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Introduction

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Abstract

Science, and by extension society, requires a comprehensive theory of attachment to guide research and practice—one grounded in a contextualized conception of attachments and their development, which encompasses knowledge from diverse disciplines engaged in the study of human development. To improve on the current paradigm, this volume embraces the diversity of attachment systems across cultures and primate species, and assesses the core assumptions and methods of attachment theory. Resultant understanding is used to project an updated version of attachment theory—one that can be applied across cultures. Suggestions for more culturally sensitive research methods are proposed and ideas applicable to current practice and policies discussed. A reconceptualized theory of attachment is presented based on principles that are generalizable, valid, and reliable across diverse primates and diverse human cultures. In addition, the need to make adjustments in attachment philosophy is stressed, and strategies are discussed to communicate and work with researchers, policy-makers, practitioners, and other stakeholders.

Background

With his formulation of attachment theory, John Bowlby (1958, 1969, 1973, 1980) initiated a paradigm that defined how children's development and the evolutionary functions of primate parenting would be understood for decades to come. At the time of its conception, basic science was dominated by a mechanistic understanding of human development (seen as a chain of stimulus-response patterns), while a psychoanalytic worldview (with its strong emphasis of unconscious processes) dominated application, especially clinical practice. In primatology, scientific debate oscillated between operant conditioning explanations and psychodynamic accounts of the origins of infant-caregiver bonds. Bowlby's great achievement was to enlist diverse scientific traditions (e.g., ethology and evolutionary approaches, systems theory, psychoanalysis) in formulating a foundation by which the development of socioemotional processes

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could be understood. His resulting theory, later complemented by the work of Mary Ainsworth (1967; Ainsworth et al. 1978), was compelling and attracted much attention, albeit with a time delay typical for new approaches in science.

The initial enthusiasm that greeted his seminal contribution, however, cannot offset the fact that Bowlby's understanding was incomplete, at best, and sometimes simply wrong. Although Bowlby was receptive to many new ideas, he never embraced core principles of evolutionary theory or cultural variation in parenting and children's development. He also did not acknowledge the existence of variability in caregiving practices across primate species. His cultural blindness was pointed out by Margaret Mead as early as 1954, yet her critique went unheeded (Mead 1954; Vicedo, this volume). Even today, attachment researchers have not integrated the core principles of evolution, culture, and cross-species variation into attachment theory, although they do acknowledge that different conceptions and strategies of parenting exist across cultures. They continue to claim, though, that attachment theory has strong cultural roots, due to the observational studies that Ainsworth conducted in Uganda (Ainsworth 1967). These Ugandan observations, however, are not representative of all rural non-Western cultures. Indeed, they conflict with many anthropological and cultural psychological observations that have been conducted in similar sub-Saharan villages. Differences in child-rearing philosophies, practices, and children's developmental trajectories exist and have been extensively documented for different subsistence-based communities, urban families in non-Western countries, as well as migrants and refugees in Western societies (Harwood et al. 1995; Gottlieb 2004; Keller 2007; Quinn and Mageo 2013; Vicedo 2013; Otto and Keller 2014; LeVine and LeVine 2016; Gottlieb and DeLoache 2017). Yet this decisive body of evidence has not been able to change prevailing views on attachment theory.

As a result, we (HK and KAB) approached the Ernst Strüngmann Forum to request support in examining attachment theory against the backdrop of current knowledge in cultural psychology, anthropology, evolutionary theory, primatology, and neuroscience. Our contention was that science, and by extension society, requires a comprehensive theory to guide its work—one grounded in a contextualized understanding of attachments and their development, encompassing knowledge from the many disciplines that engage in the study of human development.

The Ernst Strüngmann Forum is dedicated to the expansion of knowledge in science. It facilitates open discourse on problems faced in research—topics that require the input of multiple areas of expertise to generate greater understanding. These topics reflect real problems encountered by researchers and often indicate areas where existing paradigms may need to shift or where new ones are required. Throughout the process fostered by the Forum, "gaps in knowledge" are exposed and potential ways forward are collectively pursued. Consensus is never forced nor is it necessarily the goal. Instead, results of these multifaceted discussions are synthesized and disseminated to permit testing of

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emergent ideas, to support further debate on contentious issues, and to stimulate future research.

The overarching aim of this Forum on the cultural nature of attachment was to reconceptualize what is meant by attachment. It was not set up to scrutinize the underlying philosophical or ideological assumptions of current attachment theory, or to rehash the contributions of Bowlby and Ainsworth, or to revisit the basic mammalian biology of bonding (e.g., Carter et al. 2005). Instead, we sought to scrutinize the concept of evolution upon which attachment theory is grounded and to enlist multiple perspectives—from cross-cultural and cross-species research as well as new information from epigenetics and neuroscience (e.g., Jablonka and Lamb 2005; Suomi 2008)—to create a novel, expanded view of infant attachment(s). In doing so, we embraced the diversity of attachment systems across cultures and primate species, and used an inclusive perspective to evaluate the core assumptions and methods of attachment theory.

This volume summarizes the results of our extended discussions. In it you will find proposals for an inclusive theory of attachment, suggestions for more culturally sensitive research methods, and novel ideas applicable to current practice and policies. Attachment theory and philosophy need to adjust to the dynamic nature of science, to reflect the research that informs it and stay valid. To this end, we discuss ways to communicate and apply resultant understanding to researchers, policy-makers, practitioners, and other stakeholders.

Perspectives

Science does not take place in a vacuum and is also not static. It plays out within a context driven by worldviews and broad philosophical frameworks. The methodologies, theories, and research questions that emerge reflect this setting. Influenced by changing ideas and informed by new data, science needs to be a dynamic process, as the following examples illustrate.

Many years ago, in collaboration with Irenäus Eibl-Eibesfeldt, one of us (HK) explored the universal nature of face-to-face contact between infants and adult caregivers. Using film footage of Yanomami Indians and Trobriand villagers, clear evidence of face-to-face contact was found in these two groups, both of which differed significantly from Western middle-class families (Keller et al. 1988). This work also documented enormous quantitative differences in the amount of face-to-face contact exhibited across cultures. At the time, this variability did not arouse HK's interest like it does today (see Keller and Chaudhary, this volume).

Working within a different context, one of us (KAB) investigated the extent to which face-to-face contact between infants and adult caregivers typifies a human unique engagement system. Her initial finding was that chimpanzees engage in some face-to-face contact, but not a lot, which suggested a species difference (Bard 1994). Later though, based on increased knowledge of

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intergroup diversity in chimpanzees as well as humans, this conclusion was revised: In chimpanzees, just as in humans, there is significant variation in the amount of face-to-face contact exhibited by mother-infant pairs across two groups (Bard et al. 2005). Similar developmental processes apply to the infant-caregiver engagement system of chimpanzees and of humans; specifically, the amount of face-to-face contact is inversely related to the amount of physical contact experienced by very young infants.

Looking for phenomena defined in accordance to Western standards or mores may reveal the existence of these concepts in other, diverse environments. Such definitions, however, cannot address the validity of these phenomena within local meaning or value systems and may inhibit the examination of other, potentially more important dimensions of the same construct. Cross-cultural studies of cognition, intelligence, and the "big five" personality traits provide many examples of how an incomplete understanding can be falsely interpreted as proof of universality (e.g., Nisbett and Norenzayan 2002). There is enormous variability in the types of child caregiving arrangements and socialization strategies practiced across human cultures and primate groups, and attachment mechanisms differ as a result. A theory of attachment must account for this variability.

Attachment theorists claim that a strong evolutionary foundation is embedded into attachment theory due to Bowlby's interest in studies of rhesus macaques and perspectives from Robert Hinde (an ethologist) and Harry Harlow (an experimental psychologist) (e.g., Suomi et al. 2008). This work did provide a complement to human studies on exploration/secure base and reinforced the importance of early attachments. However, Bowlby reached conclusions based on a single nonhuman primate species living in captivity and on a limited understanding of evolutionary processes. What resulted was, at best, inaccurate and, at worst, biased.

Attachment theory assumes that an adaptive behavioral system underpins the evolutionary foundation of attachment, since attachment relationships help infants survive and thrive. Further, it holds that a specific way of mothering—one in line with Western middle-class childcare philosophy—is best for the healthy development of all infants. Neither, however, is supported by evidence.

Genetic fitness is at the core of evolutionary thinking: reproductive success is the ultimate goal, both in terms of physical and psychological development. Well-being does not drive genetic fitness. Ever since Trivers (1972) differentiated r- and K-selection strategies, reproductive styles have been correlated to different contextual conditions. Had attachment theory incorporated such a contextual view of developmental processes, a more differential understanding of parenting qualities and child development would have been the norm (Myowa and Butler; Hawkes et al.; and Chisholm, this volume; see also Lamb et al. 1984a).

How, then, can a popular but incomplete theory be brought in line with current understanding? What aspects need to be altered, and how might this

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be accomplished? To approach these questions, the following working groups were formed at the Forum:

- Evolution and attachment across primate groups (Hawkes et al., Chapter 4, this volume)
- Neural foundations of variability in attachment (Bennett et al., Chapter 10, this volume)
- Cultural evidence for different conceptions of attachment (Morelli et al., Chapter 6, this volume)
- Meaning and methods in the study and assessment of attachment (Gaskins et al., Chapter 8, this volume)

Their discussions benefited from the input of primatologists, evolutionary biologists, cultural anthropologists, cultural psychologists, neuroscientists, attachment theorists, and developmental psychologists. Based on findings from current research in their fields, participants worked collectively to expand the concept of attachment, using context-specific definitions of infant-caregiver attachments and their development.

Reconceptualizing Attachment

Evolution and Attachment across Primate Groups

In his early writings, Bowlby explicitly stressed the contextual nature of attachment, yet he focused primarily on the social environment, which in his view was defined by the mother. He did not recognize that the social environment is embedded within an ecological setting; that adaptive behaviors (including mothering) depend on ecosocial contexts, affordances, and constraints. Maternal investment does indeed vary according to context, and it can differ as a function of the caregiving arrangements of the social system in which the mother lives, which must be systematically considered (for a detailed discussion, see Vicedo 2013). What is currently lacking in theoretical accounts of attachment, but crucial for evolutionary theory, is the *contextual embeddedness* of the child or infant in his/her respective social and ecological environment (Harkness and Super 1996; Jablonka and Lamb 2007; Quinn and Mageo 2013; Otto and Keller 2014).

Bowlby used the rhesus macaque caregiving system as the evolutionary model for attachment. He did not acknowledge the enormous variability in caregiving arrangements that exist in nonhuman primate species. For instance, cotton-top tamarins rely on distributed caretaking; capuchin monkeys behave in similar ways toward their mothers as they do toward siblings or unrelated adults; and monogamy is rare among nonhuman primates (e.g., Sommer 2000; Bard 2018). Moreover, the very cultural context of a researcher can influence which type of behavior is chosen for study. For instance, Japanese

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primatologists primarily study cooperation, whereas Euro-American primatologists are predominantly interested in competition (de Waal 2001).

Research in evolution, as a complex process, has expanded greatly over the last decades and now reveals the inadequacies of Bowlby's concept of the environment of evolutionary adaptedness (EEA) to explain the origin of attachment. In Chapter 3, Masako Myowa and David Butler address the inadequacy of using rhesus macaques as a model for infant caregiving systems in all primates. They provide a phylogenetic history of attachment among primates and identify features of attachment that are shared or which differ between humans and nonhuman primates. Importantly, they consider possible cognitive, social, and ecological factors associated with these similarities and/or differences in attachment among primates.

From a complex adaptive systems perspective, James Chisholm posits in Chapter 11 that the human capacity for culture emerged with the evolution of human attachment by means of selection for increased mother-infant cooperation in the resolution of parent-offspring conflict. After outlining the evolutionary-developmental logic of attachment, parent-offspring conflict, and the view of culture as "extended embodied minds," he describes how the embodied mind and its attachments might have been extended beyond the mammalian mother-infant dyad to include expanding circles of cooperative individuals and groups. Since attachment came before and gave rise to culture, no culture could exist for long that did not accommodate the attachment needs of its infants.

In Chapter 4, Kristen Hawkes et al. extend the evolutionary perspective with a critical look at the causes and consequences of varying care in primates. Interactions between infants, mothers, and others in a range of species are used to assess variations and commonalities, as well as to explore how development in human infants can be understood in terms of maturational state at birth and weaning compared to other primates. They conclude with a consideration of the long-term effects of infant experience in primates other than humans. Interactions between particular chimpanzee mothers and infants are described and show that trust relationships between mothers and human researchers reveal variations in mothering style that appear to result from early life events, recent experience, and social context.

Neural Foundations of Variability in Attachment

Neuroscience offers novel insight into processes that support the integration of the social brain, cultural contexts, and development of attachment relationships beyond the human case. For instance, the cortical organization of adult chimpanzees is differentially influenced by early-rearing experiences (Bogart et al. 2014); laterality in the posterior superior temporal gyrus has been implicated in the processing of social information in chimpanzees (Hopkins et al.

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2014b); and genetic variation in the arginine vasopressin V1a receptor gene is significantly associated with receptive joint attention in adult chimpanzees (Hopkins et al. 2014a). Previously, these correlations of brain structure and function with social behaviors and polymorphisms in receptor gene were associated with pair bonding in humans and voles (e.g., Phelps 2010). A scientifically valid theory of attachment must include knowledge of the neurobiological mechanisms that support plasticity in attachment outcomes (Bennett et al., this volume; Panksepp 1998; Coan 2008; Bogart et al. 2014).

Margaret Sheridan and Kim Bard look at the neural consequences of infant attachment in Chapter 9, using evidence from nonhuman primates and institutionalized infants. Whereas attachment theory suggests that the function of attachment primarily relates to the regulation of negative affect, they argue that neurobiological evidence illustrates the impact of attachment relationships on two neural systems not typically considered: the neural substrates of reward learning and the neural substrates that support complex cognitive function, such as executive function.

In Chapter 10, Allyson Bennett et al. continue the discussion into the neural foundations for variability in attachment, posing critical questions on how relationships are initiated. Instead of conceptualizing attachment as a single type of relationship or a rigid developmental channel, they propose that attachment is necessary to understand the neural foundations of multiple infant-caregiver relationships, and the role these play in developing competence across the life span. They suggest that this approach will help identify common neurobiological elements of attachment as well as the remarkable plasticity and diversity within and across individuals, cultures, and species.

Cultural Evidence for Different Conceptions of Attachment

Attachment theory is based on a particular conceptualization of infants, which we now refer to as WEIRD (Western, educated, industrialized, rich, democratic—a term coined by Henrich et al. 2010), where the infant is regarded as a separate, active, independent, and autonomous person who acts on its own wishes and desires. This view of the infant necessitates complete responsiveness from the environment, in particular the mother. In the anthropological and psychological literature, however, significant work has revealed variance in human caregiving as well as different cultural conceptions of relationships. The processes by which attachment forms and the involvement of different social partners differ substantially according to the environment in which children grow and develop. Attachment researchers, however, have not incorporated principles from this work or used it to update attachment theory.

In Chapter 2, Marga Vicedo places attachment research in its historical context and details how early attachment theorists have ignored cultural

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diversity. She examines various challenges to the ethological attachment theory and frames the discussion around two of its fundamental tenets: the universality of attachment patterns and the biological foundations of the attachment system. She demonstrates how these challenges have not yet been successfully addressed and calls for better models of the coevolution of culture and biology.

The types of caregiving arrangements experienced by infants in non-WEIRD settings are vast, and there is an array of arrangements and responsibilities for caretakers (Quinn and Mageo 2013; Otto and Keller 2014). The mother can be the primary caregiver within a network of others, as in the Aka. The mother can be the primary caregiver for a short period of time, as in the Beng community, after which care is complemented and substituted by other caregivers. The mother can be a primary caregiver who holds intensive caregiving relationships with other infants, and even animals, as in the Pirahã. Distributed caregiving arrangements are also possible, where the mother is not necessarily the primary caregiver, as in the Brazilian favelas and the Cameroonian Nso.

In Chapter 5, Heidi Keller and Nandita Chaudhary present evidence of diverse childcare arrangements in cultures outside of Western norms and argue that these arrangements are normative in their respective cultural contexts. They stress that infant care, in all environments, is far more than just an isolated, biopsychological phenomenon: it is an activity deeply imbued with cultural meanings, values, and practices. Challenging the core assumptions that attachment is dyadic and mother-oriented, they propose a "cradles of care" model to address different possibilities in child-rearing conditions, independent of geographical place and age group of caregivers.

Gilda Morelli et al. (Chapter 6) take a pluralistic approach to attachment and present an alternative view to classic attachment theory. Because children develop attachment relationships that are locally determined, they argue that the study of child development must be informed by a systematic, ethnographical approach—one that involves observing, talking with, and listening to local people as they go about living their lives. They hold that a child's social network is of paramount importance.

Both WEIRD and non-WEIRD perspectives have implications for the very definition of attachment. The affectional bond—a relatively long-enduring tie in which the singular partner is important as a unique, noninterchangeable individual (WEIRD perspective)—is just one possible solution. To explore this further, Cindy Liu and colleagues (Chapter 7) examine the concept of monotropy, a basic component of attachment theory, by looking at the practice of transnational separation in Chinese immigrant families. Prolonged separation between parents and children is a common occurrence for many families in the United States and China. Thus it provides a cultural exemplar to extend and situate the meaning of attachment.

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Meaning and Methods in the Study and Assessment of Attachment

To assess the quality of attachment relationships, researchers have relied on the Strange Situation Procedure (Ainsworth et al. 1978), a systematic observational procedure whose validity is limited to middle-class white Americans living in the 1950s and 1960s in an urban U.S. setting. The assumptions underlying this procedure are that infants have dyadic attachments with adult partners, that infants encounter strangers moderately often but should be wary of them, that infants engage in daily independent exploration and are frequently in a room alone, and that a sensitive adult caregiver is available to respond quickly should an infant vocalize distress (Ainsworth et al. 1978). These types of experiences, however, are not common to many infants around the world: In many cultures, infants have multiple caregivers and infants are never alone. In some cultures, infants are not encouraged to express emotion, especially negative emotions. In others, strangers are not perceived with wariness (Keller and Chaudhary as well as Morelli et al., this volume). Thus serious issues of validity arise when the Strange Situation Procedure is used in cultures other than the one for which it was designed. In part, due to a reliance on the Strange Situation Procedure, infants well adapted to their culture-specific attachment system can be erroneously labeled as atypical or even pathological from a Western/urban perspective, and vice versa (Keller 2007).

The issues surrounding how attachment should be measured and assessed across diverse cultures were addressed by Suzanne Gaskins and colleagues. In Chapter 8, they propose that attachment systems fulfill two universal functions: they provide socially organized resources for the infant's protection and psychobiological regulation as well as a privileged entry point for social learning. Based on this consideration of the functions of attachment that could be applied universally, Gaskins et al. suggest ways to understand the nature of the cultural and ecological contexts that organize attachment systems, and propose a wide range of research strategies to facilitate the extension and contextual validity of measures of attachment across cultures and species.

Emergent Issues

As one might suspect, many issues emerged during the Forum that could not be resolved; these topics have been highlighted in the individual chapters for future attention. Two particular topics, however, were written up after the Forum to help direct future discourse: (a) the current status of attachment theory and (b) the implications of attachment-related research for policy and practice.

Current attachment theory. In our evaluation of the core assumptions and methods of attachment, it became apparent that we needed to have a coherent account of the state of current attachment theory. This would also enable us to

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assess claims that attachment theory has already been substantially revised. In response, Ross Thompson prepared an overview of twenty-first century attachment theory (Chapter 12) and, importantly, highlighted points of contention that remain:

- To whom do infants become attached?
- How should differences in attachment relationships be characterized?
- What influences lead to differences in attachment relationships?
- What are the outcomes of differences in attachment?

His characterization of contemporary attachment theory underscores an ongoing tension between a monotropic view of attachment and the recognition of the importance of multiple attachments. Contemporary attachment researchers do recognize that a much wider range of normative attachments develop in early childhood than was previously acknowledged. However, they also consider much of the evidence of cultural variability to be largely irrelevant to attachment. As Thompson writes (p. 318, this volume):

> While culturally oriented researchers ask for greater *culturally informed attachment research,* attachment researchers sometimes wonder where they can find greater *attachment-informed cultural studies.* When they survey the research literature on culture and attachment, attachment researchers find relatively few studies that address the central claims of attachment theory in an informative way: as indicated above, research that might be relevant is often not focused on the developmental experience of young children.

Yet ethnographic and cross-cultural studies of non-Western societies over the last fifty years have explicitly addressed children's relational networks, emotional regulation, separation, and other issues that are central to attachment theory (e.g., Whiting 1963; Weisner and Gallimore 1977; Sorenson 1979; Tronick et al. 1987; Rogoff et al. 1993; Rothbaum et al. 2002; Konner 2005; Quinn and Mageo 2013; Otto and Keller 2014; Lancy 2015; LeVine and LeVine 2016). Does this reveal an interdisciplinary disconnect and, if so, what can be done to resolve it?

It is important to acknowledge and understand disciplinary differences. Ethnographic researchers, for example, do not like to apply methods developed for one cultural context to measure outcomes in another, distinct context. For instance, in their work with Aka foragers, Meehan and Hawks (2013:108) hold, that "the Strange Situation Procedure is not appropriate in all cultural contexts." One could go a step further and argue that imposing conditions that are deemed to be grossly inappropriate in a cultural context (e.g., separating children from others or leaving them alone in a room) is unethical. Equally, evaluating beliefs and behaviors in one culture according to the standards of another (e.g., the sensitivity scale, the Attachment Q sort) may be grossly misleading and also unethical (see, e.g., the discussion of warmth in Keller and Chaudhary, this volume). As has been repeatedly affirmed

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(e.g., Marvin et al. 1977; Takahashi 1986; LeVine et al. 1994; Harwood et al. 1995; Hewlett and Lamb 2005; Lancy 2008; Quinn and Mageo 2013; Otto and Keller 2014), some of the original and core assumptions of attachment theory are not applicable to many cultures around the world. Still, there are issues that appear to result from disciplinary differences, and these await resolution.

Implications for policy and practice. Over the past fifty years, attachment theory has permeated a wide range of professions that serve children and families, impacting policy at multiple levels. Although it may be perfectly appropriate to provide therapeutic interventions to infants and caregivers who are not adjusting well within their cultural setting, it is problematic to make diagnoses of pathology due to a lack of understanding of alternative cultural norms. As this volume illustrates, what qualifies as normal, atypical, abnormal, and/or pathological varies substantially across cultures and primate species. How, then, should application paradigms be altered to reflect current knowledge and culturally informed perspectives on attachment?

In Chapter 13, Suzanne Gaskins et al. examine how current understanding of the cultural nature of attachment can be integrated into policy and practice. They address the development of policy on multiple levels and the methods used to implement the results. They also discuss the process of translating research into policy and practice and propose an inclusive process that involves including all relevant stakeholders to minimize bias.

In Chapter 14, Mariano Rosabal-Coto et al. offer a critical appraisal of current applications and approaches to draw attention to the importance of program designs for the future. Because child-rearing practices vary across cultures, they stress that the value systems which motivate different practices must be recognized and accounted for when applications are developed and implemented. They issue a call for researchers to become proactive in rectifying misuses of attachment theory and in designing new applications that reflect cultural variation.

Further steps. To change the prevailing paradigm of attachment—both in theory and practice—will not be easy. It requires viewing the phenomenon as an evolved universal developmental task: one that has to be solved in context-specific, culture-sensitive ways to have adaptive value. Because the concept of attachment impacts the lives of so many individuals, we view this not as an academic exercise but rather as a moral imperative.

We hope this volume will spur further discourse and guide future study based on truly universal principles: ones that are generalizable, valid, and reliable across all primates and all human cultures. Importantly, we hope that you will join us in furthering the understanding necessary to complete and apply a contextualized and culturally informed attachment theory.

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