Memory in Cultural Context:

A Methodological Perspective

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Abstract

This thesis investigated comparatively declarative memory in infants and children from two different cultural groups. Applying three different memory tasks, memory was assessed in rural Cameroonian Nso children and children from middle-class German families. Everyday concepts of memory were also investigated in both cultural groups. Study 1 implemented an adapted Western deferred imitation paradigm with nine-month-old infants. Study 2 applied an adapted Western face-recognition task to four-year-old children. Study 3 investigated mothers’ everyday concept of memory in children and developed and applied a memory task (shop task) based on the Nso concept of memory to four-year-old children. All three memory tasks were adapted with regard to different methodological aspects. The results revealed that memory performance varies with the familiarity and meaningfulness of the implemented task and assessment method. The middle-class German children demonstrated an advantage in Western-based memory tasks (Study 1 and Study 2) while the Nso children showed a tendency to outperform the middle-class German children in a task considered more meaningful for the Nso community. The results are discussed with regard to adaptation procedures in memory assessments. A new theoretical framework, the cultural model of memory, is introduced to shed further light on the “what” and “how” of cultural memory processes. Finally, practical implications for memory assessments are presented to facilitate the study of memory in a cultural context.
1 Introduction

Memory is an integral part of our everyday functioning. The relevance of memory for human behavior has resulted in extensive scientific activities aimed at describing and explaining memory processes. Most of the theories and studies are based on phenomena that reflect the very specific context of Western, educated, industrialized, rich, and democratic (WEIRD) societies (Henrich, Heine, & Norenzayan, 2010). Members of WEIRD societies account for approximately 96% of participants in psychological research even although they only represent about five percent of the world’s population (Arnett, 2008; Henrich, Heine, & Norenzayan, 2010). Thus, it has been proposed “that members of WEIRD societies, including young children, are among the least representative populations one could find for generalizing about humans” (Henrich, Heine, & Norenzayan, 2010, p. 1).

Research on societies beyond the WEIRD ensemble mostly applies standard Western assessment procedures to non-Western participants. As such, most studies tend to implement Western instruments by merely translating them in a literal manner (Van de Vijver & Hambleton, 1996). Important issues of bias are not addressed; for example, it is only assumed – rather than tested – that a given adapted test version measures the construct under study equally well in all cultural groups. Furthermore, other methodological challenges, such as the cultural appropriateness of the implemented procedure, are often not reflected.

The aim of the dissertation was to investigate children’s memory in two very different cultural groups while paying particular attention to the divergent prior experiences and cultural realities of the respective cultural groups. Memory was assessed in rural Nso children and in children from urban middle-class German communities. The memory assessments employed focused on declarative memory and thereby built upon prior research with infants and children from both cultural groups. Within the scope of this thesis, three different declarative memory tasks will be presented in three studies.
In what follows, perspectives on the methodological challenges of task assessments will be reviewed. This will be followed by an outline of how past research has handled the challenges of studying memory in cultural contexts. The cultural realities of rural Nso and middle-class German families will subsequently be described, and finally, the tasks will be introduced that were employed to study declarative memory in more culturally appropriate ways.

1.1. Cultural and cross-cultural approaches to testing

Should memory assessments cross borders? While some researchers have argued that tests are uniquely tied to the culture of origin and are thus non-transferable (e.g., Greenfield, 1997), others have assumed that if potential sources of bias are considered, the same tests can and should be employed in different cultural settings (e.g., Van de Vijver & Poortinga, 1997). The first perspective has been subsumed under the assumption that “you can’t take it with you” while the second perspective has been described with the approach that “you can take it with you” (Greenfield, 1997). The latter perspective assumes that certain psychological phenomena are universal and can be measured in a comparable manner (Holding, Abubakar, & Kitsao-Wekulo, 2008). In order to apply a test in different cultures, certain steps – such as identifying potential sources of bias – have to be followed (e.g., He & Van de Vijver, 2012). Bias is not an inherent property of a test, but it can result from the comparison of test scores across specific cultural groups (He & Van de Vijver, 2012). It occurs if differences in test scores “do not correspond to differences in the underlying trait or ability” (Van de Vijver & Tanzer, 2004, p. 264). Furthermore, bias does not describe random measurements; it describes those that are systematic and replicable (He & Van de Vijver, 2012). If cultures are similar and have a small cultural distance, it may be possible to eliminate bias completely. However, bias can only be reduced if cultures are very different (Van de Vijver & Hambleton, 1996). Three different forms of bias have been distinguished: item, method, and construct bias (Van de
Vijver & Hambleton, 1996). Construct bias can occur when the definition and meaning of the construct only partially overlap among the different cultural groups under study (Van de Vijver & Hambleton, 1996; Van de Vijver & Leung, 2011). It has been suggested that statistical techniques as well as “local surveys aimed at exploring the everyday conceptualizations of the construct and the behaviors associated with the construct” are constructive ways of investigating construct bias (Van de Vijver & Hambleton, 1996, p. 5). Construct bias is least likely if a new instrument is simultaneously developed for different cultural groups with the help of a multicultural team that is knowledgeable in the construct under study in the different cultures (Van de Vijver & Hambleton, 1996). When conducting a test or developing a new one, next to construct bias, both method and item bias need to be considered (Van de Vijver & Tanzer, 2004). Method bias can result from differences in samples, instruments, and administration. For example, instruments can vary in terms of participants’ familiarity with the stimulus material, the instruction, or the response procedures (Van de Vijver & Tanzer, 2004). Moreover, item bias can result from variations on the specific item level, such as inappropriateness of item content or wording (Van de Vijver, Hofer, & Chasiotis, 2010; Van de Vijver & Leung, 2011). If bias occurs in one or more of these areas, tests need to be adapted or new tests have to be assembled (Malda, Van de Vijver, Srinivasan, Transler, Sukumar, & Rao, 2008). Adaptation “usually amounts to a combination of a close translation of some stimuli and a change of other stimuli when a close translation would be inadequate for linguistic, cultural, or psychometric reasons” (He & Van de Vijver, 2012, p. 4). Task assembly implies that an entirely new instrument will be designed that is specifically suited to a certain cultural group (He & Van de Vijver, 2012). This option would be adequate if the construct’s definition varies across cultures or if the item content of most items is unsuitable for all investigated cultural contexts (Van de Vijver & Tanzer, 2004).

This cross-cultural approach to testing has traditionally been compared with a cultural perspective that views tests as cultural genres that “require shared values, shared knowledge,
and shared communication” (Greenfield, 1997, p. 1115). Since these requirements are assumed to rely on unique cultural experiences, tests should be developed in the culture in which the instrument will be applied. To develop an assessment, the meaning and interpretation of the psychological construct have to be investigated. Observational studies and open-ended interviews can aid in describing the behavior of the cultural group and in inferring meaning systems. This approach stresses an ethnographic perspective that highlights the cultural-specificity of psychological phenomena. Universal abilities are not denied; rather, it is assumed that their expression varies with the respective cultural context. By implementing culture-specific tests, universals are then unraveled since subjects can respond in culturally familiar and meaningful ways (Greenfield, 1997). If researchers transfer tests to a different cultural group despite these recommendations, they should investigate “culture-specific meanings, culture-specific ways of knowing, and culture-specific modes of communication” to enhance test validity (Greenfield, 1997, p. 1123). If, for instance, a cultural group values a hierarchical form of communication – with children generally being expected to listen obediently to elders instead of speaking for themselves – researchers can try to implement an action-oriented response format that focuses on the child’s nonverbal behavior rather than on a verbal response (Greenfield, 1997).

The following subsection provides an overview of how researchers have unraveled and dealt with the methodological challenges that can arise when conducting memory assessments in different cultural groups.

1.2 Memory in (cross-)cultural context

Scientific approaches to the study of cultural influences on memory development have been influenced by Western “trends” in memory research. For example, in the 1960s, the principle of “free recall” was highly topical in memory studies. Word lists were read to the participant, who then had to recall them in any order remembered (Baddeley, 2009). Researchers
discovered that the memory material was being organized in categories rather than being memorized at random (Bousfield, 1953). Moreover, a subjective organization was being imposed during the recall of lists with seemingly unrelated words (Tulving, 1962). Although the participants of such memory experiments were most often from WEIRD cultures (Henrich, Heine, & Norenzayan, 2010), researchers would infer conclusions (for example, that participants seek to categorize the memory material) that were assumed to be universal.

The application of the “free recall” method with Liberian Kpelle children (aged between six and fourteen years) and adults was groundbreaking in drawing attention to the cultural nature of memory (Cole, Gay, Glick, & Sharp, 1971). A list-learning task was employed with items that were familiar to the Kpelle: the terms belonged to four different categories of items (foods, tools, clothing, and utensils) that could be purchased at the market. Despite the familiarity with the test items, the Kpelle children and adults remembered fewer items compared to observations of US subjects. Furthermore, the Kpelle did not group the presented items into the underlying categories, nor did they impose any form of organization to the material. However, children from the same community who performed weakly in these Western laboratory tasks displayed excellent capabilities in everyday sorting tasks. For example, Kpelle and American children were provided with leaves considered to be important in Kpelle culture. While the American children demonstrated no ability in sorting the leaves into the underlying categories, the Kpelle children excelled at the task. Cole and colleagues (1971) concluded that it is not sufficient to ensure the familiarity of the test material. Rather, besides the stimulus familiarity, the cultural relevance of the task for the specific cultural group has to be considered. Cole (1996) reflected:

When, if ever, would these people encounter a task where they were required to commit a list of words or objects to memory simply for the purpose of remembering? Might we not obtain different results if we used a task more representative of the memory tasks that Kpelle people ordinarily encounter? (p. 65)
Researchers argue that tasks such as the “free recall” test lack a meaningful organization and context that is characteristic of how memory is practiced in everyday life situations in non-Western cultures (Mandler, Scribner, Cole, & DeForest, 1980; Rogoff & Waddell, 1982). By implementing tasks that are devoid of meaningful connections, the equivalence of the task affordance is reduced across cultural groups rather than established; this is especially so for subjects who are unfamiliar with school-like settings and do not have the experience of learning abstract information (Rogoff & Chavajay, 1995; Rogoff & Waddell, 1982). Thus, instead of conducting studies with memory content stripped of a culturally relevant organization, it has been suggested that more contextualized tasks should be employed, to which children can relate from everyday experiences (Kuhn, 2000; Rogoff & Waddell, 1982).

Studies focusing on an appropriate contextualization of memory material have revealed that contextual embeddedness influences the extent of cross-cultural performance differences (Rogoff & Chavajay, 1995). Mayan children (aged between six and thirteen years) have been shown to score much lower in several list-learning tasks compared to US-American children, although the items applied were familiar to both cultural groups (Kagan, Klein, Finley, Rogoff, & Nolan, 1979). However, Mayan children from the same community scored equally well as their American counterparts in recalling the location of real and familiar objects in a three-dimensional miniature scene (Rogoff & Waddell, 1982). Furthermore, research on non-schooled Vai children and schooled US-American children (aged six to eleven years) revealed that children of both groups remembered memory material that was embedded in a story at a similar level and in a similar pattern (Mandler, Scribner, Cole, & DeForest, 1980).

Taking contextual influences seriously implies not only acknowledging physical properties but also (and more importantly) recognizing questions of shared meaning, communication, interpretation, and knowledge (Schliemann & Carraher, 2001). Moreover, it requires analyzing task characteristics with regard to the interpersonal context of the activity as well as the goal of the activity (Rogoff, 1984). A lack of familiarity with the
communication pattern or the task’s goal can result in misinterpretation and, in turn, restrict performance (Greenfield, 1997; Guberman & Greenfield, 1991). For example, the importance of an appropriate form of communication has been demonstrated in a study with Kokwet children from western Kenya. A familiar elder told children in a familiar setting a story about a boy who herds cows (Harkness & Super, 1977). When asked to repeat the story, 90% of the three-year-old children remained quiet and did not respond since the test situation violated the children’s normative behavioral conduct, which focused on respectfulness and quietness (Harkness & Super, 1977).

Cole and colleagues suggested that “cultural differences in cognition reside more in the situations to which particular cognitive processes are applied, than in the existence of a process in one cultural group and its absence in another” (Cole et al., 1971, p. 233). According to this view, cognitive skills should be viewed in situational contexts (Schliemann & Carraher, 2001). Skills develop through experience in areas in which they are practiced; thus, they are bound to specific contexts and related activities (Rogoff, 1984; Rogoff & Mistry, 1985). Situational or contextual approaches have been further advanced in the model on “culturally situated cognitive competence” by Wang, Ceci, Williams, and Kopko (2004). The authors’ maintain that there are no such things as invariant, core competencies universal to every human child. Instead, cognitive competence is relative to specific cultures, to the particular cognitive spheres or domains valued in a culture, to the social and physical contexts where the child participates in organized activities, and to the cultural and societal demands as perceived by the child herself. (pp. 4-5)

Cognitive competence can be assessed by the interplay of four-components: cultural artifacts, cognitive domains, interpersonal contexts, and individual schemata. By performing everyday activities, children learn about cultural artifacts (such as shared beliefs and
practices), which in turn transform how they perceive and think about cognitive tasks.
Moreover, cognitive competence is shaped by the demands of culturally valued cognitive
domains ("specific areas of knowledge"). Knowledge in valued domains facilitates
participation in cultural activities. It is transferred via culturally shaped interactions with
competent others and is organized by the individual through culturally valued scripts.

Studying children’s memory by considering the cultural context implies acknowledging
that memory is shaped by specific cultural experiences. The following subchapter focuses on
the cultural realities of both cultural groups under study in this dissertation: rural Nso and
middle-class German families.

1.3 The cases of rural Nso and middle-class German families
The Nso are located in the north-west of Cameroon in the Bui Division of the Bamenda
Grassfields. The Bamenda Grassfields comprise several Fonds (chiefdoms), the largest of
which is the Nso Fon (Nsamenang & Lamb, 1993). The Fon is the spiritual leader of the
Nso, and he is thought to be the linkage between the living world and the world of ancestors
(Goheen, 1996). The Nso are traditionally subsistence farmers (Goheen, 2011) whereby the
heavy manual labor on the farm is performed by women who weed and harvest crops
throughout the year (Goheen, 2011). Men used to be hunters and warriors; today, they work in
different entrepreneurial areas such as coffee farming or palm wine tapping (Goheen, 1996).
The level of formal education is comparably low, with an average of seven years, while the
fertility rate is rather high (Keller, 2007).

Nso families live in compounds organized around patrilineal lines (Nsamenang &
Lamb, 1993). They have a strong sense of community belonging, and the social hierarchy is
clearly defined. Younger members of the community are expected to show obedience and
respect toward elders. Moreover, adults exert a strong authority and discipline over children;
they are taught to follow instructions rather than express their own will (Keller, Demuth, &
Yovsi, 2008; Nsamenang & Lamb, 1995). The primary goal of socialization lies in fostering a socially competent and socially intelligent child (Keller, 2007). Social competence is achieved within the community, and it is only by interacting with the larger community that the child attains “full selfhood” (Nsamenang & Lamb, 1993). To learn social responsibility and to prevent children from becoming spoiled, children are expected to perform certain chores (Keller, Demuth, & Yovsi, 2008; Nsamenang, 2001). They learn to perform duties in an apprenticeship system (Nsamenang & Lamb, 1993). Depending on their level of maturity and social competence, they are allocated different roles in a step-by-step manner. For example, from as early as three, children begin to care for their younger siblings (Lamm, 2008; Nsamenang & Lamb, 1995). Besides caring for infants, children are expected to perform chores in the form of errands and other household duties (Nsamenang & Lamb, 1993). The performance of chores is supposed to train the child’s listening skills as well as the ability to follow instructions and to complete goals (Nsamenang, 2001). If children complete chores as expected, they are rewarded and praised (e.g., by receiving food) (Nsamenag & Lamb, 1995). As an Nso mother reports:

Even no matter where you send the child, it will not be angry and go on the errand.

Even when you ask the child to go to the farm and bring anything […] and you ask for him to bring to the farm, he doesn’t have any problem. Is never angry, no matter what you ask her to do, she’ll do. (Keller et al., 2006, KR7)

Furthermore, Nso children are expected to learn informally. Learning by means of observation and imitation is considered the most important pathway to acquiring knowledge (Keller, Demuth, & Yovsi, 2008).

If he sees you doing anything, he will try to imitate it because he knows that if you are doing it, that should be a good thing or he might ask you whether this thing is a good or a bad thing. (Keller, Demuth, & Yovsi, 2008, P1:47)
Observational learning has been described as a prototypical practice for cultures in which children actively participate in the social community (Paradise & Rogoff, 2009). This form of learning is “associated with accomplishing goals that are clearly relevant to the family and community” (Paradise & Rogoff, 2009, p. 107). Nso children practice observational learning within the peer culture, and siblings or peers are considered “masters” in the learning processes of younger children (Nsamenang & Lamb, 1995). Accordingly, child-to-child socialization has been reported to be very important for the learning processes of Nso children, and it has been suggested that other children are even more influential in a child’s cognitive development than adults (Nsamenang & Lamb, 1993).

The cultural context of Nso families can be contrasted with the cultural realities of middle-class German families. Middle-class German families live primarily in highly industrialized and post-industrialized surroundings. The level of formal education is comparably high, and the fertility rate is rather low. The responsibility for child rearing rests squarely on the parents rather than on the extended family (Keller, 2007). Infants spend most of their time in the care of their mothers, and only 18% of children below three years are cared for by non-family members (Keller & Otto, 2011). The majority of children start attending daycare centers with professional caretakers at the age of three (Keller & Otto, 2011).

The goal of socialization lies in fostering psychological autonomy (Keller & Kärtner, 2013). From early on, children are expected to express their own desires, preferences, and intentions (Keller & Kärtner, 2013). Learning to develop a sense of one’s desires is considered integral to becoming a unique individual with a self-assured and independent character (Keller & Otto, 2011). A middle-class German mother accounts that:

an ideal child for me is, when they, yes, when they develop, when they have their own personality […] they form their own personality. (D17; Keller et al., 2006)
Children are expected to develop their own interests by choosing the activities they like to perform with their caretaker (Keller & Otto, 2011). Parents’ behavior is child-centered, and they seek to meet the child’s choices and desires whenever possible (Demuth, Keller, & Yovsi, 2012). For example, mothers try to inquire about the preferences and intentions of infants by treating children as quasi-equal communication partners (Demuth, Keller, & Yovsi, 2012).

Furthermore, children are expected to develop the ability to spend time on their own, for example, by playing with objects. Interacting with objects is also believed to foster the child’s cognitive development, for instance, in terms of abstract thinking (Keller, 2007). Since middle-class German families value a good school education for their children, they train competencies that are thought to help with building a career later in life (Keller & Otto, 2011). Abstract and logical reasoning skills are important in prototypical school settings in which tasks are often divided into steps without a clear reference or overarching theme (Paradise & Rogoff, 2009).

Both cultural groups can be considered prototypes of the great divide between the values and practices of agrarian societies vis-à-vis those in urban-industrial and post-industrial societies (LeVine & LeVine, 2015). When comparing memory across such different cultural groups, certain methodological challenges arise. The following subchapter will briefly outline the memory tasks chosen to measure declarative memory in both cultural groups. It will also present the respective adaptation steps and procedures in order to ensure comparability between the task assessments.

1.4 Measuring declarative memory in rural Nso and middle-class German children

All tasks employed in this dissertation focused on the assessment of declarative memory. Declarative memory can be subdivided into semantic and episodic memory (Tulving, 1972). According to Tulving, “episodic memory receives and stores information about temporally
dated episodes or events, and temporal-spatial relations among these events…” (p. 358). Semantic memory contains impersonal knowledge about facts and the world in general. For example, a list-learning task is considered to measure episodic memory since it “refers to a personal experience that is remembered in its temporal-spatial relation to other such experiences” (p. 387). Nelson (2014) has suggested that the kinds of declarative processes proposed by Tulving do not hold for infants and pre-school children. Rather, Nelson put forward a more general view of an early “basic memory” that is “derived from personal experience in everyday living” (p. 92). Early declarative processes are assumed to be more general, with the defining characteristics of episodic and semantic memory appearing later in development. Nelson thus supposed that this form of general declarative memory can be expressed through gestures, actions, or other means and resembles the kind of memory observed in children in the imitation paradigm.

In this dissertation, three declarative memory tasks were employed in three studies to investigate memory in rural Nso children and middle-class German children:

**Study 1. Deferred imitation.** Imitation and observation have been described as an important pathway in acquiring knowledge in different cultural groups. For example, rural Nso children learn primarily via observation during interactions with other children (Nsamenang & Lamb, 1995). Only few studies have used standardized experiments to assess imitation in non-Western contexts. Thus, little is known about the applicability of standardized Western imitation tasks to non-Western contexts. An adapted version of a Western deferred imitation paradigm was administered to six-month-old rural Nso infants and middle-class German infants (Goertz et al., 2011). The study employed a puppet with a smiling female face as its test material. Newborns were shown to display a face preference, and infants were especially attracted to smiling female faces (Bayet et al., 2015; Johnson, Dziurawiec, Ellis, & Morton, 1991). Accordingly, the female face was seen as an appropriate stimulus for both cultural groups. The test material was either administered with a culturally
familiar face (own-race) or with a culturally unfamiliar face (another race). The results supported the assumption that imitation is a universal learning tool: at six months of age, infants of both cultural groups displayed imitation. Moreover, there were similar levels of imitation among infants of both cultural groups (Goertz et al., 2011).

The study of Goertz and colleagues (2011) used a female adult model to demonstrate the target actions. However, rural Nso children learn primarily via imitation and observation from other children (Nsamenang & Lamb, 1993). Thus, in Study 1, deferred imitation was assessed in both cultural groups by adapting the age of the model. Imitative behavior was tested in nine-month-old infants since the imitation rate is still quite low at six months of age (Goertz et al., 2011). The procedures during the course of the task were similar to the deferred imitation study by Goertz and colleagues (2011) with six-month olds. A specially designed puppet with a smiling female face served as the test material. The German infants were given a puppet with a Caucasian face while the Nso infants were given a puppet with an Nso face. The age of the model was adjusted, and the infants were either presented with a child or an adult model. Furthermore, the presented target actions varied in their level of difficulty. It was assumed that the Nso children would benefit from the presentation of a child model irrespective of the difficulty of the target action. However, in line with previous Western-based research (Zmyj, Aschersleben, Prinz, & Daum, 2012; Zmyj, Daum, Prinz, Nielsen, Aschersleben, 2012), it was presumed that the middle-class German infants would benefit from an adult model when a difficult target action was presented and that they would not differ in terms of the imitation level (with regard to the model’s age) if an easier target action was modeled.

**Study 2. Face-recognition.** Meaningful social experiences determine the recognition of faces. With experience, the ability to distinguish faces becomes more pronounced for the faces of one’s own race. The establishment of a preference for one’s own face compared to that of another race (other-race effect) has been reported for adults from different cultural
groups (Chiroro, Tredoux, Radaelli, & Meissner, 2008; Hancock & Rhodes, 2008). Only very few studies have investigated the other-race effect in children from different cultural groups. Three-year-old rural Nso children as well as middle-class German children were tested with a computerized face-recognition paradigm that displayed either smiling female Caucasian faces or smiling female Nso faces (Suhrke et al., 2014). The presentation time was extended for the Nso children to account for their greater unfamiliarity with computers. The results revealed that children of both cultural groups demonstrated the other-race effect, yet despite the longer presentation time, the Nso children exhibited a reduced face-recognition rate across the faces of both races compared to middle-class German children (Suhrke et al., 2014).

The study of Suhrke and colleagues (2014) administered whole faces (internal and external features were presented). However, Nso women traditionally wear headgear. Thus, Nso children can be expected to be more familiar with the presentation of faces with headgear compared to middle-class German children, and this could in turn influence the face-recognition system. In Study 2, the presentation of faces was adapted to account for Nso children’s experiences with headgear. Faces of smiling Caucasian women or smiling Nso women were either presented with headgear (only showing the internal features of the face) or without headgear (showing internal and external features) to four-year-old children of both cultural groups. To account for the Nso children’s greater unfamiliarity with computers, the presentation time was extended for them. Since Nso children are about equally familiar with faces presented with or without headgear, it was assumed that they would display the other-race effect in both conditions (with headgear and without headgear). Conversely, middle-class German children are not familiar with headgear. Thus, it was assumed that the other-race effect would be larger for German children (or present only) if faces were displayed without headgear.

**Study 3. Shop.** Study 1 and Study 2 focused on item- and method-level adaptations of Western memory tasks. The results of both studies revealed that the middle-class German
children displayed increased overall behavior during the task performance compared to the
Nso children. Study 3 assumed that despite the adaptations employed, the Nso children might
have been disadvantaged in these prior memory tasks due to differences in the underlying
memory construct (construct bias). Everyday concepts of children’s memory were
investigated in the Nso and middle-class German mothers in order to identify memory
domains that were considered to be meaningful in the respective cultural groups. Based on the
results, a new contextualized memory task, which was assumed to be more meaningful for the
Nso children, was applied to four-year-old children of both cultural groups. The task consisted
of a shop: children had to remember to retrieve certain items from the shop as well as to
deliver a message. Both the errand and the message were to be performed for a member of the
community in order to provide a meaningful goal for the task-related activity. Moreover, it
was ensured that the items presented in the task were familiar to both cultural groups. Since
the task was considered more meaningful to Nso children, it was assumed that the Nso
children would outperform the middle-class German children in both aspects (errand and
message) of the task.

In this dissertation, the memory performance of rural Nso and middle-class German
children was assessed as part of a large scale, longitudinal study on learning and memory
development in infants and children. Four different universities (University of Bielefeld,
University of Frankfurt am Main, University of Giessen, and Osnabrück University)
collaborated in the research project, which was funded by the German Research Foundation.
2 Empirical Studies

2.1 Study 1.


**Theoretical background:** The phenomenon of deferred imitation has mostly been studied from a Western perspective. Different aspects such as the social context of imitation have been investigated. For example, Zmyj and colleagues (Zmyj, Aschersleben, Prinz & Daum, 2012; Zmyj, Daum, Prinz, Nielsen, Aschersleben, 2012) varied the age of the model and the target action difficulty level. 14-months olds imitated familiar actions more often from a peer. However, a novel task was only imitated when demonstrated by an adult model. The authors assumed that adults are perceived as more competent and thus preferred for more demanding tasks, while peers are modelled in order to communicate with them. The present study investigated culture specific patterns with regard to the age of the model in deferred imitation. Nso infants have been described to learn primarily through observation and imitation in groups of other children. Thus, it was assumed that they would benefit from a child model irrespective of the difficulty level of the target actions. Following Western research, middle-class German infants were expected to reveal an adult model advantage when imitating a difficult target action.

**Method:** Deferred imitation was assessed with urban middle-class German infants (*N* = 45) and with rural Cameroonian Nso infants (*N* = 43). All infants were nine-months old. Infants received a puppet with a smiling female face as test material. Nso infants received a puppet with a smiling Nso face and middle-class German infants received a puppet with a smiling Caucasian face. Seven target actions were demonstrated to the infant by manipulation three different areas of the puppet. The target actions varied in their difficulty...
level. Furthermore, children either received a female adult or a female child to model the
target actions.

Main results: The analyses demonstrated that infants from both cultural groups show
defered imitation. However, middle-class German infants performed overall more target
actions compared to rural Nso infants. Infants showed similar imitation patterns regarding
the age of the model. Across both cultural groups, infants showed more imitation with an
adult model. Moreover, regarding the target action difficulty level results revealed that
infants of both cultural groups showed more imitation if an adult modelled a difficult target
action. Infants learnt a similar amount of target actions irrespective of the model’s age
regarding the relatively easier target areas.
2.2 Study 2.


**Theoretical background:** Face recognition is shaped by daily experiences. For example, children have been shown to be better at recognizing faces of their own race compared to faces of a different race (other-race effect). Children’s daily experiences with the mode of face presentation are assumed to shape the occurrence of the other-race effect. The present study suggested that children’s common mode of presentation influences the other-race effect. Western children are mostly used to seeing faces with internal and external features. In Experiment 1, four-year-old middle-class German children were studied. In this group the other-race effect was expected to be bigger if whole faces were presented rather than if the external features were covered with a hat. In contrast, rural Cameroonian Nso children are used to recognizing whole faces as well as faces by their internal features only. In this group the other-race effect was expected to be present in both modes of presentation.

**Experiment 1**

**Method:** The sample consisted of urban middle-class German children (*N* = 104) that were 4-years-old (mean age = 4;4). Children were tested with a forced choice recognition task. Children either received the whole face condition or the inner face only condition and either saw Caucasian or African faces.

**Main results:** The analyses revealed that children benefitted from their experience with own-race faces only if faces were presented in their familiar way. Own-race faces were only recognized more accurately if the whole face was presented. The other-race effect was not present in the inner face only condition.
**Experiment 2**

**Method:** The sample consisted of rural Cameroonian Nso children \((N = 70)\) with a mean age of 4 years and 4 months. Nso children received an extended presentation time to account for their greater unfamiliarity with computers. Furthermore, a local experimenter led the experiment while a German experimenter entered children’s responses.

**Main results:** The analyses showed that Cameroonian Nso children recognized whole faces and faces covered with a hat equally well. In both conditions African faces were recognized at a higher level compared to Caucasian faces. Thus, Nso children showed the other-race effect irrespective of the mode of presentation.

Furthermore, Nso children’s overall accuracy was lower compared to middle-class German children’s overall accuracy.
2.3 Study 3.


Theoretical background: Most laboratory studies administer Western memory tasks in non-Western settings without considering that the construct under study might differ in the investigated cultural groups. This practice has shown to systematically disadvantage non-Western children. Study 1 investigated the everyday concepts of memory held by Nso and urban middle-class German mothers of three- to four-year-old children. We expected that Nso mothers would emphasize aspects of the Nso socialization agenda that train cognitive competence in a social context. Middle-class German mothers were expected to focus on fostering child-centered cognitive competence. In Study 2 we developed and applied a new memory task for four-year-old children that was based on the Nso concept of memory. We expected Nso children to outperform middle-class German children in this new memory task that was considered more meaningful for Nso children.

Experiment 1

Method: The sample comprised of rural Cameroonian Nso mothers (N = 27) and middle-class German mothers (N = 31). The mean age of Nso children was 3.70 years and of middle-class German children 3.94 years. Mothers were asked the question “How do you know that a child is good or bad at remembering?” in their native language. A data-driven analysis frame was derived from the material to code maternal responses. Two sets of codes were identified: memory characteristic codes and memory content codes.

Main results: Both cultural groups emphasized that memory performance can be inferred from the length of the memory interval and from the frequency of repetitions. However, only Nso mothers mentioned that accuracy is important when remembering. Furthermore, differences were revealed regarding the memory content. Nso mothers
mentioned content codes that were related to routines and obligations such as performing errands or delivering messages. German mothers, on the other hand, emphasized content codes that emphasized child-centered memory content, such as remembering past events.

**Study 2**

Based on Study 1 we chose to develop and apply a new memory task that focused on the domains of “errands” and “messages”. Both domains were considered as highly culturally salient and meaningful activities that Nso children deal with as part of their daily lives. Although the task reflected the Nso concept of memory it was also assumed to be familiar for middle-class German children since they practice buying and selling through role-play in a toy scenario (*Kaufmannsladen* game).

**Method:** *N* = 71 Nso children and *N* = 100 middle-class German children participated in the study. Nso children and middle-class German children were on average 4.41 years old. Different groups of items were displayed in a shop. Items were selected based on their familiarity in each cultural group. After a familiarization phase children were told to retrieve a certain amount of items from the shop and to remember a message. Both tasks were to be performed for the child’s father (or other familiar adult).

**Main results:** Nso and middle-class German children retrieved a similar amount of correct items from the shop. However Nso children retrieved fewer items that were not part of the instruction compared to German children. Furthermore, Nso children remembered the message with greater accuracy. The effect was significant for the part of the message that contained a clear social reference.
3 Discussion

Memory was investigated comparatively in infants and children from two very different cultural groups: urban middle-class German families and rural Nso families. The results revealed the importance of culture-specific meaning and knowledge systems for memory. The memory performance of infants and children was influenced by the familiarity and meaningfulness of the task given to the respective cultural groups. The results stress the need for adaptation procedures in cross-cultural memory research that consider conceptual differences in meaning in addition to the adaptation procedures that focus on the item and method levels.

The everyday concepts of memory differed between the cultural groups, and these differences could be linked to differences in the cultural models of the respective cultural groups (Study 3). When asked about memory in three-to-four-year-old children, the middle-class German mothers stressed memory domains that foster the child’s psychological autonomy, such as the recollection of past child-centered events. The German mothers stated that they knew whether a child was good (or bad) at remembering if:

“…the child talks about an excursion to the Zoo that took place a long time ago …” (P1071)
“…the child can report what he or she did a while ago…” (P2921)
“…if a child can tell me about what he or she experienced months ago…” (P5005)

Conversely, the Nso mothers emphasized memory content that supports social competence and the child’s purposeful role within the larger community. They viewed the correct chore performance, such as children’s delivery of errands and messages, as central for memory:

“…you send the child to buy something, and the child does exactly that…” (P4024)
“…the child delivers a message as expected…” (P4903)
“…the child does exactly what he or she is assigned to do…” (P4907)
In what follows, the results of the applied tasks and adaptation procedures are discussed in greater detail in the context of the meaning systems of the respective cultural groups.

### 3.1 Memory tasks and task adaptations

In Study 1, nine-month-old infants were given an adapted version of a deferred imitation paradigm that was originally designed for Western infants. The implemented test material was adapted to account for the different prior experiences of infants in both cultural groups (see Chapter 1.4 for adaptations of the test material). Besides the test material, the age of the model (child vs. adult), which demonstrated the target actions, was adapted to reflect the Nso children’s observational learning experiences in groups with other children. The results revealed that both groups of infants demonstrated similar levels of imitation. Moreover, unexpectedly, the infants from both cultural groups displayed similar imitation patterns with respect to the model’s age and the difficulty level of the target action. The infants benefitted from an adult model when a difficult target action was modeled; their imitation level did not differ with respect to the model’s age when an easier target action was modeled. Besides these similarities, differences appeared with regard to the overall performance of the target actions: the Nso infants performed fewer target actions compared to the middle-class German infants. Moreover, the Nso infants needed more time than the German infants to establish contact with the test material. These results point to the limitations with which researchers are faced when implementing adapted versions of standardized Western tasks in non-Western contexts. The greater unfamiliarity of the Nso infants with the task setting as a whole (for example, regarding the decontextualized setting) and the purposeless nature of the demonstrated target actions probably outweighed the proposed adaptation effects of presenting a child model.

Study 2 implemented a face-recognition task with four-year-old children of both cultural groups. The task was originally designed for Western children and was adapted to suit the experiences of children in both cultural groups. The stimuli of the task (female faces)
varied and were adapted to accord with Nso children’s experiences of seeing female faces in everyday situations. Nso children are used to seeing female faces with and without headgear since Nso women wear headgear for certain occasions, for example, when working on the farm. Faces were presented on a computer screen. The presentation time was extended for the Nso children to account for their greater unfamiliarity with computers. As expected, the Nso children were better at recognizing the faces of their own race over those of a different race (other-race effect) when the faces were presented with or without headgear. Furthermore, the other-race effect was only present in middle-class German children if the faces were presented without headgear. Overall, the German children performed the task at a higher accuracy level compared to the Nso children. The decontextualized presentation of the stimuli as well as the unfamiliarity with computers possibly disadvantaged the Nso children. Nevertheless, the implemented task adaptations revealed that cultural experiences with faces influence children’s face recognition abilities.

Study 3 applied a shop task that focused on the delivery of an errand and a message with four-year-old children from both cultural groups. The task was based on the Nso concept of memory and was thus considered more meaningful for Nso children. Despite the differences in meaning, both item- and method-level adaptations ensured task familiarity for the middle-class German children. While Nso children practice errand situations in purposeful community situations, middle-class German children often engage in playful role situations with a Kaufmannsladen (shop) game. Moreover, it was ensured that all children were equally familiar with the presented items. The results revealed that children from both cultural groups performed at a relatively high overall level, thus relating to the task. Compared to their middle-class German peers, the Nso children showed a tendency to perform both aspects of the task (errand and message) more accurately. Thus, children in both cultural groups followed culture-specific strategies when carrying out the task: most of the Nso children only retrieved the items that were instructed from the shop (thus performing the task with greater
accuracy) while some middle-class German children also selected additional items that were not part of the instruction, perhaps following their own desires.

The results of the outlined studies reveal the importance of prior experiences and culture-specific meaning systems when conducting cross-cultural memory research. The next subchapter aims to integrate the results of this dissertation by proposing a culture-sensitive memory model that focuses on aspects of meaning and knowledge with regard to the child’s task-specific memory performance.

### 3.2 The cultural model of memory

The results of this dissertation support the claim of Wang and Ross (2007) that “differences in cultural beliefs about memory are likely to affect how and when people use memory” (p. 648). This dissertation aims to shed further light on the influence of memory concepts for memory performance, and the “how” and “when” of cultural memory processes, by proposing the “cultural model of memory” (see Figure 1). The “cultural model of memory” is based on the assumptions of the “ecocultural model of development” by Keller and Kärtner (2013) and Kuhn’s (2000) domain-specific theory on memory. The ecocultural model of development links differences in the ecosocial context (e.g., formal education, family structure, and household type) to culture-specific developmental pathways. Differences in the ecosocial context lead to specific psychological cultural models (with predominant emphasis on psychological autonomy and hierarchical relatedness). The psychological cultural models guide parental behavior through the parental belief system (Keller, 2007; Keller & Kärtner, 2013). Through parental interactions, children learn about the meaning of their experiences. For example, Western, urban, highly educated, middle-class families follow parenting behavior that supports psychological autonomy (i.e., personal preferences and independent mental states) (Keller & Kärtner, 2013). Rural farming families with low levels of education
follow parenting behavior that is oriented towards hierarchical relatedness (i.e., communal goals and social obligations) (Keller, 2007; Keller & Kärtner, 2013).

The cultural model of memory aims to link cultural beliefs and practices to the child’s memory performance in a given memory task. The model assumes that:

(a) concepts of (and beliefs about) memory can vary across cultures.
(b) cultural experiences influence the formation of domain-specific knowledge systems.
(c) cultural (training) experiences determine a child’s memory performance.

Figure 1: The Cultural Model of Memory

The model presumes that the child’s daily experiences determine the formation of his or her culture- and domain-specific knowledge systems. The child forms knowledge systems within culturally meaningful content domains. Memory retrieval is facilitated in content domains to which the child can meaningfully relate from prior experiences, for example, due to some form of training (Kuhn, 2000). Memory domains develop with experience in areas in which they are practiced. The model views memory domains as overlapping: learning to perform in one domain can extend to other culturally similar domains. Domain-specific knowledge
structures evolve from experience and influence the child’s experience in a co-constructed process: parental behavior fosters knowledge in certain domains; evolved knowledge structures facilitate memory processes in the child, which in turn influences the parental behavior toward the child. Domain-specific knowledge structures do not only determine what the child recalls but also when and how the child memorizes. For example, domain-specific knowledge affects the formation of culturally meaningful goals for memorizing.

In what follows, the assumptions of the cultural model of memory are outlined with regard to rural Nso and urban middle-class German families. Rural Nso families follow the cultural model of hierarchical relatedness (Keller & Kärtner, 2013). Nso parents value relational socialization goals and close family ties (Keller, 2007). Children are expected to become socially responsible members of the community (Kärtner, 2015). They learn to behave obediently, and respect toward elders is of primary importance (Keller & Otto, 2011). Parents guide children’s behavior and training toward respect and responsibility (Kärtner, 2015). Children are expected to support the community by caring for younger siblings and helping with chores (Nsamenang & Lamb, 1993; Lamm, 2008). The beliefs and behavioral practices of Nso families are reflected in Nso mothers’ concept of children’s memory. Central memory domains are goal-directed and focus on the child’s behavior within the community. Nso mothers value community-related memory domains like the performance of routines, obligations, errands, and messages (Study 3). Moreover, Nso mothers stress the importance of accurate memory when performing community-relevant tasks (Study 3).

Conversely, urban middle-class German families follow the cultural model of psychological autonomy (Keller & Otto, 2011). Middle-class German families value socialization goals that focus on the individual rather than on the community. From early on, mothers encourage children to develop their own preferences, desires, and a sense of themselves (Kärtner, 2015; Keller, 2007). German mothers’ parenting behavior fosters exclusive dyadic attention with a focus on face-to-face interaction and object stimulation.
Furthermore, mothers support the autonomy of the child by promoting child-centered conversations about past events (Schröder, 2012). The beliefs and practices of urban middle-class German mothers were reflected in the mothers’ concept of children’s memory: German mothers mostly stressed child-centered memory domains that focused on verbal dialogue (i.e., stressing past events) (Study 3). Moreover, German mothers did not emphasize memory content that carried a social significance for the community. Rather, meaningful memory domains were more abstract and decontextualized (such as regarding the recollection of objects or locations). Thus, middle-class German children learn that memorizing does not need to be directed towards a goal beyond the purpose of remembering but that it can be a goal in itself (Study 3).

The differences described above were shown to influence the memory performance of infants and children in both cultural groups. The Nso children displayed a tendency to outperform their middle-class German counterparts in a contextualized and goal-directed errand and message task (Study 3). However, the middle-class German infants demonstrated an advantage over the Nso infants in a decontextualized deferred imitation task that implemented abstract objects (Study 1). Furthermore, the German children outperformed the Nso children in a decontextualized face-recognition task (Study 2). Further cross-cultural research is needed to gain insight into the relevance of domain-specific meaning and knowledge systems for memory assessments. When conducting memory research, certain practical implications should be considered. The next chapter presents the implications of the cultural model of memory in conducting memory research with different cultural groups.

### 3.3 Implications for memory assessments

The cultural model of memory emphasizes the role of the child’s cultural context in memory performance. A contextual perspective on children’s memory has traditionally been associated with observational approaches rather than with laboratory-based approaches.
distinction of Baker-Ward and Ornstein (2014, p. 44) in the Table below). According to the (artificial) distinction by Baker-Ward and Ornstein (2014), observational approaches are high in ecological validity and focus on culturally defined values and beliefs. The meaningfulness of the memory task is thereby emphasized, and the role of the participant’s prior knowledge is considered. However, traditional laboratory approaches to the study of memory in children assess memory in an experimental form. This method ensures the systematic study of the impact of the variables that are assumed to influence memory. Yet, in traditional approaches, memory is measured in an isolated manner. The centrality of the task’s familiarity and meaningfulness is neglected, and aspects of culture are discarded (Baker-Ward & Ornstein, 2014).

Table 1: Some properties of the contexts in which memory development is examined in field-based and laboratory-based approaches as artificially dichotomized

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Field</th>
<th>Laboratory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conceptual framework</td>
<td>Contextual</td>
<td>Mechanistic</td>
</tr>
<tr>
<td>Methodological approach</td>
<td>Observation</td>
<td>Experimental</td>
</tr>
<tr>
<td>Experimental control</td>
<td>Less emphasis</td>
<td>More emphasis</td>
</tr>
<tr>
<td>Ecological validity</td>
<td>More important</td>
<td>Less important</td>
</tr>
<tr>
<td>Participants’ familiarity with the physical environment</td>
<td>Everyday</td>
<td>Limited or non-existent</td>
</tr>
<tr>
<td>Source of the to-be-remembered information</td>
<td>Naturally occurring</td>
<td>Experimenter-provided</td>
</tr>
<tr>
<td>Meaningfulness of the memory task</td>
<td>Necessary</td>
<td>Not necessary</td>
</tr>
<tr>
<td>Participants’ knowledge of task, materials</td>
<td>Extensive</td>
<td>Variable</td>
</tr>
<tr>
<td>Participants’ level of interest</td>
<td>Higher</td>
<td>Lower</td>
</tr>
<tr>
<td>Assessment of remembering</td>
<td>Embedded in other activities</td>
<td>Isolated</td>
</tr>
<tr>
<td>Contextual supports for remembering</td>
<td>Readily available</td>
<td>May be limited</td>
</tr>
<tr>
<td>Unit of analysis</td>
<td>Individual or dyad</td>
<td>Individual</td>
</tr>
<tr>
<td>Levels of the environment</td>
<td>Microsystem (immediate setting); may extend to macrosystem (culturally defined values, beliefs)</td>
<td>Within-individual, microsystem</td>
</tr>
</tbody>
</table>

In this dissertation, it is argued that memory skills develop with experience in areas in which they are practiced. When testing memory, the performance of a child in any given task depends on the extent to which the child can relate to the task from prior experiences. The
results of the studies presented here thus stressed the importance of the child’s knowledge- and meaning-making, for example, with regard to culturally valued memory (content) domains. Decontextualized memory studies that assess memory in a systematic but isolated form are argued to be more representative of a Western concept of memory.

Thus, to consider cultural differences, not only observational studies but also experimental laboratory approaches should focus on the task’s ecological validity and meaningfulness. These suggestions are included in a new approach to measure memory: the “situated laboratory approach”. The focus of the situated laboratory approach lies in the meaning system of the cultural group, such as that outlined in the cultural model of memory (see Table 2).

**Table 2: Proposed cultural approach to assess memory in the laboratory**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Situated Laboratory Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conceptual framework</td>
<td>Cultural Model of Memory</td>
</tr>
<tr>
<td>Methodological approach</td>
<td>Experimental</td>
</tr>
<tr>
<td>Experimental control</td>
<td>Emphasis</td>
</tr>
<tr>
<td>Ecological validity</td>
<td>Important</td>
</tr>
<tr>
<td>Participants’ familiarity with the physical environment</td>
<td>Given</td>
</tr>
</tbody>
</table>
The approach aims to implement standardized laboratory assessments in order to systematically investigate the influence of the variables that are assumed to influence memory development; at the same time, it ensures the task’s ecological validity. For example, in order to consider the cultural meaning system as fully as possible prior to developing and implementing a memory task in a cultural group, open-ended interviews should be conducted with regard to the memory concepts under investigation. In line with the cultural model of memory, the goal of such interviews should be to identify culturally meaningful memory content domains.

The situated laboratory approach pays attention to potential sources of bias in cross-cultural memory assessments, especially regarding the familiarity and meaningfulness of the implemented task. Further task-specific aspects are considered in the model, such as the culture-specific mode of communication. It is important to acknowledge the mode of communication, particularly with regard to the task’s response procedure. Moreover, when implementing a task, the culture-specific function of memorizing needs to be reflected upon. For example, some Western cultural groups view memory training as a goal in itself while rural non-Western cultural groups have been shown to train memorization for social purposes. Thus, to get the fullest possible picture of children’s memory-related abilities, taking account of socially motivated memory goals in task design is important, especially so when conducting comparative research with rural non-Western infants and children. The model assumes that if the task and test situation are perceived as relevant, the task will also be experienced as interesting for a child of the respective cultural group; this is thought to be important in order to increase the child’s motivation to remember the memory material.

When assessing memory in cultural groups that have a large cultural distance, rather than seeking to assemble a task that suits all cultural groups, different memory tasks can be applied that cover a broad range of memory domains with varying degrees of cultural meaningfulness. Researchers can thereby gain knowledge regarding memory domains that are
especially relevant in the respective cultural groups. Researchers can also focus on intracultural differences. Additional knowledge regarding the role of culturally valued memory domains and intracultural differences is needed, for example, for diagnostic purposes. So far, Western child therapists still apply Western memory tests to children from very different cultural groups, thereby possibly systematically underestimating children’s memory performance. A misdiagnosis carries heavy implications for the child and his or her family. For example, the child’s self-esteem can suffer if he or she is misplaced in a special education class, which can then lead to actual learning difficulties.

Appropriate ability tasks that measure meaningful abilities for different cultural groups are still very rare. Until adequate tests have been developed, child therapists should become aware of the cultural variation in development pathways, such as that regarding memory development. Most often, child therapists lack knowledge regarding cultural groups that differ from those in WEIRD societies. An increased awareness of cultural differences could enable practitioners to more cautiously interpret the child’s performance in already existing tasks.

This dissertation set out to shed additional light on the complexity of cross-cultural memory assessments. The results revealed that memory assessments were influenced by the cultural meaningfulness of the applied assessment method. Further cross-cultural memory research should aim to investigate memory by considering the knowledge and meaning systems of the cultural group. It is proposed that the cultural model of memory and the situated laboratory approach can aid in the materialization of this goal.
4. References


