

Bronfenbrenner's Bioecological Theory Revision: Moving Culture From the Macro Into the Micro

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Abstract

Bronfenbrenner's bioecological theory of human development is one of the most widely known theoretical frameworks in human development. In spite of its popularity, the notion of culture within the macrosystem, as a separate entity of everyday practices and therefore microsystems, is problematic. Using the theoretical and empirical work of Rogoff and Weisner, and influenced as they are by Vygotsky's sociocultural perspective, we reconceptualize Bronfenbrenner's model by placing culture as an intricate part of proximal development processes. In our model, culture has the role of defining and organizing microsystems and therefore becomes part of the central processes of human development. Culture is an ever changing system composed of the daily practices of social communities (families, schools, neighborhoods, etc.) and the interpretation of those practices through language and communication. It also comprises tools and signs that are part of the historical legacy of those communities, and thus diversity is an integral part of the child's microsystems, leading to culturally defined acceptable developmental processes and outcomes.

Keywords

cultural microsystems, human development, Bronfenbrenner's theory

Bronfenbrenner's bioecological theory of human development is one of the most widely known theoretical frameworks across a variety of disciplines and fields of practice in the social sciences. For example, in the field of early childhood education, Bronfenbrenner's theory has been in recurrent use for well over 20 years (Härkönen, 2007). The popularity of the model began in the 1980s, in the next decade after its first major formulation (Bronfenbrenner, 1977).

Even though the bioecological theory has made a lot of important contributions and has explained with great complexity developmental transformations as part of interdependent systems, it seems that the majority of research within the framework resulted in having "conceptual confusion and inadequate testing of the theory" (Tudge, Mokrova, Hatfield, & Karnik, 2009, p. 198). Tudge et al. (2009) examined 25 articles published from 2001 to 2008 all being based on Bronfenbrenner's theory; however, only 4 of these used the latest transformation of the theory appropriately in their research

within the author's observations. Among the conceptual confusion, the notion of culture stands out as particularly problematic.

The bioecological theory's stance on culture can be challenged from major theoretical views, such as Vygotsky's sociocultural theory, Barbara Rogoff's transformation of participation perspective, and Thomas Weisner's ecocultural theory. They all propose in some way, as Markus and Kitayama (2009), that "culture is not separate from the individual; it is a product of human activity" (p. 423). This means that culture is not a separate system operating from a macro level, but it is within everyday action (activities, routines, practices) and part of communities of practice through a language mediated meaning-making system. Culture also lies in

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our cognitive processes, such as intelligence (Sternberg, 2004) and memory. Therefore, it is necessary to consider culture in the study of developmental processes (Sternberg, 2014). However, even in its many transformations, in Bronfenbrenner's model, culture is barely formally introduced, and thus disguised inside the major processes that occur just "out there" in the distal environment.

The bioecological theory "raises questions about treating individual and cultural processes as separate entities" implicitly (Rogoff, 2003, p. 44), where "individual and 'larger' contexts are conceived as existing separately, related in a hierarchical fashion as the larger contexts affect the smaller ones, which in turn affect the developing person" (p. 46). This is why in this article we unite Rogoff, Weisner, and Vygotsky's socio-cultural perspective to reconceptualize the role of culture as an intricate part of proximal developmental processes. Following their critique and conceptualization of culture, we propose a revision to the model where culture has the role of operationalizing microsystems and therefore becomes part of the central processes of human development. Since various cultural legacies become part of everyday life, the diversity of human experience is emphasized in this new model.

To develop our arguments, first we give a historical overview of the role of culture in Bronfenbrenner's bioecological theory. We then present theoretical arguments from the Rogoff, Weisner, and Vygotsky perspectives and exemplify how they contribute to our major theoretical revision on the role of culture in microsystems. Finally, we present our revision to the model and empirical cross-cultural data that support our important paradigm shift of this theory.

Historical Overview of the Role of Culture in Bronfenbrenner's Bioecological Paradigm

The development of Urie Bronfenbrenner's theory had two major periods. The first period was the 1970s with the publication of *The Ecology of Human Development*, and the second period was the 1990s. The first publication was in 1958, when Bronfenbrenner was concerned with the state of research in developmental psychology. He criticized the emphasis given to experimental rigor instead of theory development. He stated that "much of contemporary developmental psychology is *the science of strange behavior of children in strange situations with strange adults for the briefest possible periods of time*" (Bronfenbrenner, 1977, p. 513). As an attempt to remedy this, Bronfenbrenner developed ecological theory in the 1970s, with an early influence of Kurt Lewin's approach to group dynamics and some of Brim's (1975) terminology.

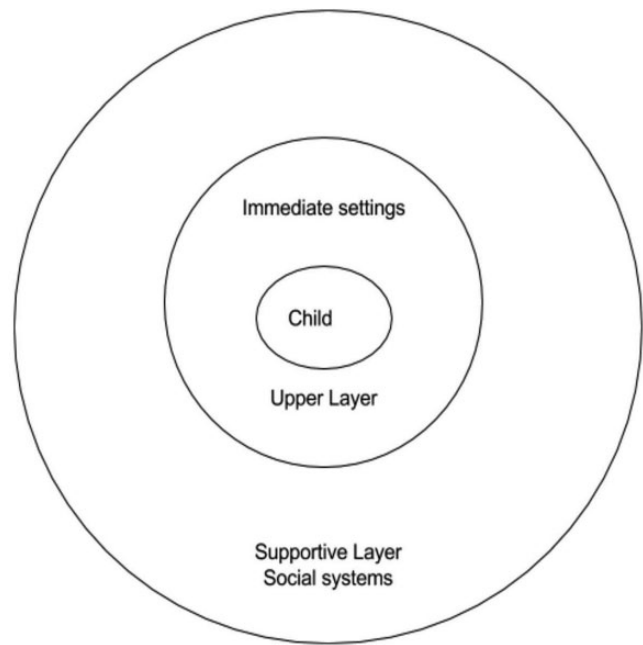


Fig. 1. Ecological model. This figure illustrates the ecological model in 1974.

Bronfenbrenner defined ecological theory as the study of human development in context or enduring environments (Bronfenbrenner, 1974). The child's ecology was, then, the enduring environments in which the child lived, consisting of two concentric layers, the upper and the supportive and surrounding layers (see Fig. 1). The upper layer or the immediate settings (home, school, street, playground, etc.) had three dimensions: a physical one, the people and the roles they played in the child's life, as well as the activities in which these people and the child are engaged. It also included the social meanings of these activities.

The supportive layer was an adjacent one to the immediate encompassing system that determined what can or cannot occur in the immediate context (Bronfenbrenner, 1974). It included the physical and geographical settings as well as institutional contexts (social systems). It is in this outside layer also, from where there is the possibility of second order effects interfering with the immediate context. The second order effect was defined as the effect of a third C in A and B (Bronfenbrenner, 1974). These early definitions of ecological theory do not define culture, but culture is implied in the form of social systems that are part of the supportive layer. As Bronfenbrenner stated,

The supporting and surrounding layer, in which the immediate setting is embedded, limits and shapes what can and does occur within the immediate setting: (1) geographic and physical, for example, a housing project in which people

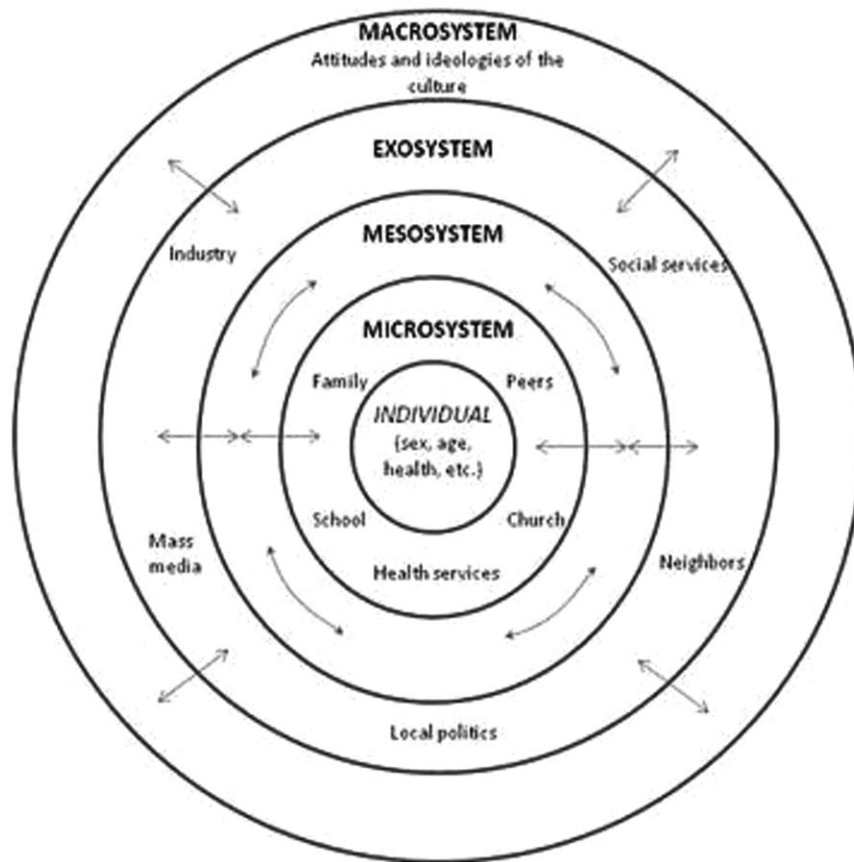


Fig. 2. The ecological theory of human development. This figure illustrates the second revision to ecological theory (Bronfenbrenner, 1977).

live; (2) institutional—the social systems which affect what can occur in the immediate setting. (Bronfenbrenner, 1974, p. 2)

Bronfenbrenner's further development of the theory in 1977 expanded the layer model into a more complex series of systems interdependent on each other (see Fig. 2). *The Ecology of Human Development* was defined then as

the scientific study of the progressive, mutual accommodation, throughout the life span, between a growing human organism and the changing immediate environments in which it lives, as this process is affected by relations obtaining within and between these immediate settings, as well as the larger social contexts, both formal and informal, in which the settings are embedded. (Bronfenbrenner, 1977, p. 514)

The ecological environment became a nested arrangement of structures, each contained within the next. The structures now were referred to as the microsystem, the mesosystem, the exosystem, and the macrosystem. A

description of each system is given in Bronfenbrenner (1977).

In this reiteration of the ecological theory of human development, culture is not defined on its own either, but it is said to contain the macrosystems, as well as to be an ideological structure of the mesosystem (Bronfenbrenner, 1977). Certain concepts associated with culture are also said to be part of various macrosystems, such as laws, rules, information, and ideology. Another concept introduced is the blueprint, which is mentioned as part of the macrosystem:

A macrosystem differs in a fundamental way from the preceding forms in that it refers not to the specific contexts affecting the life of a particular person but to general prototypes, existing in the culture or subculture that set the pattern for the structures and activities occurring at the concrete level. Thus, within a given society, one school classroom looks and functions much like another. The same holds true for other settings and institutions, both informal and formal. It is as if all were constructed from the same blueprints. These "blueprints" are the macrosystems. Some

actually exist in explicit form as recorded laws, regulations, and rules. (Bronfenbrenner, 1977, p. 515)

The concept of blueprint is not further explained, but could be assumed to be associated with how culture gets reproduced from one setting to another. In its exposition, culture for Bronfenbrenner is homogenizing rather than diversifying the human experience.

The 1990s brought another set of important revisions in Bronfenbrenner's theory, named the general ecological model or bioecological paradigm (Bronfenbrenner & Ceci, 1994).

The developments were summarized in two propositions. He also introduced the process-person-context notion. See the two propositions in Bronfenbrenner and Ceci (1994).

Along with highlighting proximal processes, revisions were made to some of the systems and a new one was added. The one added was the chronosystem that alludes to changes or consistencies over time of the characteristics of the person and the environment (Bronfenbrenner, 1999). In regard to investigating the impact of time as a proxy for historical period on the proximal processes, studies would have to be longitudinal (Tudge et al., 2009).

Another important revision made was in the description of the microsystem. It was said that it comprised patterns of activities in the immediate setting, but now some of the activities were described as involving interactions with symbolic features, that is, interactions with persons, objects, and symbols (Bronfenbrenner, 1995b). He also states that "for reciprocal interaction to occur, the objects and symbols in the immediate environment must be of a kind that invites attention, exploration, manipulation, elaboration, and imagination" (Bronfenbrenner, 1999, p. 6).

Although there is further development of the role of social and interactional features of the microsystems, as well as objects and symbols, there is no tie to the notion of culture in these developments or with these concepts. Culture does not appear in everyday practices or activities, since culture is somewhat theoretically divorced from its products (objects and symbols). From its inceptions and throughout its revisions, Bronfenbrenner's model lacks clarity of precision around the construct of culture. Since the theory's development, a proper in-depth definition of culture and an acknowledgment of its important role in human development have been lacking. Culture has been situated in the macrosystem and said to play a role because of the interdependence of the systems. But how these transactions operate and how culture is operationalized and measured remain invisible in these models. No

conceptual definition of culture has been elaborated. Without a proper conceptual definition, research and interpretation in human development and culture are negatively affected.

In the following sections we introduce Vygotskian and neo-Vygotskian approaches to the role of culture in development as a way to challenge Bronfenbrenner's approach, conceptually as well as methodologically. Our conceptual framework follows Mistry et al.'s (2016) conceptualization of culture as "generalizable ideologies and practices shared by groups, as well as, the meaning-making processes through which individuals interpret their environmental contexts by drawing on the shared ideologies available to them as members of groups" (p. 4). Culture is both the process and the content of daily activity and is thus inseparable from all contexts where developmental processes and outcomes take place, especially in the microsystems.

Vygotsky's Sociocultural Theory

Culture is a major concept in Vygotsky's sociocultural theory, even though it was not well developed by Vygotsky and his followers (Wertsch & Tulviste, 1992). Sociocultural theory is based on how culture mediates human experience and transforms human activity. One of its fundamental premises is that the external use of culturally defined tools and signs is later internalized in higher psychological functions. From this framework, culture is not a separate entity operating from a higher outside macro system, but culture is the system in which every human daily activity is realized and eventually internalized.

Vygotsky's sociocultural theory originated following the 1917 Bolshevik Revolution in Russia. Alongside Luria and Leontiev, Vygotsky worked toward a psychology that would harmonize with Marxism. Concepts such as tools, labor, and culture and history were drawn from within Marxist influence and reconceptualized to explain learning, development, and higher psychological functions. From Vygotsky's perspective, cultural forms of behavior arise during infancy: in particular in the use of tools and the development of human speech: "This alone places infancy at the center of the prehistory of cultural development" (Vygotsky, 1930–1934/1978, p. 34). The implications are that development is, from the beginning, a culturally mediated process because the use of tools and human speech are culturally defined and acquired behaviors. The acquisition of cultural forms of behavior implies also that interpsychological functions between members of a cultural group become intrapsychological. This is expressed by the "general law of cultural development":

Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (interpsychological), and then inside the child (intrapsychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relations between human individuals. (Vygotsky, 1930–1934/1978, p. 48)

Therefore, Vygotsky's sociocultural theory places culture in everyday activity because every form of human activity is a cultural form of behavior: developed and enacted in a defined cultural context and later internalized by the individual. Vygotsky's account of culture suggests "human mental functioning, even when carried out by an individual acting in isolation, is inherently social, or socio cultural, in that it incorporates socially evolved and socially organized cultural tools" (Wertsch & Tulviste, 1992, p. 551). It is also a notion closely related to semiotic mediation, understanding language as a system of signs inherent to developmental processes and outcomes (Wertsch & Tulviste, 1992).

Although Bronfenbrenner was influenced earlier by Vygotsky with the concept of reciprocal activity occurring in microsystems, as well as proximal processes (Wong, 2001), he did not consider Vygotsky's more abstract formulations (Bronfenbrenner, 1995a). Vygotsky's perspective contrasts with Bronfenbrenner's notion of culture as part of a remote macrosystem, whose involvement in human activity and settings is by means of interdependence between concentric circles. The concept of interdependence comes from the discipline of dynamics in physics and was used by Kurt Lewin to explain the behavior of social forces in a field (Lewin, 1939). Interdependence implies "dynamic properties," "types of reactions," and "types of influences" (Lewin, 1939). In Bronfenbrenner's theory, culture is an external influence because it belongs in the macrosystem. In other words, culture is a separate entity from the immediate settings.

The nature of interaction is seen in the patterns of the activities performed, which are said to be influenced by it. Therein lies the fundamental conceptual difference between Bronfenbrenner and Vygotsky. Bronfenbrenner's use of the concept of interdependence simplifies the role of culture in development by situating culture as an external influence, whereas Vygotsky's cultural mediation places it at the center of the microsystem because culture provides the means, activities, and meanings of every human activity within a particular social origin.

It is important to distinguish between Lewin's influence on Bronfenbrenner and his influence on Vygotsky. As Wong (2001) observes:

Lewin was highly valued by Vygotsky. . . . In "Tool and Symbol in Children's Development," Vygotsky (1930) adhered to the Lewinian distinction between phenotypic (description of external manifestation) and genotypic (explanation of origin or essence) viewpoints and declared his inclination to determine causal-dynamic relations in psychological analyses. But the Lewinian concept of "life space" or "total situation" did not fertilize the soil of the cultural-historical approach. (p. 367)

Lewin's concepts adhere more to a geographical and physical analogy, while Vygotsky's cultural mediation is a dialectic internalization of what once were external cultural signs and tools. The dialectic internalization implies that higher psychological functions are neither external or internal because the dialectics require a radical transformation that blurs any line across them. In other words, the external becomes an extension of internal psychological functions.

Aside from fundamental limitations in the notion of culture in Bronfenbrenner's theory, methodological questions have arisen too. If culture enters developmental research as an external factor from another system, its analysis is reduced to describing the interaction with other systems. But as we have been arguing from Vygotsky's perspective, culture is part of the articulation of the microsystems in research process, because developmental changes imply "mastery of devices and means of cultural behavior and thinking" (Luria, 1930, cited by Wertsch & Tulviste, 1992). Through daily activities and practices, culture becomes the unit of analysis.

Vygotsky's perspective has influenced a lot of theorists, and the sociocultural perspective has grown in the United States, Latin America, Europe, and elsewhere (Rodríguez Arocho, 1996).

Contributions from this perspective contrast with Bronfenbrenner's theory and situate the importance of considering culture and context as inseparable (Mistry et al., 2016).

Thomas Weisner: Ecocultural Theory

In the topic of culture and developmental research, Thomas Weisner has contributed with conceptual and empirical work from the perspective of the ecocultural theory. From this theoretical perspective, **the cultural community provides children with developmental pathways inside an ecocultural context (Weisner, 2002). Developmental pathways are internalized (or crystallized) in everyday routines (bedtime, video games, homework, cooking dinner, etc.). In this sense, culture is the routines we engage in** According to Weisner, García Coll, and Chatman-Nelson (2010, p. 84), "developmental pathways refers to the different kinds of

activities, organized by families and local communities, in which the child could or will engage during development." Although Bronfenbrenner's perspective takes into consideration the importance of routines and activities on the microsystem, there is no clear reference to these actions as culturally defined or mediated, and, similar to Vygotsky's sociocultural theory, the ecocultural perspective understands culture as not separated from the person and its interactions with the microsystem, but developing as habits in a cultural community. In this sense, cultural pathways consists of activities we "step into" and move through life (Weisner, 2002).

According to Weisner, there are multiple behavioral and mental processes involved in the developmental attainment of culture (Weisner, 2015). Some of them can be in conflict with cultural values and producing intrapsychic and cultural conflict (Weisner, 2009). From this perspective, the mentality of an individual's culture includes shared and idiosyncratic beliefs, practices, and experiences that can be at conflict and could lead to contradictory actions (Tonyan, Mamikonian-Zarpas, & Chien, 2013). This phenomenon cannot be located in any of the systems of Bronfenbrenner's theory, since it is the individual child or parent internalization or not of cultural scripts. The individual becomes an actor in its own development and not a total passive recipient of culture.

Weisner's theory recognizes the importance of the ecological and cultural environment where the process of development is taking place, headlining the relationship between individual processes and sociocontextual conditions that have an effect on the processes and outcomes (McWayne, Limlingan, Melzi, & Schick, 2016). Because these processes are contextual, one has to determine where the person is developing, and what are the resources, practices, beliefs, goals, institutions, and so on in that cultural community. In a sense, what we are trying to know is the "developmental niche" the person is experiencing (Super & Harkness, 2002). This concept makes sense with our model of cultural microsystems because we want to identify the practices, narratives, and institutions, among others, in a cultural community that contribute to developmental processes and outcomes.

Barbara Rogoff: Transformation of Participation Perspective

Barbara Rogoff describes development as transformation of participation in sociocultural activities (Rogoff, 2003). Her conceptualization of cultural processes in human development originates from Vygotsky's sociocultural theory. Rogoff et al. (2007) places culture within "community routines" that provide guidelines

"of engagement to cultural participation to build on in daily activities" (p. 2). Cultural processes are not part of a hierarchical system that interacts indirectly with the individual; rather, culture permeates all aspects of life (routines, habits, language) and therefore developmental outcomes and processes.

Culture mediates development and learning since the child begins the process of socialization (Correa-Chávez & Rogoff, 2005). Learning processes are related to cultural practices that dictate the type of engagement the child will partake in the community. Children are assigned to specific settings (day care, soccer practice) by their caregivers or other agents of socialization. "These settings have important consequences on the development of habits of interpersonal behavior, consequences that may not be recognized by the socializers who make the assignments" (Whiting, 1980, p. 111). Cultures differ in how they make these assignments and how these settings are organized in profound ways.

The intent community participation approach emphasizes the inclusion and engagement of children in productive community activities (Rogoff, Correa-Chávez, & Silva, 2009); this way children learn from listening and actively observing adults engaged in production activities (Rogoff et al., 2007). Also, this tradition attempts to carry out objectives by shared communicative efforts between children and adults (Rogoff et al., 2007). In contrast, the assembly line approach separates children from adult community activities and situates them in particular settings designed exclusively for them, such as schools and day care settings, which in turn structure communication differently (Correa-Chávez & Rogoff, 2005). In fact, following this type of instruction, communication is mainly dyadic since information is transmitted from experts to children without shared productive efforts and communication and even learning mostly relies on words. This exemplifies the importance of culturally defined institutions, traditions, and practices in establishing the settings and the everyday practices in which members of a community will participate, the microsystems in Bronfenbrenner's model.

Bronfenbrenner's Bioecological Model Revision: Moving Culture From the Macro Into the Micro

As we have argued from the theoretical perspectives of Vygotsky's sociocultural theory, Thomas Weisner's ecocultural theory, and Rogoff's transformation of participation perspective, culture plays a central role in everyday actions (settings, activities, routines, pathways, etc.) and provides the immediate context for human development. Culture is an ever changing

system composed of the practices of social communities and the interpretation of those practices through language. Language is not only a medium for communication; through language, practices are defined in content and form facilitating action that is not completely limited by those definitions because of context. Through language and practices, culture provides the tools and signs that are part of the historical legacy of those communities. These are integral parts of the child's microsystems.

In our revision to the bioecological model, our main critique comes from an ontological dimension and from a practical dimension. Human development takes place within a **cultural** system. Culture constitutes the context and reality of the developing person and that makes culture a paradigm. From a practical dimension, individuals participate in cultural practices shaped by context specificity and interact with communities and social institutions that are both proximal and distal. Communities and social institutions are also interpretative systems that have the power to change and be changed in those interactions. Culture is embedded in all institutions that have the power to homogenize the daily routines within that context through political policies, laws, and regulations. Individuals interact in different contexts and internalize certain cultural values and practices, making each experience unique from a particular time in life development. Thus, the individual adds diversity to the setting it interacts in.

A child's cultural system is within an ever historical transforming sphere (chronos), which moves and contains the other systems in the bioecological model, but does not relate to them as an outside layer. In our model, we propose **cultural microsystems, which include family, peers, school, neighborhoods, day care centers, and so on, shaped and structured by the social relationships and activities that operate within a certain cultural definitions**. In addition, cultural microsystems not only organize the relationships between what Bronfenbrenner considered mesosystems, but the larger institutions outside the immediate settings or Bronfenbrenner's exosystem. Therefore, there is no need to differentiate mesosystems and macrosystems from cultural microsystems or the exosystem, because cultural practices already contain those relationships. **These systems flow from one another and interact with one another, not bounded and distinctly, but fluidly**.

Within the child's cultural systems, socialization is done through community routines that provide guidelines "of engagement in daily activities" (Rogoff et al., 2007) or as Weisner (2002) conceptualizes it, in cultural pathways. Similar to what Cole (1996) proposed, culture is situated in the middle. Socialization is done in everyday activities within human relationships that culturally

define age appropriate daily activities, routines, and pathways. Other communities, settings, and social institutions, which are located in layers outside of the microsystem in Bronfenbrenner's bioecological paradigm, are also constantly being transformed by the cultural system in a reciprocal way. They are not bounded separate entities, but flow into one another. This means that Bronfenbrenner's exosystem and macrosystem contain the outside settings in which the child does not directly participate, but they still are also originated by culture. Culture is what binds together the various institutions, through the creation of communities of practice that the child participates in or is a part of.

In regard to the biological dimension, we stand by Luria's (1979) assertion that **biology is in a subordinated position to the social and the cultural historical**. "Biology and culture are not alternative influences but inseparable aspects of a system within which individuals develop" (Rogoff, 1990, p. 28). Scientific research has proven that its influence can transcend generations, promoting vulnerability and predispositions as mentioned by Conrad Waddington's term of "epigenetics." Presently, "the majority of environmental factors such as nutrition or toxicants such as endocrine disruptors do not promote genetic mutations or alterations in DNA sequence. However, these factors do have the capacity to alter the epigenome expression" (Skinner, Manikkam, & Guerrero-Bosagna, 2010, p. 214). In addition, the environment in which the individual resides might change over time. **The human capacity for adaptation, both cultural and biological, will be tested when being presented with new challenges in a series of diverse conditions. The particular response to the exposure to toxins, hazards, changes of diet and stressors, caretaking changes, increasing school demands, and so on will be a function of an adaptive system that has evolved biologically and culturally up to now.**

Diagrams serve as visual tools that facilitate the understanding of theoretical ideas (Rogoff, 2003). However, the ways in which ideas are represented may restrain or limit our understanding, more so when the sketches intend to portray visual representations of complex processes. Bronfenbrenner portrayed the systems that compose the ecological paradigm in a diagram made out of concentric circles. This layout of nested circles is questionable since it "separates person and culture into stand-alone entities, with culture influencing the person" (Rogoff, 2003, p. 49), contrasting with our perspective that proposes individual development not separated from its social and cultural-historical context (Rogoff, 2003). Moreover, the separation of the systems carries an implicit meaning about the hierarchical relationships between them, implying that the outer

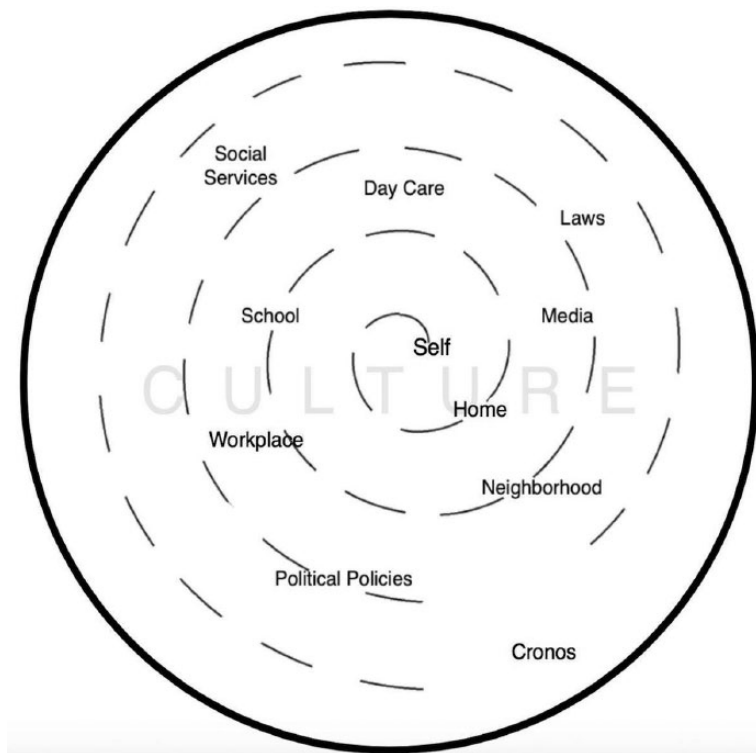


Fig. 3. The cultural microsystem model. This figure portrays culture as existing within different settings, distal or proximal in relation to the individual. It seeks to represent settings as cultural practices (cultural pathways) that relate to the individual in mutually defining processes, emphasizing the transactional nature of human development.

circles influence the inner ones, and the latter are dependent on the systems in which they are embedded. This is not consistent with our understanding of the transformative and “mutually defining processes” between individuals and cultural practices (Rogoff, 2003, p. 49).

In contrast, see Figure 3 for a visual representation of the revised model. **Instead of concentric circles, we depict a spiral moved by the chronos dimension in which culture exists within different settings, distal or proximal in relation to the individual. It seeks to represent settings as cultural practices (cultural pathways) that relate to the individual in mutually defining processes, emphasizing the transactional nature of human development.**

We argue that cultural microsystems are justified theoretically by the notions of **cultural mediation** in Vygotsky’s theory, and the notions of **cultural routines** and **cultural pathways** by the theories of Rogoff and Weisner. Empirically, many cross-cultural studies have validated a variety of cultural systems by paying attention to social activities, relationships, and negotiations being done in everyday activities and how they affect and shape human development.

Empirical Studies That Support the Cultural Microsystems Paradigm Shift

We now present some examples of research that supports our revision of Bronfenbrenner’s model within a cultural framework of daily practices, which is the main reformulation we propose. Research within this framework takes into account culture in every phase of the research process, but especially in the conceptualization and theoretical framework that defines and operationalizes the research problem. For example, within the proposed framework, **quantitative research focuses on measuring daily practices with instruments that are culturally sensitive in both theory and adaptation. Qualitative research focuses on describing and understanding daily practices within a unique cultural framework.**

Culture as part of family systems’ daily practices

Ren and Hu (2014) conducted a multiple-case study to analyze maternal interaction strategies in four Chinese families in Singapore and explored factors that influence choice of interaction strategies and some of the

social, cultural, and contextual factors that shape it. Among the differences found were that teaching mothers had more control over the interaction than non-teaching mothers and immigrant mothers tended to solicit more active participation (Ren & Hu, 2014). Therefore, this study highlights differences in contextual and sociocultural factors that influence mother-child interactions that could contribute to different developmental processes. Other researchers, including García Coll and colleagues (García Coll et al., 2002; García Coll & Marks, 2009), have found that parental involvement in children's education varies widely among immigrant groups. This is consistent with our model in the sense that the communities and individuals can diversify the experience and interactions in a specific context.

Research based on Weisner's ecocultural theory has also proven the shaping of culture in everyday routines (Newland et al., 2013; Plowan, Stevenson, Stephen, & McPake, 2011). McWayne et al. (2016) explore the "niche profiles" of families engagement practices in a group of low-income Spanish- and English-speaking Latino families of preschool children. They found that there is heterogeneity in the pattern of family engagement practices among the families and demographic factors were good predictors of the pattern on the language group and have a relationship with children's social and language skills. These findings highlight the importance of studying cultural practices in daily activities to comprehend heterogeneity within an ethnic group. Furthermore, the study of routines facilitates the recognition of factors that contribute to development.

Culture as part of schools and other learning environments

Rogoff et al. (2007) suggest that "investigating the organization of children's participation in routine activities offers a way to address the dynamic nature of repertoires of cultural practices" (p. 490). Mejía-Arauz, Rogoff, Dexter, and Najafi (2007) conducted a study to explore peer interaction in three groups of children. Results indicated that triads of children who had indigenous heritage and whose Mexican families had immigrated to the United States communicated more often as a group, while the triads of children from European heritage more frequently engaged dyadically or individually. Triads of children from Mexican heritage with maternal extensive schooling exhibited both patterns of communication or resembled the European heritage children. Thus, schooling and community participation do not operate separately in a mechanistic fashion, but rather "participation in institutions is an important aspect of a constellation of related cultural practices

that contribute to children's repertoires of social organization" (p. 1003). This study exemplifies how cultural processes in different settings mediate children's approach to peer interactions and suggests that culture is within everyday activity and routine practices. It also illustrates the significant role that routine organizers play in creating the settings that members of a community attend and the routine activities in which they partake (Rogoff et al., 2007). Therefore institutionalized rules lay out the foundations that structure human relations and communication, which occur in culturally defined settings.

Tsethlikai and Rogoff (2013) conducted a study to examine how cultural practices impact learning in two groups of American Indian children. The results indicated that children who were more engaged in cultural activities in their community could recall the story with more precision. This finding highlights the transactional nature of development and how it is influenced by the cultural contexts in which participation takes place. In a similar fashion, Tonyan (2015) showed that family child care providers' descriptions of "culturally organized ideals of care, or cultural models, held by adults can impact the kind of activities that children experience in their daily lives" (p. 312).

Culture as part of day care settings

Tonyan et al. (2013) used an ecocultural model to develop a group-based approach to understand the relationship between beliefs and practice on child care providers from an archival analysis using the Observational Ratings of the Caregiving Environment. The group-based approach managed to identify meaningful groups of providers with shared beliefs, experiences, and working conditions, and the characteristics of those groups differed in observed behavior. In Rogoff's (2003) approach, beliefs and practices are only part of what keep peoples and communities together.

McWayne et al. (2016) used the ecocultural perspective to investigate the distinct patterns of engagement among 650 Spanish and English self-identified Latinos primary caregivers of Head Start children with low income and 38 teachers and to examine the relation between the patterns, family demographic factors, and children's language and social skills. The findings suggested that providers of care who reported low engagement had less education than those who reported average engagement. Parents of both language groups (Spanish-speaking and English-speaking) who reported high levels of engagement with children engaged in a high level of supplemental practice (e.g., enrolling children in classes outside of school). Moreover, there were distinctions across the dimension of high-profile care

provider between the Spanish- and English-speaking subsamples. Ecocultural theory reminds us that the cultural niches in which children and families live give us indications of what communities, families, and children have in common and value by their cultural heritage, and their particular cultural constructions.

Conclusions

The importance of this revision lies in the fact that Bronfenbrenner's model guides not only research, but also some important ways of thinking and serving communities. Bronfenbrenner originally stated the importance of bridging social policy and developmental research (Bronfenbrenner, 1974). His model has been incorporated by major institutions worldwide (World Health Organization, UNICEF) as one of the theoretical backgrounds for social programs and research. Current revisions of the model have been applied to new interpretations of social policies as dynamic developmental systems where the bioecological model's key concepts are used to inform different aspects of it (Foster & Kalil, 2005). Our revision incorporates Foster and Kalil's (2005) dimensions, but **emphasizes that culture needs to take an important role in public policy as the major informant of processes, contexts, persons, and time.** Any social policy and social program should incorporate the analysis of how cultures operate in everyday activity. Perhaps **the successful implementation of new public policies might be a function of how they are relevant, incorporated, and supported by the cultural microsystems.**

In sum, the original conceptualization of how culture operates in Bronfenbrenner's bioecological model is problematic because it is situated in a macrosystem, as if operating externally from everyday activities, actions, and routines in the microsystems. A revision of the model from Vygotskian and neo-Vygotskian approaches, like Rogoff's and Weisner's theories, led us to create a new framework that situates culture as a critical part of the microsystems as well as all other systems that the microsystems are part of. **We propose that the bioecological paradigm should be revised with a conceptualization of culture operating as part of the microsystems. Evidence to support our revision includes theoretical definitions of culture as well as empirical studies where culture is observed as part of daily routines and practices in families, peer settings, and child care and school settings.**

Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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