

## PROXIMAL PROCESSES AND CAUSALITY IN HUMAN DEVELOPMENT

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**ABSTRACT:** *The bioecological model developed by Urie Bronfenbrenner includes the process, person, context, time framework and a concept of interaction known as proximal process. While the concept of proximal process is essential in explaining developmental outcomes, it has not been fully developed. The goal of this inquiry is to focus in particular on proximal process and examine some aspects of it in terms of the Aristotelian four causes. Bronfenbrenner's theory is introduced, and proximal process is defined and briefly appraised. The four Aristotelian causes are defined, and examples are suggested. The concept of proximal process is examined with regard to material cause, formal cause, efficient cause, and final cause. It is important from the perspective of developmental research to more fully define proximal processes and to conceptualize them in terms of the four causes that were described by Aristotle. Such a conceptualization could lead to identification of measurable variables that represent the four Aristotelian causes.*

**KEYWORDS:** Proximal Process, Causality, Aristotle

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### INTRODUCTION

Urie Bronfenbrenner's theory construction project (Bronfenbrenner, 1979, 1998, 1999; Bronfenbrenner & Morris, 1998; Bronfenbrenner & Morris, 2006) began with the ecology of human development and evolved as a bioecological model including a process, person, context, time (PPCT) framework. The bioecological model is used widely and has significant potential for stimulating further theoretical development and for providing a foundation for future research in human development.

Following the publication of *The Ecology of Human Development* (Bronfenbrenner, 1979) most of the applications of his theory were mainly based on concepts of contexts. This approach continues today to represent the meaning of Bronfenbrenner's work for many researchers. Within this approach, the levels of ecological organization are considered as a design template for selecting variables. A study is considered to be ecological if microsystem, mesosystem, exosystem, and/or macrosystem variables are used in model building and analysis.

Bronfenbrenner's later work, PPCT, has been referred to as a theory, a model, and a framework. Bronfenbrenner (1999) did not see PPCT as a theoretical model or a research design, but a framework for classifying phenomena and defining properties. There is evidence that it has been used as a design template. However, it is not clear that the details of the PPCT framework have been used fruitfully. That is, it appears that some researchers have not taken advantage of the fullness of the PPCT framework, incorporating process, person, context, and time variables. Tudge, Mokrova, Hatfield and Karnik (2009) reviewed research based on the PPCT framework and found that relatively few researchers have used the framework comprehensively. Perhaps this is due to lack of clarity of its essential concept and constructs. Thus further explanations are necessary.

## Proximal Process

In bioecological theory, reciprocal interaction between an individual and environments, incorporating persons, objects, and symbols is defined as proximal process (Bronfenbrenner & Morris, 1998). The emphasis is on the reciprocal nature of interaction. The key to understanding proximal processes, and ecological processes in general, is that the relationships of people with environments are bi-directional. Proximal processes are not simply the unidirectional effects of environments doing things to people. Another misconception is that proximal processes are only about social interactions. Proximal processes are more than the interaction of two individuals in direct communication; they are also interactions with objects and symbols that make up the context. Just as proximal processes are not limited to interactions with other people, it is also obvious that simply the presence of other people in the immediate environment does not necessarily lead to the occurrence of a proximal process. Bronfenbrenner and Morris (2006) observed that proximal processes are not necessarily isolated events. They are recurring and may vary in degrees of complexity. Effective proximal processes may be part of a sequence

A basic definition of the concept of proximal is a clear reference to a near context (Bronfenbrenner & Morris, 1998; Bronfenbrenner & Morris, 2006). However, what is the boundary between proximal environments and distal environments? How are proximal stimuli to be distinguished functionally from distal stimuli? Are distal stimuli less developmentally efficacious than proximal stimuli? Are there functional differences between proximal and distal stimuli if: (1) proximal processes can include spatially distal stimuli; (2) participants in proximal processes make no effective functional distinction between proximal and spatially distal stimuli, and (3) there is no effective functional distinction between proximal stimuli and spatially distal stimuli with regard to sensation, perception, or developmental outcomes?

The purpose here is not to move broadly toward realizing the goal of fully explicating the concept of proximal process. Rather, the purpose is to examine some of its basic dimensions. We do so by considering how proximal process is related to concepts of causality in the Aristotelian four causes. This complements previous studies of causality in psychology (Griffore, 1978) and in the ecology of human development (Griffore & Phenice, 1988).

## Aristotelian Causes and Proximal Process

Proximal processes can be conceptualized in terms of four Aristotelian causes, or *aitia*. They are *matter*, *form*, *agent*, and *purpose* (Benn, 1914; Griffore, 1978; Griffore & Phenice, 1988; Stumpf, 1966), which are associated, respectively, with *material cause*, *formal cause*, *efficient cause*, and *final cause*.

**Material Causes.** Material causes refer to the matter of which something is made (Benn, 1914; Griffore, 1978; Griffore & Phenice, 1988; Stumpf, 1966). Material causes in proximal processes are essential potentials or capacities. The origin of potentials and capacities are the genetic code. This is the essence of pure potential, which is at the foundation of growth, maturation, and development. It consists of adenine, guanine, cytosine, and thymine, which are in DNA and RNA. This matter is in the individual at conception and develops as a consequence of interaction with environments. In developmental science, a distinction is often made between exogenous variables, which are variables whose values are not affected by the values of other variables, and endogenous variables, whose values are affected by the values of other variables. Some might consider material causes to be exogenous variables. However, changes

to DNA, in the epigenetic code, are the results of experience (Roth, Lubin, Funk, & Sweatt, 2009; Sweatt, 2009).

When development occurs, there is more in the individual than potential and capacity. Development occurs when form and shape emerge from matter in the context of proximal processes. That is, development occurs when *formal causes* are produced. They are produced by the effects of two other causes that are incorporated within proximal processes: *efficient causes* and *final causes*. We will examine these two causes and then see how, coupled with material causes, they produce formal causes in the form of developmental outcomes.

***Efficient Causes.*** Efficient causes have characteristics of agency (Benn, 1914; Griffore, 1978; Griffore & Phenice, 1988; Stumpf, 1966). Participants in proximal processes encounter events that cause them to begin, sustain, and end proximal processes. Environments are full of discriminative stimuli that prompt action, reinforcers that strengthen responses, and other events that lead to decline and extinction of responses. Some events, such as birth and death, are momentous efficient causes. Others are routine. Mealtime can be an efficient cause of interaction and discussion. A ringing phone is an efficient cause for interactions, some of which can be developmentally consequential. Business meetings, academic conferences, and visits with health care providers can shape the future and alter the life course.

Efficient causes may be conceptualized as the result of an interactive process involving two or more individuals, which has the effect of producing developmental outcomes. In metacontingency theory (Glenn, 2004, 2010; Malott & Glenn, 2006), interlocking individual operants lead to aggregate products. Thus, proximal processes may be considered metacontingencies that bring about developmental outcomes. Participants in proximal processes are, in varying degrees, aware of the complexity and outcomes of their metacontingencies and how their behaviors are coordinated with the behaviors of others. Some developmental outcomes are considered more or less desirable within cultural contexts. Metacontingencies of positive development are selected within organizations, communities, and society for support, based on the need to contribute to communities and society. Proximal processes involving family members are interlocked with the proximal processes of others at the community level. Indeed, the unique patterns of proximal processes within families are selected and shaped by the mesosystem relationships of families within their communities. Interactions within families cannot be separated from the interaction of families with communities.

Efficient causes are essentially phenomenological. Some aspects of efficient causes have direct effects on the person. Physical injuries suffered by the experiences of being struck by lightning in many ways do not require interpretation. However, other aspects of the lightning strike and its contexts are given subjective interpretation. Bronfenbrenner (1979, pp. 22) was explicit that “the aspects of the environment that are most powerful in shaping the course of psychological growth are overwhelmingly those that have meaning to the person in a given situation.” He traced phenomenology in philosophy and psychology, and sociology and identified a principal influence as Kurt Lewin (1935), noting that what is important is not the objectively measurable environment, but the meanings people construct of environments. Yet, despite the importance of subjective meaning, interpretations and applications of proximal process often suggest that environments directly cause behavior, thus ignoring the subjective meanings that people make of their experiences. Children make meanings not only in an abstract general sense (Novak, 1993; Wells, 1986), but with regard to specific contexts, such as classrooms (Lyle, 2000), in the home and in preschools (Flewitt, 2005), in art (Einarsdottir, Dockett, & Perry, 2009;

Wright, 2007), and in music (Burnard, 2002). In the long course of developmental change, adults construct not only specific meanings, such as in educational settings (Kasworm, 2003), but in a general sense as well, as explored extensively by Frankl (1992). Berger and Kellner (1964) observed, regarding the process of meaning making in couples, that when there is interaction, individuals bring their complete developmental histories and their perceptions of their cultural experiences.

As Scarr (1992) observed, individuals have unique ways of understanding, constructing and taking action on environments. Environmental reality is not acquired; it is constructed, and each individual's construction of reality is unique. Individuals who share experiences inevitably construct these experiences in unique ways. While individuals experience common stimuli within families, they construct unique microenvironments (Plomin & Thompson, 1987). Thus members of the same family may see the same family in very different ways.

**Final Causes.** The final cause of a thing is where it will end (Benn, 1914; Griffore, 1978; Griffore & Phenice, 1988; Stumpf, 1966). From this perspective, when individuals participate in proximal processes, the final cause may be considered the end point of developmental progress. At the individual level, the end is to fully realize the potential inherent in individual capacities. This is a view of the end point of proximal processes that is solely individualistic.

From the perspective of sociobiology, the final causes in proximal processes may be considered forms of adaptive phenotypes, specifically social behaviors. There is an adaptive capacity to create effective proximal processes that bring about individual development as well as social behavior. Proximal processes function to maintain the capacity in a population to engage in adaptive coordinated social behaviors. The capacity to engage in coordinated social behavior is applied to achieve group advantageous behavior within specific ecosystems. Thus, the final cause of proximal processes extends beyond individual development. Manifestations of proximal process function to maintain the capacity to engage in aggregate behavior. As proximal processes foster developmental outcomes for individuals, these processes maintain, in a population, the evolved capacity to engage in aggregate behavior for the benefit of forming and sustaining human communities.

The capacity to combine and articulate adaptive combinations of individual behaviors is central to multilevel selection theory. Discussing altruism, Wilson and Wilson (2007) suggest that if a group is to adapt, coordinated behavior is necessary. Therefore, for adaptation and survival, group-advantageous altruistic behavior will provide a greater adaptive advantage than selfish and competitive behavior. Aggregations engaged in the most adaptive aggregate behavior are selected, based on the adaptive advantages provided by their unique alignments of proximal processes.

**Formal Causes.** Formal causes may be considered the full manifestations or products of interactions of material causes with efficient causes and final causes. Participation in proximal processes may be enabled by, and/or constrained by general or specific potentials, such as found in physical and cognitive abilities and personality characteristics. For example, interaction with others in social environments depends on mobility, which enables one to become situated within a context in which interaction is possible. In a physical environment in which other individuals are present, proximal processes depend on motivation and social skills to enable participation. Participation in sports activities requires physical skill, intellectual ability, knowledge of the rules of participation, social skills to articulate one's own behavior with the behaviors of others, and motivation to continue interaction over time in pursuit of a

common goal of playing a sport. Successful participation in a college class requires having adequate prerequisite information, the cognitive skills necessary to understand and use information, the motivation to participate, and the social skills necessary to act as a member of the class.

Personality characteristics are described in terms of what are commonly known as the big 5 traits: openness, conscientiousness, extraversion, agreeableness, and neuroticism (Curtis, Windsor, & Soubelet, 2015; Hayes & Joseph, 2003; Macdonald, Bore, & Munro, 2008; Zillig, Hemenover, & Dienstbier, 2002), and the dark triad, which are Machiavellianism, narcissism, and psychopathy (DeShong, Grant, & Mullins-Sweatt, 2015; Turnipseed & Cohen, 2015; Vernon, Villani, Vickers, & Harris, 2008). Each of these traits can be considered a formal cause, resulting from proximal process interaction of material causes with efficient and final causes. The big 5 and the dark triad traits also are combined and configured in ways that are unique to individuals. For example, one might measure very high on some traits and very low on others, or possibly be in the middle of the continuum on all traits, or any number of other unique combinations. Represented on bar graphs, there could be countless unique shapes or forms, and each unique configuration could be related in unique ways to particular proximal processes in specific contexts. Interactions of traits with treatments or contexts have been described as aptitude X treatment interactions (ATIs) (Cronbach & Snow, 1979; Snow, 1989). It is clear that having a personality structure that incorporates interactions of low openness, low conscientiousness, low extroversion, low agreeableness, and high neuroticism might affect participation in proximal processes in particular ways. If each trait were measured at the opposite end of the continuum the effects on participation in proximal processes could be very different. Of course there are many disorders, such as obsessive-compulsive disorder and narcissistic disorder, which are forms or configurations of characteristics that can have marked effects on participation in proximal processes. Forms, shapes, and configurations of the big 5 and dark triad traits, and even personality disorders, may change over time. Patterns of change over time influence patterns of participation in proximal processes.

## CONCLUSION

The purpose of this paper is to examine proximal processes in terms of causality. This is a complement to studies of causality in psychology (Griffore, 1978) and the ecology of human development (Griffore & Phenice, 1988). It is important from the perspective of developmental research to more fully define proximal processes and to conceptualize them in terms of the four causes that were described by Aristotle. The utilization of the four Aristotelian causes will enable researchers to identify measurable variables that will represent a more complete understanding of the importance of proximal processes and their consequences in human development. While it is possible to describe proximal processes from a variety of perspectives, these causal dimensions are basic and useful. Current research often focuses on models based on efficient causality. While important, this is only one causal dimension. Taking a broader view of causality allows for the integration of diverse theoretical foundations, ranging from behavior analysis to sociobiology.

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