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THE MISSING PERSON

*Some Limitations in the
Contemporary Study of Cognitive Aging*

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This chapter offers a sociological perspective on cognition, human development, and aging. The sociological lens brings into focus several questions that receive relatively little attention in the prevailing discourses of cognitive aging yet are fundamental to an adequate understanding of age, cognition, and their interrelationship. These questions concern both the *explanandum* (the phenomenon to be explained, in this case, cognitive aging) and the *explanans* (the explanations—the causal forces that must be taken into account in understanding cognitive aging). A sociological perspective contends that the explanans of cognitive age-related outcomes cannot be understood without a systematic consideration of both *social structure* and *human action*. In the second section of this chapter, we explore how cohort analysis and related developments open a new set of questions concerning the explanans of aging. In the third section, we consider the implications of a sociological perspective for considering the explananda—the range of phenomena that

comprise the subject matter of cognitive aging that includes some distinctly human dimensions of cognitive performance. These issues have implications for research questions and thus for the kinds of data and evidence that are marshaled for assessing cognitive aging. Our intent is to encourage a reconsideration and clarification of some of the basic premises and objectives of the field.

THE CONSTITUTION OF AGE:
DIMENSIONS OF THE SOCIAL

*The genuine mark of an empirical science is
to respect the nature of its empirical world.*

—Herbert Blumer

It will not be news to readers of this volume that a revolution occurred in the study of human aging four decades ago, when cohort analysis was introduced independently, and almost simultaneously, in psychology and sociology. In

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psychology, this happened through the work of Schaie and Baltes (Baltes, 1968; Baltes & Reinert, 1969; Schaie, 1965). In sociology, Ryder's (1965) classic paper introducing the concept of cohort was followed by the influential work of Riley and associates (Riley, 1973; Riley & Foner, 1968; Riley, Johnson, & Foner, 1972). It is interesting that in both cases the initial work was focused not on age but on other problems. Schaie's initial concerns were heavily methodological, and Ryder—writing in the context of the youth activism of the 1960s—focused on the dynamics of generational change, as had Mannheim's (1952) earlier paper. As Riley and associates made clear, the paradigm of cohort analysis as practiced in the social and behavioral sciences originated still elsewhere, in epidemiology (e.g., Frost, 1939; MacMahon, Pugh, & Ipson, 1960; Riley et al., 1972). In the work of Baltes and Schaie in psychology and Riley and Foner in sociology, the relevance of cohort analysis for the study of aging in the social and behavioral sciences became rapidly apparent.

In this section, we discuss cohort analysis, scholarly reactions to it, and its implications for the study of age in general and cognitive age in particular. As we will show, the implications of cohort analysis are not limited to matters of intercohort variation. Cohort analysis also opens up the more general problem of the contingency of age-related outcomes on social forces. To understand age-related change requires consideration of broader ways in which age is socially constituted (Baars, 1991) and of the developmental principles that underlie the central role that social forces play in human aging.

Cohort Analysis

A *cohort* can be defined as the aggregate of individuals who enter a social system in the same time period (see Riley et al., 1972). In studies of age, birth is typically the entry event. Because human societies inevitably involve technical and cultural change, members of a birth cohort (typically defined in 5- or 10-year intervals) experience a common set of societal circumstances that may cause them to develop and age in distinct ways.

Cohort analysis demonstrated that age-related patterns are not fixed but variable

and contingent, in a range of properties, including personality development (e.g. Baltes, Cornelius, & Nesselroade, 1979) and lifestyle preferences, as well as cognitive performance (e.g., Alwin, Hofer, & McCammon, 2006; Alwin & McCammon, 1999; Schaie, 2005; Schaie, Willis, & Pennak, 2005). Especially under conditions of rapid change, the differentiated experience of members of succeeding cohorts produced differentiated patterns of cohort aging on multiple characteristics (Elder, 1998; Elder, Johnson, & Crosnoe, 2003). One of the most familiar demonstrations of the contingency of age-related patterns focuses on the impact of educational expansion over the 20th century in the United States and other late modern societies. Educational expansion, it was argued, created a steady trend of increase in related performance capabilities (including test taking) for succeeding cohorts. From this perspective, when cross-sectional age differences indicate increased performance in cognitive test performance by younger respondents, this may be in substantial part an artifact of cohort differences in educational opportunity and experience. Such an interpretation has recently been called into question by Alwin and colleagues, who have reported inferior performance in younger cohorts (e.g., Alwin, 1991; Alwin & McCammon, 1999, 2001). What is not at issue from either of these perspectives is that cohort effects are real and consequential.

Longitudinal analyses have shown that cross-sectional studies that had previously been widely assumed to represent natural processes of chronological aging are not that at all: They instead represent the piling up of multiple cohorts at a single point in time—cohorts that differ not only in age but also in experience. Each cohort possesses its own collectively shared experience as well as its members' historically unique life histories. As Matilda Riley frequently reminded us, individuals who are 75 today are not at all the same as were the 75-year-olds of a century ago, or as will be those of 2045. She termed the common practice of using cross-sectional data to make inferences about individual change the *life-course fallacy* (e.g., Riley, 1973; Riley et al., 1972). As the tradition of longitudinal research developed, it became recognized that cross-sectional age

patterns could no longer be treated as reliable indicators of the actual life course trajectory of a given characteristic.

The impact of this multidisciplinary appreciation of cohort analysis sparked a revolution for the study of age in the social and behavioral sciences. As a result, the enterprise of life span psychology was born (Baltes, 1968; Schaie 1967), as was the modern sociology of age (Riley & Foner, 1968; Riley et al., 1972) and the life course (Elder, 1975). It established the necessity of longitudinal research in the study of age and helped fuel the development of quality longitudinal data sets and of analytical techniques to deal with such complex data. Nevertheless, the full implications of cohort analysis for understanding aging have yet to become part of the mainstream scientific discourse in social and behavioral science approaches to age.

The Response to the Challenge of Cohort Analysis

It is informative to consider responses within the behavioral and social sciences to the challenges posed by cohort analysis and the realization it brought—that patterns of development and aging that had been generally taken for granted and assumed to be universal were actually quite contingent on life course experience. We focus on two alternative responses: (1) paradigm change and (2) damage control. *Paradigm change* is, at least from a sociological perspective, the logically required response. It encompasses a number of dimensions and principles that require detailed exploration. *Damage control* warrants attention because it describes what has been the major reaction within social and behavioral sciences generally, including the study of cognitive aging.

Paradigm Change: Rethinking Basic Assumptions

To the extent that human aging is historically and socially contingent, it cannot be a matter of transcultural, transhistorical universality. That human aging has been shown to have such contingencies on many dimensions is the premise on which the need for paradigm change is founded. This has been a matter of some debate in the

study of life span development (Baltes & Nesselroade, 1984; Dannefer, 1984a, 1984b, 1999a; Lerner, 2002) and gerontology (Baars, Dannefer, Phillipson, & Walker, 2006). Paradigm change entails a rejection of the idea of normal aging as it is described by the major intellectual traditions of human development. These include not only the classic organismic model with its strong assumptions of universal, sequential patterns of age-related change (see, e.g., Gutmann, 1994; Reese & Overton, 1970) but also its nuanced variants that give some attention to contextual factors, such as life span development and developmental contextualism (Baltes, 1979; Baltes & Smith, 2004; Featherman & Lerner, 1985; Lerner, 1991). Although such approaches indicate positive movement toward an appreciation of context, they remain constricted by their reliance on traditional models (Dannefer, 1984a; Dannefer & Perlmutter, 1990; Morss, 1990, 1995). An apprehension of human aging requires a recognition of the limits of such assumptions, and the introduction of a set of principles that will countenance these contingencies, which we term the *social-constitutionalist* (SC) paradigm (Baars, 1991; Baars et al., 2006).

Cohort analysis reveals that numerous aspects of human aging are contingent on experience in a particular social context. Yet logic requires that “cohort effects” stand not as the central problem but merely as a symptom of larger unresolved questions and issues of how and why sociohistorical contexts influence the lifelong development of human beings. From this broader perspective, cohort effects have been important not only in their own right but also because they open a window onto more fundamental questions: What exactly is it about the nature of the subject matter—the life form and species-being of *homo sapiens*—that permits such inordinate variability in the way that its members age? In what other ways is aging socially organized? The source of cohort differences is in the differentiated circumstances and environmental contingencies experienced by succeeding cohorts as they age, yet it must be acknowledged that social and environmental contingencies vary within cohorts as well as between them, generating intracohort variation that is patterned and systemic, as well as inter-cohort variation. The SC paradigm thus reveals

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that the cohort problematic is only the tip of the iceberg in the exploration of social *explanans* of cognitive aging. Social forces that shape patterns of aging are not limited to issues of social change and intercohort variability; they apply equally to conditions of social stability and intercohort homogeneity. Thus, rather than encapsulating or being synonymous with environmental effects on aging, cohort differences comprise only a *first opening* to a new horizon of inquiry, a horizon that is predicated on the recognition of a distinctly human problem of age-related change.

In order to grasp the significance of this opening, it is necessary to move from the level of cohorts and populations to the level of the aging individual. "The genuine mark of an empirical science," Blumer asserted, "is to respect the nature of its empirical world" (1969, p. 48). The subject matter of cognitive aging is, of course, age-related change in individual human beings. Therefore, the question is: What is it about the developing and aging individual—about human nature—that allows for the diversity of age-related outcomes observed across cohorts and between members of the same cohorts?

Homo Sapiens: Hard-Wired for Flexibility. To begin to confront these questions will require a systematic consideration of the features of the human organism and human development that permit open-ended outcomes and a variable range of responses. It will compel an acknowledgment that the developmental processes that govern age-related change within the human organism itself are, in Barbara Rogoff's (2003) apt phrase, "hard-wired for flexibility". This is evident in infancy and early childhood in the uniquely human condition of *extero gestation* (Berger & Luckmann, 1967; Dannefer, 1999b; Gould, 1977a; Hrdy, 2000), which refers to the relatively extended portion of neonatal human development that occurs after birth, immersed in a social environment. Human development is thus fundamentally contingent on social and interactional influences. Extero gestation helps explain the plasticity and "world-open" character of human development from infancy onward. A companion principle, *neoteny* (Bromhall, 2003; Dannefer, 1999b; Gould, 1977b; Montagu, 1989), refers to the lifelong potentials for growth,

learning, responsiveness and change that in other species are largely the province of childhood. In homo sapiens, such potentials are evident through the life course, including old age (Baltes & Willis, 1982; Langer, 1989, 2005; Langer & Rodin, 1999; Schaie, 2005); Yang, Krampe, & Baltes, 2006). The recognition of these species-unique, evolutionarily selected, and hard-wired features of human development require a replacement of the organismic model—with its strong assumptions of age-related sequences of universal change—with an interactionist approach that apprehends and incorporates processes occurring in the social environment into the model of age-related individual change, including cognitive change.

Beyond Cohort Effects: The Social Organization of Cognitive Aging. In addition to these developmental principles of flexibility and potentials for change, a range of other explanatory principles must be considered as aspects of the social organization of aging. We have discussed elsewhere (Dannefer, 1987, 1999b; Dannefer & Patterson, 2007; Dannefer & Uhlenberg, 1999; Hagestad & Dannefer, 2001) several such principles relevant for age-related outcomes. Here we focus on three in particular: (1) the *intra-cohort variability principle*, (2) the *intercohort stability principle*, and (3) the *naturalization principle*. Because of space limitations, the discussion will necessarily be brief.

1. Sociogenesis of intracohort variation. Over the past several years, increasing attention has been given to the phenomenon of the diversity of the aged on a wide range of characteristics, especially to the tendency for intracohort variability and inequality to increase with age. This has been a theme in both the psychology of aging (e.g., Baltes, 1993; Rowe & Kahn, 1987, 1998) and the sociology of age (Crystal & Waehrer, 1996; Dannefer, 1988). As noted elsewhere, if increasing intracohort diversity is a regular feature of cohort aging, it is misleading to focus only on measures of central tendency and to ignore the problems introduced by systematic changes in diversity over the life course (Dannefer, 1987). To the extent that such a pattern exists, it warrants focused analysis and interpretation as an enduring aspect of the social reality of aging. The robust tendency of systematically increasing

differentiation also raises obvious new questions of explanation and interpretation. Unless it is treated as error variation, intra-age variability logically compels the question of causality in a new way: If systematic *age-related changes in the amount of interindividual variability* recur, the cause cannot be age alone.

2. *Sociogenesis of intercohort homogeneity.* A persistent tendency within life span and life course literatures has been to equate “contextual effects” with the phenomenon of social change, implying that stability across cohorts plays little role in the production of age-related outcomes (Dannefer & Uhlenberg, 1999; Hagestad & Dannefer, 2001). An implication of the above considerations is the recognition that the effects of social forces do not depend on change: Effects of social forces may be especially evident in times of change, but in times of stability they are no less present, and indeed may be even more potent because they go unnoticed. Stability across cohorts does not entitle researchers to presume that the recurrent pattern represents an absence of environmental effects, or the presence of an ontogenetic human universal of aging and development.

One of the underappreciated insights of Riley’s original age stratification paradigm is the naming of age as a feature not only of individuals but also of social structure, which is embedded in language and cultural systems of normative expectations. The very concept of age, when it becomes an integrated, normative feature of social structure, takes on a facticity of its own and becomes an independent influence on the aging of individuals. As a social fact, age is a coercive and constraining feature both of social structure and of micro-interaction and thus has an influence on individuals and groups that is not reducible to ontogenetic processes of organismic aging.

When social practices that rely on age as a primary basis of social organization remain stable over a sustained period of time, they may generate a relatively high degree of stability across cohorts in patterns of aging. This is precisely what occurred with the establishment of the institutionalized life course in late modern societies in the 20th century (Kohli & Meyer, 1986). The institutionalized life course, which has produced both increasing intracohort and

intercohort homogeneity of timing of life transitions, is a result of a constellation of socially emergent age-graded policies and practices, including age-graded homogeneity in school experience and in the transition to adulthood as well as career and retirement experiences. The effects of such social processes can extend beyond role structures to influence individual identity and other psychological characteristics. For example, these processes may be hypothesized to account for findings of stability of individual differences over time in attitudes or personality (e.g., Alwin, 1994; Alwin, Cohen, & Newcomb, 1991; Costa & MacRae, 1980), because research reporting personality stability has generally been based on samples of respondents living in the relatively stable social orders of late modernity.

3. *The principle of naturalization: The social organization of the idea of age.* When the significance of age as a basis of social organization and feature of social structure remains stable over a sustained period of time, it may not only generate a relatively high degree of stability across cohorts in empirical patterns of aging, but also may lend plausibility to the idea of age as a naturally unfolding reality. A concomitant of the establishment of the institutionalized life course has been the emergence of age norms as a powerful aspect of social structure and as a guide for personal life (e.g., Chudacoff, 1989). Despite their historical recency and obvious social sources, age norms have become taken-for-granted, definitional aspects of age. This cohort-centric misattribution of a socially organized patterning of age as something that is natural and inevitable comprises an example of naturalization—mistaking humanly produced and socially specific phenomena for natural ones (Dannefer, 1999b). Of course, this is not to suggest that all patterned, age-correlated individual outcomes are social in origin. Yet the extent to which such patterns reflect general, organismically based processes of aging cannot be understood without considering the role of historically specific, socially contingent conditions such as the bureaucratization and naturalization of age that have occurred over the past 150 years in industrial societies. Without an understanding of the social organization of age

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or of the ways in which social organization interacts with ontogenetic features of aging, the ability to provide an explanation of the processes underlying age-related cognitive outcomes will remain severely limited. It is for this reason that a paradigm change—a reformulated model of human nature and a reformulated set of research assumptions and questions—is required to move the task of explanation of cognitive aging forward.

Damage Control: Defending Orthodoxy

From a sociological perspective, it is clear that paradigm change comprises at least one necessary condition for meaningful advance to occur in the study of cognitive aging. Equally clear, however, is that paradigm change has not been the primary mode of response to the vast array of evidence of social influences on age-related processes. The dominant response to the challenge of cohort analysis in the social and behavioral sciences has not been to confront the full theoretical and empirical implications of the challenge but to adopt an intellectual posture that has the effect of minimizing, containing, and ignoring those implications. This has been a long-standing practice, and we are not the first to note it. It was noted by Irving Rosow (1978), and the legitimacy of his concern was subsequently acknowledged by Schaie:

Developmentalists have often treated historical time and generational effects as confounds to be controlled and explained away. Thus, it is not without a good deal of justification that Rosow (1978) could argue that [varieties of cohort analysis] treated the effects other than age as nuisances and that any information developed on them was at best incidental. (1984, pp. 1–2)

We term this posture *damage control*. The logic of damage control is roughly as follows: The discovery of cohort differences in patterns of aging clearly makes the task of defining the true character of aging more complex, but it does not eliminate the truth that aging is ultimately a universal and internally governed process. In terms of empirical research practices, a damage control perspective seeks to treat cohort analysis and any other social factors as essentially noise

to be controlled in the quest to understand true aging processes. From a damage control perspective, it is important to get a handle on such factors as cohort effects, in order to get such extraneous variation under control so that the “true age” pattern that is present in the population, lying beneath the annoyance posed by cohort effects, can be discovered. Indeed, to give too much ground to cohort analysis may seem to threaten the very idea of a science of development and aging, because it diminishes the predictive power and explanatory claims of age. Damage control continues to be a frequent mode of response to the problems raised by the SC approach. We consider two modes of damage control: (1) containment and (2) abandonment.

Containment. Containment can take two forms: (1) limiting attention to social forces on aging to those associated with social change, namely, dramatic social–historical events or times of pronounced or rapid social change (“cohort effects” proper), and (2) focusing on nomothetic, central-tendency patterns within each cohort, thereby ignoring the problem of intracohort variability.

1. Equating social forces and social change. The first form of containment—equating the importance of social forces with social change—derives from the close linkages between cohort analysis, the life course and life span perspectives, and macro-social change. In innumerable programmatic statements and paradigmatic formulations across these perspectives, scholars have emphasized social change as a basis for the need to analyze life course patterns of discrete cohorts (e.g., Baltes, 1979; Elder, 1998; Riley, 1973; Riley & Foner, 1968).

The close connection between social change and cohort differences ultimately compels the logical question: “What if there were no change? Would the power of social and environmental forces to alter the path of human aging be any different?” In a hypothetical society of great demographic and cultural stability, cohort effects might be nil. However, in view of the known mechanisms of human development discussed above, such a circumstance clearly would not imply a reduction to zero of social effects on aging. It would simply mean that in order to understand the extent to which social

influences are regulating the aging process, it will be necessary to go beyond the study of historically unique events and to investigate more subtle yet pervasive aspects of the social organization of aging (Dannefer & Uhlenberg, 1999; Hagestad & Dannefer, 2001).

2. *Focusing on nomothetic patterns.* The second form of containment is the tendency to *focus on nomothetic patterns and central tendency measures* while treating intra-age variability as uninteresting and unimportant error variation. This has been extensively discussed elsewhere (Dannefer, 1987, 1988, 2003; Maddox & Lawton, 1988). Both forms of containment deflect attention from examining the extent to which intra-age variation is socially organized through mechanisms of resource allocation operating, for example, in labor and marriage markets, education and health care policy, and other aspects of opportunity structures through which advantage and disadvantage accumulate. As noted earlier, the likelihood that intracohort variation in cognitive test performance is organized by opportunity structures and other social factors has been supported by numerous empirical analyses (e.g., chap. 26, this volume; Schmitz-Scherzer & Thoma, 1983).

Abandonment. Abandonment is the second significant form of damage control and entails the movement away from cohort analysis and other forms of longitudinal research. It is true that the initial wave of enthusiasm for cohort analyses lasted some time, fueling not only influential conceptual frameworks in the 1970s but also significant new enterprises of longitudinal research. Yet, looking back over the past two decades of work, it appears increasingly that such longitudinal databases may be of more interest to health researchers than to researchers focusing on cognitive performance, personality, or other mental characteristics. Our review of recent published analyses of age-related change in cognition suggests a continuing preference for cross-sectional designs (details available from the authors at robin.patterson@case.edu).

Taken together, we regard these various aspects of damage control as reflecting a long and established tradition of research practices founded on the logic of the organismic model. As an indication of the scope of this legacy, it is

interesting to recall that disinclination toward longitudinal data predates cohort analysis and was sometimes based on remarkably felicitous reasoning, with its own latent implications. In his classic analyses of intelligence, David Wechsler (1958) acknowledged the value of longitudinal data yet vigorously defended his cross-sectional analyses. A main thrust of his defense provides remarkable testimony to the power of the organismic paradigm and the logic of damage control, because of its unwittingly back-handed use of sociological logic:

Actually, only a few longitudinal studies have been reported, and the two most frequently cited . . . were done on special population samples . . . in that the subjects for the studies were individuals of superior intelligence . . . college students with estimated IQ's of 110 and above. . . (and) . . . the parents of gifted children. . . Now it is well known that intelligence test scores of persons of superior intellectual ability tend to hold up or even improve for some time beyond the age of 25. . . The subjects of the Bayley study were individuals engaged in vocations and professions (teaching, etc.) whose day to day activity might well exercise or involve some practice in the kinds of ability called for by the tests. (Wechsler, 1958, p. 138)

Ironically, what Wechsler is describing here is precisely the social organization of intelligence. Anticipating the findings of later research, Wechsler recognizes that (1) the age-based declines are not universal but vary essentially along social class lines, and (2) test performance is substantially influenced by one's work and other experiences (Manly et al., 1999).

The resistance to paradigm change has clear intellectual costs for limiting researchers' abilities to recognize the social contingency of age-related declines in individual lives. Not surprisingly, these costs can also impede theoretical progress along the very cutting edge of cognitive aging research.

DAMAGE CONTROL, PARADIGM CHANGE, AND ERGODICITY

From a sociological perspective, continued efforts at damage control inhibit the advance of

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sociological understanding of cognition, while the embrace of a paradigm change that recognizes the social contingencies of cognitive development and change can further advancement in the field. In relation to age, recent work on heterogeneity and cumulative dis/advantage has provided one example of the benefits of an SC paradigm for understanding age-related processes (Dannefer, 2003). The exploding body of work in cognitive science and brain imaging that demonstrates how experience and context affect brain growth and development in adulthood as well as in childhood provides another powerful example (e.g., Donald, 2001; Maguire et al., 2000).

As an additional example, consider the value, as yet unrealized, of the SC paradigm for the study of ergodicity. The proposition that change processes in human individuals and populations are nonergodic is consistent with the logic of the SC paradigm. Part of the challenge of ergodicity concerns what appears to be the uniqueness of individual trajectories over time, when viewed against the pattern of the cohort. As Molenaar (2004) put it:

Each person is initially conceived of as a possibly unique system of interacting dynamic processes, the unfolding of which gives rise to an individual life trajectory in a high-dimensional psychological space. Most psychological processes will have to be considered to be nonergodic. For nonergodic processes, an analysis of the structure of IEV [interindividual variation] will yield results that differ from results obtained in an analogous analysis of IAV [intraindividual variation]. Hence, for the class of nonergodic processes (which include all developmental processes, learning processes, adaptive processes, and many more), explicit analyses of IAV for their own sakes are required to obtain valid results concerning individual development, learning performance, and so forth. The foundational issue at stake concerns the relation between the structure of IEV and the structure of IAV. (p. 202)

The SC paradigm can make important contributions to this challenge. By recognizing the role of social forces in organizing aspects of individual cognitive resources and processes and their change over time, some of the “unique” variation in individual trajectories can be understood as not unique at all but as socially patterned. Recent

research on cortical plasticity is making clear that the effects of experience are as dramatically evident in physiological as in psychological terms. For instance, London taxi drivers have been shown to grow larger hippocampi based on their learning and practice in knowing London streets (Hartley, Maguire, Spiers, & Burgess, 2003; Maguire et al., 2000; Maguire et al., 2003). Changes in the somatosensory system have been shown to occur because of extended guitar practice or violin playing, or many other tasks requiring fine motor skills (e.g., Levitin, 2006; Rencanzone, Schreiner, & Merzenich, 1993). It is reasonable to expect, then, that some of the apparent uniqueness in intraindividual variation (IAV) over time can be reinterpreted as a pattern of change that will be shared across individuals (interindividual variation) who share strong commonalities in daily experience (whether driving a London cab or playing classical violin). Of course, the likelihood of becoming a cab driver or violinist (or a psychiatrist, street gang leader, or stewardess) is not random. It is a likelihood that is related to social origins, to education and labor market circumstances, and to other socially organized contingencies an individual encounters across time through particular historical and biographical moments. Thus, experientially patterned commonalities in intraindividual change may be linked to broader influences of social location, social relationships, and social opportunity. It may be fruitful for scholars of ergodicity to consider the social context of individuals whose IAV is studied and its influence on IAV patterns.

This suggests the hypothesis that, by consideration of social processes that organize individual opportunity and cognitive experience (e.g., the system of occupational stratification and its norms and expectations around characteristics like age and gender), one can reduce dramatically the proportion of IAV that must be treated as a matter of individual uniqueness. Such a strategy can provide a new set of ordering principles—principles of social structure that organize populations, which includes the role structure that organizes opportunities for learning and change. Thus, ergodicity may benefit from the addition of a sociodynamic level of analysis between the discrete (but only partly unique) individual and the aggregate of a cohort or population. This approach would further the

goal of understanding, shared with and in agreement with ergodic analysis, by demonstrating that although age-related change is nonergodic it is nevertheless a systemic, orderly phenomenon, one that is governed by the forces of social life. The SC approach agrees that many of the processes leading to IAV are unique and “self-organizing” (Molenaar, 2004, p. 211), but emphasizes that self-organization is a socially located and socially driven process. The learning of cab drivers can in some respects be thought of as self-organizing, but it is a process that is dictated by the imperatives of their life situation in a particular social structure, the rules of the road. Self-organization is dependent on social organization. An SC approach allows for the possibility that the trajectory of “each single participant obeys a different factor model” (Molenaar, 2004, p. 210), but it goes further in postulating that the different factor models in question are likely to be obeying the dictates of opportunity in a historically specific, socially organized structure of opportunity, desire, constraint and legitimacy.

THE MISSING PERSON: DISTINCTLY HUMAN DIMENSIONS OF COGNITION

Minimalist settings produce Minimalist people.

—Merlin Donald

As noted, a sociological perspective requires a reconsideration not only of the *explanans*—the postulated explanations and conceptual models proposed to account for age-related cognitive outcomes—but also of the *explananda*—the phenomenon of cognitive aging itself. Such an approach must begin with an acknowledgment of distinctly human aspects of cognition.

Paul Baltes (1993) concluded his Kleemeier Award address to the Gerontological Society of America with this statement: “When I was 28, I was a fool. But I had an excellent memory.” Baltes thus juxtaposed the distinction between two fundamentally different properties of cognitive functioning—wisdom and judgment on one hand, speed and memory on the other.

These two dimensions are not equally represented in the psychology of aging. The study of

wisdom and practical intelligence remain undernourished stepchildren in the field of human cognition. Thus, the study of cognitive aging has yet to capture adequately those aspects of cognition that are most distinctly human, notably imagination, creativity and innovation. These are not esoteric or occasionally occurring characteristics, and they are not the exclusive province of successful inventors and artists. The use of imagination and creativity and the devising of innovation are integral to human activity in everyday life, occurring routinely in ordinary mundane situations that require practical everyday problem solving (Lave & Wenger, 1991). Without broad consideration of these uniquely human aspects of cognition, the science of cognitive aging is “missing the person” that is its true subject matter.

In the lived experience of everyday life, human cognition is constantly applied to world-construction—the generation and maintenance of social relationships that provide the context of one’s own sense of self and personhood. In the course of the everyday, human actors generate novel ideas, contrive new forms of terrorism and new defenses against it, practice powers of persuasion (whether for the purpose of selling appliances, getting out the vote, or rechanneling the motives of children or associates) and engage in empathy (choosing with great care and precision the words, pacing, and tone of speech, and accompanying nonverbal gestures). We devise creative ways to keep students engaged in a late afternoon class and devise methods and measures to distinguish fluid from crystallized intelligence, and so on. These capabilities are fundamental to the very condition of human personhood, both because creativity is always socially grounded (Langer, 2005; Russ, 2000–2001) and because the constitution of social relationships happens only through a purposeful, intentional and ultimately creative process.

Although properties like memory, processing speed, and abstract reasoning are clearly not irrelevant to such endeavors, they represent only a small subset of the dimensions that are germane to understand the workings of human cognition and cognitive aging. To focus on such characteristics alone may be compared to conducting the road test of a new automobile by focusing only on the luggage capacity and steering ratio while

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ignoring more central features to its quality and performance, such as torque, center of gravity and the responsiveness of its suspension, and its overall structural integrity.

From this perspective, the study of cognition and aging has been, in neuropsychologist Merlin Donald's (2001) term, *minimalist*:

Experimental psychologists, like me, tend to examine people in stripped-down Minimalist settings. And Minimalist settings produce Minimalist people. . . . In the laboratory, we objectify humans in the same way that we do rats and insects. (pp. 16–17)

Donald (2001) offered this observation as both a defense of the laboratory method, and also a critique of its limits:

When people are removed from their familiar settings—work, school, home, city, street—and subjected to bare-knuckled scrutiny, their conscious capacity reveals its severe limitations. This includes everyone. (p. 18)

Of course, questions of the degree to which such laboratory exercises can be extrapolated to real world activities, and the extent to which they rely on matters like the motivation of the respondent (which is likely not age neutral), remain especially relevant in judging their utility in studies of age. Practical everyday tasks undertaken in the service of an often consequential goal or outcome are, at least in principle, measurable as well as “real.” To develop comparatively meaningful, standardized assessments of these outcomes obviously is a daunting task, but it is a required task if the science of cognitive aging is to be true to its subject matter. This argument implies the need to develop new and more complex kinds of cognitive assessments and measurement. Moreover, it has been shown that when older people are tested on tasks that have personal relevance to them, they often perform dramatically better. This suggests the need for a broadened lens of inquiry and measures of a wider range of dimensions, to capture the essence of the distinct character of human cognition and its relationship to aging.

If research on cognitive aging largely considers a limited range of dimensions of human cognition, and utilizes a limited set of measures of

cognitive ability, the resultant conclusions of such research will also have limited scope and value. Important as these properties may be, human cognitive ability is not reducible to scores on intelligence tests, dementia screening tools, or quickness and accuracy of vocabulary recall. It must be acknowledged that the subject matter of human cognition is complex, elusive, and dauntingly difficult to measure. Yet the dictates of science require that the task of measuring or otherwise characterizing the phenomenon of interest is determined first of all by the phenomenon itself, and not by the preconceptions, traditions, and measures inherited or imported from the study of some other subject matter. “The genuine mark of an empirical science is to respect the nature of its empirical world”—Blumer’s dictum applies here as well. Thus we must confront the question: To what extent is the subject matter of human cognition and cognitive aging adequately respected by studies that focus on the narrowly defined performance, speed or memory capabilities?

CONCLUSION: SOCIAL FORCES, THE MISSING PERSON, AND THE FUTURE OF COGNITIVE AGING

Citizens of late modernity are born into and live out their lives immersed in a society and culture that systematically denigrates old age. It is a society comprised of institutional forms that systematically exclude elders from full social participation and that focus on perceived decrements and debilities of advancing age while failing to ask questions of (a) the social sources of these perceived decrements and (b) the specific individual characteristics upon which the perception is based. Instead, observed age-related differences in behavior and in performance are naturalized, and one of the central roots of social beliefs in inevitable decline with age—pervasive ageism within society—remains unnoticed and unnamed. When a social context is one that systematically and pervasively denigrates old age and glorifies youth, it is a context that may be capable, all by itself, of producing negative age-related trajectories of intellectual performance and physical health.

In terms of life history and circumstances, behavioral and social scientists are not insulated

from the realities of ageism: For us, too, ageism is an integral, constant part of everyday life, with its pervasive tendencies toward the naturalization of age-associated behavior. Yet developing an adequate understanding of the relationship of age and cognition obviously requires an interrogation not only of the immediate performance capabilities of individuals but also of the causal factors that contribute to those outcomes, not only of the dimensions of human cognition for which established measures have been developed but also of uniquely human cognitive abilities, like imagination and creativity, that are even more daunting to measure. It requires not only the refinement of technical procedures of measurement but also a scrutiny of how those particular measures were chosen in the first place. Such considerations, in our view, add further to the reasons to question the assumption of general slowing that has often been regarded as an integral part of normal aging and to constitute a general null hypothesis in numerous studies of aging (e.g., Perfect & Maylor, 2000).

Recently, evidence challenging the “general slowing hypothesis” has been accumulating, even in studies that rely on cross-sectional data and focus on narrowly defined performance measures (e.g., Kliegl, Mayr, & Krampe, 1994; Verhaeghen et al., chap. 8, this volume), leaving space for doubt about the generality of general slowing with age, even under such “minimalist” conditions where it has most clearly been established. When age differences are found on less difficult tasks but not on more complex tasks, and when they erode asymptotically, possibly indicating a learning effect (Verhaeghen, 2002), the credibility of general slowing as a fair substantively meaningful, universal human process is called further into question. Slowing, it may be suggested, is in some cases not general but is socially organized and socially specific. In this volume, for example, Berg’s chapter (chap. 13) illustrates a growing body of work on practical reasoning that provides clear relief from the mantra of decline, by reporting an age trajectory of positive improvement. This is, of course, what might be expected from the known divergence in the trajectories of fluid versus crystallized intelligence.

Shifting to the domains of everyday life, with the practical demands and opportunities for creative micro-solutions that are integral to it, there

is even greater reason to doubt that general slowing with age is a general human process. In everyday life, it has been demonstrated that performance is related to life history and circumstantial conditions. There is also evidence to suggest that an individual’s test performance and the mental and physical conditions that underlie it are related to ageism. In a cleverly designed set of experiments, Langer and associates (Langer, 1989, 2005; Langer & Rodin, 1999) have shown that when elders are removed from the oppressiveness of an ageist societal context, their performance can improve significantly.

In this chapter, we have suggested that the study of cognitive aging is at an early point in developing an adequate understanding of age and that such understanding can be advanced by drawing on the perspectives offered by the SC paradigm. Like the study of aging more generally, the study of cognitive aging to a large extent has accepted the pervasive, implicit assumptions—the “hidden curriculum”—of the culture of ageism as representative of human nature rather than analyzing the social sources of age-related change, and has too often focused on a restrictively narrow set of outcomes that define age-related differences in terms set by modernity and ageism, outcomes that do not capture higher-level cognitive functions that are the unique province of *homo sapiens*. Thus much of the field of cognitive aging implicitly embraces the conditions produced by modernity and constructs its problematic in such a way that those conditions cannot be interrogated.

In sum, we suggest that progress in advancing understanding of the relation of cognition and age will depend on attention to both the explanans and the explananda of cognitive aging. Regarding the explanans, the study of cognitive aging will be advanced to the extent that the irrepressible and powerful dynamics that are adumbrated by the SC paradigm are recognized and embraced as an integral aspect of research design. Regarding the explananda, we suggest that advance will be inhibited as long as the study of cognitive aging focuses on measures that capture only a small and constricted subset of the range of human cognitive capabilities. By facing such problems, the study of cognitive aging can contribute to generating ideas and findings that clarify the extent to which age-related outcomes

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are the result of the institutionalized life course of late modernity, rather than continuing to report findings that legitimate and render invisible the structures of the institutionalized life course as well as the culture of ageism and their influences on various cognitive outcomes. On the other hand, without facing such problems, the field of cognitive aging risks legitimating not only structures but also definitions of aging and old age that delimit opportunities available to elders and that are destructive to the self-understanding, self-definition, and identity of aging individuals.

Again, this is not to contend that all age-related decrements are due to the ageism embedded in the institutionalized life course. We recognize that experiential and social forces interact with obdurate, organismic processes that involve diminishing capacities and that may directly and indirectly affect cognitive performance (Baltes & Lindenberger, 1997; Dannefer & Patterson, 2007; Dannefer & Perlmutter, 1990). Our concern is not to deny the existence of domains in which there may be unavoidable decline but to point to two broadly important truths about age-related cognition that make a wholesale embrace of phenomena such as "general slowing" untenable. First, to some unknown yet substantial degree, age-related decrements have their source in social practices, not in organismic processes; and second, there are vast domains of cognitive performance—often consisting of dimensions that are difficult to study—that may not follow the a common, age-linked trajectory of decrement. Until these problems and possibilities are directly confronted, the study of aging, including cognitive aging, will continue to be a source of legitimization of the institutionalized life course and ageism rather than a means of understanding the extent to which the institutionalized life course and ageism are sources of what is mistaken for natural reality of aging.

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HANDBOOK OF COGNITIVE AGING

Interdisciplinary Perspectives

Edited by

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