the realization of power goals at t2, which was not significant in the first step of analyses, becomes marginally significant.

⁶ To examine the robustness of our findings, additional analyses were performed excluding the covariates culture, age, and sex, respectively. Mostly, the findings are in line with the results presented in the text. With respect to analyses on success in realizing achievement goals t2, there is only one slight change: Instead of showing a marginal significance, achievement goal importance at t1 significantly predicts the realization of achievement goals at t2 in additional analyses ($B = .211$; $SE = .054$; $t = 4.281$; $p < .001$). Analyses on the domain of affiliation exactly mirror the findings in the text. Finally, analyses in the power domain without controlling for culture and sex do not produce findings that meaningfully deviate from the ones reported in the text: Only the interaction term drops from the level of significance to marginal significance ($B = .030$; $SE = .016$; $t = 1.831$; $p = .068$). Yet, the significance of conditional effects at high and medium levels did not change.

⁷ In further analyses, it was found that the time interval between both measurement points significantly correlated with self-reported success in goal realization at t2 (achievement: $r = -.410$; affiliation: $r = .265$; power: $r = -.136$; $ps \leq .001$). Thus, we reran models with time intervals as additional covariates. Findings exactly mirror the ones reported in the text, with the exception of the main effect of the importance of achievement goals at t1: While the main effect was marginally significantly related to success in realizing achievement goals at t2 in original analyses, it does not reach the level of significance ($B = .089$; $SE = .055$; $t = 1.634$; $p = .103$) when the additional covariate was included.

Finally, in analyses on power goal realization at t2, the moderation effect of *nPower* is marginally significant ($p = .068$) while it was significant in analyses across cultural samples.

Table 10

Effects of Cultural Group on Links between Components in the Assumed Model

outcome	B (S.E.)	t-value	F-value	R ²
Success of achievement goals (t2)			57.864***	.458
			df = 8, 548	
Importance of achievement goals (t1)	.140 (.065)	2.161*		
<i>nAchievement</i> (t1)	.036 (.019)	1.904(*)		
Importance of achievement goals (t1) * <i>nAchievement</i> (t1)	.001 (.030)	.021		
Culture	.254 (.080)	3.185**		
Culture * Importance of achievement goals (t1)	.183 (.139)	1.316		
Culture * <i>n Achievement</i> (t1)	-.041 (.039)	-1.028		
Culture * Importance of achievement goals (t1) * <i>nAchievement</i> (t1)	-.102 (.064)	-1.590		
Success of achievement goals (t1)	.521 (.038)	13.602***		
Success of affiliation goals (t2)			52.276***	.463
			df = 6, 549	
Importance of affiliation goals (t1)	.204 (.049)	4.140***		
<i>nAffiliation</i> (t1)	.038 (.017)	2.264*		
Importance of achievement goals (t1) * <i>nAffiliation</i>	-.007 (.016)	-.441		
Culture	-.083 (.072)	-1.147		

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Culture * Importance of affiliation goals (t1)	.067 (.075)	.983	
Culture * <i>n</i> Affiliation (t1)	.031 (.036)	.847	
Culture * Importance of affiliation goals (t1) * <i>n</i> Affiliation (t1)	.017 (.034)	.511	
Success of affiliation goals (t1)	.518 (.049)	10.675***	
Age	.001 (.020)	.050	
Success of power goals (t2)			35.022*** df = 9, 547
Importance of power goals (t1)	.111 (.045)	2.457*	
<i>n</i> Power (t1)	-.010 (.014)	-.680	
Importance of power goals (t1) * <i>n</i> Power	.030 (.017)	1.832(*)	
Culture	.178 (.065)	2.739**	
Culture * Importance of power goals (t1)	-.125 (.078)	1.599	
Culture * <i>n</i> Power (t1)	-.011 (.030)	-.378	
Culture * Importance of Power goals (t1) * <i>n</i> Power (t1)	.049 (.034)	1.445	
Success of power goals (t1)	.555 (.043)	12.789***	
Sex	.035 (.065)	.536	

(*) $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

6.4 Discussion

In the study at hand, we hypothesized that goal commitment at t1 would interact with implicit motive strength to predict goal success at t2 approximately 7 months later. That is, for those high in a given implicit motive, goal importance and goal success should be associated

more closely than for those low in implicit motive strength. We tested this hypothesis for the three motivational domains of achievement, affiliation, and power. Finally, we hypothesized that participants' culture of origin, that is, whether they were born and raised in an individualistic (Germany) or a collectivistic (Zambia) cultural context, does not affect the relationships between psychological constructs.

Measurement Equivalence

Given that we collected data in two highly different cultural contexts, the measurement equivalence of instruments had to be examined before testing our hypothesized model. Based on findings reported on the cross-cultural applicability of the instruments used in the present study (e.g., Hofer & Chasiotis, 2003, on goal dimensions) and analyses on item/picture bias (differential item functioning, see Van de Vijver & Leung, 1997) for the implicit motive assessment, we concluded that (structural) relationships among psychological constructs could be meaningfully examined across cultural groups.

Main Study Findings

Bivariate correlations between psychological constructs corroborate findings typically reported and point to the significance of our assumed model: First, in line with the two-system model of motivation (McClelland et al., 1989), implicit motives and goals dimensions hardly show any overlap with each other. Correlation coefficients were either nonsignificant or small. The highest correlations between implicit motives and goals were found in the motivational domain of affiliation. This finding indicates that individuals differ in how far both types of motives are aligned with each other. Second, the goal dimensions of importance and success were found to be significantly associated with each other (Klein et al., 1999). Our model-related analyses across cultural samples support our assumptions on longitudinal effects of goal importance on goal success (controlled for goal success at t1). Moreover, the assumed moderating effects of implicit motives could be confirmed in the motivational domain of power: Commitment to power goals (t1) predicts successful power goal realization (t2) only

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among adolescents with a pronounced *nPower*. Importantly, additional analyses showed that culture did not qualify for moderating effects of the implicit power motive. Thus, the present findings demonstrate the importance of implicit motives for the successful realization of power goals once one has committed to power goals. This finding is in line with previous literature on “hot” and “cold” goals (Brunstein et al., 1998; Schultheiss et al., 2008). Notably, power goal commitment predicted successful power goal realization approximately 7 months later. Yet, we could demonstrate that goal realization only increases when goal commitment is underpinned by a strong *nPower*. During adolescence, power-related strivings (e.g., to be able to exert influence in my community) might not be unconditionally appreciated by adolescents’ interaction partners (Hofer & Chasiotis, 2003). Thus, as (long-term) power goal realization might be tedious and bothersome at times, a strong implicit power motive helps individuals to stay on track. Implicit motives’ capacity to experience the consummation of motive-specific incentives as rewarding and pleasurable (Brunstein et al., 1998) might help to sustain power goal commitment and individuals’ effort to successfully attain the goal even under potentially tough circumstances.

Analyses on goal success in the domains of achievement and affiliation do not indicate that implicit motives moderate longitudinal effects of goal importance on goal success. In contrast, it was found that the successful pursuance of affiliation goals was predicted by a strong commitment to either affiliation goals or a strong *nAffiliation*. The main effect of *nAffiliation* suggests that adolescents even if reporting little commitment to affiliation goals might nevertheless successfully proceed in their goal striving when characterized by a strong *nAffiliation*. Probably, adolescents are able to experience implicit motives’ affective rewards without consciously reflecting on their goals (see Schultheiss et al., 2008). It also has to be noted that, in contrast to power goals, affiliation oriented strivings of adolescents are typically fostered rather than hindered by their social context. Thus, although we hypothesized to identify a moderation effect of *nAffiliation*, goal commitment alone entails beneficial effects on goal

success. Similar notions seem to apply to the motivational domain of achievement. However, we found the weakest association between goal importance and goal success within this motivational domain. Moreover, *nAchievement* did not predict the level of achievement goal success. Interestingly, however, the pattern of association between psychological constructs in the affiliation domain was replicated in model analyses that tested the moderation effects of culture on achievement goal success. It might be that the goal item content affected our findings. As described in the method section, achievement goal items were adapted to the school context (e.g., continuously improving myself at school). Although *nAchievement* can facilitate knowledge acquisition, it is arguable whether school contexts generally entail achievement-related incentives and thus arouse individuals' *nAchievement* (see also individually set vs. socially determined standards of excellence; Schultheiss & Köllner, 2014). Thus, future studies ought to use original goal items or adapt items to a non-school context to further examine the link between achievement goal dimensions and *nAchievement*.

Additional Findings

Finally, we would like to add a few brief comments on additional findings on the effects of sociodemographic characteristics on motive measurements, although age- and sex-related effects were nonsignificant in model analyses. First, age effects were identified for *nPower* and affiliation goals: Younger age was significantly associated with higher scores of both *nPower* and affiliation goal importance and success. Whether the rather weak but significant association between age and both *nPower* and dimensions of affiliation goals were found by chance or, with respect to *nPower*, reflect a change in parental strategies allowing children to develop a stronger need for power (see e.g., McClelland & Pilon, 1983) has to be examined in future research. With respect to the age correlation with affiliation goal dimensions, it might be more important for younger adolescents to establish friendships in the first place, whereas older adolescents are more concerned with increasing intimacy in existing friendships. Second, we found that male adolescents ascribed significantly higher importance to power goals and

furthermore reported to be more successful in realizing their power goals than did female adolescents. This finding is in line with research indicating sex differences in the domains of agency and communion (Bakan, 1966) with males putting greater emphasis on power-related values and goals (e.g., Schwartz et al., 2012). In line with previous findings, no significant sex differences could be identified for the *nPower*, however, male adolescents showed a higher *nAchievement* but a lower *nAffiliation* (e.g., Drescher & Schultheiss, 2016). Marginally significant gender-related differences in achievement- and affiliation-related goal dimensions are too weak to be meaningfully interpreted. Third, Zambian adolescents reported to be more successful in realizing their achievement and power goals than German adolescents. Although our analyses as well as findings reported in the literature indicate a level of measurement equivalence that allows an examination of structural relationships, it does not allow a meaningful comparison of means across cultural samples. Thus, we refrain from an interpretation of cross-cultural differences in reports of goal success.

Limitations und Outlook

Although analyses generally support our assumptions, some limitations have to be considered. First, our sample size, given that one accepts using a more liberal level of significance for detecting interaction effects in power analysis ($p < .10$; e.g., Fairchild & MacKinnon, 2009; Pedhazur, 1997) provided us with enough power for meaningfully examining moderation effects of implicit motives across cultural samples. Yet, findings on three-way interactions testing whether moderator effects of implicit motives are qualified by participants' cultural background are to be interpreted with some caution. Thus, future research has to go the tedious way to recruit even bigger samples to replicate our finding that culture does not further qualify main and moderation effects of implicit motives on goal dimensions. Second, we relied on self-report measures for explicit goal assessment. Hence, we cannot rule out the possibility that they are subject to social desirability or response bias. For example, individuals might rate successful goal realization in line with their evaluation of goal

commitment, rather than give a realistic appraisal of their success. Moreover, the achievement-related item “broaden my (intellectual) horizons at school” of the GOALS questionnaire had to be excluded in current analyses of the Zambian data because it showed an insufficient item-scale correlation. Thus, in future cross-cultural research an adapted version of the item ought to be used.

Conclusion

In sum, the present cross-cultural study adds to a growing body of literature indicating that implicit motives represent a significant component of individuals’ personalities that ought to be considered in motivational research. The strength of implicit motives plays an important role in goal development but also affects future success in goal realization. Our results were obtained in adolescent individuals in two highly diverse cultural contexts using a longitudinal approach. Generally, the present findings can be considered only a first hint at universal relationships between psychological constructs at hand. Thus, it is necessary to include a broader range of cultural contexts and maybe different age groups in future research endeavors. We hope that the present research will help to initiate more future research on the role of implicit motives across the lifespan.

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7. General Discussion

To take up the introductory quote by Thrash et al. (2010), the empirical studies collected in this dissertation aim to shed light on implicit motives by descending into the basement, rather than by merely turning on a light in the attic. Specifically, the main goal was to extend the sparse findings on implicit motives in childhood and adolescence by examining psychological correlates of the three implicit motives *n*Achievement, *n*Affiliation, and *n*Power. The present dissertation contributes to the existing body of knowledge by building on research focusing mainly on the domain of *n*Power and *n*Affiliation (Raihala & Hansen, 2019; Raihala & Kranz, 2019; Spengler et al., 2020a, 2020b), thereby enhancing the understanding of children's needs.

Starting with a developmental perspective on *n*Power, Study 1 demonstrates the role of authoritarian parenting as well as children's perception of psychologically controlling parenting for the development of *n*Power. By implementing a longitudinal design, it was possible to show that higher authoritarian, but not positive parenting as reported by the parents at children's age 6/7 predicted children's scores of *n*Power approximately 3.5 years later. Furthermore, by taking children's perception of parental behavior into account, psychological control could be identified as a moderating variable. That is, the longitudinal negative association of authoritarian parenting as reported by parents and children's *n*Power was only present in children that reported high or medium levels of psychologically controlling parenting, but not for those that reported low levels of psychologically controlling parenting. These results are in line with and expand pioneering work on the association of parenting behavior and *n*Power (McClelland & Pilon, 1983). However, our results challenge the notion of implicit motives as stable personality dispositions across the lifespan that are formed in the preverbal stages of development (McClelland et al, 1989). Nevertheless, our findings are in line with the reasoning of (dis-)incentive fueled learning experiences that persist throughout the lifespan (Denzinger & Brandstätter, 2018; Schultheiss & Köllner, 2014).

Both Study 1 and Study 2 focused on the agentic motives of *nPower* and *nAchievement*, respectively. However, while the primary objective of Study 1 was to identify developmental predictors of *nPower*, Study 2 had the aim to identify the energizing role of *nAchievement* for objective performance while considering the moderating effect of competitive anxiety. In detail, a positive association of *nAchievement* and swimming performance in children and adolescents could only be identified when they reported low levels of cognitive and somatic competitive anxiety. At medium levels of cognitive and somatic competitive anxiety, there was no significant association of *nAchievement* and swimming performance, while at high levels of cognitive and somatic anxiety, there was a negative association of *nAchievement* and swimming performance that fell just short of reaching statistical significance. Lastly, the association of *nAchievement* and swimming performance was positive and significant at high levels of self-confidence, not significant at medium levels of self-confidence, and negative and significant at low levels of self-confidence.

As with Study 2, the objective of Study 3 was to examine the function of implicit motives rather than their antecedents. In detail, the aim of Study 3 was to show that implicit motives facilitate the attainment of congruent goals. Study 3 encompassed all three implicit motives, that is, *nAchievement*, *nAffiliation* and *nPower*. Furthermore, the investigation of two diverse cultural samples, namely Germany and Zambia, has the potential to expand the scope of previous findings on goal pursuit. Specifically, regarding *nPower*, findings replicate existing research on “hot” and “cold” goals (Brunstein et al., 1998; Schultheiss et al., 2008), that is, power goal success was predicted by the interaction of power goal commitment and *nPower*. In detail, there was a significant positive effect of power goal commitment on power goal success only at high and medium, but not at low levels of *nPower*. This interaction effect was equivalent across both cultures. Regarding the domains of achievement and affiliation, only the respective main effects of goal importance reached significance and the main effect of *nAffiliation* reached marginal significance in the final model. Findings were consistent across

adolescents' cultural backgrounds, indicating an advance in research concerning the universality of goal pursuit processes involving implicit motives.

7.1 Limitations and Outlook

Limitations of Studies 1 to 3 are discussed in their respective chapters, yet, there are some overarching limitations that ought to be addressed. Primarily, despite the implementation of longitudinal designs in Studies 1 and 3, it has to be noted that relatively short time spans were examined in the respective studies. Study 2 solely relied on a cross-sectional design. Thus, causal inferences can only be drawn with caution. Research on the longitudinal development of implicit motives is still incredibly sparse. Although Denzinger and Brandstätter (2018) offer an extensive overview on the stability of implicit motives, they report mostly on cohort comparisons or tests of retest reliability of implicit motive measures. Future studies concerning the development of implicit motives should aim to examine longer periods in individuals' lifespans. Thereby, critical periods for the development of implicit motives can be studied with regard to their implications for personality development in general. For example, taking Erikson's theory of psychosocial development (1968) into account, implicit motives could be studied in regard to their role for crisis resolution and, in turn, whether the process of crisis resolution affects the development of implicit motives. Erikson (1968) already stated that identity formation, as the core developmental task of adolescence, might involve implicit processes. Recent research on identity formation (Hofer et al., 2022) empirically underlines the importance of implicit motives for this developmental stage. Specifically, findings illustrate the benefits of exploration and commitment of identity elements that are undermined by adolescents' respective implicit motive (Hofer et al., 2022).

Since implicit motives are theorized to develop in the preverbal stages of development (McClelland et al., 1989), future studies on the role of parenting behavior ought to take a closer look at these early stages of motive development. Specifically, observations of early parent-child interactions might add valuable insights when studied longitudinally with respect to the

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development of implicit motives. Recent findings demonstrate effects of parental levels of *n*Affiliation and *n*Power as well as parents' attachment style and the interaction of the two on early parenting behavior (Safyer et al., 2019). This research ought to be complemented by assessing children's implicit motives as early as possible, in order to enhance our understanding of the transgenerational transmission of implicit motives. Furthermore, by examining longer timespans and taking both parents' and children's implicit motives as well as parenting behavior into account, conclusions on the bidirectionality of their relationship might be drawn. In essence, a child with high levels of *n*Power will display certain behaviors in order to have an impact. These behavioral tendencies might affect parents' child-rearing practices, resulting either in rewarding children's power strivings or punishing them. Whether children's power strivings are rewarded or punished might depend on parents' implicit motives. A highly power-motivated parent, for instance, might even experience power stress as a result of children's power-motivated behavior (e.g., Wray-Lake et al., 2010). It seems likely that, in turn, this parent will attempt to suppress children's power-motivated behavior, for instance through an increase in authoritarian parenting strategies, while a parent with low levels of *n*Power might take a more lenient approach to children's power-motivated behavior or even affectively reward this behavior.

The theorization of Study 1's research questions relied mostly on the role of (dis-)incentive driven learning experiences for the development of implicit motives (cf. Schultheiss & Köllner, 2014) and the sparse longitudinal findings on the development of *n*Power, that is, in essence, McClelland and Pilon's pioneering study from 1983. Drawing on Köllner and colleagues' (2019) framework of pruning and tuning, future research should also take prosocial behavioral manifestations of *n*Power into account. It seems likely that these prosocial behavioral tendencies are rewarded or at least tolerated rather than punished, providing children high in *n*Power with positive affective experiences of having an impact, leading to a positive circle of self-reinforcing motive-dependent learning processes (cf. Schultheiss & Köllner, 2014).

Additionally, building on existing research concerning bio-psychological markers of implicit motives (e.g., Köllner et al., 2019), the (possible) hereditary basis of implicit motives deserves further investigation.

It is imperative that future research focuses not only on the replication and extension of findings on *nPower*, but also takes *nAchievement* and *nAffiliation* into account to extend the scope of research on the development of implicit motives. This seems to be particularly important since Study 3 found the assumed moderating effect of implicit motives only in the domain of power, but not in the domains of achievement or affiliation. Recent evidence demonstrates a moderating effect of *nAffiliation* on the effect of social life events on subjective well-being that highlights the importance of motive congruence (Hofer et al., 2022). Apart from these recent findings and McClelland and Pilon's (1983) finding that unresponsiveness to children's crying was related to adults' *nAffiliation*, research focused mostly on the overlap of early attachment style and *nAffiliation* (Ainsworth et al., 1978; 2015). However, it has to be noted that these findings possibly only apply to the "dark side" of *nAffiliation* (Weinberger et al., 2010) that is theorized to be rooted in a fear of rejection (Boyatzis, 1973). The intimacy component of *nAffiliation*, on the other side, is theorized to be rooted in the hope of establishing intimate and warm relationships (McAdams, 1992). Transferred to parenting behavior as measured in the GE-APQ, positive, involved and responsive parenting might be linked to the intimacy component of *nAffiliation*, since these parenting behaviors are positively correlated with socio-emotional competencies (Reichle & Franiek, 2009). Likewise, the intimacy component of *nAffiliation* is associated with positive social outcomes (for overviews, see McAdams, 1992; Weinberger et al., 2010). However, findings regarding the distinction of the affiliation and intimacy component of *nAffiliation* remain rather heterogeneous (cf. Schultheiss & Köllner, 2021).

Regarding *nAchievement*, effects of strict toilet training and gratification of children's autonomous mastery could be identified (e.g., McClelland & Pilon, 1983; Winterbottom, 1958).

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Future studies ought to implement a measure of parenting behavior that incorporates both rules, for instance, the respective ZKE scale (Reitzle et al., 2001) and positive parenting, especially with regards to rewarding children's autonomous mastery of tasks, that is, authoritative parenting. Interestingly, in a recent study, Runge and colleagues (2025) found evidence for a transgenerational positive correlation of parents' *n*Achievement and their children's academic performance. Furthermore, they found a positive correlation of parents' explicit achievement motive with their expectations regarding children's academic achievement. These findings demonstrate the importance of taking parents' implicit as well as their explicit motives into account for the development of their children's academic motivation. Notably, though, the authors did not consider children's *n*Achievement or explicit achievement motive. Future studies ought to close this gap to shed light on which parental strategies predict implicit in comparison to explicit motives. While implicit motives are posited to develop through nonverbal parenting strategies that foster (dis-)incentive fueled learning experiences, explicit motives are posited to be developed through explicit verbal parenting strategies (McClelland et al., 1989; McClelland & Pilon, 1983). These explicit parenting strategies might in turn be associated with parents' implicit and explicit motives. For instance, Peterson and Stewart (1992) identified positive correlations of *n*Affiliation and *n*Power with parental generativity in women, as well as positive correlations of *n*Achievement and *n*Affiliation with involved parenting in men. In addition, Hofer and colleagues (2012) identified an association of mothers' *n*Power, but not *n*Affiliation, with frequency of body contact with their infants. Considering both *n*Power and the explicit power motive, Zemp and colleagues (2017) demonstrated a positive association of parental power motive incongruence with inconsistent parenting. Taking parenting strategies as well as children's development of both implicit and explicit motives into account would also allow inferences on antecedences of motive congruence, thereby adding to the sparse research on this important research question (see Schattke et al., 2011, for the relationship of early fostering of self-determination and adult levels of motive congruence).

It has to be noted, that in the dissertation at hand, although implicit motives were examined in conjunction with explicit constructs like competitive anxiety (Study 2) and goal commitment (Study 3), the interaction of the three implicit motives was not examined. In line with Winter and colleagues' channeling hypothesis (1998), findings on power stress in children demonstrate a moderating role of *nAffiliation* for the association of *nPower* and markers of power stress (Spengler et al., 2020b). Specifically, children high in *nPower* reported more negative attitudes towards a video-game character that dominated them only when they exhibited low or medium levels of *nAffiliation*. Future research should examine the moderating role of *nAffiliation* for the relationship of *nAchievement* and performance in team sports, for instance, since available research points to a positive impact of *nAffiliation* on performance in team contexts (e.g., Sorrentino & Sheppard, 1978).

Furthermore, it has to be noted that, despite basing the measurement of implicit motives in our studies on recent work on implicit motives in childhood (e.g., Raihala & Hansen, 2019; Spengler et al., 2020a, 2020b), specific methodological considerations for applying the PSE in samples of children and adolescents, for instance regarding minimum word count or time given to recount the stories, are still to be systematically implemented.

Lastly, although further steps to a more comprehensive knowledge on the universality of processes involving implicit motives could be made by investigating two diverse cultural samples in Study 3, Studies 1 and 2 solely relied on Western educated industrialized rich democratic (WEIRD) samples. Due to the rather homogeneous socio-economic background of participants in conjunction with the small sample size especially in Study 1, the generalizability of our findings is limited. Granting that effects and correlates of implicit motives are posited to be universal (cf. Hofer & Chasiotis, 2022), research on the universality of developmental processes forming implicit motives is still pending (for an exception see Chasiotis et al., 2006). Although absolute levels of implicit motives might differ as a function of early-life learning experiences, the influence of bio-psychological markers, for instance gonadal steroid hormones

like testosterone and progesterone, on the development of implicit motives is likely not culture specific. Still, in the future, a broader variety of cultural contexts should be considered in implicit and explicit motive research.

7.2 Implications

Notwithstanding the limitations previously discussed, the findings compiled in this dissertation carry some important implications for theory and practice. Firstly, taking children's perspective on parenting behavior into account offers an important addition to the rather heterogeneous findings on the overlap of parenting perceptions (for a meta-analysis, see Korelitz & Garber, 2016). Research on strongly negative parenting behavior, like punishing behavior or authoritarian parenting behavior, and strongly positive parenting behavior, like positive parenting behavior, indicates significant differences in children's and parents' perception of the respective parenting behavior (Reichle & Franiek, 2009). Therefore, in Study 1, we proposed a moderation rather than a mediation model. In line with research on the respective parenting behaviors, both authoritarian parenting and positive parenting from the parents' point of view differed significantly from psychological control and warmth/support from the children's point of view, respectively. However, recent evidence on the role of supportive and negative parenting for identity formation in adolescents (Lehmann et al., 2021) points to a significant overlap of parents' and adolescents' report of the two parenting behaviors. It has to be noted, however, that participants in this study were mostly in the middle to late stages of adolescence rather than on the verge of transcending into adolescence as in Study 1. Meta-analytical evidence points to an increase in overlap of parents' and children's perception of parenting with children's age (Korelitz & Garber, 2016). Generally, future studies on the conjoint effects of parents' and children's view on parenting should aim to implement corresponding measures for parents and children.

Interestingly, results in Study 3 point to a negative association of *n*Power and age, that is, older adolescents exhibited lower levels of *n*Power than younger adolescents. In comparison,

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in Study 1, no significant association of age and *nPower* was identified. Evidently, the age range of children in Study 3 was much broader in comparison to the age range in Study 1. Still, when comparing children's *nPower* of Study 1 at ages 6/7 at t1 to ages 9 to 11, no significant correlation could be identified. In Study 3, it was argued that the negative association of *nPower* and age might be due to shifts in parenting, that is, a decrease in authoritarian parenting behavior as children grow older. Despite the small sample size and limited age range of Study 1, the decrease in authoritarian parenting from t1 to t2 reached statistical significance, that is, parents reported significantly less authoritarian parenting approximately 3.5 years later when children had transitioned from middle to late childhood. It seems plausible that this decrease in authoritarian parenting continues as individuals transition from childhood to adolescence. By this point, personal independence of adolescents has likely been more established, potentially leading to a less pronounced need for negotiation through authoritarian parenting strategies (Havighurst, 1953). In the same notion, in Study 1, a significant decrease in positive parenting was observed over the course of the study period and, again, it seems plausible that this decrease persists through adolescence. Since adolescents tend to rely progressively less on parents to understand and regulate their emotions (Havighurst, 1953), the importance of positive parenting might also decrease during the course of adolescence.

Building on McClelland and Pilon's pioneering work from 1983, we solely focused on the influence of parents' behavior on the development of implicit motives. However, the potential impact of other caregivers should be considered in future research on the development of implicit motives, for instance, the role of teachers in kindergarten. Although findings demonstrate a positive association of teacher-children relationship with children's school enjoyment, self-concept and growth mindset (Lu et al., 2023), systematic research on teaching strategies in regards to children's implicit motives is still pending. However, it seems plausible that the theorization of affective learning experiences applied to parenting strategies might function similarly in other learning contexts (cf. Schultheiss & Köllner, 2014). This entails

important practical implications, since the significance of contexts outside the family environment for developmental processes increases during childhood (cf. Bronfenbrenner, 2000). For instance, children might encounter teachers that positively enforce independent task mastery, thereby fostering the development of *n*Achievement. Bridging the gap to findings from Study 2, this might in turn positively influence children's performance in various contexts. Following this notion, the impact of other caregivers or authority figures, for instance sport coaches, might function in a similar way and affect the (dis-)incentive fueled learning that fosters implicit motive development.

The findings on the role of *n*Achievement for objective performance in sport underline the energizing function of implicit motives. Although the direct association of *n*Achievement and performance postulated in prior research (Wegner & Teubel, 2014, Lang et al., 2012) could not be identified in Study 2, there was a positive association of *n*Achievement and objective performance at low levels of cognitive and somatic anxiety and at high levels of confidence, as well as a marginally significant negative association of *n*Achievement and performance at high levels of cognitive and somatic anxiety. This finding aligns with the channeling hypothesis (Winter et al., 1998), which postulates effects of explicit constructs like personality traits on the manifestation of implicit motives that include affective, cognitive and behavioral outcomes. It has to be noted, though, that the CSAI-2 is usually applied to study the state component of competitive anxiety (Martens et al., 1990b). Future research should make an effort to clearly differentiate between the state and trait component of competitive anxiety. Furthermore, since implicit motives are posited to influence long-term behavioral trends (McClelland et al., 1989; Schultheiss & Köllner, 2021), researchers ought to implement longitudinal designs in order to examine long-term effects of *n*Achievement on sports performance. Regarding instructions in performance contexts, future research should focus on non-verbal cues rather than purely verbal instructions to activate *n*Achievement. Prior findings demonstrate an effect of verbal cues on

the activation of the explicit achievement motive, but not *n*Achievement (Engeser & Baumann, 2014).

In Study 3, the focus also lay on the energizing function of implicit motives, however, not in regards to objective performance, but instead in regards to the subjective perception of successful goal realization while taking on a cross-cultural perspective. Adding to existing findings on “hot” and “cold” goals (Brunstein et al., 1998), these findings highlight the role of motive congruence for successful goal realization, at least in the domain of power. As various findings demonstrate, motive congruence is associated with positive outcomes such as well-being (e.g., Baumann et al., 2005). Therefore, it is crucial to apply these findings in order to not only understand, but actively foster striving for motive-congruent goals, especially in adolescence as a critical period for identity formation (Erikson, 1968). Strikingly, the main effect of *n*Affiliation on successful goal realization was significant, highlighting the energizing function of *n*Affiliation even in the absence of explicit goal commitment (cf. Brunstein et al., 1998).

7.3 Conclusion

Summing up, the objective of this thesis was to contribute to the existing body of research on implicit motives by incorporating two understudied demographics, namely children/adolescents as well as a non-WEIRD sample. An investigation of the Big Three implicit motives with consideration of both antecedents as well as objective and subjective parameters offers an approach to further enhance the understanding of a still sparsely researched construct that nevertheless shows important correlations with various psychological processes. Building on existing findings, the significance of childhood and adolescence as crucial developmental periods for the formation and realization of implicit motives could further be demonstrated. Undoubtedly, however, more research is needed to scrutinize the present findings. Moving forward, it is crucial to apply the knowledge gained from empirical research to benefit children and adolescents in their everyday lives.

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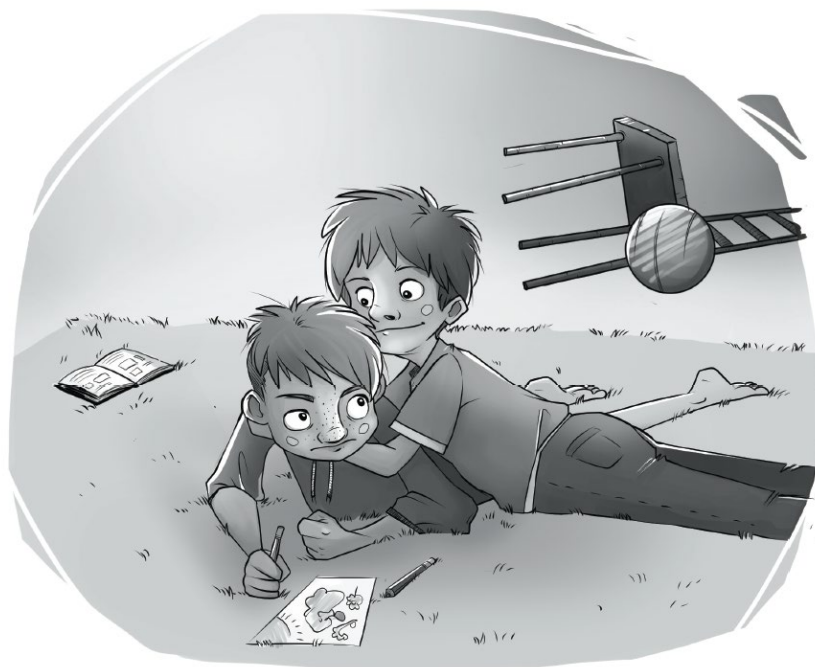
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9. Appendix

PSE Picture Cues for Children (Study 1)

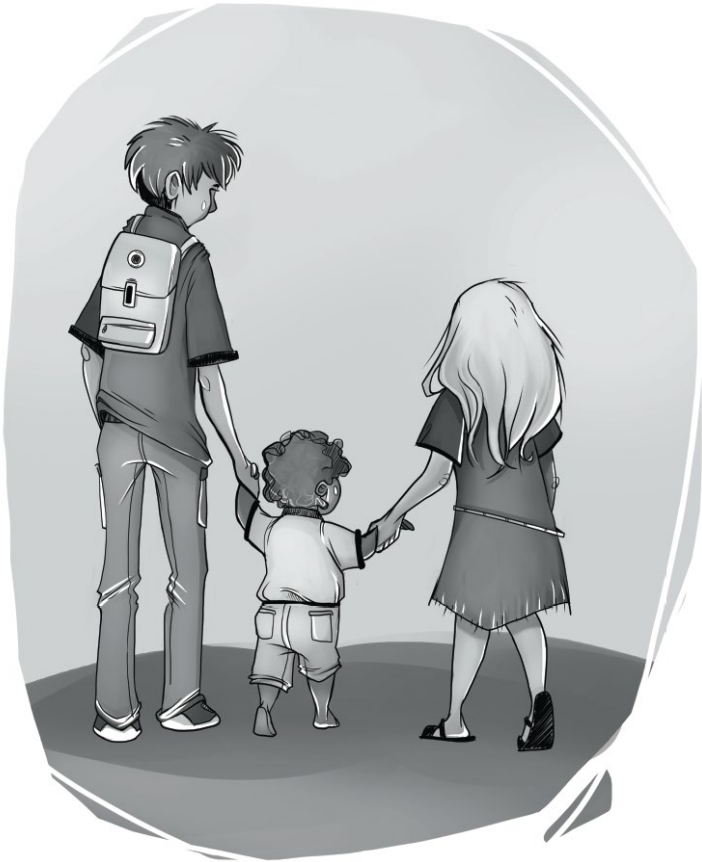
Picture 1: Children on the Floor



Picture 2: Children in School



Picture 3: Children Walking



Picture 4: Children and a Ball



Picture 5: Children and a Box



Picture 6: Children and Presents

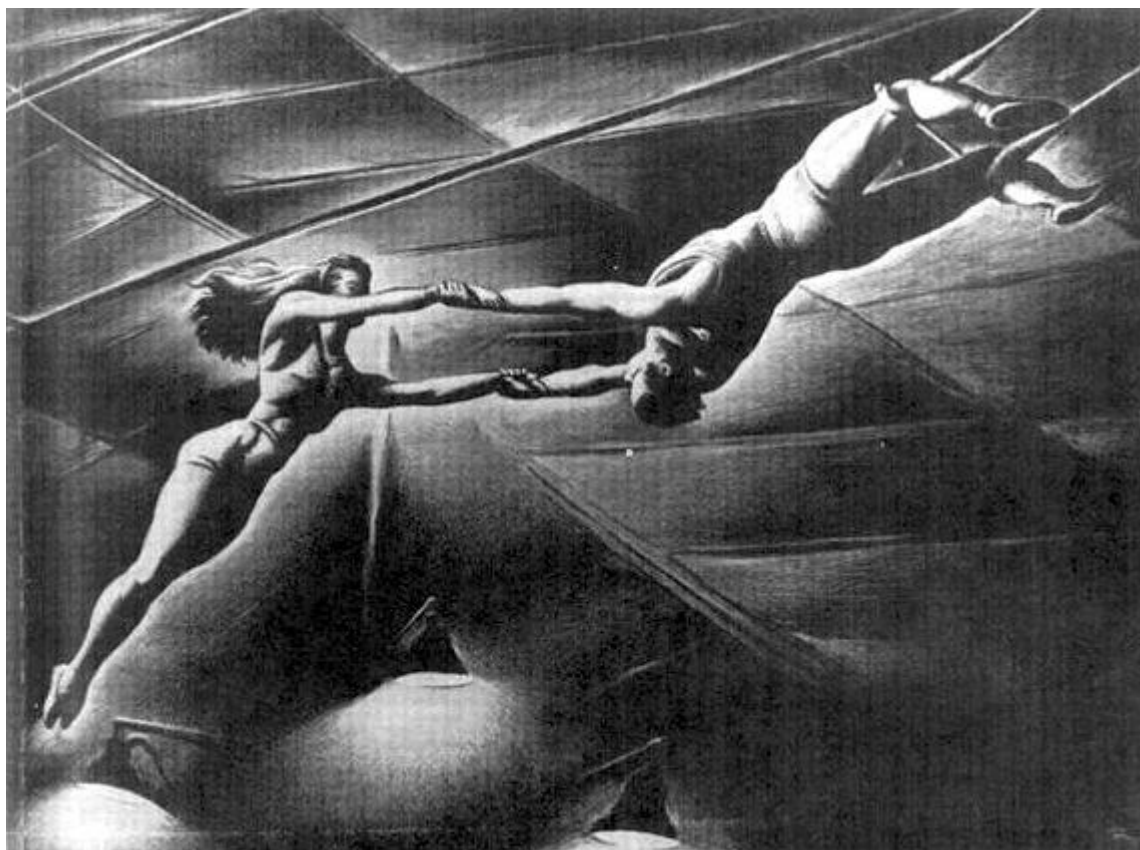


PSE Picture Cues with achievement pull for Children and Adolescents (Study 2)

Picture 1: Bicycle Race



Picture 2: Trapeze Artists



Picture 3: New Pic 17



Picture 4: New Pic 09

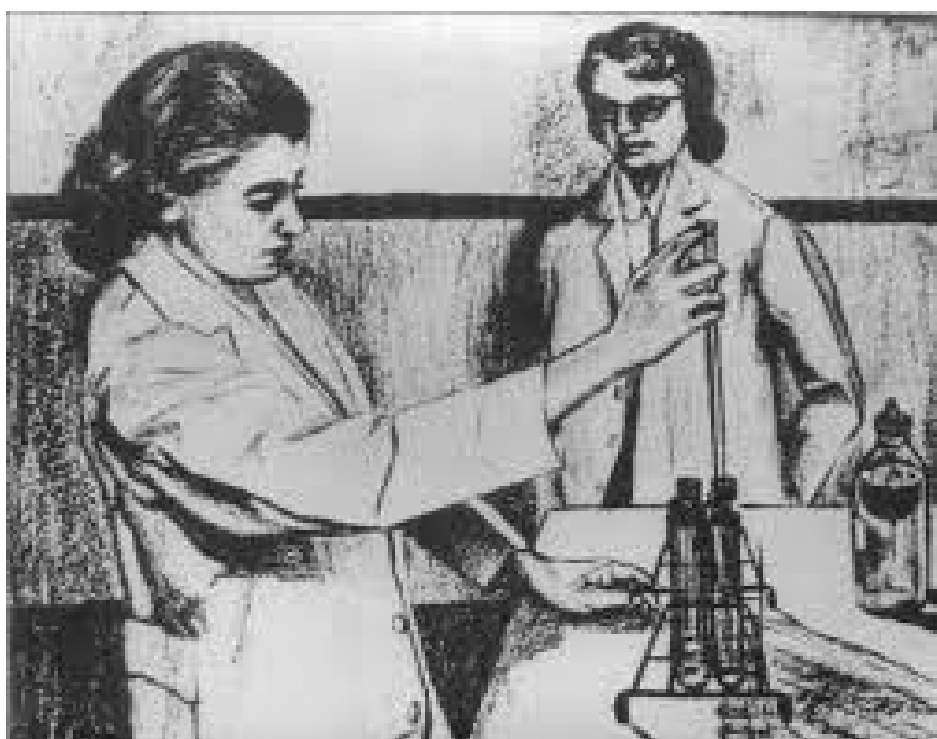


PSE Picture Cues Applicable Across Cultures for Adolescents (Study 3)

Picture 1: Couple by a River



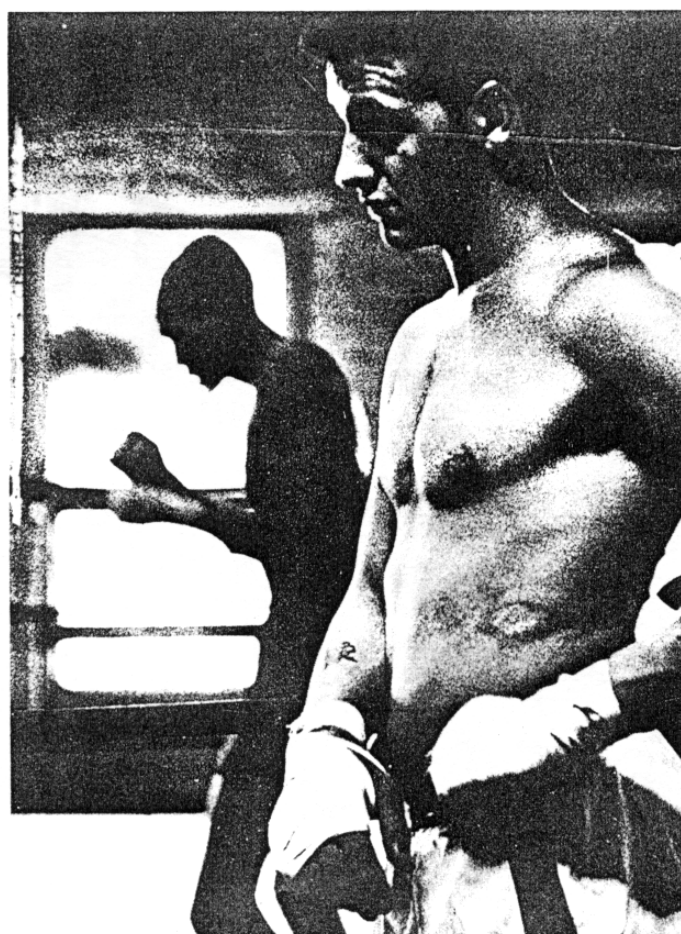
Picture 2: Women in a Lab



Picture 3: Nightclub Scene



Picture 4: Boxer



Picture 5: Four Men Seated at a Table



Picture 6: Ship Captain



Authorship, Publication Status, and Contribution

Chapters 4 to 6 represent empirical research articles that are published or submitted for publication. The respective status of each article as well as its authors and author contributions are listed in the following.

Study 1 (Chapter 4): Published Manuscript

Kerpen E., Busch, H., Schulte im Busch, B., & Hofer J. (2024). The role of parenting style for the development of the implicit power motive in children. *Motivation and Emotion*, 48, 264–277. <https://doi.org/10.1007/s11031-024-10071-4>

Ellen Kerpen: conceptualization, data curation, formal analysis, investigation, project administration, writing (original draft); Holger Busch: funding acquisition, writing (review and editing); Benedikt Schulte im Busch: data curation, investigation, project administration; Jan Hofer: conceptualization, funding acquisition, project administration, supervision, writing (review and editing)

Study 2 (Chapter 5): Manuscript Submitted for Publication

Kerpen, E., & Hofer, J. (2025). Beneath the Surface – the implicit achievement motive interacts with competitive anxiety in predicting adolescent swimmers’ performance

Ellen Kerpen: conceptualization, data curation, formal analysis, investigation, methodology, writing (original draft); Jan Hofer: supervision, writing (review and editing)

Study 3 (Chapter 6): Published Manuscript

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and Zambian adolescents. *Personality and Social Psychology Bulletin*, 50(9), 1408–1420.

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Jan Hofer: conceptualization, data curation, funding acquisition, project administration, supervision, writing (review and editing); **Ellen Kerpen**: conceptualization, writing (original draft); Holger Busch: conceptualization, funding acquisition, writing (review and editing); Meike Lehmann: data curation, investigation; Anita Menon: conceptualization, project administration

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I hereby declare in lieu of an oath that I have prepared the dissertation at hand without the unauthorized assistance of third parties and without the use of other than the stated aids. The data and concepts taken directly or indirectly from other sources are marked with reference to the sources. The dissertation has not been submitted to any other examination authority in the same or similar form, either in Germany or abroad. I assure the correctness of the preceding declaration and am aware of the legal consequences of a false statement.

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Trier, 22.08.2025

Ellen Kerpen