

Implicit versus Explicit Ways of Using Bronfenbrenner's Bioecological Theory

Commentary on Jaeger

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There are many things to appreciate in Elizabeth Jaeger's [2016] paper. Initially she does a fine job describing the development of Bronfenbrenner's bioecological theory, showing the ways in which the theory changed over time from one that appeared (at least to his readers) to concentrate primarily on contexts of development to one in which proximal processes were placed front and center. As Jaeger notes, Bronfenbrenner had focused on context during the 1970s because contemporary developmental psychologists paid so little attention to it. However, from the start, he termed his theory "ecological" because he viewed development as arising from the interaction of individuals and the contexts in which they were situated.

Given that his theory became so quickly identified as a theory of contextual influences on development, Bronfenbrenner attempted during the 1980s to deal with this misinterpretation in three related ways, each of which Jaeger describes. First, he made clear that any model of human development had to explain the *processes* by which development occurred; second, he paid more explicit attention to the role played by person characteristics; third, although this was always implicit in his concern with process, he made increasingly explicit his discussion of time, both longitudinal and historical. By the late 1990s, he had renamed his theory "bioecological," placed "proximal processes" (oft-repeated engagement in activities and interactions, increasing in complexity) at the heart of his theory, and provided more detail about the different types of person characteristics that influence proximal processes as well as about different ways of conceptualizing time. Bronfenbrenner referred to the operational design to be used to test the theory as the process-person-context-time (PPCT) model.

For scholars who continue to treat Bronfenbrenner's theory as one that deals solely with the effects of the microsystem, mesosystem, exosystem, or macrosystem on development, or even one that focuses on person-context interactions, Jaeger's paper should go a long way to help correct those misunderstandings. Even more effective in this regard is her valiant effort to counteract the facile representation of the theory as nothing more than a set of concentric rings, each of which corresponds to one or other of the famous "systems" of context. Her visual representation of the PPCT model is excellent.

Jaeger goes much further, however, than simply describing the theory's evolution and trying to correct misunderstandings. She also explains the importance of examining the ways in which person and context characteristics influence proximal processes over time, drawing on her own research in the area of literacy development. In the course of her longitudinal study with four children, she explained how she studied proximal processes by examining the increasing complexity of her interactions with the children and the tasks in which they were engaged. She showed, too, how both the school and home context influenced the nature of those interactions, as did the children's own characteristics. Not only was her study conducted over time, but she also discussed the ways in which the historical time period may have influenced the children's literacy development. In brief, Jaeger knows bioecological theory well and has illustrated how it can be used effectively in one area of research.

This is no small feat, given the complexity of bioecological theory. There is no doubt that the theory is complex, with three types of person characteristics, four types of context, and three ways of conceptualizing time, all of which simultaneously engage in subtle interaction in the course of ever-changing proximal processes. As my colleagues and I have argued elsewhere [Tudge, Mokrova, Hatfield, & Karnik, 2009; Tudge et al., 2016], and as Jaeger agrees, there is no need to include all of these factors in the research design, and studies can be effectively designed that use Bronfenbrenner's theory as the foundation for their research. But this brings up the central question of my commentary: what exactly does it mean to say that a theory is being employed as the foundation for the study?

Here, I think, Jaeger and I differ. The differences can be easily seen in the section of the paper in which Jaeger describes others' research. As she noted, her goal was to examine research in the area of literacy that "employed Bronfenbrenner's [bioecological] theory in its execution" and eliminated studies that "failed to use it as the theoretical foundation". In other words, the intention was to use similar methods to those my colleagues and I had used [Tudge et al., 2009] and are continuing to use [Tudge et al., 2016], although Jaeger restricted herself to research in a single domain (literacy) whereas we examined family studies and developmental science more broadly.

Jaeger and I clearly used different criteria for deciding whether researchers employed the theory as the foundation for their study. Tudge et al. [2009] argued that researchers should (a) make explicit their theoretical foundations, (b) describe the theory accurately, and (c) use appropriate methods to test it. Theory testing, we feel, is a crucial component of our enterprise. In our more recent paper [Tudge et al., 2016], we quoted Paul Meehl: "Theories in 'soft' areas of psychology lack the cumulative character of scientific knowledge. They tend neither to be refuted nor to be corroborated, but instead merely fade away as people lose interest" [1978, p. 806]. Scholars may of course cite theorists whose ideas have alerted them to the importance of

one or other variable or to the interaction among variables, but surely this is different from them using someone's ideas as the theoretical foundation for their research. If the foundations have not been firmly established, the entire edifice is in danger.

Using our criteria to evaluate the eight studies that Jaeger cited as good examples of research using Bronfenbrenner's theory, we would have said that six failed to reach our requirements. In our recent (2016) paper, we, like Jaeger, only considered papers whose authors said that they were using Bronfenbrenner's theory; mere citation of the theory was not sufficient. We categorized studies as falling into one of five types: (a) those whose authors only cited Bronfenbrenner's work prior to the mid-1990s, and thus were not using the final version, (b) those who cited the mature work but did not consider the PPCT model, (c) those who considered the PPCT model only in the introduction, (d) those whose study variables were related to this model, and (e) those whose authors appropriately tested and evaluated the model. Just as in our 2009 paper, in which we could only identify four of 25 studies conducted since 2000 that seemed to have used the theory appropriately, in the more recent paper only two of 20 appropriately tested and evaluated the model, although in a further seven, the study variables were at least related to the PPCT model.

Of the papers that Jaeger cited as good examples, two [Barnyak, 2011; Hettinger & Knapp, 2001] only cited Bronfenbrenner's work from the 1970s. (Barnyak cited Bronfenbrenner's 2005 book, but only drew on a 1973 paper included in it.) Similarly, Connor, Son, Hindman, and Morrison [2005] only cited one of his papers from the 1980s. In their later work [Connor et al., 2010, 2012], they cited Bronfenbrenner and Morris [2006] but only to the effect that Bronfenbrenner's theory employed a "transactional, bidirectional framework" [Connor et al., 2010, p. 450] and that their "model is informed by ecological and dynamical systems theories" [Connor et al., 2012, p. 53]. De Jong and Leseman [2001] cited Bronfenbrenner and Ceci [1994] in which the earliest appearance of the bioecological model is found. However, this work is cited only to the effect that "under appropriate maximized instruction, children's genetic potential will be optimally actualized, reducing the impact of (prior) sociocultural factors" (p. 410).

By contrast, the remaining two papers [Farrant & Zubrick, 2012; Ponitz, Rimm-Kaufmann, Grimm, & Curby, 2009] not only cited the mature version of Bronfenbrenner's theory, but also laid out the components of the PPCT model, and their study variables appropriately reflected those components. Such an approach allows the theory to be tested and, if found wanting, modified or rejected. This needs to occur if we are to advance the fields of family studies and developmental science [Demo & Buehler, 2013; Meehl, 1978; O'Brien, 2005; Thomas, 1997; Tudge et al., 2016]. Theories can only be tested if their major concepts are carefully described and the methods used are designed to appropriately test those concepts and the interactions among concepts. In other words, the foundations need not only to be in place, but also to be tested to ensure that the scientific edifice is on firm ground.

The fact that Jaeger included the remaining six papers as examples of those that she felt appropriately used bioecological theory suggests that we differ in our views of how best to exemplify the use of theory. Perhaps, though, my colleagues and I were taking too strict a line, and there certainly seem to be some advantages in examining studies whose authors at least implicitly allow readers to see how the theory could be operationalized. In the eight studies that Jaeger discussed, the authors had measured interactions that could, quite reasonably, have been termed "proximal processes" and

showed how both characteristics of children and their social partners and characteristics of the context modified those proximal processes over some period of time. In other words, if scholars are interested in understanding how to operationalize bioecological theory, they can read these papers to discover the types of variables that make sense to use from a Bronfenbrennerian perspective. They would, however, have to rely on Jaeger's paper to explicitly connect the variables to the theory in all but two cases.

There is a problem, however, in examining studies in which the methods are only, at best, related implicitly to the theory on which the research is said to be based. It is simply not sufficient to examine person–context interactions as they develop over time, even if in the course of their studies those interactions could be viewed as exemplifying proximal processes. Theorists other than Bronfenbrenner focus on interactions between individuals and the contexts in which they are situated, and argue persuasively that longitudinal studies are necessary for research to be considered developmental in nature [see, for example, Overton, 2015; Sameroff & Mackenzie, 2003]. No one would argue that bioecological, relational developmental systems, and transactional theories are identical; indeed, Overton argued that Bronfenbrenner's theory and relational developmental systems fit within different metatheoretical paradigms. I think that we need more compelling, and certainly more explicit, evidence that the examination of person–context interactions over time is based on any specific theoretical foundation.

For scholars concerned about the complexity of the PPCT model and wondering how to base their research on bioecological theory and test it appropriately, Jaeger's discussion of the work of Farrant and Zubrick [2012] and Ponitz et al. [2009] is far more useful, given that they explicitly link their variables and methods to bioecological theory, than her consideration of those studies that can at best be related implicitly to the PPCT model. Her own research, moreover, is a model for what can be done to operationalize a complex theory. All that is needed is the willingness to test it rigorously, assess where it is wanting, and suggest ways of improving it.

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