Serendipitous Relations as Self-Organization through Reflective Engagement

Commentary on Napolitano

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Key Words

Developmental systems theory · Life course · Life span development · Reflective mode of engagement · Relational metatheory · Self-organization · Self-regulation · Serendipitous relations

In his astute and insightful article, Christopher Napolitano [this issue] presented a theory of *serendipitous relations* to address what remains an underexplored arena of transaction and transformation in development: those person-environment relations in which individuals *intentionally* act to both promote and take advantage of *unexpected* life events, establishing novel developmental pathways of adaptive organization in the process. As an integration of action-theoretical and life span developmental approaches [e.g., Geldhof, Little, & Colombo, 2010; Lerner, Freund, De Stefanis, & Habermas, 2001; Napolitano, Bowers, Gestsdottir, & Chase, 2011] subsumed under the overarching framework of the relational developmental systems paradigm [Overton, 2013; Overton & Lerner, 2012], Napolitano's theory revives and substantively extends the original, transactional meaning of serendipity, a term which was coined to describe an act of discovery borne of sagacity and chance but which has become far too commonly identified with *either* fortuitous chance events *or* an individual's skill in discovery. Critically, his theory establishes an organizational framework for understanding and structurally grounding the real- and developmental-time dynamics that comprise serendipitous relations between person and world, lending important perspective not only to our scientific understanding of how development proceeds across the life span but also to our self-reflective understanding of the very process by which we as scientists engage in scientific discovery [e.g., Dunbar & Fugelsang, 2005; Kulkarni & Simon, 1988].

Napolitano's theoretical focus revolves around an individual's agency in its "reflexive-intentional mode" [Brandtstädter, 2006, p. 535], with specific appeal to inten-

tional self-regulatory activities or, in Napolitano's words, "chosen, organized actions-in-context that further valued goals or purposes" (p. 296). Through such activities, termed *serendipitous actions*, individuals can not only identify and capitalize on idiosyncratic and unplanned life events but can also foster the very conditions of person-environment transaction likely to yield such events. Napolitano's theory details the characteristic patterning of these serendipitous actions and establishes a three-phase sequential model for ordering the coaction of serendipitous activity and unexpected live events. His model furthermore highlights the importance of having a *serendipitous orientation* toward the world by framing serendipitous actions within the broader, dispositional context of an individual's growth focus and openness to novelty. An individual's serendipitous orientation – involving as it does the *choice* to be open to new goal strivings and to possibilities for developmental transformation – constitutes an important organismic starting point for initiating serendipitous relations and for contextualizing the occurrence and meaning of unexpected, non-normative life events.

The concept of serendipitous relations importantly articulates a dynamic, constructive process by which individuals engineer their own positive development *through higher-order, reflective activity*. As typically construed, reflective activity or engagement with the world is marked by a clear subject-object structure and involves a detached, "Cartesian" or scientific stance in which we as subjects contemplate the world, our actions in it, and our felt experience *as objects*. Such activity developmentally emerges from lower-order, *prereflective* activity, which, in contrast to reflective activity, involves an immediate, symbiotic immersion in the world, where things are known in terms of what we can do with them and where knowing inheres in the act of doing as an embodied and embedded activity. Prereflective engagement, in other words, is about a resonance with and attunement to the world absent of any self-referential awareness of self as subject standing in relation to the world as object. The critical role played by prereflective levels of organismic activity in the developmental emergence and transformation of neurological, morphological, and psychological structure is well-established empirically [e.g., Anderson et al., 2013; Einspieler, Prayer, & Prechtl, 2012; Katz & Shatz, 1996; Westermann et al., 2007] and has assumed renewed theoretical and metatheoretical prominence in developmental science, especially in the wake of the embodied cognition movement [e.g., Clark, 1997; Varela, Thompson, & Rosch, 1991; Wheeler, 2005]. An unfortunate side effect of prereflective activity's focal prominence, however, has been the relative neglect and/or marginalization (at least within the climate of current developmental science) of reflective activity and its promotion of positive developmental transformation.

Napolitano has importantly issued a much needed reminder to the field that reflective, consciously deliberative levels of activity – not just prereflective levels – play prominent roles in the process of actual developmental construction across the life span rather than being simply relegated, at best, to the maintenance and consolidation-elaboration of existing developmental pattern or, at worst, to epiphenomenal byproduct. Moreover, though his theory is couched specifically in terms of self-regulatory activity, I would argue that Napolitano has constructed a model of broader impact for developmental science in that his concept of serendipitous relations critically informs our understanding of the process of *self-organization in developmental-time*. In effect, serendipitous relations capture how self-organization can arise in development as a consequence of an individual's reflective activity, providing a unique

focus on the operation of self-organizing dynamics *through an individual's reflective engagement with her world*.

Self-organization – as a core principle of dynamic systems approaches to development [e.g., Lewis, 2000; Thelen & Smith, 1994; van Geert, 2000] and of the relational developmental systems paradigm in general – involves the *spontaneous generation of pattern* at both real- and developmental-time scales, yielding local, context-specific organization in organismic activity and global, context-general organization (e.g., levels or stages of developmental organization) in organisms as structured wholes. It is the process by which new irreducible forms arise in a system *in completely unplanned fashion* – without design, set of instructions, or any form of prefiguring – purely through the lower-order fluctuations and nonlinearity of relations among the components that comprise the system [Kelso, 2000; Lewis, 2000; Thelen & Smith, 1994]. Or, as Kelso [1995] wrote, in self-organization “the system organizes itself, but there is no ‘self,’ no agent inside the system doing the organizing” (p. 8). In other words, stability and organization at the *macrolevel* of a system arise from and are constantly maintained by the ever-present *microlevel* variability and dynamics of the system. More *complex* levels of organization in development thus arise in genuinely novel fashion from the nonlinear dynamics that obtain among the *simpler* component parts of the system, without the need for instructions. As a principle of pattern formation that transcends the divide between living and nonliving systems, self-organization establishes a common process for understanding pattern formation in *any dissipative system* – that is, for any open system, both organic and inorganic, that exists under conditions far from thermodynamic equilibrium. In fact, the inorganic physicochemical world is full of examples of self-organization, from the hexagonally shaped convection cells that emerge when a shallow layer of liquid is heated to the cloud formations that materialize overhead under conditions of air saturation in the atmosphere.

Inorganic, physicochemical dissipative systems depend on boundary conditions *external* to the system itself for both self-organization and maintenance of spontaneous pattern formation. Once these external boundary conditions are removed, the patterning or organization disappears, as when convection cells in a liquid suddenly dematerialize after an external heat source is removed [Juarrero, 2009; Ruiz-Mirazo & Moreno, 2004]. Living dissipative systems, in contrast, showcase an *autonomous* level of self-organization because “the constraints that actually guide energy/matter flows from the environment through the constitutive processes of the system *are endogenously created and maintained*” [Ruiz-Mirazo & Moreno, 2004, p. 238, italics added]. Living systems, in other words, construct themselves by generating the very boundary conditions necessary for creation and maintenance of their self-organization, the very constraints that establish far-from-equilibrium conditions [Witherington, 2011].

No self or autonomous agency is necessary to explain self-organized patterning in inorganic, physicochemical dissipative systems since patterning in such systems is essentially assembled from without. However, a self – that is, the system's organizational integrity which endogenously constrains its own local dynamics – *is* necessary to fully explain system patterning in living, organic systems [Deacon, 2012; Witherington, 2011]. Juarrero [2009] wrote of living systems that “by reversing the exergenic direction of classically thermodynamic processes and bringing a measure of control inside the systems, the appearance of endergenic processes creates an integ-

rity and self-direction that were previously absent” (p. 92). This autonomous agency is, first and foremost, prereflective in nature – a basic agency of self-production that characterizes all living systems. Such prereflective agency organizationally and developmentally precedes the deliberative, reflective forms of agency that, at least in humans, mark higher levels of cognitive sophistication. Paralleling increases in the organizational complexity of a living systems’ agency are increases in the endogenous self-organization of the system. Juarrero [2009] captured this evolution of self-organizing process across levels of system complexity by pointing to:

the progressive “internalization of regulatory processes” that marks the evolution from the proto-autonomy of physical dissipative structures to the strong autonomy present in biological hereditary autonomous systems and finally to that displayed in the exercise of human free will ... Human beings thus embody the potential for an additional degree of autonomy – linguistically articulated and self-consciously chosen autonomy – that distances us even further from merely energetic exchanges. (p. 93, 98)

Across the dynamic systems literature, relations between processes of system self-organization and a system’s reflective, consciously deliberative activity are routinely framed as a circular causal cycle of influence between the bottom-up, local-to-global dynamics of system construction (processes of self-organization) and the top-down, global-to-local constraints of system organization (reflective, deliberative activity) [Witherington, 2011; Witherington & Heying, 2013]. Describing this circular causal cycle as the complementary pair of agency and self-organization (denoted *agency~self-organization*), Kelso and Engstrom [2006] elaborated:

... “agency” as a steering factor arises from self-organization and derives its meaning within the context of the very self-organizing processes it may be said to steer ... self-organizing processes are the source of agency and that agency is capable of steering the dynamics. (p. 199, 218)

Thus, higher-order, reflective levels of agency in a system (characterized, for example, by future-oriented, deliberative planning ability) emerge from lower-order, self-organizing dynamics that are themselves devoid of any plan (characterized by “blind,” local interactions of lower-order components of the system). This higher-order, reflective agency, in turn, *constrains* the very self-organizing dynamics that give rise to it [Juarrero, 1999; Kelso, 1995; Kelso & Engstrom, 2006].

As a constraint on the self-organizing dynamics of a system, reflective agency or activity narrows – in top-down fashion – the degrees of freedom available to the system by limiting what kinds of bottom-up processes are available to that system. Bottom-up processes of self-organization are still the dynamic force behind pattern construction – it is just that reflective activity of the system can constrict the playing field of self-organizing dynamics available for use in any given context. Napolitano’s theoretical model opens up a new vantage point on the dynamics of this circular causal cycle by framing reflective activity as sometimes more than just a process of constraint, operating to constrict a system’s degrees of freedom and its bottom-up dynamics. His model of serendipitous relations instead directs focus to those circumstances under which reflective activity, as a higher-order property of systems relative to their lower order self-organizing dynamics, *expands* the self-organizing dynamics of energetic exchange between person and world.

In the context of serendipitous relations, for example, an individual's reflective goal orientation and vision for the future (such as wanting a better life, looking for career advancement, etc.) may constrain her self-organizing dynamics by establishing certain degrees of organizational closure. But by the same token, when this individual chooses to be serendipitously oriented in the service of her goal orientation, such reflective activity also serves to broaden that individual's organizational openness in domains relevant to the goal orientation. She chooses to open herself to unplanned possibilities – in effect, planning to capitalize on the unplanned – promoting a wider network of possible, self-organizing dynamic processes of construction through increased exposure to and receptivity toward unexpected, non-normative life events. Basically, the reflective activity of serendipitous relations serves *both* as an overarching global *constraint* on the local, self-organizing dynamics of the system *and* as a *facilitator* of those local dynamics by loosening the system's organizational closure and opening the system to increased possibilities for novelty in its transaction with the world. As such, Napolitano's model of serendipitous relations takes an important step forward in establishing an organizational framework for a more thorough-going study of *self-organization through reflective engagement*.

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