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Using Multilevel Systems Theory to Integrate Dynamic Person-in-Context Systems

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From a multilevel systems theory (MST) perspective (cf. Anderson, 1998; Cacioppo & Bernstein, 1992; Campbell, 1990; Derryberry & Tucker, 1991; Pattee, 1973; Peck, 2007; Salthé, 1985; Schneirla, 1949; Sheldon, 2004), the person-situation debate has forestalled complacency and hastened an increasingly detailed analysis of persons, situations, and their dynamic interactions. Despite the resulting movement from general to more differentiated views of person-in-context systems (e.g., Shoda, LeeTiernan, & Mischel, 2002), theoretical progress relevant for understanding and integrating dynamic person-in-context systems is slowed by (a) over-reliance on general linear models (e.g., ignoring heterogeneity and non-linear relations) and (b) the lack of well-developed multilevel theories (e.g., assuming all aspects of person-in-context systems exist within or across a single unidimensional levels system). For example, conceptualizing behaviors, cognitions, and emotions as distinct “units” – existing either at different “levels of analysis” or within a single level – “slices personality in a wholly fictitious way” (Allport, 1961, p. 259) by ignoring the multilevel organization of the brain (Lewis & Todd, 2007; Peck, 2007).

Accounting simultaneously for both person-by-context interactions and the parallel distributed processes characterizing the intraindividual dynamics that produce the behavior that influences those interactions appears to require several different multilevel systems (cf. Sheldon, 2004; Peck, 2007). For example, the person-by-context interface reflects the classic (Type 1) subject-object distinction and conforms to a unidimensional series of *levels of organization* ranging from the sub-atomic to the astrophysical. In contrast, intraindividual dynamics reflect the phenomenological (Type 2) subject-object distinction and implicate no less than three additional unidimensional levels systems (each of which is related obliquely to the other three): *levels of representation* corresponding to our evolutionary history, *levels of integration* corresponding to our developmental history, and *levels of consciousness* corresponding to our volitional history (Peck, 2007; Roeser & Peck, in press).

Integrated person-in-context models will require careful attention to the nature of, and relations among, operating characteristics specific to each of these multilevel systems (cf. Magnusson, 2003). For example, consistent with Allport's (1961) conceptualization of traits as “*neuropsychic structures*” (p. 347) that influence (but are not defined by) behavior, MST suggests that personality traits and “cognitive-affective processing units” (Shoda et al., 2002, p. 317) will remain relatively nebulous concepts until they are defined in terms of the multilevel, networked architecture of the brain. Rather than reducing psychological concepts to biological

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concepts, MST suggests that biological and psychological concepts are typically alternative verbal descriptions of the same underlying parts and processes. That is, given that the biological complexity of brain has been organized across evolutionary time in a series of increasingly sophisticated regulatory systems (e.g., brain stem, limbic system, cortex) (Derryberry & Tucker, 1991; MacLean, 1990; Schneirla, 1949); and given that these regions of the *neuroaxis* correspond closely to psychological systems described in terms of temperament (Buss & Plomin, 1984), sensory-affective-motor (iconic) schemas (Bowlby, 1988; Case, 1991), and verbal-symbolic beliefs (Schultheiss, 2001); the differences between biological and psychological definitions of personality appear to be more ideological than substantive. MST facilitates the integration of these perspectives by highlighting their common referents.

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References

- Allport, GW. Pattern and growth in personality. New York: Holt, Rinehart, & Winston; 1961.
- Anderson NB. Levels of analysis in health science: A framework for integrating sociobehavioral and biomedical research. *Annals of the New York Academy of Sciences* 1998;840:563–576. [PubMed: 9629283]
- Bowlby, J. A secure base: Parent-child attachment and healthy human development. New York: Basic Books; 1988.
- Buss, AH.; Plomin, R. Temperament: Early developing personality traits. Hillsdale, NJ: Erlbaum; 1984.
- Cacioppo JT, Bernstein GG. Social psychological contributions to the decade of the brain: Doctrine of multilevel analysis. *American Psychologist* 1992;47:1019–1028. [PubMed: 1510329]
- Campbell, DT. Levels of organization, downward causation, and the selection-theory approach to evolutionary epistemology. In: Greenberg, G.; Tobach, E., editors. *Theories of the evolution of knowing*. Hillsdale, NJ: Erlbaum; 1990. p. 1-17.
- Case R. Stages in the development of the young child's first sense of self. *Developmental Review* 1991;11:210–230.
- Derryberry, D.; Tucker, DM. The adaptive base of the neural hierarchy: Elementary motivational controls on network function. In: Dienstbier, RA., editor. *Nebraska symposium on motivation*. Vol. 38. Lincoln: University of Nebraska Press; 1991. p. 289-342.
- Lewis MD, Todd RM. The self-regulating brain: Cortical-subcortical feedback and the development of intelligent action. *Cognitive Development* 2007;22:406–430.
- MacLean, PD. The triune brain in evolution: Role in paleocerebral functions. New York: Plenum; 1990.
- Magnusson, D. The person approach: Concepts, measurement models, and research strategy. In: Damon, W.; Peck, SC.; Roeser, RW., editors. *New Directions for Child and Adolescent Development: Vol 101 Person-centered approaches to studying human development in context*. San Francisco: Jossey-Bass; 2003. p. 3-23. Series Ed, Vol Eds
- Pattee, HH. The physical basis and origin of hierarchical control. In: Pattee, HH., editor. *Hierarchy theory: The challenge of complex systems*. New York: Braziller; 1973. p. 71-108.
- Peck SC. TEMPEST in a gallimaufry: Applying multilevel systems theory to person-in-context research. *Journal of Personality* 2007;75:1127–1156. Special Issue: B. W. Roberts (Ed.), Contextualized identities: Integrating self-in-context to traditional issues in personality psychology. [PubMed: 17995460]
- Roeser RW, Peck SC. An education in awareness: Self, motivation, and self-regulated learning in contemplative perspective. *Educational Psychologist*. in press. Special Issue: A. Kaplan & H. Flum (Eds.), Motivation and Identity.
- Salthe, SN. *Evolving hierarchical systems: Their structure and representation*. New York: Columbia; 1985.

- Schneirla, TC. Levels in the psychological capacities of animals. In: Sellars, RW.; McGill, VJ.; Farber, M., editors. *The quest of modern materialism*. New York: MacMillan; 1949. p. 243-286.
- Schultheiss, OC. An information processing account of implicit motive arousal. In: Maehr, ML.; Pintrich, P., editors. *Advances in motivation and achievement: Vol 12 New directions in measures and methods*. Greenwich, CT: JAI Press; 2001. p. 1-41.
- Sheldon, KM. *Optimal human being: An integrated multi-level perspective*. Mahwah, NJ: Erlbaum; 2004.
- Shoda Y, LeeTiernan SL, Mischel W. Personality as a dynamical system: Emergence of stability and distinctiveness from intra- and interpersonal interactions. *Personality and Social Psychological Review* 2002;6:316–325.