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Abstract

Applying a preschooler version of an instrument measuring implicit motives (Operant Multimotive Test), the authors investigated the interrelations of autobiographical memory, theory of mind, and implicit motives in the preschool years. Four- to 6-year-old children from Bamenda (Cameroon, $N = 30$) and Osnabrück (Germany, $N = 52$) were tested using a location false belief task, and a second order task as measures for theory of mind and a version of Wang and Leichtman's task on children's narratives as a measure of autobiographical memory coded with the Cognitive Complexity Scoring Manual. Regression analyses for mediator effects while controlling for moderating effects of culture show that cognitive complexity of autobiographical memory mediates the relationship of mentalistic abilities and sociocultural orientation of implicit motivation. Results are discussed within the framework of the independent-interdependent construal of the self.

Keywords

autobiographical memory, cross-cultural developmental psychology, implicit motives, independent self, interdependent self, false belief, second order false belief, theory of mind

There is growing evidence that universal developmental tasks are solved differently depending on sociocultural orientations of construals of the self, but empirical investigations of specific

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developmental pathways leading to these different self-construals are still scarce (Greenfield, Keller, Fuligni, & Maynard, 2003; Keller & Greenfield, 2000; Markus & Kitayama, 1991). In this study, we propose that different ways of processing autobiographical narratives in preschoolers can help explain the development of, and the relation between, false belief understanding and implicit motives and therefore ultimately the formation of the self. False belief understanding (Chasiotis, Kiessling, Hofer, & Campos, 2006) and autobiographical recall (Wang, 2004) have been repeatedly linked to differences in sociocultural orientation. Besides an almost concurrent ontogenetic emergence, autobiographical memory and false belief understanding share a meta-representational nature (Bjorklund & Pellegrini, 2002; Nelson, 2005; Perner, 2001). Moreover, conceptual relations between autobiographical experiences and the development of implicit motives have been postulated earlier (Atkinson, 1958; McClelland, 1987), and the link between autobiographical memory and implicit motivation has been empirically observed in adult samples (Woike, 1994). Thus, if autobiographical memory is developmentally related to false belief understanding and to implicit motives, the question arises whether there is also a developmental link between false belief understanding and implicit motivation. And if there is such a relationship between implicit motivation and false belief understanding and both are influenced by autobiographical memory, it is interesting to investigate whether these relations have developmental consequences for the formation of the self. In the following, the concepts of autobiographical memory, implicit motives, false belief understanding, and their interrelations will be presented before describing the aim of our study.

Autobiographical Memory

Remembering personally involving events, both significant and routine, is commonly understood as autobiographical recall (Bluck, 2003; Fivush & Nelson, 2004). Being able to recall and organize such events can help a child in establishing a domain general cognitive capacity that forms the basis for other domain-specific abilities like causality or intentionality (see Carver & Bauer, 2001, for support from research using delayed imitation, and Nelson, 1986, for evidence from research in language, play, and story recall). Ultimately, autobiographical memory can be regarded as a necessary tool for the developmental task of self-construction. Current research in this field takes an increasingly functional perspective, focusing on the “how” and “why” of remembering personal life events instead of assessing merely the recall performance of adults and children (Bluck, 2003; Bluck, Alea, Habermas, & Rubin, 2005).

At age 3 to 4, children start to participate actively in “memory talk” with their parents (Nelson, 1992; Pillemer & White, 1989), a process by which children begin learning to refer to themselves in the past. Depending on the cultural context, this process either focuses on the child as the main character (elaborative) or stresses the social responsibilities of the child (normative; see Wang, Liechtman, & Davies, 2000). It is generally not until 4 or even 5 years of age that children begin to locate their self in events in a specific past and future (Moore & Lemmon, 2001; Nelson, 2005). From this time on, the functions of autobiographical recall play a rapidly increasing role in children’s daily lives, even if autobiographical memory is generally not considered fully fledged at this stage (Bluck & Habermas, 2001). This role is signified by three functions of autobiographical recall: self, social, and directive (Bluck, 2003; see also Baddeley, 1987; Bluck et al., 2005). In the present study, we will focus on the difference between interpersonal (social) and intrapersonal functions (self, directive; see also Robinson & Swanson, 1990). Fostering continuity and promoting a stable sense of the self by knowing one’s own past are aspects typically seen as representative of the self-function (Conway, 1996; Neisser, 1988; Pillemer, 1992; Robinson & Swanson, 1990). Often seen as the main function of autobiographical memory (Fivush & Nelson,

2004; Neisser, 1988), the social function helps in establishing and maintaining relationships: Sharing memories (re)creates bonds (Pillemer, 1992), helps us in understanding others (G. Cohen, 1989), and enhances empathic skills (Bender, Lachmann, Chasiotis, & Pohl, 2008; Pohl, Bender, & Lachmann, 2005).

Such functional aspects are reflected in the manner in which people process autobiographical information. This mnemonic structure can be distinguished between a differentiated and an integrated way of organizing autobiographical content, which determines the cognitive complexity of the narrative (Woike, Gershkovich, Piorkowski, & Polo, 1999). Differentiation refers to the number of distinct and contrasting aspects in a memory, whereas integration is characterized by expressions of causalities and similarities between aspects. Both may operate together but serve different purposes: perceiving oneself as being different and unique as opposed to feeling interdependent and connected. Thus, these structural processes capture key elements of the functions of autobiographical memory for the self (differences and uniqueness) and social purposes (relationships and interdependence). Not surprisingly, cognitive complexity and the concept of independence and interdependence seem to be closely related. Independent individuals make more use of differentiation (to set themselves apart from others), whereas interdependent individuals more often use integration (to be connected with others; cf., Markus & Kitayama, 1991; Tetlock, Peterson, & Berry, 1993).

Implicit Motives

This functional approach on autobiographical memory can be extended to implicit motivation. Implicit motives reflect recurrent preferences for particular qualities of affective experience (McClelland, 1987). The three basic implicit motives are affiliation (communion), achievement, and power (agency; cf., McClelland, 1987; Murray, 1943; Winter, 1991). The affiliation or intimacy motive represents a concern for warm, close relationships and for establishing, maintaining, or restoring a positive affective relationship with a person or group (McAdams, 1984). The achievement motive is defined as a need to enhance one's performance or to surpass certain standards of excellence (McClelland, Atkinson, Clark, & Lowell, 1953/1976). Finally, the power motive is defined as one's desire to influence the behavior or emotions of other people (Winter, 1991). According to McClelland (1987; McClelland, Koestner, & Weinberger, 1989), these implicit motives represent highly generalized preferences derived from autobiographical experiences during early, preverbal childhood (see also Atkinson, 1958). Whether children implicitly associate pleasure with experiencing behavior linked to achievement, power, or affiliation shapes their future preferences. For example, parental permissiveness for aggressive, egoistic behavior in early childhood has been linked to a pronounced power motive later in life (McClelland & Pilon, 1983). The affective pleasure associated with such behavior serves as the natural incentive to re-experience events linked to this affective quality, which results in a substantial predictive validity. In contrast, verbalized self-reports of goals and values have a short-term predictive validity, and their development depends on representational capacities acquired during language development (McClelland & Pilon, 1983; see also Chasiotis, Hofer, & Campos, 2006; Hofer & Chasiotis, 2003; Hofer, Chasiotis, & Campos, 2006). Because implicit motives develop in the pre-linguistic period, they are introspectively less accessible but express themselves in individuals' fantasies and are therefore measured by fantasy-based methods. Picture-story exercises, based on the Thematic Apperception Test (TAT; Murray, 1943), have been routinely used to assess implicit motives (McClelland & Pilon, 1983; Winter, 1973). Such tests are thus qualified for assessing themes of preverbal developmental phases and manifestations of unconscious affective dispositions.

Woike et al. (Woike et al., 1999; Woike, Macleod, & Goggin, 2003; Woike & Polo, 2001) have found a pattern of results similar to the reported relationship on the sociocultural orientation of the self and the content and structure of autobiographical memory in numerous experiments on implicit motives. They found that individuals structure their autobiographical memories in a motive-congruent way: Agentic individuals make more use of differentiation and communally oriented individuals use more elements of integration in their narratives. Taking a cross-cultural perspective, Bender, Chasiotis, Hofer, and Kiessling (2005) grouped the motive components according to their assumed sociocultural orientation and could find meaningful effects with autobiographical memory (see also Bender, 2006). They used a combination of motive components of the three basic motives of affiliation, achievement, and power, which are characteristic of an interdependent (e.g., sociability) or an independent self-construal (e.g., status orientation). Bender et al. (2005) demonstrated that the use of autobiographical recall and implicit motivation corresponds to the salient self-construal (independent and interdependent; Markus & Kitayama, 1991) in adult participants from Germany, Cameroon, and People's Republic of China. Interdependent motive realizations (e.g., sociability) were linked to a less specific and later childhood memory, whereas independent motive realizations (e.g., status orientation) were found to relate to a highly specific and early memory. Bender et al. (2005) concluded that the use of autobiographical memory for self-purposes in early life should lead to an independent self-construal, whereas the social function of autobiographical recall should lead to more interdependent individuals (see also Bender, 2006). To our knowledge, similar studies on autobiographical memory and implicit motivation of children in the crucial developmental period of 3 to 5 years do not yet exist.

For the purpose of the present study, we used a combination of one motive component for each of the three basic motives of affiliation, achievement, and power, which are characteristic for an interdependent or an independent self (see "Method"). Besides theoretical considerations, the selection of the components is based on empirical findings from samples of German and Cameroonian adult participants in a research project aimed at measuring implicit motives of affiliation and power cross-culturally with samples from Germany, Costa Rica, and Cameroon (cf., Chasiotis & Hofer, 2003; see also Hofer & Chasiotis, 2005).

Interdependent Motive Orientation. For the affiliation motive, we used the implicit theme of sociability (extraverted contact, good mood, having fun together), because it is related to a collectivistic, positive approach mode of affiliation. One of the motivational modes in achievement motivation that can be attributed to an interdependent self is "achievement according to social standards" because of the social orientation of achievement motivation. In addition, the component for the power motive "powerlessness" (obedience and feeling guilty) was used for the interdependent motive orientation because of the higher power distance reported in interdependent cultures (Hofstede, 1980). Empirically, this selection is confirmed by a significantly higher amount of the combination of these components of affiliation in Cameroonian than in German participants ($t = 2.5, p < .05, N = 245$) and by the significantly higher amount of powerlessness in Cameroonian participants compared to Costa Rican and German participants ($t = 3.0, p < .01, N = 365$; cf., Chasiotis & Hofer, 2003).

Independent Motive Orientation. For the affiliation motive component of the independent self, we chose the component of affiliation labeled *loneliness* (i.e., feeling rejected, not being understood), as independence and individualism can lead to feelings of being isolated or left alone (higher in Germans than in Cameroonians, $t = 2.47, p < .05, N = 245$; Chasiotis & Hofer, 2003). For achievement, we used the component "inner standard of excellence," which is related to individualistic feelings of being proud of one's achievements. Finally, the power motive component "status orientation" was chosen to account for the individualistic striving to be the focus of

attention and to receive recognition (higher score in the combination of these power components in Germans than in Cameroonians, $t = 2.2$, $p < .05$, $N = 245$; cf., Chasiotis & Hofer, 2003).

Theory of Mind

Children's understanding of false belief-situations is regarded as a central aspect to children's theory of mind because it represents a litmus test for the presence of mentalistic representational abilities (Chasiotis, Kiessling, Hofer et al., 2006; Chasiotis, Kiessling, Winter, & Hofer, 2006; Dennett, 1983; Flavell, 1999; Wellman, Cross, & Watson, 2001). Many precursors of mentalistic understanding have been identified, which generally point to the importance of mnemonic abilities for false belief understanding (Bauer, Wenner, Dropik, & Wewerka, 2000; Carver & Bauer, 2001; Tomasello, 1999). Clements and Perner (1994; see also Garnham & Ruffman, 2001) showed that 2-year-olds already look at the proper location despite providing the incorrect verbal response. In other words, children may already behave correctly in a false belief paradigm, without being able to articulate why. Such implicit nonverbal abilities might precede the explicit, verbalizable knowledge on false belief tasks (see also Karmiloff-Smith, 1992). In connection with such findings, it has been argued that the emergence of episodic (Nelson, 2005) and autobiographical memory (Pillemer & White, 1989) in the preschool period may serve as a prerequisite for the development of self-representation and, through this, false belief understanding (Welch-Ross, 1997). According to Robinson and Swanson (1990), the social function of autobiographical memory is achieved through the ability of converting one's own experience into recallable representations that enable a person to derive predictions about other people's behavior (see also Bender et al., 2008; Pohl et al., 2005).

Thus, social development, memory development, and inferential thought about others are functionally interconnected: The functions of autobiographical recall provide an individual with insight into his or her own mental processes, thus helping to develop hypotheses and working models to predict other people's behavior on the basis of one's own experiences (Robinson & Swanson, 1990). In other words, false belief understanding and the functions of autobiographical recall both revolve around understanding psychological states and causes and relate the past to present and future (Nelson & Fivush, 2004; Reese, 2002; Welch-Ross, 2001) and are developmentally related (Nelson & Fivush, 2004; see also Carpendale & Lewis, 2004). Considering these mutually influencing relationships, the developmental question arises whether differences in the functions of autobiographical memory (e.g., self and social function; Bluck, 2003) lead to differing construction of selves (independent and interdependent; cf., Markus & Kitayama, 1991), motivational differences, and ultimately differences in the performance in theory of mind tasks. Implicit motives are typically considered to develop ontogenetically earlier than false belief understanding. Children who have many experiences that set themselves apart from others (like in face-to-face interactions; Keller, 2007) store these experiences in their autobiographical memory. Such experiences, and associated memories, might be particularly appropriate to promote an earlier understanding of the mental states of others, because the child has learned very early to focus on his or her own individual states. In contrast, parenting behavior that maintains closeness and a sense of belonging (e.g., body contact; Keller, 2007) may not be suitable to accelerate a child's false belief understanding, because it does not stress the child's distinctiveness from others (including the caregiver).

Selection of Samples and Aim of the Study

Assuming that sociocultural orientations draw on construals of the self, the selection of our cultural samples was based on the considerations of Kağitçibaşı (1996; see also Markus &

Kitayama, 1991, 1994) to differentiate the dimensions of interpersonal distance (separateness-relatedness) and agency (autonomy-heteronomy). The combinations of these dimensions relevant to our study are independence and interdependence. Independence is defined as comprising autonomy and separateness, an adaptive pattern in Western, urban, educated middle-class. Therefore, we selected a German middle-class sample described as expressing prototypical independence (cf., Keller, Lohaus, et al., 2004). The prototypical interdependent sociocultural orientation—defined as comprising heteronomy and relatedness—is adaptive in rural populations with lower socioeconomic and educational status. For the purpose of this study, we selected a sample of rural Cameroonian Nso, one of the largest ethnic groups in the northwest province of Cameroon (anglophone part of Cameroon; see Nsameng & Lamb, 1994, 1995; Yovsi, 2003). We expected that both the self-descriptions of the children and the mother's description of the child's self-construal would be in line with the criteria of sample selection.

In this study, we investigate the influence of autobiographical memory on false belief understanding and implicit motives in preschoolers from Cameroon and Germany using a preschooler version of an instrument measuring implicit motives in adulthood—Operant Multimotive Test (OMT; Kuhl & Scheffer, 1999; Scheffer, 2005) and the *Cognitive Complexity Manual* (Woike, 1997)—to code children's narratives. Besides these methodological purposes of applying a preschooler version measuring implicit motives as well as assessing cognitive complexity in preschoolers cross-culturally for the first time, the aim of this study is to examine the relationship between autobiographical memory, mentalistic understanding, and sociocultural orientation of implicit motivation in divergent cultural samples of preschoolers.

The influence of culture on memory becomes increasingly important during the preschool years, as children are called upon to remember culturally significant facts and pragmatic information (Nelson, 2005). This cultural impact could also influence the development of a culture-specific (i.e., interdependent or independent) motivational orientation of the child (McClelland & Pilon, 1983). From an ontogenetic adaptation perspective (Bjorklund, 1997), the preverbal, implicit memory system in infancy is functional for that given period of life to build basic knowledge of recurring particulars of the social world in which infants find themselves and can be regarded as a prerequisite for cognitive structures that develop later (Nelson, 2005). Therefore, we propose that children who make more use of their autobiographical memories for social purposes should show a rather interdependent self-construal and an accordingly more interdependent implicit motivational pattern than children who primarily use their memories for self-purposes, who should then be rather independent in their self-construal and implicit motivation. In research on adults, independent participants date their earliest memories significantly earlier than interdependent participants (cf., Han, Liechtman, & Wang, 1998). This can be interpreted as indicating that members with an independent sociocultural orientation develop an earlier perception of oneself as an individual distinct from others. Accordingly, we set out to investigate whether this pattern already appears in the preschool period. Similarly, in our recent cross-cultural investigation of false belief understanding in German, Costa Rican, and Cameroonian children, controlling for relevant contextual variables such as mother's education, gender, siblings, language understanding, and age, we concluded that false belief understanding might be related to a more independent self-construal because there was a lower false belief understanding in children of the interdependent Cameroonian culture (cf., Chasiotis, Kiessling, Hofer et al., 2006), which focuses predominantly on normative parenting. In a similar approach, Keller et al. (2004) could also demonstrate that 2-year-old Cameroonian children showed more obedient reactions to parental requests compared to Costa Rican and Greek children. From that perspective, a parental focus on obedience and mastery of impulse control might provide fewer interactional and conversational contexts that foster an early development of mentalistic abilities such as false belief understanding. Interdependent parenting goals of obedience and compliance

might thus be related to an earlier compliance behavior and a later false belief understanding. In contrast, independent, authoritative parenting might focus less on impulse control but may instead provide rich mentalistic conversational contexts, thereby promoting children's earlier false belief understanding (Pears & Moses, 2003; Vinden, 2001). Thus, an earlier acquisition of a theory of mind and an earlier onset of autobiographical memory might be more prevalent in cultural contexts with a more independent sociocultural orientation. Moreover, we assume that an interdependent motive orientation, expected in Cameroonian children, is related to indicating a later first memory and a lower false belief understanding, whereas an independent motive orientation, expected in German children, is related to the recall of an earlier first memory and better false belief understanding.

In conclusion, autobiographical memory is related to both mentalistic understanding and implicit motivation. The relationship between mentalistic understanding and implicit motivation will be investigated in the present study for the first time. If implicit motivation and mentalistic understanding are linked, we propose that autobiographical memory could be a mediator of this relationship. Thus, we expect cross-cultural differences in age at first memory, cognitive complexity in autobiographical memory, and false belief understanding in the preschool years, while assuming a universal, culturally invariant mediational role for autobiographic memory for mentalistic and motivational development.

Method

Study Design

After training research assistants, a pretest was carried out ($N = 10$) in Germany. The results of this pretest were used for further modification of the experimenter script before starting with the main study. Changes in wording and materials of the tasks were made as a result of discussing the materials with our collaborators and their students in Cameroon. A translated experimenter script specified every aspect of the task. For the main study, kindergartens and nursery schools in urban areas of Germany (Osnabrück) and in rural areas of Cameroon (villages in the Bui Division of Bamenda) were contacted and asked for their participation. Parents of 4- to 6-year-old preschoolers attending these institutions were informed about the topic and the procedure of the present study. Children of parents who gave consent to participate were tested individually.

Participants

Fifty-two German preschoolers from Osnabrück (22 boys and 30 girls) and 30 Cameroonian preschoolers from Bamenda (16 boys and 14 girls) participated in the experiment. The Cameroonian children ($M = 66.4$ months, $SD = 8.7$) were slightly older than the German children ($M = 59.4$ months, $SD = 12.7$; $t = 3.0$, $p < .01$). All subsequent analyses controlled for this effect.

Procedure

Participants were tested individually by native interviewers of their respective country. The interview was split into two sessions on two separate days to ensure that the children's attention was sufficient to work on all of the tasks equally. In the first session, the autobiographical memory interview and the self-description tasks were administered. The second session consisted of a children's version of the OMT and the theory of mind tasks. Task order was not counterbalanced to avoid priming effects on the autobiographical memory interview and the OMT. Session 1 took approximately 20 minutes to complete, and Session 2 took 30 minutes. All material was

tape-recorded and transcribed by the interviewers themselves to prevent any misunderstandings due to recording quality. Interview language in Germany was German, and in Cameroon English (as the official language), and all subsequent coding of these interviews was carried out in these languages. Interview sites were either a quiet room of the kindergarten of the child (Germany) or a quiet room in the house of the child's family (Cameroon). Before the first interview was carried out, the interviewers established a friendly contact with the child to create a comfortable interview atmosphere. After Session 2, the interviewers gave each child a small gift.

Measurements

Cognitive complexity in autobiographical memory. For the measurement of autobiographical memory, we adapted a procedure of Wang and Liechtman (2000; see also Wang, 2004). Children were first asked to tell a warm-up story ("Tell me what things you did over the past weekend") to familiarize the child with the subsequent narrative tasks. Following this, the interviewer introduced the child to the actual task:

You and I are going to play a fun game. It's called "question-and-answer game." I'm going to ask you some questions. You can reply in any way you want. There are no right or wrong answers. You'll see, it's really fun. Are you ready?

After an affirmative response, the interviewer asked the child to answer three standardized open-ended memory questions: (a) "Now can you tell me about a time, these days, when your mom or dad scolded you for something?" (b) "Now I'd like you to tell me just one thing you did recently that was really special and fun." (c) "You know, some kids can remember things that happened to them when they were very little. What is the first thing you remember?" (see Han et al., 1998; Wang, 2004; Wang & Liechtman, 2000). This final task is a quite common memory task among adults, however all three tasks have been shown to elicit autobiographical memories that vary in their distance from the present (Han et al., 1998; Wang, 2004). After an initial response of the child, the interviewer reacted with standardized prompts to stimulate the child (e.g., "What happened then?" "Can you tell me more?" "And then?") until the child clearly indicated (by gestures or speech) that her or his story was finished. After the last open-ended question, the child was asked: "Do you know how old you were at that time?"

The resulting three memories were then coded for cognitive complexity according to the *Categories of Complexity Scoring Manual*, by Woike (1997). This scoring system consists of four broader categories of differentiation/integration and their respective subcategories. Simple differentiation refers to the introduction of new attributes, with the number of separate new aspects as the coding variable. Elaborated differentiation refers to the perception of differences in the form of contrasts (two opposing aspects), relative comparisons (comparisons on a single dimension), and restrictions of meaning (limiting and qualifying the perspective of a person). Simple integration encompasses supporting aspects that describe low-level connections between elements, in which the meaning of attributes is enhanced. Elaborated integration refers to causal links (dynamic relationships and mutual influences), similarities (two objects seen as sharing a feature), and resolutions (the introduction of overarching themes or conclusions; for details, see Woike, 1994, 1997; Woike & Aronoff, 1992). The scoring system was developed to code narratives written by adults and was adapted to children's narratives. To account for differences in the children's language and memory content, the threshold for each subcategory to be coded was modified after thoroughly discussing these changes with the original author of the manual (B. Woike, personal communication, May 10, 2005; e.g., the importance of keywords to code for opposing aspects was lowered: "*I wanted to play. There was nobody on the playground*" is now coded as a contrast but would not have been coded in the adult version, as the contrast is not directly

expressed). In this adapted version for preschoolers, only the elaborate categories of differentiation and integration were used, in line with previous research (cf., Woike et al., 1999).

Two coders have been trained in the scoring of autobiographical memories with the *Categories of Complexity Scoring Manual* (Woike, 1997), achieving an agreement of more than 90% with the training material on all subcategories of the manual. The transcribed memories were then each coded independently by these two coders, resulting in an interrater agreement of 74% for German and 82% for Cameroonian narratives. Any disagreements were solved by discussion. A composite score comprising integration and differentiation was then computed by dividing the integration score by the sum of differentiation and integration score, resulting in the percentage of integration within the cognitive complexity (see also Woike et al., 1999).

Self-description. Children were asked to describe themselves in an open-ended form, following a method used by Wang (2004), which was originally developed by Keller, Ford, and Meacham (1978). They were to spontaneously say as many different things as possible that are descriptive of themselves. The interviewer initiated this task by telling them: “[Child’s name], I would like to write about you, to write something that will tell about [child’s name]. What is the first thing I should put in what I write about you?” After each response of the child, the interviewer reacted with standardized prompts to elicit a further self-description (e.g., “What else can I write about you?”). When the child made clear (by speech or gestures) that he or she was finished, the interviewer went on to the next part of the interview.

Then, children were asked to answer the Twenty Statement Test (Bochner, 1994; Kuhn & McPartland, 1954), in which participants are to complete sentences starting with “I am . . .” to assess private, public, and collective aspects of the self. This measure has been widely used to assess differences in the organization of information about the self across cultural groups (e.g., Bochner, 1994; Bond & Cheung, 1983; Trafimow, Triandis, & Goto, 1991; Triandis, 1989). The interviewer told the child, “Now, [child’s name], let’s see if we can think of some more things about you. How about if you finish a sentence, like this, [child’s name] is . . .”. When the child finished one sentence, the interviewer encouraged the child, “Can you finish the sentence in another way to tell about you? [Child’s name] is ___”, until the child clearly stated (by speech or gesture) that he or she was finished.

Both self-description tasks were pooled for coding: On average, the children completed no more than four sentences per task. Pooling resulted in a list of self-descriptions with the responses to the technique by Keller et al. (1978) at the beginning and the TST responses at the end. The coding unit of the self-descriptions was propositions, as defined by Fivush, Haden, and Adam (1995). Up to seven of these propositions, consisting of both the TST and the technique by Keller (following previous studies; e.g., Bochner, 1994; Wang, Liechtman, & White, 1998) were then coded for their salient self-aspects. Repetitions and notions that were clearly not self-descriptive were not coded (e.g., “[Child’s name] closes her eyes”). Self-descriptions were coded as *private* when they referred to personal qualities, attitudes, beliefs, and behaviors not related to other people (e.g., “I am intelligent”) and as *collective* self-descriptions when the responses concerned demographic qualities or groups with which the participant may share a common fate (e.g., “I am a pupil”). Responses about friendship, responsiveness to others, or sensitivity to the viewpoints of others (e.g., “I like to take care of my siblings”) were coded as *public* self-descriptions. Coding was carried out by two research assistants who agreed on 91% (94%) of all Cameroonian (German) self-descriptions, with disagreements being solved by discussion.

The pooled responses of both the free self-description and the TST were then weighted according to their position (see Bochner, 1994). It is very likely that in a self-description task, aspects that are mentioned first represent more salient aspects than those mentioned later in the self-description. Up to seven aspects of the participants were included in this weighting process (which represents the general consensus concerning TST-like measures; see Bochner, 1994,

Wang et al., 1998). The first received a weight of 7, the second a weight of 6, down to the seventh that received a weight of 1, which could result in a possible total score of 28 distributed across the three categories (private, public, and collective).

Family Allocentrism Scale (FAS). A measure that was filled out by the mothers of the children to gather indirect information about the self-construal of the children was the FAS (Lay et al., 1998). This scale is used to assess the degree of familialism as an indication of whether the child's environment tends to be interdependent or independent, and it comprises 21 statements about family cohesion (e.g., "My own happiness depends on the happiness of my family"), including six inverted items. Mothers were asked to report their agreement on a 5-point Likert-type scale (ranging from 1 = *not at all* to 5 = *completely*). The final measure was generated by recoding the six inverted and summing across all items (Cronbach's $\alpha = .71$).

Implicit motives. A child version of the OMT (Kuhl & Scheffer, 1999; Scheffer, 2005) was administered to assess the implicit motive components in children. The OMT differentiates four approach components and one avoidance component for each motive (affiliation, achievement, and power) on the basis of crossing two affective sources of motivation (positive vs. negative) with self-determined versus incentive-focused forms of motivation. The differentiation of five forms of motivation allows for testing theoretically interesting differences in the type of self-regulation involved in need satisfaction (cf., Baumann, Kaschel, & Kuhl, 2005; Scheffer, Eichstaedt, Chasiotis, & Kuhl, 2007). The implicit motive components used for preschoolers in the present study do not comprise components of the mature self (cf., Baumann et al., 2005; Kuhl, 2001; Kuhl & Scheffer, 1999; Scheffer et al., 2007). Extensive research on the OMT is reported in Scheffer (2005; see also Scheffer, Kuhl, & Eichstaedt, 2003; Scheffer et al., 2007).

Using this modified TAT technique, children were presented with a total of six pictures, asked to invent a story, and asked to give their spontaneous answers to the following questions: (Cameroonian version) (a) "What does Yaah/Taah want?" (b) "How does Yaah/Taah feel?" (c) "Why does Yaah/Taah feel this way?" (d) "How does the story continue?" In a pretest ($N = 10$), a total of 12 pictures from the picture set of the adult version of the OMT and from preselected children's picture books were used. Pictures were selected to be understandable for preschool children by showing well-known social contexts like play or family situations. Another important criterion for selection was the cross-cultural applicability of the pictures. Of the finally selected six pictures, five (Yaah/Taah is lifting a stone, Yaah/Taah stands in front of a group, Father is talking to Yaah/Taah, Yaah/Taah is drawing a circle, and Yaah/Taah is swimming with his or her friends) were from the picture set for adults and the sixth (Yaah/Taah is holding a ball) was a new one. As a slight deviation from the procedure with adults, children did not have to choose the main character of the story, to decrease the cognitive load of the task. Instead, an arrow was added in each picture to highlight the main person. Scoring of the motive imagery in the stories, based on the manual by Kuhl and Scheffer (1999), was carried out by research assistants who reached a reliability of 79% for German and 77% for Cameroonian OMTs. Scores of each motive were determined by summing up the coding of the six pictures (since the coding manual does not allow double coding, the highest score that could be achieved was 6 per individual). The composite scores of the inter- and independent motive orientation was the sum of the coded motive orientations of affiliation, achievement, and power (see Table 1).

Theory of mind. In the past, false belief tasks have been the most widely used measures for the assessment of theory of mind abilities (see Wellman et al., 2001). One selection criterion for the tasks used here was the potential adaptability for cross-cultural research (see also Chasiotis, Kiessling, Hofer et al., 2006). For this study, we selected two tasks designated to build a theory of mind battery score for the age range of 4 to 6 years (for the advantages of using test batteries compared to "one item tests," see Rushton, Brainerd, & Pressley, 1983; van de Vijver & Leung, 1997):

Table 1. Descriptives of Motive Components, Cognitive Complexity Score, and Theory of Mind Battery

	Germany (N = 52)			Cameroon (N = 30)			Sample Differences
	Range	M	SD	Range	M	SD	ANCOVA (Age Controlled)
Family Allocentrism Scale	3.5 to 5.3	4.54	.43	4.5 to 6.5	5.43	.48	***
Self-Description Scale							
Private	0 to 22	10.81	6.3	0 to 28	13.17	7.3	ns
Public	0 to 13	1.78	3.4	0 to 16	3.17	4.8	ns
Collective	0 to 18	2.37	4.6	0 to 21	9.37	6.4	***
Interdependent	0 to 6	2.40	2.22	0 to 6	1.98	2.34	ns
Motive Orientation							
Affiliation: Sociability	0 to 4	.86	1.17	0 to 4	.77	1.16	
Achievement: Social orientation	0 to 2	.15	.36	0 to 1	.03	.18	
Power: Powerlessness	0 to 3	.67	.88	0 to 5	.90	1.67	
Independent Motive Orientation	0 to 6	1.36	1.50	0 to 4	.57	1.04	**
Affiliation: Loneliness	0 to 2	.38	.40	0 to 2	.17	.18	
Achievement: Being proud of oneself	0 to 2	.13	.39	0 to 1	.03	.18	
Power: Status orientation	0 to 2	.13	.34	0 to 1	.03	.18	
Cognitive Complexity Score	0 to 1	.70	.11	0 to 1	.86	.09	
Theory of mind battery	0 to 3	1.87	.86	0 to 3	1.33	.92	

** $p < .01$. *** $p < .001$.

a version of the "Location False Belief-Task" (Wimmer & Perner, 1983) and a variant of the so-called "Birthday-Puppy-Task" (Sullivan, Zaitchik, & Tager-Flusberg, 1994).

Children were tested individually by two experimenters. One experimenter read/told the story (beginning with the "location false belief" task) verbatim (following the script) and enacted it with props, whereas the other experimenter recorded the child's responses. At the beginning of each task, the materials were introduced to the subject (i.e., key locations and names of the story characters). The gender of the child character in each story matched the gender of the participating child.

(a) *Location false belief*. In this task (see Maxi-standard task; Wimmer & Perner, 1983), the child's ability to adequately predict a person's thoughts and behavior, based on a wrong assumption about the location of an object, is tested. First the experimenter tells a story to the child that is simultaneously acted out with a kitchen unit comprising two cupboards, an attractive foodstuff, and two puppets, one representing the mother and one a child of the same sex as the target child. In the following, the Cameroonian female version is summarized, also to show minor cultural adaptations:

Yaah (the female child doll) and her mother return home from the market. Yaah puts her ground nuts into the lower blue marked drawer of a small cupboard, tries to remember where she put them and states that she is looking forward to eating them later (to emphasize the mental state of Yaah), before she leaves the scene to go out and play. During Yaah's absence, while preparing food, the mother takes some of the ground nuts and transfers the rest to the second, purple marked drawer.

Next, control questions concerning the original location (memory control question) and the current location (reality control question) of the ground nuts are asked. If one of the questions is not answered correctly, the course of events is retold once more. Only if memory and reality control questions are answered correctly is the “think” question asked (“Where does Yaah think the ground nuts are?”). In case the child does not respond or gives a wrong answer to the “think” question, the “look” question is asked (“Where will Yaah look for the ground nuts?”). The coding of the false belief question was done only if both control questions were answered correctly. Correct answers were coded for answering the “think” question correctly or for not answering or failing the “think” question but replying correctly to the “look” question. In case the child answered both control questions correctly but failed the false belief “think” and “look” question, the response was coded as incorrect (incorrect = 0, correct = 1).

(b) *Second order ignorance task “Birthday-Puppy-Task”* (cf., Sullivan et al., 1994). The German and Cameroonian version of the story were identical except for the location of the hidden puppy. In accordance with the original task, the puppy was hidden in the basement of the house in the German version but was kept in the backyard of the house in the Cameroonian version. Again, the Cameroonian female version will be reported here. The story tells of a mother who wants to surprise her daughter Yaah on her birthday with a puppy dog. Yaah expresses her hope to get a puppy dog for her birthday. Since Yaah’s mother wants to surprise her daughter, she tells her that she did not get a puppy for her but a great toy instead. After this introduction, two control questions are asked to test the child’s understanding of the first part of the story (“Did Yaah’s mother really get Yaah a toy for her birthday?” “Did Yaah’s mother tell Yaah she got her a toy for her birthday?”).

If both control questions are answered correctly, the experimenter continues with the story. If the child fails, the first part of the story is enacted again before the control questions are asked for a last time. If the child fails a second time, the story ends here, and the child is not included in later analysis. The story continues with Yaah stating that she goes outside to play. On her way out and unseen to/by her mother, Yaah crosses the backyard of the house and discovers the puppy dog. She then expresses her excitement about the fact that her mother really got her a puppy dog for her birthday.

After the discovery of the real birthday present, two further control questions were included to assess the child’s understanding of first-order knowledge or ignorance (“Does Yaah know that her mother got her a puppy dog for her birthday?” “Does Mom know that Yaah saw the birthday puppy in the backyard?”). To avoid response bias, yes and no responses are counterbalanced across the control questions. If the child answers both questions correctly, the experimenter gives feedback and continues with the final part of the story. If the child fails one of the questions, the experimenter corrects the child and continues.

While Yaah is still absent, her grandmother comes for a visit. She asks the mother if Yaah knows what she will really get for her birthday. In the following test questions, no feedback is given. The first test question (second-order ignorance) inquires what Yaah’s mother will reply to Grandma. In case the child does not respond to the test question, two alternatives are given, asking whether Yaah knows or does not know what she will get for her birthday. Then, Grandma asks Yaah’s mother what Yaah thinks her mother got her for her birthday (second-order false belief question). The answers of the second-order ignorance and the second-order false belief question were summed up to form the final test score for false belief understanding (incorrect = 0, correct = 1; range = 0 to 2). Only if both control questions were answered correctly were the false belief questions coded. In total, 16 children, who did not differ in any other relevant variable from the rest (5 of the Cameroonian and 11 of the German sample), did not pass the control questions in one of the theory of mind tasks and were excluded from further analysis. The first- (location false belief) and second-order (birthday puppy) false belief tasks were then aggregated to form a composite score.

Results

Group Differences

FAS. Confirming our considerations on sample selection, Cameroonian mothers score significantly higher on familialism than German mothers, $F(1, 81) = 26.8, p = .001$; see Table 1).

Self-descriptions. Also according to our expectations, Cameroonian children articulate more collective self-descriptions than German children, $F(1, 81) = 17.1, p = .001$, while private and public self-descriptions do not differ significantly between the samples (see Table 1).

Age of earliest memory. Concerning the age of earliest memory, and concordant with findings on adults (Chinese and U.S. Americans; Wang, 2001a, 2001b) and Chinese children (Han et al., 1998; Wang, 2004), Cameroonian preschoolers ($M = 2.5$ years, $SD = 1.7$) indicate a later first autobiographical memory than German children ($M = 1.4$ years, $SD = 0.9$), $F(1, 65) = 5.0, p < .05$, age controlled.

Cognitive complexity. In the composite score across all three questions on autobiographical memory, Cameroonian preschoolers show a significantly more integrated cognitive complexity compared to German preschoolers, $F(1, 65) = 29.9, p < .001$, age controlled (see Table 1).

Theory of mind battery. The composite score of the three false belief questions of the Location Task and the Birthday-Puppy-Task (Cronbach's $\alpha = .70$) is significantly lower in the Cameroonian sample than in the German sample, $F(1, 65) = 6.1, p < .05$, age controlled (see Table 1).

Implicit motive scores. As can be seen in Table 1, the low frequencies on the motive component level excluded analyses below the composite score. Support for a discriminative validity of the independent motive orientation can be drawn from the significantly lower independent motive orientation of the Cameroonian children. Although the interdependent motive orientation does not discriminate Cameroonian from German children, $F(1, 65) = 1.5, ns$, age controlled, Cameroonian children show significantly less independent motive orientations than German children, $F(1, 65) = 9.97, p < .01$, age controlled. Because, unexpectedly, the interdependence motive orientation score does not discriminate between German and Cameroonian children, this measure was excluded from further analysis.

The independent motive orientation correlates negatively with the number of collective statements in the Self-Description Scale (SDS): The more collective statements children make, the less independent are their motive orientations (see Table 2). Furthermore, the FAS is negatively correlated with the independent motive score, which indicates that the lower mothers' allocentrism scores are, the higher are children's independent motive orientation ($r = -.25, p < .05$). The collective statements of the SDS also correlate with the FAS. It is remarkable that the other two SDS scales do not correlate significantly with the FAS or the independent motive orientation score. Finally, public and private SDS do not correlate with neither second-order false belief understanding nor cognitive complexity, but again a collective SDS correlates positively with a high percentage of integration in autobiographical memory and negatively with false belief understanding (see Table 2).

Relations Between Autobiographical Memory, Implicit Motives, and Mentalistic Understanding

Autobiographical complexity (high = more integrated, low = more differentiated) correlates negatively with the independent motive orientation ($r = -.54, p < .01$) and the theory of mind score ($r = -.55, p < .01$). Mentalistic understanding and independent motive orientation are positively correlated ($r = .23, p < .05$). More differentiation in autobiographical narratives is related to a higher independent implicit motive score and to a better performance in false belief understanding, while false belief understanding correlates with an independent motive orientation.

Table 2. Correlations Between Family Allocentrism Scale (FAS), Self-Descriptions Scale (SDS), and Independent Motive Orientation Score (IMO; $N = 82$)

	FAS	IMO	Cognitive Complexity	Theory of Mind
SDS private	.17	.15	-.05	.19
SDS collective	.32*	-.43***	.39**	-.49**
SDS public	.08	-.06	.15	.16

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3. Hierarchical Regression Analyses (Simultaneous Entry Method): Testing Mediation Effects of Cognitive Complexity on Theory of Mind and Self-Descriptions Controlling for Moderating Effects of Culture ($N = 66$)

Outcome: ToM Battery				
Block	Predictor Variables	β	R^2	F
1	Independent motive orientation	.45*	.20*	6.74
2	Independent motive orientation			
	Cognitive complexity	.20	.34*	6.58
		-.44*		
3	Independent motive orientation	.29	.37*	2.75
	Cognitive complexity	-.48*		
	Culture	.25		
	Culture \times Independent Motive Orientation	-.16		
	Culture \times Cognitive Complexity	-.17		

* $p < .05$.

Testing a Mediator Model While Controlling for Moderating Effects of Culture

In the following, we tested whether cognitive complexity is a mediator variable (i.e., whether the relationship between mentalistic understanding and independent motive orientation will be significantly attenuated when the effect of cognitive complexity in autobiographical memory is controlled; see Baron & Kenny, 1986; J. Cohen & Cohen, 1975). Moreover, we examined whether this assumed mediational effect of cognitive complexity on the relationship between false belief understanding and independent motive score is present in both cultural groups. Such an additional examination is indispensable because culture may act as a moderator. Moderator variables qualify relationships between predictor and dependent variables (i.e., it is possible that the strength and/or direction of the hypothetical mediational effect varies from one [cultural] group to another). Therefore, in addition to the test of mediational effects, we conducted moderated regression analyses that are particularly recommended for cross-cultural research by Van de Vijver and Leung (1997; for applications of this approach, see Chasiotis, Kiessling, Hofer et al., 2006; Leung, 1987).

In the first model, false belief understanding was regressed on the z transformed score of independent motive orientation (see Table 3).

In the first block of the first linear regression with theory of mind performance as the dependent variable, the independent motive orientation score accounted for a significant part of the variance. After entering cognitive complexity in the next block, the explained variance increased

significantly (change in $R^2 = .14$), $F(2, 65) = 5.33$, $p < .05$, while attenuating the effect of the independent motive score on theory of mind (see Table 3).

Finally, in the third step of the regression model, we entered cognitive complexity and independent motive orientation together with the culture dummy variable and the interaction terms of culture with cognitive complexity and independent motive orientation as predictors of theory of mind performance. Only if cognitive complexity was still significant and independent motive orientation remained insignificant, even after entering culture and its interactional terms in the regression analysis, the mediational effect of autobiographical memory could be interpreted as culture-independent. As Table 3 shows, the culture dummy variable and the interaction terms of culture with the predictors do not weaken the effect of cognitive complexity. There is no significant increase in explained variance after entering culture and the interaction terms, $F(2, 65) = .474$, $p > .70$, but the mediating effect of cognitive complexity still remains significant.¹ This result can be interpreted as pointing at a culturally invariant mediational role of autobiographic memory for the emergence of an independent self: The more autobiographical memories are processed in a differentiated manner, the stronger is the relationship between false belief understanding and independent motive orientation across both cultures.

Discussion

This study is innovative with regard to its samples, measures, and content. We selected cultural samples from rural Africa and urban Europe differing in their sociocultural orientations to investigate specific developmental pathways leading to different self-construals (Kağıtçıbaşı, 1996; Markus & Kitayama, 1991, 1994). Methodologically, the *Categories of Cognitive Complexity Scoring Manual* (Woike, 1997) has been used for the first time on autobiographical narratives of children from different cultural contexts. As well, an adapted measure for the assessment of implicit motives (OMT; Kuhl & Scheffer, 1999) in the preschool years has been introduced. We could validate the combinations of the motive components for independence with self-descriptive measures that assess differences in the organization of information of the self across cultural groups (TST; Bochner, 1994; Keller et al., 1978) and with the maternal score in the FAS (Lay et al., 1998). Moreover, the independent motive orientation shows discriminative validity, with higher scores in Germany than in Cameroon.

Concerning cross-cultural differences in the earliest memory, we found that even in the preschool years, interdependent participants date their earliest memories significantly later than independent participants (see Han et al., 1998). In addition, we extended the findings of previous studies on adults' cognitive complexity with a cross-cultural, preschool sample of Cameroonian children, who show more integrated autobiographic information processing than German preschoolers. Obtaining differences as early as the preschool period supports the assumed developmental function autobiographical memory may serve: An earlier memory, and processing information in a differentiated, analytical way, may help to distinguish oneself from others and ultimately facilitate the emergence of an independent self. In support of this argument, children from cultures with an independent sociocultural orientation have been found to recognize themselves earlier in mirror recognition tasks that measure self-referential behavior (for German children, see Keller, Kaertner, Yovsi, Borke, & Kleis, 2005; for Greek children, see Keller, Yovsi, 2004). Finally, we replicated our findings on the differences in false belief understanding with a composite theory of mind score including second-order belief understanding: German preschoolers perform better than Cameroonian preschoolers in false belief understanding (see also Chasiotis, Kiessling, Hofer et al., 2006). This finding lends further support to the notion that an independent sociocultural orientation may be closely intertwined with the development of understanding the minds of others.

Investigating the interrelations of complexity in autobiographical memories, independent motive orientation, and false belief understanding, we demonstrated that more differentiation in a child's narratives is related to more independent implicit motive realizations and to a better mentalistic understanding. We can only speculate whether a motivation to realize one's desires and needs in an independent manner might enhance false belief understanding. But since the development of implicit motives is rooted in the prelinguistic period, it appears to be likely that the emergence of implicit motivation may precede (second-order) false belief understanding. According to this line of reasoning, a child develops an earlier mentalistic understanding if his or her motivational orientation is based on the more individualistic motive components of being alone (affiliation motive component), having an inner standard of excellence when he or she tries to achieve something (achievement motive component), and trying to be socially distinct from others (i.e., being more status oriented; power motive component). This could mean that the first prelinguistic interactional experiences during infancy that become represented in autobiographical memory are of a motivational nature. Applying the component model of parenting postulated by Keller (2007), this suggests that if children have many contingency experiences (predominantly during face-to-face interactions; cf., Keller, 2007), they develop more individualistic motives that enhance their proclivity to understand mental states of other individuals. Parenting behaviors like lots of body contact and emotional warmth, on the other hand, increase the sense of belonging and may at the same time blur the distinctiveness of the motivational states of the child and mother (or any other significant other interacting with the child), thereby delaying the onset of mentalistic understanding.

To further examine this relationship, we confirmed a mediation model postulating that autobiographical memory is a mediator of the relationship between theory of mind and implicit motives. This means that autobiographical information processing could be regarded as a link between false belief understanding and independent motive orientation. The importance of this relationship is further emphasized by our finding that the mediator model holds true for both cultural samples. Additionally, it is interesting to note that the mediational effect of autobiographical memory can also be observed with a self-descriptive measure as the dependent variable (see Note 1). In other words, being able to describe oneself seems to be associated with the capacity to understand the inner states of others. A possible reason for this relationship could be that children tap into their personal memories for such self-descriptive purposes. When doing so, they either recall information that is differentiated or integrated, or a mixture of both. Because autobiographical processing is related to false belief understanding, it is therefore not surprising that self-descriptions (which may be based on personal memories) are associated with false belief understanding as well.

One reason why the interdependent motive orientation did not show differences between Cameroonian and German children could be that it was not possible to construct a cross-cultural valid measure of interdependent motive orientation for the age period at hand. But another equally possible reason could be that an interdependent motive orientation (i.e., the implicit need to have fun together [sociability component; affiliation], to compare one's performance with that of others [social comparison component; achievement], and to feel implicitly not very powerful and dependent [powerlessness component; power]) may be typical for many preschoolers, because these needs reflect culture-independent issues of their age-specific developmental task of establishing interdependent social relationships with their peers. This argument is supported by the finding that children's interdependent motive orientation score is significantly higher than their independent motive orientation score (both samples: $t = 5.07, p < .001$; Germany: $t = 3.55, p < .001$; Cameroon: $t = 3.70, p < .001$). The result that children's private and public self-descriptions in the SDS do not correlate with their independent motive orientation score and the family allocentrism score of their mother could also be a hint that children at that age describe themselves explicitly in a more interdependent way and thus generally have a more interdependent self-construal

(see Table 2). This dominance of interdependent self-construals in different domains and representational levels (autobiographical memory, self-descriptions, and implicit motives) makes our results concerning false belief understanding as an indicator for the emergence of an independent self even more interesting.

Limitations

The findings from this study provide the first evidence for a mediational role of autobiographical memory in the emergence of an independent self. However, it is only possible to generalize these results to a limited extent. First, because of the small Cameroonian sample size, we could not conduct structural equation modeling with multigroup analysis to test the mediation model of autobiographical memory across cultures in a methodologically more adequate way. Also because of the small sample size, the power of our hierarchical regression model is rather weak (higher sample sizes might eliminate the mediational effect of cognitive complexity and might also lead to moderating effects of culture; see Table 3). Thus, a longitudinal replication of the present study with larger samples and an expansion to other cultures are highly desirable.

Second, many studies show that language competence contributes significantly to the understanding of false belief situations (Astington, 2001). Our findings are similar to the obtained results from our study with German, Costa Rican, and Cameroonian children on theory of mind controlling for language abilities (see Chasiotis, Kiessling, Hofer et al., 2006). However, due to its exploratory nature, language understanding of the children was not controlled in the present study.

Finally, another important limitation is that we did not control for more domain-general cognitive abilities like intelligence, which might serve as a basis for the development of cognitive complexity in general. On the other hand, we do not expect differential effects of intelligence on integration and differentiation, as both represent cognitively demanding features of information processing.

Conclusion

Bruner (1990) asserts that narrative forms are one “natural kind” of human cognition, and Brown (1991) also considers narratives and story telling to represent human universals (see also Carpendale & Lewis, 2004). In line with such claims about the central role of narratives for humans, our results can be seen as an empirical verification of their importance by demonstrating the possibly universal, culture-independent mediational role of autobiographical narratives for development. In discussing Bruner’s view on autobiographical narratives, Nelson (2005) stresses that this universality does not imply that narrative content is innate in the sense of a fixed genetic program (a manifest universal in Brown’s [1991] terms) but that the organization of experiences in terms of events is characteristic for humans. Within this perspective, Nelson’s (2005) definition of autobiographical memory fits perfectly with Brown’s (1991) concept of a structural universal (i.e., a psychological mechanism that determines psychological variance on the manifest, culture-specific level). After having recently identified conflict inhibition as an important structural universal for the development of false belief understanding across cultures (Chasiotis, Kiessling, Hofer et al., 2006; see also Chasiotis, Kiessling, Winter et al., 2006), with autobiographical information processing, we now can possibly add another structural universal that may enhance our understanding of how culture-specific construals of the self emerge.

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Note

1. As further analyses show, the culturally invariant mediational role of cognitive complexity in autobiographical memory on the sociocultural orientation of the self still holds even with another dependent variable measuring explicit self-descriptions instead of mentalistic understanding: A regression model with the collective self-descriptive measure (SDS) as the dependent variable and cognitive complexity and independent motive orientation as predictors shows the same mediational effect of cognitive complexity in autobiographical memory without significant effects of culture. In the first block with collective self-descriptions (SDS) as the dependent variable, the independent motive orientation score ($\beta = -.44, p < .05$) accounted for a significant part of the variance ($R^2 = .19$), $F(3, 65) = 6.24, p < .05$. After entering cognitive complexity ($\beta = .47, p < .05$) in the next block, the explained variance increased significantly (change in $R^2 = .16$), $F(2, 65) = 5.99, p < .05$, while attenuating the effect of the independent motive score on collective self-descriptions ($\beta = -.18, p < .4$). In the third step of the regression model, there's no significant increase in explained variance after entering culture and the interaction terms, $F(2, 65) = 1.57, p > .3$. All other hierarchical regression models, which were conducted to test for mediational relations beyond the already mentioned ones, do not work (e.g., neither the FAS nor any of the SDS scales can be regarded as culture-invariant mediators for the relationship between sociocultural orientation of implicit motivation and theory of mind). Also, the inclusion of the control variables age and gender in the regression model does not change the presented pattern of results in any substantial way. Further statistical information can be requested from the authors.

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