

Bronfenbrenner's ecological theory has had a steady influence on Developmental research over the last two decades. However, some areas of research have embraced it more than others. The question is why. First, briefly outline the main tenets of Bronfenbrenner's view of development. Next, pick two areas or topics of research, one to which the theory has significantly contributed and one which has been relatively untouched by the theory. For each area/topic, review and critique the theoretical, empirical, analytic, practical or professional reasons that the theory has/has not had an impact. Finally, in your opinion, how would you like to see each of these areas evolve over the next decade?

Urie Bronfenbrenner's bio-ecological systems theory, with its emphasis on development in context, has had a considerable impact on the conceptualization of developmental psychology. However, some content areas within developmental psychology have integrated Bronfenbrenner's framework into research more so than others. For example, our understanding of socialization, or the process by which individuals' attitudes and behaviors conform to those endorsed by her society, has been heavily influenced by bio-ecological systems theory. Our understanding of certain types of psychopathology, such as ASD, on the other hand, has been relatively untouched by bio-ecological systems theory. Instead, research on ASD has largely remained focused on microsystem elements, such as genetic or parent influences, at the expense of studying contextual variables. The purpose of this paper is to explore the impact that Bronfenbrenner's theory has had on developmental psychology and to consider potential reasons for this phenomenon. Identifying the reasons behind the differential influence of bio-ecological systems theory on two content areas in developmental psychopathology will inform future directions for each area. This paper will first explain in more detail Bronfenbrenner's bio-ecological systems theory. Next, the ways that bio-ecological systems theory has affected research on socialization or, conversely, not affected research on ASD will be discussed. Potential reasons for this difference will be explored, and finally, recommendations for the evolution of research in both depression and ASD will be given.

Bronfenbrenner's ecological theory, also called the bio-ecological systems theory, describes several nested systems with bi-directional influences which may influence individual child outcomes. At the innermost system, the microsystem, lie child characteristics, such as the child's biology or genetic makeup. The microsystem also consists of the immediate environments, such as parental interactions or peer interactions, that directly influence the child. In psychology, the studying just the microsystem has historically been dominant in research, as investigators focused on concepts such as parent-child relationships or genetic influences on child behavior in an isolated way. However, Bronfenbrenner also specified other systems within which the microsystem occurs, and with which the microsystem interacts. The mesosystem is comprised of the connections between different immediate environments. For example, a child's neighborhood might be considered a mesosystem, as it encompasses family, peers, and school. More distally, the exosystem is comprised of external environment settings which indirectly influence the child's development, which may be mediated through parts

of the microsystem or mesosystem. For example, parental workplace could be considered part of the exosystem, as it affects the child through the parent's mood and behavior. Next, the macrosystem contains the larger cultural context in which these interactions occur. The macrosystem includes such constructs as the national economy and the norms associated with the culture/subculture. Eastern versus western values, for example, influence how lower level systems, such as the family or school, are operated and how the child's behavior is interpreted. Finally, the chronosystem recognizes the place of historical events in shaping the other systems. Advances in technology as well as socio-political events (the Great Depression is a prominent example) have an impact on all levels of the system. Taken together, the nested, interacting, and transactional systems in bio-ecological systems theory provide a more holistic framework within which to understand psychological phenomena across the lifespan.

Bio-ecological systems theory has had a large impact on the way that socialization has been studied. While early socialization theories largely focused on social elements of the microsystem (i.e., the mother), current conceptualizations of how children acquire societally appropriate behaviors and attitudes takes into account the cultural and socio-political context. Socialization is "the process whereby an individual's standards, skills, motives, attitudes, and behaviors change to conform to those regarded as desirable and appropriate for his or her present and future role in a society" (Parke & Buriel, 1998, p. 463). Socialization can occur across the lifespan, but is a very prominent part of childhood and adolescence. Early theories of socialization focused on the processes within the microsystem, as the mother's behavior was seen as the only or primary socialization agent for the child. Psychoanalytic stage theory placed great emphasis on the distal effects of single events in childhood, usually relating to experiences with the mother. With behaviorism came the reductionistic view that children learned all appropriate social behaviors through reward and punishment; individuals who engaged in antisocial behavior were thought to have inadequate learning opportunities in their environments. Social learning theory added the observation that children learn appropriate behaviors through observation, in addition to direct rewards and punishment.

However, these early conceptualizations of socialization were limited in several ways, which were directly addressed by new theories influenced by a bio-ecological systems framework. First, these theories were all largely Western, individualistic, and based on Caucasian, middle-class populations. The culturally determined structure of the parent-child relationship was assumed to be the same regardless of setting, and these theories were assumed to be universal. Relatedly, focus remained on the mother, assuming a female, biologically related caregiver in a two parent, married home. Second, they were largely non-developmental theories, assuming that the same principles applied to all children regardless of age. Third, the focus was entirely on one aspect of the environment in the microsystem, ignoring the effects of biological and genetic contributions to behavior. With the advent of Bronfenbrenner's framework, which put emphasis on development in context, these limitations were addressed in new theories of socialization. Systems theory transformed the conceptualization of the social agents of socialization from simply the mother-child dyad to include the entire family, father, siblings, aunts, uncles, grandparents. Family members influence each other, both directly and indirectly, and thus require different units of analysis (e.g., mother-child, father-child, marital, etc.) Moreover, this family system is embedded in other social support

systems, which also requires an additional level of analysis. Current thinking on socialization also acknowledges that these social changes occur within biological and genetic constraints, which may also be modified by the environment. Recent models of socialization purport that children are born with certain neural and genetic predispositions and/or into a certain socio-cultural context that propels them along a certain trajectory. However, proximal events can lead to many outcomes, and the meaning and adaptiveness of these initial behavioral tendencies may vary by context.

There are several reasons for Bronfenbrenner's heavy influence on socialization. First, Bronfenbrenner's conceptualization of development in context was specifically geared toward such complex social-biological processes as socialization. Although Bronfenbrenner's theory has had widespread impact cross-discipline, even affecting such areas as political science and economics, Bronfenbrenner was a developmental psychologist who studied normative human development. Such a fundamental topic as socialization fit well into Bronfenbrenner's theory. Second, it is relatively easy to test higher level variables, such as culture, because it is not difficult to find large samples of normally developing children and their parents. As multi-level analysis requires large sample sizes, researchers on socialization, which occurs in all children in all cultures (though differently), are able to test Bronfenbrenner's framework. Third, recent statistical advances such as hierarchical linear modeling, latent growth modeling and other tools allow longitudinal designs that include multiple units of analysis and take into account the relationships among the levels.

While Bronfenbrenner's ecological theory has impacted research design as well as interpretation of results in socialization, it has had comparatively little impact on Autism Spectrum Disorders (ASD) research. ASD is a pervasive developmental disorder characterized by communication and social deficits, and restricted, repetitive behavior and interests (APA 1994). Research and theory of etiology in ASD has mainly focused on the microsystem, largely ignoring the contribution of levels of context to the expression of symptoms, the impact of symptoms on the individual and family, and the developmental trajectory of symptoms. Whether it is a family dynamics explanation of ASD or a purely biological etiology, theory and research in ASD has largely not examined the interacting effects of school, neighborhood, culture, and socio-political events on the development of ASD. Based on Kanner's (1943) first descriptions of autism, "refrigerator mothers", or parents who were emotionally cold and unavailable to their children, were first offered as an explanation for the symptoms of ASD. Bettelheim (1967) further expanded on a psychogenic view of autism, focusing on the parents' behavior as a direct and sole cause of autistic behavior. More recently, neurobiological and genetic explanations for autism have replaced social explanations of ASD, though a coherent etiology of ASD has not yet evolved (Lord & Bailey, 2002). Family studies have established that ASD is heritable, though heritability estimates range based on how broadly the autism phenotype is defined (Dawson, 1999). Moreover, structural and functional differences in brain patterns have been observed in ASD individuals (Lord & Bailey, 2002). Studies examining both brain and genetics suggest that differing brain patterns may be an intermediate step linking genetic predisposition and the ASD profile (Wassink et al., 2007). Despite that in the past few decades, thinking about ASD has radically shifted from parenting explanations to biological explanations, there has been a

neglect to study first their interaction, within the microsystem, but moreover the interaction with larger elements of the system.

Although it will ultimately be an empirical question to ask how context plays a role in the development of ASD, there are certainly clear first steps for future research on the importance of context for ASD. A first step toward an integrative approach to ASD research that recognizes the contributions of biology and society will be to recognize the bidirectional relationships between the two and the importance of context. While there is strong evidence that there is a biological element to ASD, there is also a tendency to assume that biological or brain differences cause behavioral differences above and beyond social influences, including non-parent social influences. Brain differences can also be caused by social influences, instead of the other way around. In addition, the relationship between genetic predisposition and social influences on ASD are not unidirectional; environment can not only interact with genetics but also have a transactional relationship as both environment and genetic expression are altered by each other. For example, there is evidence that a genotype of the serotonin transporter linked polymorphism (5-HTTLPR) influences social functioning in individuals with ASD (Brune et al., 2006). However, the article was not able to explore how social functioning may be exacerbated by the reactions that ASD individuals with the genotype receive from others. With decreased inborn social skills, ASD individuals may retreat more from social interactions as others are non-responsive or hostile to their advances. This may cause or exacerbate structural or functional differences in social reward centers in the brain, and may trigger decreased expression of genes controlling neurotransmitters involved in social reward. Thus, biology may be impacted by social forces and vice versa. To take this a step further within the ecological framework, in highly communal societies, a developmentally delayed set of social skills may be seen as more worrisome, strange, and disturbing. ASD individuals in communal societies might then experience more rejecting responses from others, further exacerbating their symptoms. Equally likely, however, ASD individuals in communal societies might bond with several caregivers of varying ages and social needs (i.e., sibling, cousin, aunt or uncle, grandparents), increasing their opportunities to learn flexible social skills. As ASD individuals have a demonstrated ability to learn social abilities in the right settings (Lord & Bailey, 2002), context is an important variable to study.

Despite the utility of bio-ecological systems theory in studying ASD, Bronfenbrenner's framework has not been integrated in ASD research due to several reasons. First, the study of high-level variables such as culture require relatively large sample sizes, as groups across these high level variables are compared. However, a limitation in many ASD studies is in recruiting enough participants. Clinical and child clinical populations are difficult to find and recruit; ASD more so because it is relatively rare, compared to disorders like anxiety or conduct problems, with ASD prevalence estimates ranging from 1 in 1000 (Dawson, 1999) to 1 in 150 (CDC, 2007). Additionally, the infrastructure is generally lacking to easily find and recruit ASD subjects. University of Michigan is a special case in that it has the University of Michigan Autism and Communication Disorders Center (UMACC), which draws in ASD individuals from a wide area for assessment/treatment as well as research. Researchers at other universities without a clinic like UMACC largely do not have access to a well-characterized, readily available ASD sample, as assessment takes many hours, multiple

informants, and converging diagnoses from several trained clinicians (Risi et al, 2006). Even at UMACC, however, sample sizes are often not large enough to statistically compare context effects, and variability in context is often low, as participants are largely from the Midwest. In addition, journals, especially biologically-oriented journals, often require that participants be medication-free, due to concerns that psychoactive medication may be a confound. However, many ASD individuals are on medication, requiring exclusion of about 50% of a potential sample. Controlling for the effects of medicine are next to impossible, as individuals are on a wide variety of medicines at variable doses, necessitating exclusion. Meta-analyses might be a first step in overcoming this sample size problem, but as most researchers do not directly measure or report context variables in their studies, this may not be a viable option to integrate Bronfenbrenner's theory.

Second, bio-ecological systems theory may not have been integrated into ASD research because ASD is a relatively newly described disorder, and there may not be enough time to for the field to have a large-scale perspective on ASD. Although Leo Kanner first observed and documented classical autism in the 1940s, it was not until 1987 and 1994 that the broader categories of Pervasive Developmental Disorder – Not Otherwise Specified (PDD-NOS) and Asperger's syndrome, respectively, were added to the DSM. As such, there really have been only about thirteen years to do research on Autism Spectrum Disorders as they are currently defined. Considering how long it takes and how difficult it is to recruit a well-characterized sample, as discussed above, ASD research is still in its first steps, starting to look at relationships in the microsystem and how they might interact with each other. When ASD research has had more years to develop, it will include higher level systems as well.

Lastly, the current focus on biology as a primary or sole cause of ASD without regard to context may be a product of early research that blamed mothers for their children's disorder. Growing up with a "refrigerator mother" was compared to living in a concentration camp by leading researcher (and Holocaust survivor) Bruno Bettelheim (Bettelheim, 1967). Leo Kanner (1943) scathingly wrote that mothers and fathers "just happen[ed] to defrost enough to produce a child." The implicit or explicit blame that research on mothers' (and fathers', but particularly mothers') behavior as a cause of autistic symptoms was so distressing to parents that it eventually caused a paradigm shift to genetic and biological research that lifted blame from mothers. How to study familial and societal effects on negative outcomes in children without assigning blame, and particularly without assigning blame in a biased and gender-stereotyped fashion, is a problem that researchers in many areas face. On the other hand, discovering social aspects of ASD etiology could be empowering and positive, as they can inform new treatments and venues for ameliorating problem behavior. Because the tone has been largely negative and blaming instead of positive and empowering, study of social context in ASD research has lagged behind other aspects of developmental research.

To summarize, Urie Bronfenbrenner's bio-ecological systems theory has transformed the field of developmental psychology, but more so in some areas, such as socialization research, than other areas, such as Autism Spectrum Disorders research. While ASD researchers face challenges that socialization researchers do not in applying bio-ecological systems theory to their work, there are several ways in which I, as an ASD researcher, would like to see my field evolve. First, in order to overcome the sample size problem, I would hope to see increased cooperation and collaboration among researchers

nationally and internationally. Not only does international collaboration this increase the sample size, it also increases the variability in socio-cultural contexts. Second, ASD researchers should not neglect to measure and report aspects of context, such as culture (i.e., relevant attitudes, norms, etc.) and family variables. If researchers do this, even if it is a small study that does not have the power to test higher-level variables, the results can be understood within the reported context and perhaps eventually analyzed in a meta-analysis. Lastly, ASD researchers should find a sensitive, empowering way to study and disseminate research on social aspects of context that does not assign blame, but neither ignores the effects of family context. Much of this may come in framing research questions and findings in positive terms, asking questions like, “What do families do that buffer the negative effects of symptoms?” This is in contrast to most ASD research, which frame questions in terms of how variable X exacerbates or causes debilitating symptom Y. While ASD researchers have specific challenges that they must overcome before they will be able to take advantage of the focus on context in bio-ecological systems theory, socialization researchers are farther along in how they have integrated Bronfenbrenner’s work. However, research on socialization could also evolve by opening channels of communication and influence to other areas of psychology. For example, socialization process are altered in ASD individuals such their ability to pick up subtle cues to appropriate behavior is lessened. Looking at ASD traits in a non-ASD population at several analytical levels would inform understanding of abnormal traits. Until the challenges that some areas of psychology face more than others are successfully overcome, bio-ecological theory will be unevenly applied in psychology research.

References (Outside of Class)

- American Psychological Association. (1994). Diagnostic and Statistical Manual of Mental Disorders. Washington, DC, American Psychiatric Association.
- Bailey, A., et al (1995). Autism as a strongly genetic disorder: Evidence from a British twin study. *Psychol. Med.* 25; 63-77.
- Brune CW, Kim SJ, Salt J, Leventhal BL, Lord C, Cook EH, Jr. (2006): 5-HTTLPR Genotype-Specific Phenotype in Children and Adolescents With Autism. *Am J Psychiatry* 163:2148-2156.
- Bettelheim, B. (1967) *The Empty Fortress: Infantile Autism and the Birth of the Self*, The Free Press, New York
- Bronfenbrenner, U. (1979). *The Ecology of Human Development: Experiments by Nature and Design*. Cambridge, MA: Harvard University Press.
- CDC (2007).
- Kanner L (1943). "Autistic disturbances of affective contact". *Nervous Child* 2: 217–50.
- Lord, C. & Bailey, A. (2002). Autism Spectrum Disorders. *Child and Adolescent Psychiatry*, 4th ed, (pp. 636-663). Oxford: Blackwell Sciences.
- Lord C, Risi S, Lambrecht L, Cook EH, Jr., Leventhal BL, DiLavore PC, et al (2000): The autism diagnostic observation schedule-generic: a standard measure of social and communication deficits associated with the spectrum of autism. *J Autism Dev Disord* 30:205-223.
- Dawson, G. (1999). Written testimony to the Public Health Subcommittee, United States Senate
- Wassink TH, Hazlett HC, Epping EA, Arndt S, Dager SR, Schellenberg GD, et al (2007): Cerebral cortical gray matter overgrowth and functional variation of the serotonin transporter gene in autism. *Arch Gen Psychiatry* 64:709-717.