From Static to Dynamic: The Ongoing Dialectic About Human Development

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Each scientific discipline will, in its development, move from more static representations of phenomena to more dynamical ones (West, 1985). The study of behavioral development is no exception. The understanding of cognitive, emotional, and personality development and change has come a long way in the past few decades, moving from relatively static conceptions of individual attributes and debates about their relative stability to more dynamic models of behavioral processes. In turn, the field has advanced in its understanding of the ways that individual development is embedded within cultural contexts (e.g., within-person cross-domain interactive processes and biocultural co-constructive ontogenetic development; Markus & Kitayama, 1991; Tsai, Knutson, & Fung, 2006). Life span and life course theoretical and methodological frameworks have been key to this shift from static to dynamic (Baltes, Lindenberger, & Staudinger, 2006; Elder, Johnson, & Crosnoe, 2003). The need for

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articulating and testing hypotheses about a dialectical interplay between two dynamics—social structures and individual lives—has demanded innovative approaches from theorists and methodologists, as they have developed new ways of thinking about and modeling the dynamic and complex changes in behavior observed to occur with time and age.

The Social Structures and Aging conferences and book series were, from the outset, conceived as an exploration of these emerging dynamic views (see Riley, 1989). In an early volume, for instance, Abeles and Riley (1987) engaged the dialectic between the aging of individuals and changes in social structure. They reviewed the evidence of how, and through what mechanisms (e.g., family, work environments), changes in social structure (e.g., longevity) influence individual aging processes (e.g., cognitive aging)—and, in turn, how the changes in individual aging influence societal norms and roles and redefine social structures. In this chapter, we explore more generally how ongoing dialectics have pushed researchers into debates and considerations of individuals as dynamic, rather than static, entities. To frame the discussion, we use complementary pairs (e.g., person and context; see Kelso & Engstrom, 2006) to place and organize some of the past and current issues that have characterized the landscape of developmental study. We draw selectively on examples from the fields of personality, emotion, and cognition. Our overarching observation is that the debates and ongoing reconciliations of trait and situation, stability and change, person and context, and socioemotional and cognitive phenomena have positively contributed to and fostered an ongoing transformation and maturation of our discipline—from conceptions of development as static to dynamic (West, 1993). In the sections that follow, we highlight how these complementary pairs have pushed the field by providing new lenses through which the complexities of human behavior can be viewed. We conclude with a note that methodological innovations currently emerging will likely move dynamic perspectives further into the forefront of our scientific discipline.

TRAIT AND SITUATION

The general shift from relatively static to more dynamic inquiry mirrors, and is in some ways an extension of, the trait versus situation debate in psychology. Since early in the 20th century, researchers examined and debated the generality of sampled behaviors (e.g., Allport, 1937; Thorndike, 1906), asking the question, Are individuals behaviorally consistent? Summarizing work in the trait personality arena, Mischel (1968) argued that personality measurements were, given their low correlations with behavioral outcomes, severely limited in their predictive power. Scores of studies in social psychology demonstrated that in a given situation, characteristics of the social and physical context contributed as much, if not more, than personality traits to behavioral outcomes. At the extreme, some contended that personality did not exist. In the ensuing debate about the relevance and primacy of trait or situational characteristics, researchers identified and sought to rectify a number of methodological shortcomings in prior studies (e.g., attenuation, single-item assessment) and examined how novel methodologies might help resolve and/or explain contrasting empirical findings and the conclusions derived from them (e.g., Alker, 1972; Bem, 1972, 1977; Bem & Allen, 1974; Cattell, 1983; Epstein, 1979; Golding, 1975; Nesselroade & Bartsch, 1977; Schae, Campbell, Meredith, & Rawlings, 1968).

As part of this discourse, in their presentation of the interactionist perspective, emphasizing a continuous, multidirectional interaction between person characteristics and situation characteristics, Magnusson and Endler (1977) noted that the "modern interactionist theory of behavior...has important consequences for the choice of models and for methods of data collection and data treatment" (p. 409). In particular, an interactional perspective requires information regarding individuals' multidimensional patterns of reactions across situations. A key example is stimulus-response (S-R) inventories, wherein individuals rate their own reactions on a number of scales for each of a number of verbally described situations (e.g., Endler, Hunt, & Rosenstein, 1962). More recently, the multivariate, multisituation (i.e., multioccasion) data provided by S-R-type inventories has been obtained through intensive observation procedures. For example, in a study of social behavior, Shoda, Mischel, and Wright (1994) systematically observed children's behaviors in vivo across a wide variety of interpersonal situations, which occurred in a residential summer camp setting. The intensive data collection provided the raw evidence necessary to evaluate "if...then..., situation-behavior relations" (p. 676) of the S-R type noted above. Specifically, the repeated hourly measurement of children's behavior across situations (average of 167 hours of observation per child) allowed these researchers to obtain if-then relationships for each child, or in other words, intrindividually, situation-behavior profiles, or behavioral signatures. Although these hour-to-hour behavioral signatures differed substantially from child to child, the pattern of relationships was relatively stable from week to
week; that is, children exhibited a relatively consistent pattern of situation-behavior responses over time. Such findings can be taken as an indication that situations influence behavior, but in a rather consistent, or trait-like, manner for each person.

Experience sampling paradigms, wherein individuals are measured repeatedly and intensively over a relatively short period of time, have also allowed for further examination and consideration of the interactionist perspective (Bolger, Davis, & Rafaeli, 2003). For instance, Fleeson (2001), in a series of studies examining individuals’ behavior across 2–3 weeks of everyday life, found that individuals regularly reported experiencing the full range of personality traits over the course of everyday behavior. Within-person fluctuation of personality states was substantial, with trait-relevant behaviors varying from hour to hour within-person as much or even more than the same behaviors between persons. However, despite individuals’ behaviors being inconsistent across situations, the amount and quality of inconsistency (e.g., central tendency, skew, kurtosis of within-person distribution) was stable across time (e.g., week to week) and reliable across persons; that is, behavioral variability itself appears to be a stable and enduring personal characteristic (i.e., a trait). Furthermore, interindividual differences in within-person variability were found, in some domains, to be related to trait personality (e.g., measures of the Big Five). Thus, similar to the observational studies examining behavioral signatures, findings from experience sampling studies provide evidence for both variability and stability of behavior, albeit at different levels of analysis and along different time scales.

The general message conveyed is that by engaging in a dialectic that initially pitted trait and situational characteristics against one another, efforts made in the field to reconcile empirical findings resulted in integrative theoretical perspectives and led to methodological innovations. The debates have pushed and continue to push researchers to question the static nature of individual behavior and to consider if and how individuals function as dynamic beings, that is, people who interact with the situations they encounter in both predictable and fortuitous ways (see, e.g., Bandura, 2006).

As the discussion continues, we see that theoretical accounts of behavior will need to be increasingly precise regarding the particular time scales (e.g., hours, weeks, months, years, etc.) on which behaviors or patterns of behavior are expected to vary and/or be stable. Additionally, as the temporal ordering of intraindividual behavioral variability is considered, new methodologies will be needed that can articulate and test hypotheses regarding if, how, and why individuals tend to exhibit particular temporal signatures and how such temporally ordered patterns of behavior might themselves exhibit stability or change over time.

**STABILITY AND CHANGE**

Despite the focus on change, the study of development has been viewed as an investigation of early-life phenomena and constrained primarily to the study of infants, children, and adolescents. Reformulating the concept of development as broader than mere growth to one inclusive of the continuities and changes occurring at all ages led to the emergence of a life-span developmental framework that provided a basis for investigating how ontogenesis extends across the entire life course (Baltes et al., 2006). This theoretical merging of the gains occurring during the early phases of life with the seemingly pervasive losses noted in the latter part of life (along with other concurrent theoretical and empirical developments; see, e.g., Elder et al., 2003; Sontag, 1971) has since demanded further reconciliation of when and why development, in both children and adults, is sometimes characterized by stability and sometimes by change (whether gains or losses).

In the personality domain, for example, there has been ongoing argument regarding whether personality characteristics remain stable or change over the life span (Costa & McCrae, 2006; Roberts, Walton, & Viechtbauer, 2006b; Schaie & Parham, 1976; see also Lachman, 1989). Much as in the trait–situation debate, relevant data have provided support for both sides of the argument, some for stability and some for change. In brief, longitudinal and cross-sectional studies simultaneously indicate both relative stability in the rank ordering of individuals on trait measures of personality across time (e.g., relatively high test–retest correlations on the Big Five, e.g., Roberts & DelVecchio, 2000; Schaie, 2005) and substantial change in (group) mean levels of personality with age (e.g., Roberts, Walton, & Viechtbauer, 2006a; Schaie, 2005).

Similarly, in the cognitive domain, arguments have ensued regarding whether aging is characterized by inevitable decline or by stability (see, e.g., Baltes & Schaie, 1976; Horn & Donaldson, 1977). Again, the relevant data can be interpreted as providing support for both sides, with different aspects of cognitive function (e.g., fluid and crystallized abilities) exhibiting different patterns of change with age (Horn & Cattell, 1967). Schaie (2005) and others (e.g., Park et al., 2002), for instance,
provided evidence that beginning around age 20, individuals are likely to experience continuous, regular decline in basic cognitive abilities such as perceptual speed, inductive reasoning, and memory. At the same time, however, verbal ability or knowledge (e.g., vocabulary, synonymy, and antonymy identification) appears to remain stable, or even improve slightly, over the adult life span.

In attempting to make sense of the contradictory evidence, where some data indicate age-related stability and other data indicate age-related change, the life span perspective offered a combined view, or *differential aging* (e.g., Baltes, 1987). From this perspective, rather than pitting stability versus change, both are engaged, and the focus shifts from an either-or question to what characteristics and which persons change and what characteristics and which persons remain stable. In this view, individuals are composed of dynamic characteristics that change and remain stable at different rates under different conditions. While intuitively more appealing, such views demand highly sophisticated methodological approaches. Although more work needs to be done, recent studies illustrate some of the ways in which this more dynamic differential aging perspective is being articulated, across domains and across persons.

Schindler, Staudinger, and Nesselroade (2006), for example, were interested in older individuals’ motivation to pursue personal goals. Using longitudinal data collected from older adults, they found evidence for differential aging across types of goal engagement. On average, investment in leisure, sexuality, friends, and occupation domains remained stable until age 80, after which it declined precipitously. In contrast, investment in health, cognitive fitness, independence, and family domains remained stable throughout old age. Such results demonstrate how differential aging across constructs is helping to clarify which domains may be considered more or less basic, that is, optional or obligatory investments.

From a similarly dynamic perspective, Rönnlund, Nyberg, Bäckman, and Nilsson (2005) examined differential aging across semantic and episodic memory in a sample of 35- to 80-year-olds. On average, practice-adjusted episodic memory scores remained relatively stable until age 60, then exhibited decline. In contrast, practice-adjusted semantic memory improved through age 60, before also exhibiting decline. The differential pattern of dynamics observed before and after age 60 suggests that various aging processes interact in complex ways, and perhaps in different ways at different parts of the life span. While complicated, such results help to clarify theoretical accounts of the potential processes and causes contributing to memory performance and change (see, e.g., Buchler & Reder, 2007).

In addition to dynamics of change differing across domains, they may also differ across individuals. For example, when examining age-related change in life satisfaction, Mroczek and Spiro (2005) noted interindividual differences in how some 1,900 men’s levels of life satisfaction changed across the 40- to 85-year age span. On average, the prototypical individual’s level of life satisfaction was characterized by a slight increase through age 65, followed by a correspondent decrease thereafter (i.e., quadratic curve). Individuals, however, differed significantly in how they changed, with some individuals increasing and/or decreasing more rapidly than others. These interindividual differences in the trajectory of change were related to the situation or context in which they occurred. In particular, differences were related to levels of individuals’ trait extraversion and neuroticism, prevalence of memory complaints, and marriage status. In sum, such results highlight that when viewed from a more dynamic perspective, differential changes are prevalent across constructs, across ages, and across persons. More generally, the move to consider and study differential dynamics seems to be providing further insight into the potential causes and consequences of behavior.

Over the past 30 years, research on differential aging has trumped the previous conceptions of exclusive stability or inevitable and uniform growth or decline. The aforementioned studies provide just a few examples of how the move from more static to more dynamic perspectives has advanced our knowledge of differential aging in numerous domains and how it unfolds across the life course. We see that these differential dynamics themselves can provide some of the quasiexperimental paradigms needed for teasing out the causes and consequences of behavior. Continuing inquiry into when and under what conditions constructs or persons change and/or remain stable will, without doubt, further our understanding of how biological, psychological, contextual, social, and other processes interact to produce behavior.

**PERSON AND CONTEXT**

Almost in parallel to the interactionist resolution of the trait-situation debate, developmentalists in the 1970s were reconstituting earlier notions of individual behavior as a function of both person and environment
(e.g., Lewin, 1935). The emerging developmental contextual approaches highlighted the ongoing dynamic interactions or transactions occurring between individuals and their environments (Bronfenbrenner, 1979; Ford & Lerner, 1992; Sameroff & Chandler, 1975). Recent work stemming from this integration of person and context illustrates some of the increasingly dynamic views of behavior that are emerging in the literature.

Tsai and colleagues (2006), for instance, suggested a dialectic interplay between cultural and individual phenomena, such that group-level cultural norms (e.g., social structure) and individual-level temperament together influence emotional states. In particular, the interplay suggests that individuals prefer, or would ideally like to feel, those emotions that are valued at the societal level. In line with this hypothesis, young adults from East Asian cultures have been found to disproportionately value positive emotions that are relatively low in arousal, whereas younger adults with American culture have been shown to value positive emotions that are relatively high in arousal. Controlling for individuals’ ratings of actual affect, European American undergraduates rated that they would ideally like to feel greater levels of high-arousal positive states (enthusiastic, excited, strong) and lower levels of low-arousal positive states (calm, at rest, relaxed, peaceful) than Asian American undergraduates. Furthermore, these influences seem to be active even early in the life span. For example, Tsai, Louie, Chen, and Uchida (2007) found not only that American children prefer both excited (vs. calm) smiles and exciting activities in storybook content compared to Asian American and Taiwanese children, but also that the top 10 selling storybooks in the United States had greater proportions of excited (vs. calm) expressions and more high-arousal activities (e.g., running) relative to Taiwanese storybooks. As with the more dynamic differential aging views on stability and change, these studies highlight how differences across culture can be useful in identifying how and why persons and contexts interact to affect individual preferences or behavior.

Pushing the idea of interactive dynamics a bit further, developmental contextualist approaches highlight that both persons and contexts are changing over time. Furthermore, the nature or quality of the transactions between these two may also change over time. Taking this notion seriously, researchers have begun examining long-term (i.e., age-related) differences in short-term process. Mróczek, Spiro, Griffin, and Neupert (2006), for example, used daily diary and multilevel modeling methods to describe how stress-related processes occurring at the daily level may change or differ with situational circumstance or age. They found that the process of neuroticism, as captured by individuals’ short-term day-to-day affective reactivity to daily environmental stress (i.e., the person-context transaction), differs with age. Highly neurotic older adults are not as reactive as their highly neurotic younger counterparts, suggesting that the character of short-term transactions does change over the long term. This research not only spurs new questions regarding how, when, and at what level person-context transactions manifest, but it also highlights how another layer of change must be considered. As increasingly more hypotheses about the temporal course of dynamic processes become the conceptual focus of research on human development, there will be an increasing need for methodologies that can articulate the dynamics of the dynamics.

Socioemotional and Cognitive Phenomena

In the 1980s, Lazarus (1984) and Zajonc (1984) were characterizing the contemporary conceptualizations of emotion and cognition as static, separate processes and debating the primacy of either emotion or cognition. Today, more integrated and dynamic views of emotion and cognition have emerged (Carstensen, Mikels, & Mather, 2006). For instance, from a person-oriented perspective (Magnusson & Stattin, 2006), multiple aspects of function are characterized as functional nodes that interact in concert as a holistic system, in much the same manner that persons and context interact. Said differently, function in any given domain (e.g., cognition) occurs within the context of what is occurring in other domains (e.g., emotion). Over the past 30 years, integrated perspectives on how multiple processes occurring within the same individual influence one another through ongoing and dynamic interactions have gained prominence. The debate has shifted from a view of emotion and cognition as independent and stable processes to one about the mechanisms, reasons, and parameters for the dynamic interaction of socioemotional and cognitive processes.

To illustrate, in studies examining differential responses of the cognitive subsystem in different socioemotional contexts, older adults have been found to perform worse on memory tasks when negative cultural stereotypes about the impact of aging on memory were highlighted. For example, Rahhal, Flasher, and Colcombe (2001) found that instructional manipulations exaggerated age differences in memory performance.
When the memory component of the task was highlighted—using the word memory in the instructions—older adults did not perform as well as younger adults. In contrast, when the instructions did not emphasize the memory component of the task, older and younger adults performed at similar levels. Similarly, these researchers found that older adults performed at lower levels in conditions when negative cultural beliefs about the impact of aging on memory were activated, as compared to conditions with minimal or no stereotype threat (Hess, Auman, Coleman, & Rahhal, 2003). In sum, both studies suggest an ongoing dynamic between cognitive processes (e.g., memory and the ability to use effective strategies) and the socioemotional context (e.g., negative cultural stereotype threat) in which they occur.

Some major theoretical frameworks have also emerged from the debate over the mechanisms, reasons, and parameters for the interaction of socioemotional and cognitive processes. For example, socioemotional selectivity theory suggests that changes in time perspective (i.e., perceived time left in life) lead to shifts in socioemotional goals (Carstensen, 1992, 2006). When time is perceived as limited, individuals focus on more emotional goals (e.g., spending more time with one’s family), but when time is viewed as expansive, greater importance is placed on knowledge-related goals (e.g., learning new skills). Empirical evidence generated from socioemotional selectivity theory suggests that socioemotional goals dynamically influence many cognitive processes. Using age and its inherent relationship to time left in life as a proxy for time perspective, age differences in memory and attention—for example, the positivity effect—reflect shifts in socioemotional context. The positivity effect is defined by Carstensen et al. (2006) as “a developmental pattern in which a disproportionate preference for negative material in youth shifts across adulthood to disproportionate preference for positive information in later life” (p. 349). While cognitive decline was once thought to be inevitable, the positivity effect demonstrates how socioemotional context selectively influences cognitive processes, more clearly defining the mechanisms, reasons, and parameters for this powerful interaction.

Similarly, dynamic integration theories of affect and cognition (e.g., Labouvie-Vief, 2003; Labouvie-Vief & Medler, 2002) suggest further interplay between socioemotional and cognitive subsystems. Socioemotional functioning (e.g., affect complexity and regulation) is influenced by the quality or amount of cognitive resources available, such that when cognitive resources are high (e.g., younger adulthood), there is sufficient capacity available for complex affective processing and regulation. But when cognitive resources are low (e.g., older adulthood), the complexity of socioemotional processing is necessarily hampered and constrained. For instance, it has been found that the emotions experienced on days when the cognitive subsystem may be overburdened, and reserve resources are low (e.g., high-stress days marked by excessive rumination; see also Linville, 1985), are characterized by less complex structures, as compared to days when cognitive reserves are high (e.g., low-stress days; Zautra, Berkhof, & Nicolson, 2002). Such studies demonstrate how, even within-person, the cognitive context in some way determines or influences socioemotional processes.

The debate over the interaction between socioemotional and cognitive processes spurred theoretical advancement—such as socioemotional selectivity and dynamic integration theories—about specific mechanisms and models. Methodological advancement continues to elucidate these theoretical frameworks and encourage further theoretical advancement. For example, the use of functional magnetic resonance imaging (fMRI) has allowed researchers to investigate the neural systems underlying emotion and cognition. Mather et al. (2004), for example, found that amygdala activation in older adults occurred only in response to viewing positive (as opposed to negative) images. One recent study by Larkin et al. (2007) showed brain activation in older adults when they anticipated gains, but not when they anticipated losses, in contrast to younger adults, who showed brain activation in response to anticipation of both gain and loss. Phelps (2006) argued that neuroimaging research on the amygdala makes a significant contribution to the areas of emotional learning, emotion, and memory; emotion's influence on attention and perception; processing emotion in social stimuli; and changing emotional responses. Social cognitive neuroscience is emerging as a distinct field that seeks to understand relationships among the socioemotional, cognitive, and neural levels of analyses. The methodological advancement of fMRI continues to test the leading edge of theory and more clearly elucidate the interaction between socioemotional and cognitive processes by associating specific neural anatomy with behavior.

Future studies must develop more clearly defined models and theories, using fMRI and integrative methodological approaches to test new ideas. In addition, methodological advancement must inform theory and create hypotheses that make predictions based on neural anatomy and function of emotional and cognitive structures. The debate about the mechanisms, reasons, and parameters for the interaction between
socioemotional and cognitive processes must push toward a more accurate, integrated, and specific understanding of these processes.

CONCLUSION

Over the past century, the articulation of theory, and in particular, developmental theory, has made great strides (Lerner, 2006). In this chapter, we examined how some ongoing dialectic tensions have contributed to this transformation. The theoretical merging of traits and situations, stability and change, person and context, and multiple domains within a person has demanded new methods suitable for the examination and organization of the overall structure and sequence of development across the life course. In response to the new empirical needs derived from such theoretical development, powerful multivariate longitudinal conceptions and models have emerged, which can be adapted and used to describe the dynamic complexities of behavioral change (e.g., Box & Jenkins, 1976; Bryk & Raudenbush, 1982; Collins & Horn, 1991; Collins & Sayer, 2001; Schaie et al., 1988). In turn, the innovations in methodological conceptions, measurement, research design, and modeling procedures for studying change have pushed theorists to further refine hypotheses regarding how the processes and mechanisms of development proceed. This ongoing dance between theory and method, wherein sometimes theory leads, and other times method hastens forth and beckons theory to catch up, is one of the hallmarks of the scientific dialectic and certainly has contributed to the reconceptualizations and progression of developmental science from static to dynamic (Wohlwill, 1991).

It may be fair to say that fields advance when dynamic methods are articulated and dynamic theories are tested. In particular, the theoretical complexities of multilevel, multi-time-scale, and interactive dynamisms provide numerous methodological challenges, many of which shall likely require further technical and conceptual innovation. The good news is that many tools exist, and others are emerging, that will be increasingly useful in the study of behavior (see, e.g., Browne & Nesselroade, 2005; Koopmans, 1985; Nayfeh & Balachandran, 1995; Shumway & Stoffers, 2006). As these analytical and statistical modeling tools are incorporated into the psychological literature, we shall be able to unpack and achieve greater understanding of the multiple interactive dynamisms contributing to the complexity of human behavior.

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