A Living Systems Theory of Vocational Behavior and Development

Fred W. Vondracek, Donald H. Ford
and Erik J. Porfeli

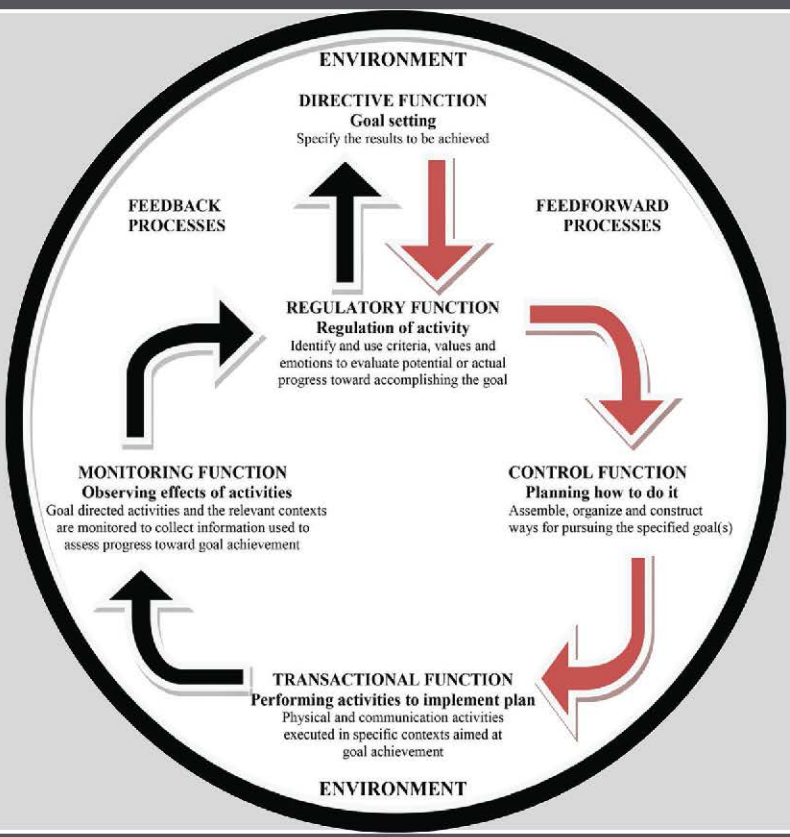

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TABLE OF CONTENTS

PREFACE

Calls for an integrative and comprehensive theory of vocational behavior and development have been issued fairly regularly during the past half century. The idea that one can isolate "segments" of human functioning and development and inspect and understand them in relative isolation from other domains has been losing out to the realization that holistic views of human functioning-in-context are not only necessary but actually feasible. Accordingly, we endeavored to utilize an existing, purely propositional model of humans as self-constructing living systems (the Living Systems Framework; D. H. Ford, 1987) and apply it to an important, substantive area of human functioning, namely, vocational behavior and development.

It may be tempting for some to view the apparent surge in "systems thinking" as a fad, which will pass and give way to other world views. The fact, however, is that the paradigms of classical science, exemplified by Newtonian physics, are rapidly being superseded by much more complex, dynamic conceptualizations that are more closely aligned with actual experience. The resulting revision of the scientific enterprise has produced new branches of established scientific fields that deal with organized complexity, that is, systems. Indeed, almost everyone is talking about systems nowadays, whether it is in reference to the universe, transportation, biology, or communications. Although this may appear to eliminate the distinction among them, Laszlo (1996) has pointed out that what they have in common is not aspects of their *substance* (as in reductionism) but aspects of their *organization*. It should thus not be surprising to discover that the Living Systems Framework (LSF) has already been applied to two different substantive fields to articulate a theory of development (D. H. Ford & Lerner, 1992) and a theory of motivation (M. E. Ford, 1992).

In our effort to utilize the LSF in creating a theory of vocational behavior and development, we were mindful of the fact that broad acceptance of "systems thinking" in various fields of science and engineering was always accompanied by demonstrations of "how to" accomplish the shift from familiar linear cause and effect paradigms that had been so successful in classical science to the much more complex world of systems. At the same time, reluctance of vocational psychologists and counselors to embrace a systems view in practice appeared to be due more to puzzlement as to how to do it than to a fundamental disagreement with the systems perspective. We thus decided to provide practical demonstrations of how to use the Living Systems Framework (LSF) in vocational research and in counseling practice.

We organized our book in a rather straight-forward way to appeal and be useful to individuals who are already knowledgeable about systems thinking as well as to those who may be new to this framework. Chapter 1 tries (once more) to make the case for integrative theorizing in the area of vocational behavior and development. Among other things, the apparent decline of vocational psychology, in spite of the importance of its subject matter, should leave little doubt about the fact that

fresh perspectives, especially efforts that can restore the connection of vocational psychology to the mainstreams of psychology and human development, should be welcome. Chapter 2 represents a summary of the theoretical framework (LSF) that forms the basis of Chapter 3, which is the presentation of our *Living Systems Theory of Vocational Behavior and Development* (LSVD). Chapter 4 demonstrates how the LSVD can be used to guide counseling interventions with adolescents who are preparing themselves to enter the world of work, as well as with adults who face the challenges of changing their career pathways. Finally, Chapter 5 addresses the implications of the LSVD for the design and conduct of research. We view this as being of critical importance because it highlights research methodologies that can propel vocational psychology to the cutting edge of contemporary research in psychology and human development and at the same time eliminate the all-too-frequent reliance on standardized measures and group data that preclude gaining critical knowledge about the unique individuals who are the focus of our research and interventions.

For readers who would like a more extensive understanding of our living systems framework and the usefulness of its applications we suggest the following sources.

Ford, D. H. (1987, 1994, 2013). *Humans as self-constructing living systems: A developmental perspective on behavior and personality*. Hillsdale, NJ: Erlbaum Associates.

Ford, D. H., & Ford C. C. (2013). *Carol's Alzheimer's journey*. LuLu Publications.

Ford, D. H., & Lerner, R. M. (1999). *Developmental systems theory*. Newbury Park, CA: Sage Publications.

Ford, M. E. (1992). *Motivating humans: Goals, emotions and personal agency beliefs*. Newbury Park, CA: Sage Publications.

Ford, M. E., & Ford, D. H. (Eds). (1987). *Humans as self-constructing living systems: Putting the framework to work*. Hillsdale, NJ: Erlbaum Associates.

Ford, D. H., & Urban, H. B. (1998). *Contemporary models of psychotherapy*. New York: John Wiley & Sons.

Vondracek, F. W., Lerner, R. M., & Schulenberg, J. E. (1986). *Career development: A lif-span developmental approach*. Hillsdale, NJ: Erlbaum Associates.

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

THE CASE FOR INTEGRATIVE THEORIZING IN VOCATIONAL BEHAVIOR AND DEVELOPMENT

Work is central to the economic welfare and the adaptive development and functioning of individuals and societies. Working occupies more of adults' waking time than any other activity. The pervasiveness of work ensures that virtually no aspect of human functioning is unaffected by it. The type of work performed by people largely determines their socioeconomic status and the environment in which they spend much of their waking hours. Work roles significantly influence our personal identity, where we go and live, and our social network. Therefore, chances are high that we select our friends and spouse or partner from among individuals we get to know through those settings. Family and work activities are interconnected to such an extent that employers, labor unions, and policy makers are unlikely to consider one without the other. Our health and well-being are intricately linked to work activity. Some work is hazardous by its very nature or location and some is associated with long-term negative consequences that adversely affect health and happiness. In contrast, some types of work offer a high probability of enhancing life satisfaction, sense of well-being and health (Vondracek & Crouter, 2013).

Although the relationship between work and human development depends ultimately on how humans construct and use their work lives (e.g., Savickas, 2002), work is perhaps the single most important determinant of developmental pathways and the quality of life across the lifespan and across national and cultural boundaries. Societal norms are based upon the expectation that all able-bodied people should work to provide for their own wellbeing, and people generally assume that healthy societies should offer the opportunity for citizens to pursue occupational success, which is often seen as an important aspect of the "pursuit of happiness."

Work is typically thought of as an essential activity that provides resources for basic needs and wants. However, there are many forms of work activity that are designed to not only sustain us but also to generate a sense of accomplishment and satisfaction. Moreover, many work activities are essential to our and others' well-being when they include, for example, child rearing, community engagement, hobbies, or home maintenance. With the lengthening of the lifespan in most countries, a significant number of adults will have the opportunity to retire and engage in work activities aimed (at least in part) at satisfactions other than earning an income. Many others, however, will need to work into old age in order to support themselves and their families. Therefore, integrative theories of vocational behavior and development and their professional applications must be focused broadly enough to encompass this diversity of work activity and developmental pathways.

CURRENT STATUS OF VOCATIONAL PSYCHOLOGY

Beginning in the 1930s, theory development and professional activity in vocational psychology have been constructed from two differing perspectives, one focused on industries and selection, the other on individuals and guidance (Savickas & Baker, 2005). The former perspective is now generally known as industrial and organizational psychology while the latter is represented by vocational psychology and counseling psychology.

Industrial and organizational psychology addresses its subject matter from the perspective of organizations and employers. The massive twelve-volume *Handbook of psychology* devotes an entire volume to industrial and organizational psychology, with sub-sections dealing with research, personnel psychology, organizational psychology, and the work environment (Schmitt & Highhouse, 2013). Typical topics in industrial and organizational psychology include defining the worker characteristics best suited for each kind of job, constructing effective work settings, and enhancing the efficiency of employees to meet and exceed workplace demands and economic goals (Gunz, 2009).

The perspective of vocational psychology attends to people becoming workers and identifying suitable work for them. Vocational psychologists employ theories of career development to understand how person characteristics like vocational interests, work values, aspirations, and aptitudes, career decision making, and vocational identity development contribute to favorable career choices. Practitioners in vocational psychology (most often counseling psychologists) assist clients in choosing and preparing for work that suits their personal goals, values, and competencies. Moreover, they work with individuals to help them adapt to changing circumstances and to create developmental pathways that optimize their ability to have meaningful occupational careers and lead satisfying lives (Vondracek & Porfeli, 2009).

Vocational psychologists' focus on a person's current attributes and potentials and on developmental processes and pathways that might lead to future desired outcomes is a unique strength. Such *developmental* interventions, focused on facilitating and cultivating a satisfying work role and life are in clear contrast to the *remedial* interventions that are the hallmarks of fields like clinical psychology and psychotherapy, which are focused on offering treatments for human dysfunction.

Unfortunately, the division of vocational psychology into two branches has persisted and deepened since its emergence many decades ago, and it has resulted in a situation where today little communication exists between the two. For example, the word "vocational" does not appear in the extensive subject index of the industrial and organizational psychology volume of the *Handbook of psychology* (Schmitt & Highhouse, 2013). This is true in spite of the fact that "the two camps share in common a concentration on vocational behavior and its development in careers from the perspective of the individual;" (Savickas & Baker, 2005, p. 43). Nevertheless, progress toward integrative theorizing and more effective communication will be all but impossible unless adherents of different perspectives can at least agree on the language they use to describe and define their subject matter.

Conceptual and Definitional Issues

Before we proceed we must note the existence of some conceptual and definitional issues that persist in vocational psychology and related areas despite repeated efforts to address them (e.g., Borow, 1964; Crites, 1969). These issues include the broad and often imprecise use of the term "career", as well as the casual usage of the term "development."

We first address the meaning and usage of the term "career." It has become commonplace to acknowledge that careers in the traditional sense, representing a more or less coherent sequence of occupational positions, account for only a small (and decreasing) slice of people's varied involvement with work (e.g., Blustein, 2006; Richardson, 2012; Savickas, 2011). Careers in contemporary industrial society have become less predictable, sequential, and ascendant than was the case in the past, leading to the postulation of *boundaryless* (Arthur, 1994) and *protean* (Hall, 1996) careers. It is thus apparent that in its traditional use the term *career* is too narrow and specific to encompass the full and changing range of phenomena associated with the central role of work in people's lives.

In contrast, the field of career studies includes many social and behavioral science disciplines, suggesting that career studies represent not so much a field of inquiry as *"a perspective on social enquiry"* (Gunz, 2009, p. 19). Moreover, there are numerous differing taxonomies of the field of career studies "in which a multitude of scholars are working in their various isolated corners, each talking to a small group of others" (Gunz, 2009, p. 20). As a consequence, there is no widely accepted definition of "career" that could be used by scientists to build upon each other's empirical research findings, representing a clear barrier to progressively building a knowledge base as is usually done in scientific inquiry.

Unfortunately, vocational psychology has contributed to the current lack of precision in using the term "career" and this is particularly true in the area typically referred to as "theories of career development." For example, Osipow (1983, p. viii) stated that his important book on *theories of career development* actually "describes and assesses the major *theories of career choice*" [italics added]. Holland (1985, p. 1) claimed that the primary concern of his theory was "to explain vocational behavior."

To deal with this rather confusing situation, we propose to adopt Crites' (1969, p. 16) view that the subject matter of vocational psychology should be "*the study of vocational behavior and development."* Consequently, we have chosen to name our theory a *Living Systems Theory of Vocational Behavior and Development.* We take issue with Crites, however, regarding his assertion that vocational behavior occurs primarily *in response to* occupational stimuli (even when the term "occupational" is interpreted very broadly to include macroeconomic conditions such as labor markets and labor and economic policies, as well as more specific job characteristics, tasks, and requirements). Our issue has to do with Crites' implicit acceptance of a mechanistic, stimulus-response paradigm to account for vocational behavior and development. Systems theoretical perspectives, like the living systems framework

(LSF; D. H. Ford, 1987a), eschew simple mechanistic, linear cause and effect, stimulus-response relationships in favor of more dynamic relationships involving causal fields and behavioral/ developmental patterns.

In our view, vocational behavior occurs when individuals pursue personal goals that are occupational in nature. For example, pertinent goals could focus on seeking, inventing, or occupying work roles, experiencing joy and satisfaction at work (or avoiding distress and dissatisfaction), engaging in work that includes original thinking (or avoiding work that is boring or mindless), experiencing the freedom to make choices at work (or avoiding feeling constrained or coerced), promoting fairness and justice at work (or avoiding unfair or unjust actions), meeting a challenging standard of achievement (or avoiding incompetence and mediocrity), and increasing one's compensation (or avoiding a decrease in compensation). Occupation-related goals may also differ in scope or pattern: They may be short term (e.g., getting a desirable assignment or getting to work on time) or long-term (e.g., graduating from high-school); they may be lifetime goals, sometimes called "core goals" (Nichols, 1991; e.g., founding a successful company, becoming CEO of a company or accumulating great wealth).

We propose to further expand Crites' (1969, p. 16) definition of vocational behavior to include behavior involved in the acquisition of values, interests, aspirations, and goals that eventually shape a person's work life. We make this proposal in recognition of the fact that children's preparation for the world of work, although not necessarily conscious and deliberate, begins much earlier than previously assumed, namely, in early childhood (for reviews, see Goldstein & Oldham, 1979; Hartung, Porfeli, & Vondracek, 2005; Watson & MacMahon, 2005). It has been reported, for example, that school-age children and adolescents do not typically draw distinctions between leisure, school, and work activities/behaviors (Vondracek & Skorikov, 1997). Moreover, children develop attitudes and values related to work when they observe how their parents relate to their work activities and circumstances (Danto, 2003; Vondracek, Silbereisen, Reitzle, & Wiesner, 1999).

An additional consideration is that choosing and adjusting to an occupation is no longer a one-time occasion, as may have been the case for the majority of workers until mid-twentieth century, but making decisions related to work and adapting to the changing landscape of work is likely to be a recurrent feature of vocational behavior throughout the life course (e.g., Savickas, 2012). Because work contexts in modern society are now continually changing and evolving, workers must themselves be prepared to change and develop in their goals, interests, and capabilities and to seek supportive contexts for work during their working life.

Vocational behavior may or may not be developmental in nature, depending on the circumstances. It may thus be useful to define what we mean by development, and we can do so best by adopting the definition of development crafted by D. H. Ford and Lerner (1992, p. 49):

> Individual human development involves incremental and transformational rocesses that, through a flow of interactions among current characteristics of

> the person and his or her current contexts, produces a succession of relatively enduring changes that elaborate or increase the diversity of the person's structural and functional characteristics and the patterns of their environmental interactions while maintaining coherent organization and structural-functional unity of the person as a whole.

We shall refer to this definition at various times to illustrate vocational developmental changes and distinguish them from other kinds of changes. For now it may suffice to note that vocational *development* is most likely associated with vocational behavior patterns that extend and evolve over considerable periods of time and persist across a diversity of contexts, thereby warranting the label *career*. Vocational behavior patterns that occur in response to specific circumstances at specific times are more likely to be associated with jobs, while those that endure across many different circumstances may come to be integrated into a career narrative with a past, present, and anticipated, but increasingly difficult to predict future.

In choosing this approach, we deliberately departed from the tripartite foundation of vocational psychology described by Crites (1969) as consisting of differential psychology, occupationology, and occupational differences in traits and factors. Although these foundational areas and their subsequent elaborations and extensions (as described previously) have continued to form the basis of most theorizing and research in vocational psychology, they may, in fact, collectively represent a major barrier to the kind of breakthrough progress needed to re-invigorate the field and to re-establish it as part of the larger scientific enterprise that has been so successful in transforming other areas of importance in human development, including, for example, medicine, nutrition, and child care.

We offer the above reflections and clarifications to explain why we propose, in the following chapters, a theory of *vocational behavior and development* and why we prefer this terminology to the more commonly used *career development* terminology. Nevertheless, to avoid needless confusion, when we refer to existing theories that are usually referred to as theories of *career development*, we will use the familiar terminology.

HISTORICAL PERSPECTIVE ON THE EVOLUTION OF CAREER DEVELOPMENT THEORIES

During the past seven decades, several influential theories of career development have emerged from somewhat different theoretical roots, each of which has stimulated a wealth of empirical research and professional practice innovations. Most of these are incremental modifications of mid to late 20th century theories. For example Holland's (1985) theory is a faithful application of the trait and factor approach pioneered by the "Minnesota School." The intellectual heritage of Super's (1980) life-span, life-space model is derived in part from Bühler's (1959) insights into life histories and Snygg and Combs' (1949) ideas about the "self". A number

of different career development theories are adaptations of Bandura's (1986) social cognitive theory (e.g., Lent & Hackett, 1994; Lent, Brown, & Hackett, 1994) or general social learning theory (e.g., Mitchell & Krumboltz, 1990; Krumboltz & Nichols, 1990). Savickas' (2002) constructivist theory carries forward Super's (1980) stage model of career development. Young and Valach's (1996, 2008) action theoretical approach utilizes several other theoretical formulations (e.g., a person and context focus; narrative, ecological, hermeneutical, and constructivist theories). All of these theories implicitly assume the person is the primary unit to be understood, but emphasize specific aspects of a person and their development, and most offer limited explanation of the role of contexts in career development.

In view of the central importance of work roles in individual and societal functioning, it is surprising that current theories of career development have had almost no impact beyond the boundaries of a few, relatively small sub-specialties in the social and behavioral sciences (for reviews, see Collin & Patton, 2009; Savickas & Walsh, 1996). These theories and their applications have failed to impress the larger domain of human development sciences and professions (and our society) with the central importance of work. Career development sciences have also failed to engage the broader scientific community in the demonstrated knowledge and methods they have established to effectively serve individuals' vocational development. After an exciting period of growth in the field during the middle of the 20th century, its reputation and social impact has declined (Savickas & Baker, 2005).

There are at least four important reasons for this relative insularity of current theories and sciences of career development: (1) Each theory focuses on only some of the numerous attributes that enable a person to function as an adaptive unit in varying contexts; (2) Collectively, they have not utilized and linked to significant, potentially relevant theoretical and empirical advances in other fields (e.g., developmental psychology; cognitive science; systems biology); (3) Most theories have primarily focused on individuals' perspectives on work roles and experiences, and generally underemphasized (or ignored) the employer imperative and social-economic contexts on workers' career development; (4) Some have failed (for the most part) to demonstrate their relevance and usefulness to the work of practitioners in the field.

These observations strongly suggest that integrative theories of vocational behavior and development (i.e., theories of career development) are needed that (1) combine a focus on the person as a unified organization of many attributes, the context as a unified organization of many attributes, and the dynamics of person-context interactions, (2) utilize relevant fundamental scientific and professional advances in other fields, (3) provide pathways of linkage to other human development domains that could continually facilitate future improvement in both (e.g., family, child, adolescent and adult development), and (4) demonstrate clear links to the work of counseling psychologists and other practitioners in the field.

In sum, if the study of vocational behavior and development is to take its rightful place in the very center of integrative, multidisciplinary conceptualizations of human

development, the various disciplines who lay claim to aspects of this domain will need to look beyond their current theoretical, scientific, and professional boundaries and endeavor to integrate and claim their place in the larger science of understanding human functioning and development and promoting positive development across the lifespan. Specifically, scholars and professionals concerned with vocational behavior and development (although they may refer to it as career development) from any disciplinary perspective could connect their theories, methods and research findings to a larger shared framework and promote the importance of their work collaboratively. If successful, this could result in having a significantly greater impact on the quality of people's lives in the domains of career and work and beyond.

Trends Toward Integrative Theorizing

There is growing agreement among scholars and professionals that understanding vocational behavior and development from cradle to grave for men and women within rapidly evolving diverse communities, societies, cultures and economies will require theoretical frameworks that are more comprehensive, dynamic and integrative. One consequence of accepting the person and context as inseparable, ever-changing units has been the growing recognition that career development can be understood only when the field moves beyond segmental and towards comprehensive and integrative theories (e.g., Borgen, 1991; Osipow, 1990; Patton & McMahon, 1999; Pryor & Bright, 2011; Super, 1980; Vondracek & Kawasaki, 1995). Some steps toward creating more integrative theories already appear in applications of social learning theory (e.g., Krumboltz, 1979; Krumboltz, Mitchell, & Jones, 1976), Bandura's (1986) social cognitive theory (e.g., Lent et al., 1994), action theory (e.g., Young & Valach, 2000, 2008) and career construction theory (Savickas, 2005).

Three noteworthy efforts to create integrative and comprehensive theoretical or "meta-theoretical" frameworks have emerged (Patton & McMahon, 1999, 2006; Pryor & Bright, 2011; Vondracek, Lerner, & Schulenberg, 1983, 1986). All include a systems perspective on person and environment, although different terminology is used to describe them.

Patton and MacMahon (1999, p.9) stressed dynamic person – context patterns:

- an emphasis on wholeness and the interrelationship of parts within a whole
- view of the whole as greater than the sum of its parts
- the inclusion of elements from a variety of fields . . .
- an emphasis on mutuality of action and interaction – that is, the dynamic and recursive impact of the individual and the context on each other

"Recursiveness" was used to describe key influences within and between systems and sub-systems, because it "incorporates many key aspects of influences, such as their being nonlinear, acausal, mutual and multidirectional, as well as including the ongoing relevance of the past, present and future" (Patton & McMahon, 1999, p. 163).

They asserted that career decision making is at the heart of career development processes, but did not define specific career decision processes.

Pryor and Bright's (2011) Chaos Theory of Careers represents a more recent effort to utilize dynamical systems thinking to articulate what they call "a new perspective on working in the twenty-first century." The Chaos Theory of Careers views individuals as complex dynamical systems who operate within other complex dynamical systems and who self-organize not only to survive but also to find meaning. Self-organization can result in order, coherence, and "resilient stability", but such dynamical systems are also "sensitive to change in initial conditions" (Pryor & Bright, 2011, p. 31).

The key elements of the Chaos Theory of Careers (Pryor & Bright, 2011, p. 184) state that both people and organizations can be seen as systems that are:

- Complex: i.e., subject to many different influences
- Changing continually: sometimes gradually or even trivially, and at other times suddenly and non-linearly
- Highly interconnected: all elements in the system are connected to every other element
- Emergent: a feature of the system is that over time a clear pattern emerges that can be seen at every level of the system: it is called Fractal Behavior
- Open: the system is open to external influences that generally serve to modify the overall pattern in minor ways, but have the potential to have a sudden and dramatic influence
- Inherently unpredictable: containing both pattern and surprise

The Chaos Theory of Careers represents a significant step toward a comprehensive model of individuals and work in the rapidly changing environment of the twenty-first century. Its focus on complexity and change represents a major departure from mid-twentieth century theories of career development. Nevertheless, the theory falls short in a number of important respects. One of these is an almost total reliance on the proposition of *self-organization,* i.e., "the propensity of phenomena to form increasingly complex patterns" (Pryor & Bright, 2011, p. 28). Processes of *self-direction* (i.e., goal setting and anticipatory thoughts) and *self-construction* (i.e., proceeding beyond organizing that which already exists) are ignored. Another problem is that throughout the book, Pryor and Bright (2011) do not explicitly define their units of analysis, which creates difficulties for the reader trying to gain an understanding of the system components and their organizational dynamics. For example, in attempting to apply nonlinear dynamical systems thinking to understanding cognition, no distinctions are made about different cognitive functions and how they interrelate (e.g., remembering; evaluating; goal setting; problem solving).

Vondracek et al. (1986) outlined an integrative life-span conception of career development and intervention, parts of which have influenced other new or revised theories of career development (e.g., Lent et al., 1994; Patton & McMahon, 1999;

Savickas, 2002; Valach & Young, 2004; Young, Valach, & Collin, 1996). They noted that "the ultimate result of embracing an interdisciplinary, systems theory-type view of career development will be a shift from simplicity to complexity…" (p. 6) and "both the individual and the context [are seen] as changing interdependently over time, which thus requires a *dynamic interactional* view of career development" (p.8).

Vondracek et al. (1986) offered two basic postulates to guide more integrative theory development. The first of these concerned *conceptual content* and fundamentally alters the basic unit to be understood: The basic unit of analysis is not just the person; rather, it is *the person-in-transaction-with-specific-contexts.* This means that a person's development cannot be studied and understood solely in terms of specific attributes (e.g. "personality traits") and their interactions independent of the diverse kinds of contexts in which they develop and operate. Each person constructs a repertoire of diverse person-context functional patterns to flexibly serve different kinds of purposes in different kinds of contexts in different periods of life and development.

The second postulate concerned *propositional content*, and transforms how to comprehend causal processes: Person functioning and development results from patterns of multidirectional, mutual-causal processes among dynamic attributes of persons and their contexts, sometimes called *causal fields.* In other words, a causal field is composed of a set of variables that are organized to function as a unit in which its components continuously interact in complex linear and non-linear fashion. Therefore, to understand living systems, the traditional mechanistic linear sequence model of cause and effect (e.g. standard regression equations and path models) must be replaced. What is required is a process model depicting person functioning and development as simultaneously acting, multivariate causal fields in which components function both as causes and effects.

Vondracek et al. (1986) made a strong case for integrative and comprehensive theorizing but lacked adequate propositions about the dynamics they emphasized. For example, they identified some likely multi-directional influences among systems components, but did not specify the processes by which these influences operate. This has undoubtedly limited the utility of their meta-theoretical model in the conduct of research and raised doubts about whether any existing comprehensive theory of vocational behavior and development can offer a useable, comprehensive and integrative theoretical framework.

Long before the more recent efforts at integrative theorizing, Super (1980) recognized that a person is a complex entity composed of integrated, interactive, dynamic attributes and patterns organized to enable a person to function as an adaptive unit in varying contexts. It followed that a complete theory of career development would have to encompass all attributes of a person. His strategy was to first create separate smaller theories focused on different aspects or "segments" of a person, and then later try to add them all together to create a unified comprehensive theory of career development. He produced some segmental theories and worked toward integration in his later years (Super, Savickas, & Super, 1996), but never achieved the goal of combining them into one comprehensive theory.

The complexity of the phenomena of human development is cited by some theorists as a main barrier to creating a unifying conceptual model that can include and bind concepts and propositions representing all basic attributes of a person and their developmental contexts. That complexity, however, is exactly what we need to embrace if our goal is to understand the nature and dynamics of vocational behavior as core aspects of human development.

As a practical matter, one can choose to focus on one or two "segments" of a comprehensive theory but ignoring other segments does not eliminate their influence because all "parts" of a person and their contexts always continually operate collaboratively, often exerting influence in unrecognized ways. Thus, while parts can be studied separately, that does not mean they function separately. They always function as mutually influential components, collectively producing unified functioning and selective transactions with their contexts.

Systems theory is often derided as a theory of "everything" and hence too unwieldy to be of much practical use. We expect that our proposed living systems theory of career will be subjected to a similar criticism until the older generations of variable-based, classroom-trained thinkers are replaced by younger generations of scientists socialized within highly-complex, data-saturated social systems contained within global web-based environments like Facebook, Twitter and the burgeoning virtual K-12 and university systems.

Theories of vocational behavior and development need not emphasize all of the complexity of human development, but they must be embedded in the larger framework of a person's life. Vocational behavior and its development in careers across the life span is deeply embedded in the fabric of human life and development, especially in countries with advanced or emerging economies, and work is what sustains human life everywhere. Hence, theories of career development and work are, in fact, theories of human development and functioning, albeit with a special focus on the developing person in relation to the world of work (Vondracek et al., 1986).

Although creating an integrative theory has been an elusive goal of vocational psychologists for quite a long time, progress toward the goal has been made, and realization of this goal is within reach. A great deal of theoretical and empirical work has advanced our understanding of career decision making (e.g., Gati & Tal, 2008), the role of self-efficacy beliefs in career choice (e.g., Lent et al., 1994), the interwoven nature of action and context in careers (Young, Valach, & Collin, 2002), and the functioning of adaptability in career construction (Savickas, 2002, 2005). These (and other) "segmental" theories and their associated empirical findings will continue to be important within an integrative theoretical framework.

A STRATEGY FOR CREATING AN INTEGRATIVE THEORETICAL MODEL

Theory is a key scientific tool for clarifying, explaining, and understanding diverse, complex and varying patterns of different kinds of phenomena, and for

making predictions about or anticipating potential future events. The concepts (i.e., parts) of a specific theory delineate the phenomena it seeks to explain and the conceptual framework represents the organization of these concepts. The scope of theories can vary to encompass many or few phenomena. When attempting to create an integrative theoretical model for a human development science and professional practice, the first question should be "What are the phenomena the proposed theory should encompass?" The second question should then be "How do the phenomena relate to each other to create a larger pattern that functions as a unit?" To the extent that both questions can be answered with clarity and specificity, the better the chances that the conceptual framework of a theory can be effectively communicated, tested, evaluated and applied. As will be illustrated later, existing career development theories generally suffer from insufficient clarity and specificity.

Concepts

Each phenomenon within a theory must be specified. A theorist gives each phenomenon a name we refer to as a *concept label*, which is used as a "handle" for discussing each kind of attribute and unit of analysis (e.g., interests; abilities; actions; self-efficacy beliefs). Unfortunately, sometimes a concept label gets reified in its use when it is treated as if it were a "thing" that actually exists. For example, as Super made clear, "self-concept" is only a name for a complex and elaborately organized pattern (or a pattern of patterns) of self-referent ideas and thoughts (e.g., Super, Starishevsky, Matlin, & Jordaan, 1963). The self-concept is not an entity; it is a pattern of ideas and thoughts. Some scholars converted that meaning into a "thing" that functioned as an agent or cause, suggesting that a person's self-concept is a guide to their vocational development.

Some phenomena initially represented as concepts are eventually directly observed and are elevated to the level of being a concrete entity (e.g., atoms in physical sciences; cells in biological sciences; the action of neurons in response to stimuli in the neurosciences). Others are inferred from a preponderance of observations of their manifestations (e.g., gravity and electricity in physical sciences; metabolism in biological sciences; thoughts in human development sciences). Concepts can vary in the size, amount, and diversity of phenomena they represent, and some can serve as subcategories of a larger concept (e.g., self-efficacy beliefs may be a subtype of a larger category called self or performance evaluations/expectations).

In the physical and biological sciences and their applications there is widespread agreement about how to categorize and label the parts or kinds of observable or readily inferred phenomena encompassed by their theories. There is limited agreement, however, about these issues in the human development sciences and professions, where people and disciplines often choose to invent their own labels for the phenomena they emphasize. As a result, different names are often used for similar categories of phenomena or similar terms for different categories across

researchers and disciplines. This problem is evident in contemporary theories of career development. For example, do the concept labels of "self-concept" and "identity" represent different or similar phenomena? Do "self-efficacy beliefs," "personal agency beliefs," "self-confidence," and "self-evaluative thoughts" refer to the same, similar, or categorically different phenomena (for a review, see Hartung & Subich, 2011).

This lack of agreement about conceptual categories and names and their use creates three serious problems:

- The only way to be sure of the intended meaning is to search for (sometimes elusive) definitions, descriptions and examples of the category named.
- Without clarity of the intended meanings, it is difficult to understand whether different theories are focused on the same or different phenomena.
- Linking proposed concepts in one discipline or research program to potentially relevant knowledge in other areas carries an additional burden of building a semantic network to identify and bridge shared meanings.

When concepts are directly observable, we can more readily agree on their properties; therefore, we can more readily identify and define them. To the extent that concepts are not directly observable, as is the case in the social and behavioral sciences, establishing the precise definitions becomes increasingly important.

Contemporary theories of career development emphasize attributes of the person and of the context that are believed to relate to vocational behavior and career choice. Each theory's concepts represent only a few "parts" or "segments" of a person's attributes and even fewer attributes of their contexts. For example, many currently popular concepts in career theory represent different kinds of cognition (e.g., goals; values; interests; self-efficacy beliefs) but few refer to emotions. At the same time, contemporary theories may focus selectively on some proximal contexts (e.g., work place; family; school) but most career theories only offer a nod to more distal and sometimes not fully observable contexts such as the overall state of the economy, labor policies, or the level of infrastructure development. A theorist may, for various reasons, choose to focus on a few attributes of a person (e.g., some aspects of cognition but not others), or their contexts (e.g., work but not family), but that does not eliminate the influence of other attributes.

An illustrative example of how some prominent vocational psychologists (e.g., Holland, Super, and Lent and his colleagues) have selectively focused on some attributes of person and context in their theories of career development (and ignored others) is shown in the following table, adapted from Patton and McMahon (2006, pp. 44, 73, 98). A number of things are noteworthy about the table. First, Table 1.1 makes it clear that the domain "career development theory" includes a wide range of phenomena, and that there are other career development concepts not included in that list (e.g. decision making, exploration). The three theories featured in Table 1.1 show little agreement about the relative centrality of various phenomena, and none of the 17 theories reviewed by Patton and McMahon address all of

Table 1.1. Influences on Career Development (adapted from Patton & McMahon, 2006, pp. 44, 73, 98: **A**=**A***cknowledged;* **N**=**N***ot acknowledged;* **SE**=**S***ignificant* **E***mphasis)*

Content Influences	*Holland*	*Super*	*Lent*
Intrapersonal System			
Ability	**N**	**A**	**SE**
Aptitudes	**N**	**A**	**A**
Interests	**SE**	**A**	**SE**
Gender	**A**	**A**	**SE**
Age	**A**	**SE**	**SE**
Skills	**A**	**A**	**A**
Ethnicity	**A**	**A**	**A**
Sexual orientation	**N**	**N**	**N**
Beliefs	**N**	**A**	**SE**
Health	**N**	**N**	**A**
Disability	**N**	**A**	**A**
Values	**A**	**A**	**A**
Work knowledge	**SE**	**SE**	**A**
Personality	**SE**	**A**	**A**
Self-concept	**A**	**SE**	**SE**
Physical attributes	**N**	**A**	**A**
Social System			
Family	**A**	**A**	**A**
Peers	**N**	**A**	**A**
Community groups	**N**	**A**	**A**
Education institutions	**A**	**A**	**A**
Media	**N**	**N**	**N**
Workplace	**A**	**A**	**A**
Environmental-Societal System			
Political decisions	**N**	**A**	**A**
Historical trends	**N**	**A**	**A**
Employment market	**N**	**A**	**SE**
Geographical location	**N**	**A**	**N**
Socioeconomic status	**A**	**A**	**SE**
Globalization	**N**	**N**	**N**

Continued

Table 1.1. Continued

Content Influences	*Holland*	*Super*	*Lent*
Recursiveness	**A**	**N**	**SE**
Change over time	**A**	**SE**	**SE**
Chance	**A**	**SE**	**N**

the phenomena considered (at least by some theorists) to be salient in career development. Second, the kinds of phenomena represented by the sub-categories in Table 1.1 are relatively vague and undifferentiated in their meanings. For example, the "Intrapersonal System" includes a mixed bag of variables, ranging from demographics to physical and psychological characteristics. Third, "Influences on Career Development" is divided into "Content Influences" and "Process Influences," a practice that the authors noted has precedent in career theory (e.g., Hackett, Lent, & Greenhaus, 1991; Minor, 1992), although it is not universally accepted.

Processes

The content-process distinction may be useful in organizing complex information in a table, but it may also perpetuate the dichotomous thinking that has obstructed the emergence of integrative and comprehensive conceptualizations about humans and their vocational behavior. Various kinds of phenomena (often referred to as content) have no direct influence by themselves; their influence results from the nature of their relationships with other components in the currently operating pattern and the current context. In living systems, those relationships are dynamic, varying across time and context. For example, a young man's self-efficacy belief about his inability to dance is generally inoperative except when he is in a current context that pertains to dancing. Within that context, however, there will usually be other forms of influence as well, e.g., (1) he may fear embarrassing himself and thus refuse to dance; (2) he may desire a friendship and therefore give dancing a try; (3) he may respond to a 'dare' by a friend and thus dance despite his misgivings.

Career development theorists often offer inadequate descriptions of the *processes* by which different attributes of a person and their contexts relate to and influence one another (e.g., how thoughts influence actions). They often describe the outcomes that are likely to result from a sequence of activities rather than the simultaneous patterns of influence that produce the outcomes (Gati & Tal, 2008). The following quote (which is implicitly based on the old mechanistic model of sequential cause-effect processes) is illustrative; words implying processes have been italicized

> Elaborating somewhat upon Bandura's general model, we posit that *emergent* interests *lead to* intentions or goals … which *increase the likelihood of* subsequent task selection and practice ... [which], in turn, *produces* particular

> performance attainments... resulting in the *revision* of self-efficacy and outcome expectancy estimates...." (Lent et al., 1994, p. 89)

This statement implies processes with words like *emergent, lead to, increase, produces, and revision of,* but does not define the processes inducing relationships between concepts. Clear definitions of processes, or in other words activities, procedures or operations by which some influence or outcome occurs, would eliminate this ambiguity.

The kinds of functioning found in living systems cannot be understood with the classic linear cause-effect, mechanistic model. A living system is characterized by simultaneously occurring activities of components that interact in mutually influential ways within a larger pattern so the system can function flexibly as a unit. In modern science, these are recognized as *self-organizing* and *self-constructing* processes. It is thus essential to think of content and process as a dynamic, integrated package, sometimes referred to as a *causal field* unit. Scientists of various backgrounds have attempted over the last century to find ways of studying the complex processes involved (for historical reviews, see D.H. Ford, 1987a; Skyttner, 2005) to develop explicit descriptions of how phenomena function, relate to or influence one another or, in other words, the dynamics of a theory. The inescapable conclusion that has emerged is that one cannot obtain an accurate understanding of persons by studying their parts separate from their dynamic organization or separate from the specific content and dynamics of the specific context within which the functioning is observed.

Reframing the Task

When individuals or groups are "stuck" in their efforts to solve a problem or make a decision, a frequently used strategy for trying to break out of their stalemate is called *reframing the task.* By going back and re-examining their objectives, starting assumptions, and their ideas and methods, they can discover new ways of operating, new possibilities, and potentially more fruitful pathways. We think career development theorizing is at that point. We already noted previously that "career development" is not a satisfactory designation for all that is encompassed by our definition of vocational behavior and development, although we are well aware of the difficulty of changing a long-term pattern of language usage. Nevertheless, we believe that the terminology we suggest is more precise and descriptive of the subject matter of vocational psychologists and career counselors.

Dissatisfaction with the incompleteness of early- to mid-twentieth century theories has produced multiple new theories in the traditional segmental form with additional kinds of concepts, and has led to calls for more inclusive efforts. The progress towards more integrative theories, however, has been slow and limited. Thus, we start this section by making an attempt to reframe the issues. To accomplish this, we looked for the "real life" events that form the basis for the large and diverse array of

abstractions (concepts) used in all the existing theories of vocational behavior and development (i.e., career development theories).

Specifically, we asked, "What kinds of phenomena do theorists seek to understand and explain when they examine vocational behavior and development?" We were particularly interested in identifying basic ideas shared by multiple existing theories as one way of locating the phenomena to be included in a comprehensive, integrative theory. In addition, we were mindful of the fact that the basic ideas are usually conveyed in two ways within a theory: (1) They are explicitly stated, and (2) they are implied by the kinds and contents of examples used to illustrate them. The result of our inquiry was the identification of the following six basic assumptions that are shared, to a greater or lesser extent, by most current theories:

1. The person, environment, and fit. Existing theories over the past century (e.g., Parsons, 1909; Super, 1957) identify the basic unit to be understood as a person seeking to understand, make plans and prepare for a personal vocational development pathway. Because the person carries out these developmental activities through interactions with diverse contexts and must find a role in the work context, vocational psychology has identified person-environment (P-E) fit as the preeminent guiding imperative of vocational behavior and development (Osipow, 1987; Edwards & Shipp, 2007).

The person side of the equation is often expressed in psychological terms like self, personality, and identity. Like the physical body is a collection of parts functioning as a whole, psychological theorists often assume that self (Super, 1957), personality (Holland, 1959), and identity (Erikson, 1956; Galinsky & Fast, 1966) are collections of psychological parts functioning as wholes and made manifest in one's career and worker roles. While psychologists endeavor to identify and examine the anatomy of personality, self, and identity perceptions, humans generally do not experience them as a collection of interrelated parts, but rather as wholes and as manifested in sentences including "me," "myself," and "I".

In their "contextualist explanation of career," Young, Valach, and Collin (2002, p. 213) explained that "career is full of goals, plans, and intentions, but these are virtually meaningless without reference to context." Holland (1985, p. 47) proposed that "a person's career or development over the life span can be visualized as a long series of person-environment interactions…." Even Super (1994), whose model of life career stages aligns him most closely with life span development, documented that almost half of his numerous publications placed him within the "person-environment" orientation. Lent et al. (1994) also acknowledged the influence of contextual factors (e.g., opportunity structure and support systems) as moderators between interests and choice goals. Moreover, they acknowledged that "socioeconomic conditions, such as extreme poverty, can powerfully affect career choice options based, in part, on their impact on other system elements, such as learning opportunities" (p. 88).

Those scholars attending to the environment side of the equation emphasize the social structural aspects of work in a way that is more or less consistent with

Mills' (1959) conception of social structure, and as Blustein et al. (2002) point out, work is deeply embedded in culture (Betz, 1993; Leong & Brown, 1995) and in the structure of opportunities and constraints (Sewell & Hauser, 1975). Even Elder's (1974) often cited study of the children of the Great Depression can be viewed as a study of how the life course changes as a consequence of work disappearing on a massive scale. People are assumed to employ perceptions of their environment to develop a conception of the social structure of their environment and their location within this social structure to make work choices. Peoples' subjective and objective location within the social structure is presumed to influence the nature and prestige of their work through the uneven availability and distribution of resources and opportunities across the lifespan. Some scholars, (e.g., Blustein, McWhirter, & Perry, 2005) emphasize the limiting role that the social structure can have upon vocational behavior and development, but few if any emphasize the facilitating role it can have.

More contemporary theories of vocational behavior and development have suggested that the P-E fit imperative offers an artificial dichotomy between the person and his/her environment and have proposed that the *person-in-context* is the basic unit whose characteristics, functioning, change and development represent the phenomena to be understood in relation to career development (Vondracek et al., 1986). A person-in-context is a complex, dynamic organization of multiple kinds of biological, psychological, behavioral, and contextual components and patterns. Although fully embracing the person-in-context as the focus of their efforts has been difficult and elusive, theorists, researchers, and practitioners have almost unanimously acknowledged that persons cannot be understood apart from the contexts within which they are functioning.

2. The principle of unitary functioning. A person always functions as an integrated unit, selectively organized to behave in specific ways for specific purposes in specific contexts. D. H. Ford (1987a, p. 5) named this the principle of "unitary functioning." Although different theories may emphasize different aspects of human functioning, all of them agree that just because a particular aspect is not emphasized as a major influence, it does not mean that such "neglected" aspects are necessarily irrelevant.

The idea of holistic, integrated functioning is certainly not new in psychology or even in vocational psychology. Nearly a century ago, Münsterberg (1912, pp.43-44) observed that "life is not divided into a region of feeling and another of knowing and a third of doing. . . . Even in the most trivial activity, our feeling, thinking and doing at first and primarily appear as a unity. . . . This unity which we find in every trivial little experience dominates our vocational life. . . ." Pryor (1985, p. 226) wrote that "Dividing the person up into bits and theorizing separately about each piece is a fundamental denial of the totality of the human being . . . ." (cited by Patton & McMahon, 2006, p. 154). Similar sentiment is reflected in most current theories of career development, as exemplified by this statement by Lent, Brown, and Hackett (1996, p. 374): ". . . a complex array of factors – such as culture, gender,

genetic endowment, sociostructural considerations, and disability/health status – operate *in tandem* with people's cognitions, affecting the nature and range of their career possibilities" (italics added). Jepsen (1990, p. 129) stressed that both theory and practice in vocational psychology must incorporate the idea that "the person functions as a unified system."

Expressions of unitary functioning of person and environment can be found throughout the field of vocational psychology under the general concept of person-environment fit. Notions of fit are also expressed in terms like congruence, correspondence, and incorporation. Learning about the self and occupations through exploration and adjusting one or both to improve P-E fit are among the assumed fundamental processes of vocational development (Parsons, 1909; Super, 1957). Aside from exploration and associated learning, expressions of P-E fit lack specific descriptions of the processes (i.e., activities, procedures or operations by which some influence or outcome occurs) that enable and produce unitary person-environment functioning.

Although not generally conceptualized as pertaining specifically to a P-E fit framework, Savickas' (2005, p. 48) definition of career adaptability "emphasizes the coping processes through which individuals connect to their communities and construct their careers." This represents a shift from the cornerstone idea of self-concept implementation to the idea of self-constructed (and continually developing) personal adaptation narratives as the key components in shaping career development (Savickas, 2011). The basic rationale is that through their daily experiences people progressively construct, elaborate and alter a general and organized story about themselves that functions to guide future activities. In an important departure from most previous theories of career development, Savickas focuses more explicitly on the processes that enable and produce unitary person-environment functioning by transitioning from the view of P-E fit as a terminal goal to proposing that adapting is a lifelong task in career development.

3. Personal agency and self-regulation. Several theoretical formulations have contributed to what is now an almost universal acceptance of the key role of personal agency and self-regulation in vocational development and choice. People regulate themselves to establish and achieve goals and to maintain preferred functioning and assert themselves in context to create, expand and maximize opportunities and to eliminate, constrain and minimize barriers associated with their goals. Individuals use evaluative thoughts and evaluative affective and emotional experiences to set priorities, choose among alternatives, evaluate the current and potential future desirability and effectiveness of current functioning, and use such evaluations to help guide and regulate their decisions and actions (e.g., Gati & Tal, 2008).

Foremost among theoretical formulations that have emphasized personal agency and self-regulation in vocational behavior and development are those that are based on Bandura's (1986) social cognitive theory (e.g., Lent et al., 1994, 1996), with its emphasis on people becoming both products and producers of their environment.

Self-efficacy beliefs, outcome expectations, and personal goals presumably operate in complex, interrelated ways in the self-regulation of behavior. For example, citing Bandura (1989), Lent et al. (1994, p. 83) note that one of the central constructs of their theory, self-efficacy beliefs, constitutes "the most central and pervasive mechanism of personal agency." Individuals exercise agency by selecting goals they judge to be appropriate, given the self-efficacy expectations and outcome expectations associated with those goals. The developmental-contextual framework (Vondracek et al., 1986, p. 75) also recognized that individuals can act as producers of their own development in a number of ways, including shaping and/or selecting their contexts. Personal agency is also a key construct in Savickas' (2005, p. 43) career construction theory, which proposes that "individuals construct their careers by imposing meaning on their vocational behavior and occupational experiences." Moreover, through exercising "career control" individuals are able to construct their future by making deliberate choices and taking responsibility for their lives.

4. Cognitive guidance of behavior pattern construction and functioning. A number of vocational psychologists have commented on the trend of the past several decades toward greater use of cognitive variables and processes in accounting for vocational behavior and development (e.g., Borgen, 1991; Lent, Brown, & Hackett, 2002). Preference, anticipation, planning, goal setting, problem solving, beliefs, and decision-making have long been recognized as cognitive processes that play a major role in enhancing self-regulation, with personal agency capabilities playing a major role in guiding vocational choices and development. The social learning theory of career decision making developed by Krumboltz (1979), the social cognitive career theory offered by Lent and Brown (1996), and Gati's Prescreening, In-Depth Exploration, and Choice (PIC) Model of career decision-making are prime examples of the growing recognition of the centrality of cognitive processes in guiding vocational behavior (Gati & Asher, 2001; Gati & Tal, 2008).

5. Affect and emotion. While affect and emotion are fundamental to human life, they have not played a major role in the theoretical formulations of most vocational psychologists (Kidd 1998). Exceptions to this observation include the recognition of felt anxiety sourcing from self- and other-imposed pressure to find and maintain work and the happiness and satisfaction that are associated with finding and developing a suitable work life (e.g., Blustein, 2006; Dawis, 2002). There is also a growing recognition that "affective disposition" is a factor to be considered in the formulation of self-efficacy beliefs (Lent et al., 1994, p. 102); "emotional aspects of career decision-making are also considered integral to the career decision-making process. . . ." (Gati & Tal, 2008, p. 175); attitudes are defined as "affective variables or feelings that fuel behavior . . . ." in the theory of career construction (Savickas, 2005, p. 52). In addition, there is an important body of research on the impact of positive emotions on the capabilities of individuals to build enduring personal resources, including social support, resilience, skills, and knowledge (Cohn & Frederickson,

2009, p.16), which is garnering attention from vocational psychologists (e.g., Leong, Savickas, & Leach, 2011).

6. Preferences, capabilities and skills (i.e., interests, aptitudes and abilities). One of the most influential theories of vocational behavior and choice over the past half century is Holland's (1997) theory of vocational interests. Interests are operationally defined by Holland to be a combination of preferences and capability beliefs. Holland believed that people usually prefer tasks that they can do and tend to do tasks they prefer. Most theories of vocational behavior and development implicitly assume that people must have the requisite capabilities and skills to succeed in pursuing their occupational aspirations and goals. Generally, needed skills may involve influencing one's context to produce the required results and/or obtaining information that can be used to guide future action patterns. One theory that explicitly addresses the role of capabilities and skills in career development is person-environment correspondence theory (Dawis, 2002). In short, the theory holds that a person exercises skills to perform tasks to fulfil needs and thereby gain satisfaction. Person-environment correspondence is achieved when the responses of person and environment result in a satisfied environment and a satisfied person. Holland extended this basic notion by asserting and demonstrating how people and contexts could be classified into combinations of six different interest types.

Naturally, if a comprehensive and integrative theory is to emerge, it must be able to incorporate these basic ideas that are shared by most current theories of vocational behavior development. As noted previously, a number of vocational psychologists have suggested that some form of systems theory is most likely to meet this requirement (e.g., Krumboltz & Nichols, 1990; Osipow, 1983; Patton & McMahon, 1999, 2006; Vondracek & Kawasaki, 1995; Vondracek et al., 1986). An early advocate of a systems view in career development, Osipow (1983) demonstrated his keen understanding of the field by suggesting that an emerging

> systems view of career behavior . . . explicitly recognizes that various situational and individual factors operate to influence career behavior in a broad way. With a highly sophisticated systems approach to career development, questions about the role of the biological, social, and situational factors in occupational behavior would become more explicit and . . . understandings of the interactions between these views would be more likely to emerge (p. 314).

Patton and McMahon (1999, 2006) and Pryor and Bright (2011) have taken important steps toward realizing Osipow's vision by articulating their respective systems theory perspectives. They succeeded in making the case for a systems framework in career theory and practice, and called attention to the need for more explicit articulation of the complex patterns of processes that are operative in any living system.

In the following chapter, we will introduce the Living Systems Framework (LSF; D. H. Ford, 1987, 1994) and related theoretical formulations consisting of Developmental Systems Theory (D. H. Ford & Lerner, 1992) and Motivational

Systems Theory (M. E. Ford, 1992) as the basic theoretical foundations for our theory of vocational behavior and development. Perhaps most importantly, the LSF includes not only a conceptual, but also an extensive propositional model, which explicates the processes underlying vocational behavior and development. It is our hope that we will succeed in addressing some of the shortcoming of previous attempts to construct comprehensive theories in the field, including those of Patton and McMahon's (2009) STF, Pryor and Bright's (2011) Chaos Theory of Careers, and Vondracek et al.'s (1986) developmental-contextual model.

CHAPTER 2

THEORETICAL FOUNDATION

The Living Systems Framework (LSF)

A sound theory of vocational behavior and development must fit within a larger general theoretical framework for understanding human development. In the current chapter we will briefly summarize a systems theory-based general model for understanding human development. This model posits that the basic developmental processes are the same for all kinds of human development, but the patterns that are created can vary greatly. Vocational behavior and its development in careers involves one of the diverse kinds of developmental patterns and contexts of a person's life (others include, for example, personal relationships; family; health; non-work activities). In the chapter that follows, we will describe how the general developmental model can be used to create a specific theory focused on a specific kind of development, i.e., vocational behavior and development.

We concluded Chapter 1 with six basic assumptions about the nature of human development on which there appears to be wide agreement among current theories of vocational behavior and development. The first two specify that a person always functions as an integrated person-in-context unit, selectively organized to behave in specific ways for specific purposes in specific contexts. Therefore, the vocational behavior and development of individuals must be understood as involving the construction of complex patterns composed of multiple attributes of each person and their contexts, functioning interactively over time. The content of each pattern must differ to effectively serve different purposes in different conditions.

We will begin Chapter 2 by demonstrating that D.H. Ford's (1987a) Living Systems Framework (LSF) represents a suitable general theoretical framework for establishing a specific theory of vocational behavior and development. Before we proceed to do so, we must note that creating a theory about anything requires answering two questions: "What is it and its parts?" and "How does it and its parts function and change?" In some fields, these questions have resulted in separate, but closely related scientific specialties (i.e., the sciences of human anatomy and physiology). In theoretical terms, the first question is answered by a conceptual model that identifies the kinds of phenomena to be understood (e.g., human thinking and actions). The second question is answered by a propositional model that identifies the processes by which the phenomena of interest are organized and operate. A conceptual model + a propositional model = a theory. We will first summarize the LSF propositional model, then the conceptual model, and then demonstrate how together they provide a way of understanding development of person-in-context integrated patterns that

enable a person to continually function as a coherently organized entity to serve different kinds of purposes in different kinds of continually varying contexts.

PERSON PATTERNS AS THE BASIC UNIT

We have learned that most people initially have difficulty understanding the basic ideas of living systems (as explicated in the LSF), not because the ideas are particularly complicated but because they do not fit familiar patterns of thinking about humans. These familiar ways of thinking about human functioning usually start with ideas about different "parts" of a person (e.g., physical attributes; interests; skills; kinds of ideas or beliefs), and then proceed to explain how they relate to and influence one another. This approach is exemplified by explaining a behavior as a weighted sum (i.e., regression equation) of parts or describing a portrait as a weighted sum of colors.

Understanding how living systems function through use of the LSF requires one to turn that thought process upside down. To begin with, one must start with the idea of complex, dynamic patterns as the basic units of human functioning, rather than focus on different "parts" of a person. Accordingly, the LSF asserts that all humans share six basic inborn processes that always interact as a "team" to produce complex, integrated dynamic process patterns at the person-in-context level. Each "team member" is responsible for one broad kind of process: biological; directive; regulatory; control; transactional; and monitoring. To produce functioning at the person-in-context level requires that each "specialist" on the team perform their role in collaboration with one another. That flexible yet integrated pattern of interdependent processes is how evolution gave humans their huge adaptive advantage over other species across highly variable environments.

The LSF then describes how different kinds of human capabilities are used to perform different kinds of functions, e.g., different kinds of thoughts to perform directive, regulatory and control functions; different emotions and values to evaluate activities and their consequences; different kinds of actions to influence contexts in different ways; and different sensory/perceptual modalities to selectively collect and share information relevant to the current pattern of activity. Each basic human capability (e.g., thinking; feeling; acting; sensing) evolved to perform specialized roles on the "inborn process team."

In LSF, behaviors are explained by patterns of the basic six processes and the capabilities that underpin them. Complex combinations of these six processes are presumed to yield the vast array of behavior and development observed in the human species. The great variety of behavior is made possible because patterns can be defined as more than a simple weighted sum of the six processes. Returning to the portrait metaphor, while two portraits may use the same weighted sum of colors, they can vary dramatically in terms of how those colors are organized on the canvass to yield an image. Imagine how two artists with just a sheet of paper and a single

pencil can create vastly different drawings despite using the same amount of lead (i.e., color being held constant in the equation).

Reading (and perhaps discussing) the ideas in this book will facilitate capturing this alternate way of thinking, and in the process it will open new vistas for understanding the nature of health and human development (including vocational behavior and development). It will actually reduce the perceived complexity of understanding the LSF model because it provides a clear place for each kind of vocational development concept as it performs one of the necessary processes in creating and implementing specific kinds of person-in-context, complex, integrated patterns. Throughout the book, it is our aim to make this fundamental transition to systems thinking as easy and intuitive as possible for the reader.

We emphasize that the basic ideas in the LSF are not new. They come from well-established, empirically documented and widely used multidisciplinary theories and applications (e.g., in psychology; biology; medicine; general systems theory and science; information and communication theory and science; engineering; ecology). The explosion of sophisticated new forms of communicative and instrumental technologies that is rapidly transforming the world has resulted from creative applications of general systems theory in both mechanical and living systems (e.g., in systems biology; movement towards personalized medicine; space travel). There is now a massive amount of evidence supporting the validity and utility of general systems theory for understanding and influencing our world and ourselves.

Therefore, it is no longer necessary to "prove" that general systems theory is sound. Instead, we need to focus on understanding how to apply it to create an integrative understanding of vocational behavior and development, and to help individuals develop their personal vocational and career development pathways. That is the purpose of this book.

While the roots of modern systems theory are over a century old, it was only about 60 years ago that it began to influence human development sciences and professions. Efforts to apply it to understanding vocational behavior and development have grown since the beginning of the 21st century (e.g., Bloch, 2005; Guastello, Koopmans, & Pincus, 2009; Kelso, 2000; Lerner, 2006; Patton & McMahon, 1999, 2006; Porfeli, 2007; Pryor & Bright, 2011).

While current versions of systems theory have different names (e.g., complexity theory; non-linear dynamical systems – NDS; chaos theory; complex adaptive systems – CAS), they are all fundamentally applications of what von Bertalanffy (1940, 1950, 1968) introduced as "general system theory" (GST). Some theorists use a new terminology derived from mathematical models to study and represent nonlinear process patterns in dynamic systems, e.g., chaos, attractors, bifurcations, fractals, phase transitions, synergetics, emergence (e.g., Guastello & Liebovitch, 2009, p. 36; Pryor & Bright, 2011). None of these terms are concept labels, i.e., they do not refer to the substance of human functioning and development (e.g., kinds of thoughts, actions, emotions, career pathways). They are proposition labels representing different patterns of variation and change in processes of functioning

in dynamic systems. The meanings of those proposition names sometimes puzzle persons unfamiliar with their mathematical meanings.

General systems theory is a pure propositional model. The special value of pure propositional models is that they can be used to understand the dynamic organization of different kinds of phenomena that have similar properties, e.g., living systems as different as insects, plants, animals and people. All mathematical formulas are pure propositional models. That is why they are so useful and powerful in science: the same mathematical formula can be used to represent patterns of relationship among different kinds of phenomena. Systems theory is the only scientifically validated propositional model that can represent developmental dynamics of living systems (e.g., its application has transformed biological theory into modern systems biology). In the following pages (using nonmathematical terminology), we will describe how this general propositional model is applied to represent human functioning and development in the LSF. This description will essentially be a summary of the key features of the LSF that are described in detail in D. H. Ford's (1987a; 1994) *Humans as self-constructing living systems: A developmental theory of behavior and personality,* in M. E. Ford's (1992) *Motivating humans: Goals, emotions, and personal agency beliefs,* and in D. H. Ford & Lerner's (1992) *Developmental systems theory: An integrative approach.* To avoid repetitive citation of these volumes, they will be referenced only where quoted directly.

All aspects of human development (e.g., biological, psychological, behavioral and vocational) are functionally interrelated by the same fundamental processes. Therefore, in this chapter we will briefly summarize the LSF process model of human development. In Chapter 3 we will use that summary to create a specific theory about the content and dynamics of the kinds of patterns called vocational behavior and development.

THE LSF PROPOSITIONAL MODEL: PROCESSES PRODUCING INTEGRATED DYNAMIC FUNCTIONING AND CHANGE

Our search for an integrative theoretical model for understanding human development began more than 50 years ago. Beginning in the mid-1950s D. H. Ford's early career focused on creating and directing a psychological services program for college students and their families, emphasizing counseling for educational/vocational development and psychotherapy for troubled individuals. He began a search for a theoretical model that could depict the dynamics and complexity of those kinds of real-life patterns. He and a colleague spent two years doing a comparative analysis of popular learning, counseling and psychotherapy theories that were popular at the time (D. H. Ford & Urban, 1963). The conclusion was that there were some similarities pointing toward a possible integrative theory but no integrative model existed. He broadened his search to a multidisciplinary analysis (e.g., biochemistry; biology; psychology; sociology; engineering) and found what he was looking for.

Modern systems theory was just emerging from theoretical seeds planted in the 1920s and 1930s, most notably by biologists, ecologists, and Gestalt psychologists.

"In all these fields the exploration of living systems—organisms, parts of organisms, and communities of organisms—had led scientists to the same new way of thinking in terms of connectedness, relationships, and context" (Capra, 1996, p. 36). It was drastically different from the basically mechanistic model that had dominated theorizing about humans for centuries. The potential practical utility of those emerging ideas about dynamic systems had been demonstrated to some extent through their application in solving some military and logistical problems during World War II.

One theoretical seed was the concept of "systematic cooperation." Systems theory casts the functioning of a living system as a pattern of interrelated processes that can create, maintain and elaborate an integrated unit of multiple subunits. The functioning of each subunit is in part controlled by its participation in that larger organization, and in which by their 'systematic cooperation,' the subunits function to preserve and elaborate adaptive patterns of functioning of the whole. Functional patterns with those unique process patterns were named systems. Research revealed that the same basic process patterns or systems were manifest in different kinds of entities, so this emerging propositional model was named General System Theory (GST; von Bertalanffy, 1940, 1950, 1968). Weiner (1948) used early versions of general systems theory to create a new field called cybernetics. It described how systems theory could be used to imitate human capabilities to create non-living, man-made self-directing and self-organizing entities. These developments helped launch the massive new technology based on error-sensing mechanisms (termed servomechanisms) to include technologies like cruise control in your car and remote control toys that now permeate societies world-wide.

The second theoretical seed was recognition that the phenomena included under the collective term *information* are of fundamental importance in understanding life (e.g., Miller, 1978). This recognition led to the creation of a new science of information theory and communication (e.g., Shannon & Weaver, 1949). Information theory provided a theoretical basis for understanding how subunits of a system could influence one another through nonmaterial means (i.e. information). This understanding spawned another massive new technology called information and communication systems and technologies to include televisions, computers, the internet, and cell phones that now are ubiquitous in most parts of the world.

These two theoretical advances and their demonstrated utility in applications converged into a general systems theory propositional model that could represent the dynamics of living systems. As used in science, the concept of system can be defined as a complex unit composed of subunits organized so that they "*by 'systematic' cooperation, preserve its integral configuration of structure and behavior and tend to restore it after non-destructive disturbances*" (Weiss, 1971, p. 14). The human body is a biological system exemplifying that definition. The "systematic cooperation" among the subunits in a living system is produced through interacting biochemical and information-based communications among them.

General System Dynamics

Figure 2.1 provides a visual summary of interrelated general system processes. The processes are made possible by a physical entity within which they function cooperatively to produce continual integrated functioning. However, a living entity's continued functioning and further development requires transactions with its contexts. Such entities are called open systems because they function in a context and their processes must function to produce desired and necessary entity-context relationships. It is very difficult to adequately portray in two-dimensional space a complex and dynamic system with its simultaneous patterning of mutually influential processes (c.f. M. E. Ford, 1992). We will attempt to overcome this by adding some descriptive information for each component.

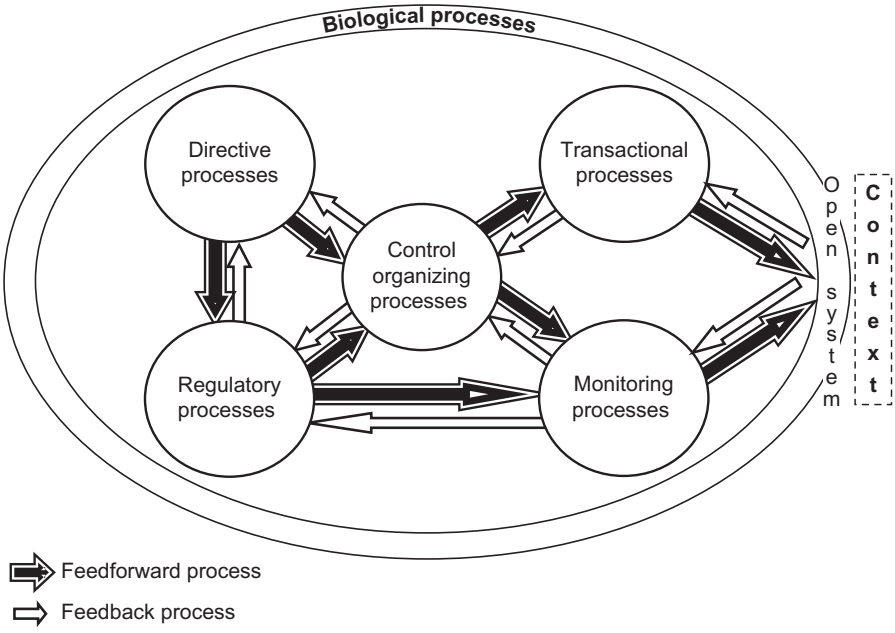

Figure 2.1. A Simplified Model of System Processes.

Directive functions. These component processes specify desired conditions to be produced. They direct all the other functions to organize their activity to produce and maintain the desired conditions in a specific context at a specific time.

Regulatory and evaluative functions. These processes provide criteria by which activity patterns designed to achieve specified results in specific contexts will be guided and evaluated.

Activity organizing and energizing functions. Guided by the specifications of the directive and regulatory functions, these component processes design a "how to do it" plan, direct its implementation by the other functions, provide varying energy resources as necessary, and revise the plan as advised by the evaluative function.

Implementing context transactions. Within the framework provided by the above processes, these component processes create and implement an activity pattern aimed at influencing the context relationships to accomplish the desired results.

Monitoring activity patterns. These component processes selectively collect information about the current state of the implementation processes and provide it to the other processes for their use.

Feedforward processes. The black arrows in Figure 2.1 symbolize "communications" among component processes that are future oriented. Their function is to help the component processes cooperate in specifying what to do where, when and how to produce desired future conditions of the system.

Feedback processes. The white arrows in Figure 2.1 symbolize "communications" among component processes that are present-oriented. Their function is to provide the component processes with information about the current conditions of the system to inform ongoing functions.

Examples of System Dynamics Functioning

System dynamics operate to produce and maintain desired conditions/states. When a discrepancy exists between an existing and currently desired state, the system operates to eliminate the difference with activity aimed at aligning the current state to the desired state. In control system technology, if a comparison of the feedforward and feedback information reveals that the difference between the current and desired state is decreasing it is called a *negative feedback process*; if the difference is increasing it is called a *positive feedback process*.

Note that these concept labels do not refer to the favorability/unfavorability of the information, but to the comparison process of the current with desired system states. Unfortunately, in everyday conversation those meanings have been reversed. For example, a person might say "the boss has started giving me a lot of positive feedback about my work." That refers to the content of the feedback information and not necessarily a means of amplifying a discrepancy. The effect of that kind of feedback may actually reduce the difference between the relationship the person has had with the boss and the good relationship desired. Alternatively, favorable feedback could prompt a person to continue to exceed their goals and thus induce a greater discrepancy or an increasingly positive feedback loop in system terms. In

systems theory it is the process of reducing that difference that is called negative feedback.

A technological example will help clarify this propositional model. Imagine a modern airplane: A physical entity with energy distributing capabilities and composed of subunits that can enable it to fly (a physical unit-in-context manifesting unitary functioning). Its computer-based automated controls enable the plane to adapt to varying context conditions so it can accurately and safely fly to a specified destination, e.g., from New York to Chicago (goal setting and feedforward processes). The pilot creates a flight plan including flight path, altitude and speed of flight (regulatory criteria) to guide the flight (activity organizing and energizing feedforward processes), and installs it in the plane's guidance system. (Her flight plan plays the role of a complex pattern activated to guide activity to reach a specific goal).

A specific episode of activity begins when the pilot initiates activity to achieve the goal of reaching Chicago safely, takes off and turns on the computer guidance system, i.e., activates the feedforward processes specifying the results wanted, and the feedback processes monitoring the characteristics of the current flight pattern relative to the goal. When the comparison of the two reveals that the plane's current flight path is deviating from the one wanted, the computer adjusts the flight controls to overcome that deviation by altering direction, altitude, and/or speed of flight and restoring the desired flight path. This behavior episode ends when the goal is achieved, i.e., when the plane lands safely in Chicago. Every flight is a separate episode and requires its own flight plan (e.g., from Chicago to New Orleans), but all flight plans are made possible by the same patterns of processes to include seven types briefly described above and in Figure 2.1.

That example illustrates that humans can create mechanistic systems that can do some things that humans can do. Does that imply that people are just fancy machines (as mechanistic theorists have argued for centuries)? No, it implies the opposite – such machines are limited imitations of living systems. What is the difference? Machines can only do what humans design and tell them to do. Humans have five inborn processes that motivate and enable every person to create and be in charge of their own life. If we add those processes to Figure 2.1, we transform it into a theoretical model of a living system.

HUMANS AS DEVELOPMENTAL SYSTEMS

For centuries, the dominant view of the nature of humans has been that they are machine-like creatures composed of parts that always function the same way, and that their behavior is a reaction to external influences upon them, sometimes referred to as stimuli. Cause and effect were viewed as linear and predictable. The resulting model was called a mechanistic model because that is the way mechanical devices (machines) are designed and operate. Historically, the field of psychology called that model of humans "behaviorism."

There has always been an alternate view struggling to be heard. This view was relegated to the "black box" within behaviorism. Within the last half century modern systems theory, supported by strong and extensive scientific evidence, has given that alternate view a powerful voice. It says that every person is a living, proactive, self-creating person rather than a reactive, machine-like unit. Only humans are self-constructing. Most technologies with human-like capabilities are limited imitations of some human capabilities and can only do what humans have designed them to do. We call the new view a developmental systems model of humans (e.g., D. H. Ford & Lerner, 1992).

Each person starts as a single cell containing processes that enable them to differentiate and elaborate themselves into the complexly organized myriad of "parts and processes." Literally, humans (and all living systems) make themselves; they are self-constructing. Biologically, we create and repair our own bodies. Psychologically, we construct, learn, modify, and repair personal patterns of thoughts, ideas, knowledge and feelings that we selectively control and use to guide our activities. Behaviorally, we construct ways of transacting with our diverse and continually varying contexts to produce information and results we need and want. The developmental processes are the same for every person (in that sense we are all alike), but differences in the purposes and contexts for which we construct functional patterns produce extensive differences. In that sense, we are all unique.

Four Human Self-Construction Processes

Four other inborn processes use our self-constructing processes to create specific functional patterns for specific purposes in specific contexts. These processes are:

Self-direction. We are our own boss, but like bosses, we must be responsive to situational imperatives. We create personal goals that guide and organize our activity patterns – (we make choices and decisions).

Self-organization. We organize our knowledge, competencies, and decisions into plans and ready ourselves and our bodies to implement them. We create, organize and prepare to implement patterns of activity to achieve our goal(s).

Self-achievement. We use skilled actions and communications to achieve desired states and ends. Continued existence, development and satisfaction depend on our transactions with our contexts to effectively produce and incorporate the results we seek.

Self-regulation. We evaluate what we do, how well we do it, the worth of the results, and we use that information to help guide our behavior. We create, modify, and/or select criteria (e.g., standards and values) and use them to evaluate our choices, the effectiveness of our efforts, and the adequacy of our accomplishments.

Three Propositions of the Developmental Model concerning how Change Occurs

The processes of change and development are fundamentally different for machines and people. Machines are created by people who design and construct parts, assemble them to create a whole, and further develop the machine through incremental and transformative improvements to its parts and how they function. Change and development in humans occur according to three related propositions of the developmental model.

Change and development always starts with what exists. Self-constructing processes in living systems operate by differentiating, elaborating or altering existing patterns,. They rarely emerge as a new "part" developed "from scratch." Imagine a seed sprouting and growing into a plant through elaboration of itself, and then elaborating further to produce a beautiful flower. In training activities such as teaching a young person a new skill, one typically starts with a related pattern they already have and then help them differentiate and elaborate it into the desired pattern (e.g., in very young children standing erect without help is a skill from which walking can be elaborated; Thelen & Ulrich, 1991). There is a huge advantage to this developmental process because it ensures that the unified functioning of all aspects of a person continues through continual change and development despite extensive elaboration of their capabilities.

Only you can change yourself. Others may help a person by suggesting or demonstrating possibilities, but their recommendations will have no influence unless the person decides to try them. For example, one person cannot force another person to truly adopt a goal. Goals (even those a person imagines) have no influence on their functioning unless they make a commitment to pursue them. That is why we use the phrase "personal goals" when discussing individual development. Sometimes a person will decide to pursue a goal they do not like that was proposed by another because doing so serves some other desirable personal goal. For example, a parent may try to impose a goal on a son (e.g., follow in Dad's footsteps and become an engineer) and the son may choose to do it not because he wants to, but because he fears that he could be losing his parents' approval). His goal is focused on maintaining a relationship, while on the surface it appears to be centered on entering a specific occupation. Another common example: A physician can help patients to change a biological dysfunction by cutting something out, putting in a new part, or by giving or exposing them to some substance, but that does not "heal" the body. A person's body has to use that help to heal itself by biologically incorporating into its integrated functioning those treatment intrusions.

Efforts to change an existing pattern will not begin until that pattern is somehow disrupted. Disruption occurs when a discrepancy exists between a current pattern and a desired pattern. Disruption of existing patterns can occur in a variety of ways

(e.g., injury; personal economic change; development of some new ideas or skills; change in context such as a new teacher or school). The most frequently used and most powerful method to produce change is self-disruption through establishing a new goal that is discrepant from current conditions and cannot be achieved with existing functional patterns.

THE LSF CONCEPTUAL MODEL: PERSON AND CONTEXT COMPONENTS AND PATTERNS

As noted in Chapter 1, there is growing consensus among behavioral and developmental scientists and among theorists focused on vocational behavior and its manifestation and development in careers that the person-in-context represents the key unit to be understood. That means our conceptual model must specify both the person and context phenomena the theory should encompass.

Person Attributes and Patterns

The person-in-context unit is very complex because a person is composed of a great diversity of attributes and always functions as a dynamically integrated unit in a context. That means that adaptive functioning of a person requires that all of those "parts" must function as a "team." An effective counselor must, therefore, understand both the specialized roles of each kind of attribute (e.g., different kinds of thoughts, perceptions, actions and emotions and the process functions they perform), and how those attributes interact as a "team" to produce the complex functional patterns of person-level functioning. It is important to recognize that all theories of human development and functioning assume that all humans have the same basic attributes (e.g., capabilities for thinking, feeling and acting); and thus, the content of our conceptual model must reflect that assumption.

Accordingly, decisions must be made about what kinds of person attributes to include in the model and what to call them. One useful source to guide such decisions is how people ordinarily talk about human attributes. For example, people agree, more or less, that all of the following exert important influences on one another and on their actions:

- arousal states (e.g., wakefulness; selective attention; energy level);
- thought processes (e.g., remembering; thinking; planning; evaluating; deciding);
- perceptions (e.g., seeing; hearing; touching; smelling; tasting);
- feelings and emotions (e.g., pain; fear; pleasure);
- interactions with contexts (e.g., talking; walking; working; playing; eating);
- biological functions and states (e.g., health status; physical limitations; biological dysfunctions).

A second source is the concepts used by scholars and professionals focused on understanding human development and functioning. Fields like psychology,

sociology, counseling and psychotherapy, biology, education, and child development use categories with names similar to those listed above. Consequently, those concepts are used in the LSF conceptual model to identify the basic kinds of person attributes that are shared by all people.

It is important to remember, however, that no attribute occurs separately from the others; a person always functions as an integrated unit. Therefore, *at the person level of functioning, attributes are organized into complex, integrated adaptive patterns that function as a unit to serve the person's purposes.* Those patterns are the fundamental developmental components of our conceptual model. The key to understanding the substance of a person's developmental pathways lies in understanding the development of their person-level adaptive patterns. (In Chapter 3 we will show that most concepts used in current theories of vocational behavior and development represent kinds of patterns rather than specific attributes.) Later, we will use the concept of *behavior episodes* to explain the creation and functioning of those person-level adaptive patterns and their role in the construction of developmental pathways.

Since a person's behavioral capabilities are hierarchically organized, it is useful to understand some other levels of organization that provide sub-units of person-level patterns. The LSF uses three broad sub-level apects; each represents different kinds of attributes and sub-patterns. We have named them the *biological aspect* (e.g., organs, heart and circulatory processes), the *psychological aspect* (e.g. thinking; feeling), and the *transactional aspect* (e.g., acting; perceiving; communicating). They are referred to as aspects because they are perspectives or viewpoints on the whole living system.

After deciding which person attributes must be included in the living systems model it is necessary to answer a second important question. Since humans evolved as living systems, we assume that humans' attributes evolved to perform different system functions. Which attributes do humans use to perform each of the living system processes (e.g., regulatory and evaluative processes, control processes) specified in our Figure 2.1 propositional model? When creating the LSF, D. H. Ford analyzed the scientific literature of biology, psychology, behavioral, developmental and social sciences and their related professions to find evidence verifying which kinds of person attributes are used to perform which kinds of system processes specified in Figure 2.1. Those findings can be found in relevant chapters in D. H. Ford, 1987a, 1994 (e.g., Directive Functions; Regulatory Functions; Transactional Functions).

Table 2.1, built from those findings, summarizes the person attributes part of the LSF conceptual model. (It also summarizes context/environment attributes that are likely facilitating or constraining influences on person-in-context functioning; those will be discussed in more detail later in this chapter.) All person attributes have been grouped into the three basic subsystem categories named the biological, psychological, and transactional apects, each of which have multiple attribute-based concepts whose names combine the attribute and its function (e.g., cognitive

Table 2.1. The LSF person-in-context conceptual model

Person Components
The Biological Aspects (e.g.)
Genetic potential; body structure/physical characteristics; biological processes; energy production (e.g., consciousness—attention arousal; activity arousal; biological components of emotion/affect arousal)
The Psychological Aspects (e.g.)
Directive cognitions (e.g., thoughts about short and long-term goals; thoughts about aspirations; thoughts about interests; thoughts about values)
Regulatory/evaluative cognitions
Anticipatory evaluative thoughts (e.g., moral or social acceptability; self-efficacy or capability beliefs; beliefs about context supportiveness; do I have the necessary time?)
Performance evaluations (e.g., progress toward goal achievement; effectiveness of methods used; behavioral effectiveness in implementation)
Regulatory/evaluative emotion and activity states
Control cognitions (e.g., information processing; problem solving; planning; decision making)
Remembering past experiences and activities and imagining potential future behavioral patterns
The Transactional Aspects (e.g.)
Material – energy based transactions (e.g., ingesting and eliminating materials; actions to influence or change contexts; actions to change relationships with contexts)
Information – meaning based transactions (e.g., vocal or symbolic communication to influence contexts; gestural communication to influence contexts; body language; sensory-perceptual monitoring or observing person and context activity)
Environment and Context Components
Natural Environments and Contexts (e.g.)
Oceans; mountains; land animals; fish; birds; trees; grasses; weather; solar system; universe;
Designed Environments and Contexts (e.g.)
Factory; office; car; home; school; athletic field; hospital; theater;
Human Environments and Contexts (e.g.)
Family and relatives; siblings; friends and peers; co-workers; supervisors; teachers; community group members; doctors and nurses; government officials; rabbis, ministers, priests;
Socio-cultural Environments (e.g.)
Socio-economic status; labor market; religions; political parties; governments; medical systems; opportunity structure; economic conditions;

evaluation). Although these attribute-based concepts are listed separately, it is critical to remember that they do not function separately from one another. They must function as a "team" to produce unified functioning at the person-in-context level; they continuously influence one another in various ways.

To make Table 2.1 more understandable, we will provide a brief description of three broad subsystems. Concepts representing more complex patterns are particularly useful. For example, M. E. Ford (1992) describes such a pattern by combining goal setting thoughts, personal agency cognitive evaluations, and emotions to represent a pattern he calls motivation, which will be discussed in greater detail in Chapter 3. We have not listed other kinds of patterns because so many can be created from the basic attributes, just as many melodies can be composed with the 88 keys of a piano.

The biological aspect. This domain is now usually called systems biology (e.g., Rigoutsos & Stephanopoulos, 2007a, 2007b). While the biological aspect is not a primary focus of theories of vocational behavior and development, it is very relevant because one's biological capabilities provide a facilitating and constraining framework for all of a person's functioning and development, and there are individual differences in that framework (e.g., genetic potential; body structure; sensory sensitivity). All of a person's transactions with the various contexts are made possible through different kinds of biological capability (e.g., seeing; thinking; walking; talking).

In return, the psychological and transactional aspects must be able to selectively influence the organized functioning of biological components and processes (e.g., thoughts about what to do with the ball must influence the dynamic biological organization of a basketball players' running, passing and shooting behavior). The biological aspect manages energy generation/utilization (e.g., energy availability) by selectively generating and distributing energy to fuel all different kinds of biological, psychological and transactional patterns of activity (e.g., consciousness and attention; physical and psychological activity; emotional states). The patterning of biological components is guided by physical and biochemical signals, while patterning of psychological and transactional components is guided by information/meaning signals. That means that material and nonmaterial phenomena (i.e. "mind and body") must be able to influence one another.

The psychological aspect. Most concepts used in existing theories of vocational behavior and development represent some aspect of a person's psychology. Although we have somewhat different labels for them, the psychological aspect encompasses four of the areas of broad agreement among theories of vocational behavior and development that were stated at the end of Chapter 1: Personal agency and self-regulation; cognitive guidance of pattern construction and functioning; affect and emotions; interests and preferences; cognitive capabilities and skills.

– *Information-consciousness-attention (ICA) arousal* makes possible efficient and effective psychological functioning through the selective collection,

transformation, construction, and use of information and its meanings in directing, organizing, controlling and regulating patterns of within-person and person-context activity. Consciousness results from a state of arousal of the brain that makes possible the collection and use of information in creating and using person-in-context activity patterns. Waking up and becoming conscious is somewhat analogous to turning on ones' computer, but the human body is never entirely shut down. A person's various activities, conducted in ever-changing and dynamic contexts, continually generate huge amounts of information that can overwhelm a person's information processing capabilities. Fortunately, humans evolved with the capacity for selective attention, which enables them to focus on information that is currently useful and to ignore the rest, and to selectively organize specific patterns of thought and action currently useful while ignoring other possibilities. This is analogous to activating from among all the software programs in ones' computer the specific one useful for current purposes. Understanding this process is of great practical value, for example, in conducting a counseling interview; controlling the clients' selective attention helps guide the counseling session. Moreover, if the client's attention wanders, it may be helpful to understand where and why it went elsewhere.

– *Goal setting cognitive functions* are processes represented by thoughts characterizing some potential future conditions (e.g., goals; aspirations) as desirable. In addition, they include thoughts on why these future conditions are considered to be desirable (e.g., values; interests). A goal may be considered desirable because it represents a valued future outcome, or because it's attainment is thought to prevent undesirable conditions from occurring. However, such thoughts do not actually perform the directive function in a person's behavior unless and until the person makes a commitment to try to produce the specific conditions necessary to achieve the goal. Some theorists refer to this state as an intention.
– *Cognitive regulatory and evaluative functions* include two distinct evaluative processes. The first of these is represented by future-oriented anticipatory evaluations of ways a person might try to achieve a specific goal. For example, whether or not a person proceeds toward achieving the goal may be influenced by evaluative thoughts about (1) the extent to which the contemplated approach is morally or socially acceptable (e.g., moral values); (2) whether one is capable of achieving that specific goal in that specific context (e.g., self-efficacy beliefs or capability beliefs); or (3) whether the context (e.g. family; boss; cost) will be supportive of the effort (i.e., context beliefs). The regulatory role of anticipatory evaluations is two-fold. Thus, anticipatory evaluations take place to first influence the decision about whether or not to commit oneself to trying to achieve a given goal in a given context, and then to influence decisions about how to do it before one starts. The second evaluative process consists of *performance evaluations*. These are evaluative thoughts about: (1) the extent to which ones' efforts are producing desired results; (2) the extent to which the strategies and methods being used are effective or need to be modified; and (3) the extent to which one

is implementing the chosen strategies and methods effectively. The regulatory role of these evaluations is to use information obtained from monitoring actual current activity and results to shape the performance activities toward maximum effectiveness in producing desired results.

– *Emotion/affective arousal processes* are patterns that automatically perform non-cognitive regulatory and evaluative functions in humans (and other mammals, e.g. dogs). Affect is a subjective experience produced by sensory processes (e.g., taste; smell; hearing; movement; pain). Those experiences vary on a like-dislike evaluative dimension and automatically regulate approach-avoidance behavior patterns. Most content and applications of various human development theories (including career development) give little attention to the powerful motivational and developmental influence of affect and emotions and their expression. There are only a few fundamental emotional patterns that are products of human evolution, and each kind exerts a different kind of evaluative/regulatory influence (see D. H. Ford, 1987a or 1994, chapter 13). Core emotions are shared by all humans. They serve different functions and tend to be activated by different conditions. For example, fear is activated by anticipation of dangerous conditions and motivates avoidance of those conditions. Anger is activated by conditions that obstruct or interfere with one's efforts to achieve personal goals and motivates efforts to overcome or eliminate those conditions. Pleasure/satisfaction/joy is activated by evaluations of significant progress towards, or achievement of, personal goals one has been seeking and motivates continuation and elaboration of goal-directed behaviors to produce those desired conditions. Discouragement or depression are activated by current and longer term anticipation of the ineffectiveness of one's efforts and abilities to accomplish personal goals and motivates giving up on such activities. Affection is activated by positive evaluations of specific interpersonal relations, and motivates behavior to cultivate and maintain such relationships.
– *Cognitive control functions* encompass cognitive guidance of behavior pattern construction and functioning. These are the remembering, reasoning, problem solving, planning and decision making, information-based thinking activities that not only construct the initial implementation plan, but also use evaluative feedback from monitoring and evaluative/regulatory cognitive functions to revise and improve the implementation pattern.

The transactional aspect. People use several kinds of implementing functions to influence their relationships with their contexts to serve their needs and achieve their goals. Two kinds of implementing functions are accomplished through material-energy-based transactions: *Physical transactions* can be used by individuals to change their relationships with their contexts (e.g., moving to a more supportive context) or to influence their contexts to better serve their purposes (e.g., changing or constructing contexts or their attributes). *Material transactions* function to obtain and ingest materials essential for life and living (e.g., breathing; eating), and to get rid of unwanted materials in the body (e.g., breathing; elimination).

Three additional kinds of implementing functions are accomplished through information/meaning-based transactions. *Communication* (e.g., vocal, written, or gestural) is the key method for influencing interpersonal relationships and persons participating in them (e.g., as in counseling relationships). *Observation* uses sensory-perceptual processes, guided by selective attention, to obtain (but not to influence) information about current person and context functioning and to provide it to other functions for their evaluative/regulatory use. *Reading* combines observation and cognitive interpretation to privately gain information without direct contact or communication with another person. Educational processes rely heavily on this kind of information/meaning transaction.

Environment and Context Attributes and Patterns

Every moment of every person's life is lived in some kind of context. Understanding and facilitating a person's developmental pathways in life requires recognizing how their specific person and context attributes form functional patterns of daily living that shape those pathways. When used as synonyms, however, the concepts of environment and context can lead to misunderstandings. Thus, we must clearly distinguish between them.

Environment refers to all the kinds of both proximal and distal phenomena surrounding a particular reference point. For example, at this moment I am sitting at my desk, in my study, in my home, with light coming in through my window, while periodically talking with my co-author and typing a manuscript on my computer. My home is in a community in a mountain valley in the state of Pennsylvania in the USA. Our sky is clear but a serious storm is moving toward us from the Midwest and storm warnings have been posted for tonight. European governments are meeting to deal with an economic crisis. A space shuttle is on its way to our space station. I smell the food cooking in our kitchen. I need to go to the kitchen and get a drink. I hear a visitor talking with my wife.

Context refers only to that part of one's current environment with which one can directly interact. In this environment description, examples of context include desk, study, home, light from window, colleague, manuscript, computer, smell of food, drink, water source, and sounds of a visitor. Other aspects of that environment (e.g., community; mountain valley; future weather; European governments; space shuttle) cannot directly influence my current behavior. They could indirectly influence it if I chose to consciously and symbolically represent them in my current thoughts and connect them to my current plans and behaviors. In fact, a uniquely human quality is the capacity to imagine unseen aspects of our environment (from the macro to microscopic) and employ them to alter our contexts.

Contexts, and the larger environments in which they are embedded, *do not directly cause a person's current behavior* (as mechanistic "stimulus – response" psychology proposed). The kind of context, however, and the environment in which it is embedded, indirectly has a fundamentally important influence by providing possibilities (affordances) for and limitations (barriers) on how a person might

behave. For example, one's community provides a pattern of roads that create possibilities for where one might drive. Nevertheless, road conditions, directional signs, stop lights, pedestrians, and traffic laws provide limitations on one's guiding ideas about where, how and sometimes when one can drive.

For individuals to achieve a personal goal, they need to select or create a context/environment that will facilitate their efforts and does not have insurmountable limitations. For example, a college freshman decides she would like to become a nurse. Unfortunately, her college does not have a nursing degree program, which forces her to either shift to a different college that has a nursing program, or change her goal to one for which her current college context provides support. Humans choose, try to shape, and selectively use attributes of their contexts/environments to serve their personal goals and purposes.

Both persons and contexts/environments are complexly organized, dynamic entities that both vary and change over time. That means that the ways and extent to which a specific person-context pattern "works" is likely to change over time. For example, in a family unit the offspring/parent pattern that served a child's purposes and needs well, is typically a pattern that will not "work" as well as the child advances through adolescence towards adulthood. Contexts are composed of many different kinds of attributes which provide different kinds of facilitating and constraining environments with different kinds of vocational and career possibilities. Thinking in terms of four broad kinds of contexts may be useful, especially in assessing one's context beliefs (see Table 2.1).

Natural environments and contexts. These are composed of "outdoor" phenomena illustrated by parks, farms, forests, lakes, oceans, animals and the weather. People often landscape their homes to reflect idyllic aspects of this kind of context.

Designed environments and contexts. Generally, these are created to provide conditions to facilitate and support specific kinds of activities and to drastically limit all other possibilities. Humans are the only species that have mastered this strategy which enables them to lead lives sheltered from troublesome aspects of natural environments. Humans have come a long way from caves and primitive shelters. They now lead most of their lives in environments and contexts that were designed to serve many different kinds of goals. Specialized contexts like hospitals, churches, schools, research laboratories, homes, factories, and athletic fields are designed environments provided in communities to serve the diverse needs and goals of humans. The dramatic success of human evolution and survival was shaped by the great advantages of living and working together in social groups. That has resulted in two other kinds of environments.

Human interpersonal environments and contexts. These represent the major source of satisfaction of the human need for caring and being cared for; helpful and supportive human relationships manifest in contexts like family, friends, co-workers and community or social groups. They also reflect the dependence of

modern complex societies on the principle of the division of labor. For example, many relatively narrow specialists in the world of work depend on one another for meeting their complex needs and diverse goals. Health and social services provide career pathways for individuals who gain satisfaction in helping others.

Socio-cultural environments and contexts. With rapid growth of human populations, these evolved to facilitate masses of people living together in safe and mutually satisfying ways. This is typically accomplished through creation and operation of cultural forms like policies, laws, political parties, levels of government, and forms of organization to ensure provision of essential human services like education and health care.

These four kinds of environments and contexts co-exist and mutually affect one another with their nature, limits and boundaries ever changing. The natural environment enters through the doors and windows of the designed environment and crashes through walls in extreme weather conditions. Human interpersonal environments can drastically change designed and socio-cultural environments and contexts as a consequence of population migration, "great depressions," warring peoples, or the simple birth of a baby prompting the need for more space in the family home. These context and environment categories are fluid and dependent just like persons are linked to and dependent on their contexts.

HUMANS AS SELF-CONSTRUCTING LIVING SYSTEMS

We will now combine our propositional and conceptual models to represent a simplified summary of the basic LSF theory. We do this by taking the general process model summarized in Figure 2.1 and transforming it with Figure 2.2 into a person's typical person-in-context behavior episode. Essentially, this involves showing the kinds of human behavior that perform the various processes within the environmental contexts in which the person's goal directed activities are carried out. Figure 2.2 represents the LSF's practical answer to the theoretical requirements that a person (a) always functions as a person-in-context unit, and (b) manifests the principle of unitary functioning. It describes the basic unit of analysis for understanding both a person's actual behavior at any moment, and for understanding the content and dynamics of their specific patterns of development throughout their life. Stated simply, individuals are always trying to accomplish something in some context even if it translates into "doing nothing", but what they try to accomplish where, when and how varies throughout each day.

A prototypical model like that represented by Figure 2.2 does not, however, describe and explain what a person actually does and why a person behaves in a specific way in a real-life situation, and that is the critical information for understanding a person's developmental pathways. This is the case because people vary in what they want, how they decide to go about producing the desired consequences, what they actually do, the ways they anticipate and evaluate their progress, the emotions that are aroused with respect to the activity, the conditions

of their biological functioning, the kinds of environments in which they interact, and the attributes of those environments upon which they selectively focus their transactions. If any of those functions are ignored, a person's behavior cannot be fully understood (D. H. Ford, 1987a, p. 145). Such comprehensive information can only be obtained by identifying the specific content occurring in each Figure 2.2 process during a specific occasion of behavior (e.g., having a specific goal in a specific context with specific and varying ways of trying to accomplish that goal). By doing that, one has a description of a real-life pattern in real time, which is what we call a behavior episode.

Behavior Episodes (BE): The Basic Unit for Creating and Understanding Developmental Pathways

Behavior episodes are context specific, goal directed patterns, which unfold over time until

- the goal directing the episode is achieved, or
- the goal is revised and then achieved, or
- the goal and further efforts to achieve it are postponed, or
- efforts to achieve the goal fail and the goal is discarded.

Then, a different goal is activated and a new behavior episode begins (D. H. Ford, 1987a, p. 149).

It is virtually impossible to understand a persons' behavior on a particular occasion unless one understands the goals and contexts that organize it, as well as the person's evaluation of progress toward the goal organizing the behavior. This is true because there are always many things going on within and between a person and the person's current context, meaning that a person cannot deal with all of that at once. In recognition of this, every behavior episode focuses attention on those current person and context attributes that will serve the current guiding goal(s) and ignores the rest. Every behavior episode is thus self-constructed and subject to self-modification.

Evaluative processes and learning from behavior episodes. What influences what one learns from one's behavior episode experiences? While they give it different names, learning theorists generally agree that it is the person's evaluations of the consequences of the activity. Remember, there are two forms of evaluation: evaluative thoughts and emotional/affective experiences.

When the guiding goal(s) of a behavior episode are accomplished, evaluative processes are positive, represented by thoughts such as "I succeeded", "I did it", "I'm done", and emotions such as satisfaction, excitement, and pleasure. Those kinds of (successfully completed) behavior episodes provide the foundation for adaptive learning and developing interest in the activity, and they increase the likelihood one will repeat that kind of behavior episode (i.e., if it worked, remember it so it can be

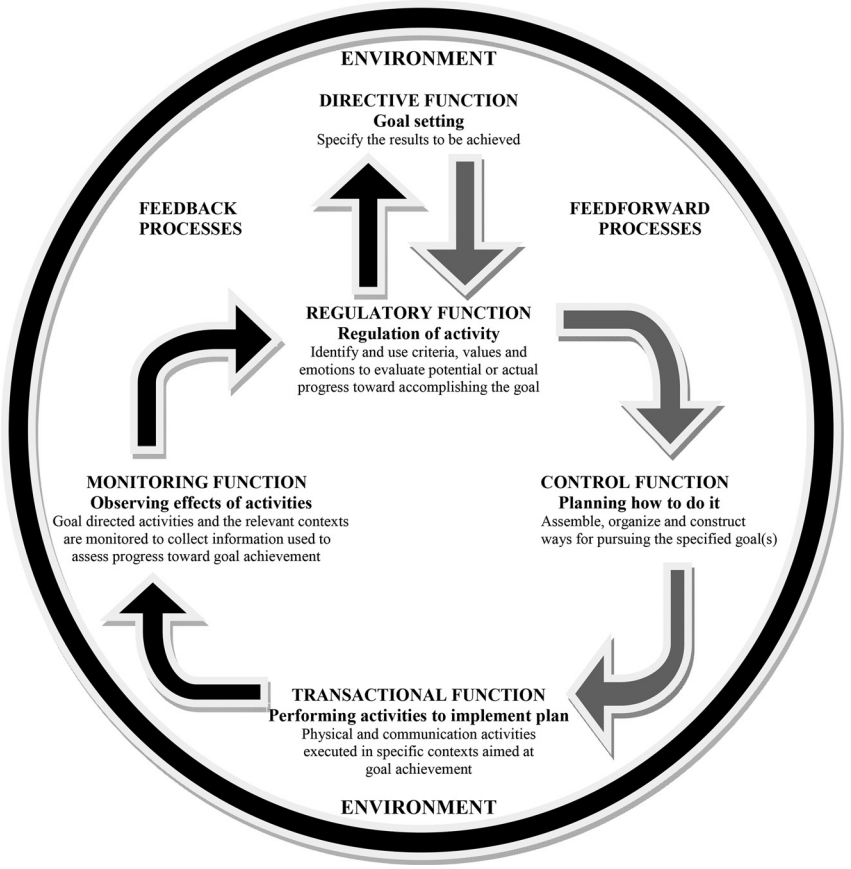

Figure 2.2. A typical behavior episode.

used to succeed in the future). When one fails to accomplish the guiding goals of a behavior episode, evaluative processes can be negative, including thoughts such as "I failed", "people will think I am incompetent", and emotions such as disappointment and discouragement. Such evaluations typically increase the likelihood that the person will not try that kind of behavior episode again and disinterest will set in. Other negative thoughts, however, such as "I did not have a fair chance", and emotions such as anger may increase the likelihood the behavior episode will be tried again to correct an injustice or just to prove that it can be done. Finally, failure can breed neutral or even positive feelings springing from alternate evaluations of the outcome. It is possible to identify potential developmental (vocational) pathways by examining a person's history of behavior episodes that ended in goal attainment and failure and the resulting positive and negative evaluations.

It is essential to recognize that a persons' behavior always occurs in the here and now. A person cannot behave yesterday or tomorrow. Past or potential future events or conditions can only influence a person if they are manifested by surrogates in the present (e.g., memories of past events; predictions of future events). All observations and interpretations of a person's behavior must be understood in that framework. For example, in a counseling interview a client may describe some episode that occurred in the past in some other context. The counselor is then dealing simultaneously with the here and now of the counseling episode and the imagined reconstruction of a past episode. The counselor must also recognize that the content of the reconstructed and current episodes may be influencing each other during the counseling session (e.g., casting the counselor in the image of a parent).

Goal patterns are often operative in any given behavior episode. For example, a person may simultaneously read the morning paper and eat breakfast (often called multi-tasking). People create and use hierarchically organized goal patterns. Large goals can only be accomplished by completing a pattern of sub-goals. This is a common issue in career counseling. For example, a high school senior adopts the goal of earning a degree in electrical engineering. It can only be accomplished through a developmental pathway composed of a series of sub-goals (e.g., graduation from high school; admission to a university; completion of an engineering degree), and a series of contexts (e.g., high school; university; apprenticeship). Each sub-goal may have multiple sub-sub-goals (e.g., passing a test; registering for the right classes) and sub-sub-contexts (e.g., classrooms and dorms). Difficulty with any sub- or sub-sub-goals of a behavior episode can disrupt that pathway and lead to changes in it.

Instrumental, observational, and thinking behavior episodes. Three somewhat different behavior episode patterns result from the kinds of goals and context transactions they emphasize:

- *Instrumental behavior episodes* focus on trying to influence or change the current context, so all transactional components are operative. Instrumental behavior episodes produce exploratory behavior, beginning in infancy, and are important for learning competencies and skills (e.g., as in laboratory and apprentice kinds of contexts). This kind of behavior episode is the primary source of work satisfaction.
- *Observational behavior episodes* focus on collecting information about person and context activity and inhibit transactional activity aimed at influencing the context. They are important for learning what is going on and how things are working.
- *Thinking and imaginative behavior episodes* focus on activating, analyzing, combining and creating new combinations of information/meaning patterns for potential future use, and inhibit most transactional functioning to reduce potential disruption of thinking activities. They are important for combining remembering, analyzing, planning and imaginative cognitive activities in preparation for and selection of future possibilities.

All three kinds of behavior episode patterns interact and facilitate one another in larger patterns of functioning over time.

A "real-life" example may facilitate understanding of how behavior episode patterns work:

Behavior episode 1: Linda gets out of bed and readies herself for her work day (general goal and behavior episode pattern). She dresses and grooms herself for the day (instrumental sub-behavior episodes). Using multi-tasking, she prepares and eats breakfast (instrumental sub-behavior episode) while listening to the news (observational sub-behavior episode) and planning her activities for the day (thinking sub-behavior episode). She is now ready to go to work (behavior episode l ends - goal accomplished).

Behavior episode 2: Linda walks to work (general goal and behavior episode pattern). She begins to walk, notices it is a beautiful day, and decides to visit the park on the way (thinking and transactional sub-behavior episode). The park gate is closed, so she gives up that sub-goal, revises her planned route and takes the bus to work (thinking and transactional sub-behavior episode). She arrives at work (behavior episode 2 ends - goal accomplished).

Behavior episode 3: Her first task of the day is to complete a report (general goal and behavior episode pattern). She assembles all the materials needed, turns on her computer, and brings up the draft she has started (transactional sub-behavior episode). However, she is asked to interview a potential employee, so she stops her planned activity (behavior episode 3 ends – goal postponed), and meets with the prospective employee (behavior episode 4 begins).

A person's entire day of activity can be analyzed and described as a series of behavior episodes, sub-behavior episodes, and patterns of each. Everything that happens between the beginning and end of a behavior episode is selected and organized to serve the goals of that behavior episode and forms a large integrated dynamic pattern.

Behavior Episode Schema (BES): Using Past Experience to Guide Current Behavior

Behavior episodes provide the experiential base for all kinds of learning, and people perform a large number of behavior episodes every day. However, the contents of each behavior episode differ from others and from itself on different occasions and in different contexts. No two behavior episodes are identical. That is because the content of each episode is selected to serve a person's specific purposes on that specific occasion and in that specific context and typically yields somewhat different outcomes.

In general, research on patterns of cognitive and other behavioral activity has confirmed that exact repetition of thoughts and actions seldom if ever occurs (Hollis, Kloos & Van Orden, 2009). What then is learned from behavior episodes? It is not specific responses; it is generalized patterns and the frameworks that hold them.

Over time, a person repeatedly experiences behavior episodes that are similar but not identical, meaning that one does not learn an automatic "habit." To capture that flow of experience for future use, a person constructs prototypical patterns supported by an architecture of schematic cognitive, activity, and context frameworks representing the general properties of similar behavior episodes along with information about variations in those general patterns. When a new behavior episode begins, its guiding goal selectively activates a relevant, previously constructed schematic framework, which is then elaborated to fit the new behavior episode circumstances.

In that way, past experience and current events are used to construct and guide the new behavior episode. That is why we call such learned forms behavior episode schema (BES). BES are not, however, permanent patterns. With each use, a BES may be altered, elaborated to fit new variations, or merged with another BES. "Information processing [technology] takes for granted that the same conditions produce the same output time and time again. However, a central finding of empirical cognition is that cognition is always under construction and rarely repeats itself exactly" (Hollis et al., 2009, p. 208).

Some further elaboration of how BES are used may be helpful. When a new behavior episode begins, all one has as a starting point is a goal formulation and a context within which to pursue it. How to achieve the goal is not specified in that starting point. In traditional terms, it would be said that the person has to figure out how to achieve that goal in that context. Our model says one does not ever entirely "start from scratch" trying to select and organize elements to create a "how to do it pattern" (that is the way one builds machines). Instead, one starts by activating a generalized how-to pattern (schema) that has been effective in similar past circumstances (a BES), using it as a starting point for a solution. It is not a detailed plan to fit all current circumstances. An actual behavior episode is a dynamic, detailed construction subject to alteration and elaboration while in process. It is modified and elaborated either through anticipatory thought about probable context conditions, or through observation of actual context conditions while in process to better fit current circumstances. In this sense, every behavior episode is to some extent a new construction that is not completed until the behavior episode ends. This process is often called "adaptation."

Referencing Linda's commute to work above, most of her experiences with the park gate have been with it being open, so that will be a part of the relevant BES activated. The formulation of her morning commute hinges on the assumption that the gate will be open. The fact that it is locked will not become operative in the ongoing behavior episode until she sees it. If she has experienced it being closed before and recalls that experience that morning, then that perception may cause her to consider the chances of it being closed and may activate a BES component about what she did when she found it locked before. In traditional language it would be said that her perception activated relevant "memories" of what happened and she uses them to anticipate what to do on the basis of the gate being open or closed. In the LSF, however, memories are not viewed as more or less static files of past

experiences, but rather as reconstructions on the basis of current experience and relevant thoughts (that is one reason that memories are often inaccurate).

Another example of the operation of BES is a famous study of human ambulation (Thelen & Ulrich, 1991). This research shows that practicing leg and arm movements begins even before an infant is born. When learning to walk, a young child: (1) starts by combining its previously constructed leg and arm movement BES to include previous conditions, plans, actions, and outcomes of these movements; (2) then elaborates that BES to learn to stand with assistance; (3) elaborates it to stand alone; (4) then elaborates it to move around an object while holding on to it; and (5) finally elaborates it to walk without support. A walking BES has emerged by elaborating earlier patterns. In fact, learning to walk results from "the confluence of many relatively autonomous processes, each with its own developmental history. Many of these processes are functional and may be used in other contexts" (Thelen & Ulrich, 1991, p. 40).

Similar patterns of BES elaboration form the basis of acquiring occupational skills and competencies. It should be underscored that one of the key ideas about developmental processes is that they always begin with some pattern that already exists and then proceed to elaborations and modifications in that pattern to increase its effectiveness for the current task and context. The prevailing thinking in terms of mechanistic model propositions is that we learn "new habits", thought of as analogous to constructing a new part or set of operations for a machine. In contrast, our proposition is that we transform old forms and habits (or patterns) into new forms and actions to fit new situations.

The Dynamics of Stability, Change and Development in Humans

The process of development is fundamentally different for machines and people. Machines are created by people designing and constructing parts, fastening them together, and energizing the system to create and enact the whole machine. In contrast, human change and development always starts with what exists. Then, through inborn self-directing, self-organizing and self-constructing processes, the initial entity or pattern is elaborated, differentiated, reorganized, and developed, thereby progressively transforming the starting units and patterns into much more elaborate, complexly organized and versatile forms while continually maintaining their integrity as a coherently organized whole. Newly developed patterns emerge from existing ones rather than being separately constructed and assembled.

For example, the self-constructing biological aspect of a person starts with a single fertilized cell and progressively grows and develops into an adult person, while maintaining unified functioning of the biological aspect throughout all developmental changes. The psychological and transactional aspects of a person also start with self-directing, self-organizing and self-constructing processes, and with a few primitive psychological-behavioral patterns (e.g., sucking; sensing; selectively attending; uncoordinated limb movement; breathing). From these

beginnings, complex functional patterns are continually constructed, elaborated, developed, and combined, while maintaining functioning as a unified whole, through continual self-organizing transactions with diverse, dynamic and changing contexts.

Nonlinear dynamics and complexity. A prime reason that people find the ideas about systems theory hard to understand and accept is that the variable-based linear model of causality has been so deeply embedded in science and society over centuries that it is all most people know and believe.

> The prevailing concept of change in psychology consists of only one form of change, linear change, which is simply undifferentiated, and with the assumption that outcomes are proportional to inputs in a straightforward manner. The overreliance among psychologists and others on the general linear model as a statistical tool for depicting change has only served to reinforce this monochrome conceptualization of change (Guastello & Liebovitch, 2009, p. 1).

Another barrier precluding widespread adoption is that the terminology of systems theory is foreign for most. Some systems theory terminology includes attractors, chaos, phase transitions, and emergence. While none of these concepts is inherently difficult to grasp, the totality of the lexicon can feel daunting.

Explanations based on linear dynamics work reasonably well for many things, like machines, but do not accurately represent change processes in dynamic systems like humans. There, change is not proportional to inputs; sometimes a large input can have a small effect and at other times a small input can produce a dramatic result. System theorists call this nonlinear dynamics, which are inherently radically different from linear dynamics. The nature of the change in such systems depends on the state of the system at the time of the input, a condition called sensitive dependence on initial conditions, which can produce consequences that are very difficult to predict and is the focus of chaos theory (e.g., Pryor & Bright, 2011).

Based on these considerations, it is clear that the same input will have different effects on a person at different times, and on different individuals because their current states differ, e.g., the same educational or training experience can affect participants differently and can affect the same person differently over time because each person is always changing. For example, while participating in a training session on how to reassemble the parts to create a functional machine, one person may be puzzled and unsuccessful for an extended period of time, but suddenly "catch on" to the pattern and easily finish the reassembly (sometimes called "insight" or an "ah ha" experience). Another person in the same training session may remain puzzled and unsuccessful. Put differently, we could say that similar patterns of developmental experiences may lead to different outcomes (e.g., occupational skills or vocational choices) and different patterns of developmental experiences may lead to similar outcomes. Thus, two individuals with very different developmental experiences end up making very similar vocational choices: A young women who grew up in a family

of artists decides to continue the family tradition and pursues a fine arts degree, while a young man, receiving strong encouragement from his parents for pursuing an engineering degree chooses to become an artist.

These examples demonstrate that humans are not mechanistically reactive entities with a constant input yielding a constant output, but are built to change the input and intervening processes to yield a similar or very different output. We are built to not only chart our own course, but to also invent different ways to travel it and to change our minds mid-way and forge new pathways and destinations through life.

This is not just a "pie in the sky" theory; nonlinear change dynamics are extensively empirically documented and their utility demonstrated in many practical applications (e.g., the same dosage of a medicine may have different effects on different people, and on the same person at different times). People whose focus is on understanding human development and functioning need to shift their thinking about causality from linear to nonlinear dynamics if they are to have accurate understandings of patterns of human development (including patterns of vocational behavior and development).

Stability and change occur through behavior episode dynamics. It is important to remember that change always starts with what exists. Since a person's behavior always occurs in integrated person-in-context patterns called behavior episodes, it follows that change processes must operate through the dynamics of ongoing behavior episodes.

When examining change processes, it is essential to distinguish between *patterns of variation* and *patterns of change*. A person never thinks or acts exactly the same way twice. Consequently, a non-varying or non-changing pattern, usually referred to as equilibrium, never occurs in humans because ongoing behavior episode processes continuously produce variations in a current state. But such variability occurs within limits, creating a stable dynamic pattern of variability called a steady state. That is why system theorists (e.g., Prigogine, 1976; Prigogine & Stengers, 1984) say living systems are attracted to an inherently unstable state or their states operate far from equilibrium, which facilitates adaptive flexibility. Only when content or organization of a steady state behavior episode pattern shifts from its current steady state is it called change.

Why should an existing pattern or state change? It can only happen because something has disrupted the existing steady state pattern, creating a discrepancy between the current state and a desired state. That creates some degree of disorganization of unified functioning within the pattern. System dynamics then operate to deal with the disruption and restore unified functioning. There are three possible ways of doing that:

– *Stability maintenance*. The disruption may be overcome, for example, by biological, psychological, or contextual adjustments that serve to restore the previous pattern. Biologically, a broken bone may be protected until it heals itself; immune system functioning may overcome an infectious disease. Psychologically,

a person's belief pattern that a particular occupation is a "bad" fit in some way may be disrupted by events contradicting this belief. The person may overcome that disruption by creating an interpretation of the events that make them fit the existing beliefs. Contextually, a disruption caused by a carpenter's broken power saw may be resolved by repairing the saw so a project can be completed.

- *Incremental change*. Some component(s) of the disrupted pattern may be incrementally altered or replaced to yield a modified version of the original pattern. For example, a minor league baseball player is a poor batter and is not improving with practice (a discrepancy between the current and the desired state). The coach helped the player learn a new batting stance (a change in a behavior episode action component) and batting improved a little. He then had the player use a different bat (change in context component) and batting improved a little more. In reviewing a video of the player batting, the coach noted he squinted severely while batting. The player's vision was checked and corrected with glasses (change in information monitoring component), resulting in a major improvement in the player's batting. It is still the same general pattern (i.e., a batting behavior episode), but some aspects have been altered (i.e., batting stance; kind of bat; clarity of vision) to produce a more desirable result. Stability maintenance and incremental change occur through negative feedback processes, which operate to restore unified functioning by reducing the discrepancy between the state one has and the state one wants.
- *Transformational change*. Sometimes the disorganization and malfunctioning of a pattern cannot be overcome with stability maintenance or incremental change processes. In such cases, continuation of the malfunctioning pattern generally increases disruption and disorganization. That is called a positive feedback process because it increases the differences between the existing and desired states. If the disruption reaches a critical level, transformational change processes will begin. The underlying rationale is that if the current state cannot be "fixed," some new pattern is needed to restore integrated functioning. For example, a worker's dissatisfaction with his job may increase month by month (a positive feedback loop is operating), despite stability maintaining and incremental change efforts to make the job more satisfactory. Distressing thoughts and emotions increase and interfere with job performance, which increases feelings of failure, until the worker can no longer endure his self-evaluations of dissatisfaction, emotional distress and failure. That is when transformational processes begin, and the outcome tends to be unpredictable. Perhaps the distressed worker will quit and find a more satisfactory work context. Maybe he will start his own business. Perhaps he will get fired, thereby escaping a bad situation. Alternatively, he may break down in some way (e.g., have a heart attack, stroke, or "nervous breakdown"). Many of these outcomes may hinge on context and environmental conditions more or less within his sphere of influence. The crossing of the possible outcomes with context conditions yields a framework of possibilities.

This model of three kinds of change processes has been applied recently to work values and work rewards (Porfeli, 2007; Porfeli & Vondracek 2007; Porfeli & Mortimer, 2010). Work values and experiences appear to undergo incremental change toward maintaining consistency between them over time.

Goal setting as a means of self-disruption. Disrupting existing states plays a positive motivational role in human development. Learning depends on it. People intentionally activate these change processes to serve their own purposes. When individuals create personal goals to guide their behavior, they are imagining future conditions they evaluate as desirable and worth pursuing. That creates a discrepancy between one's current state and a state one wants. Goal directed behavior aims at eliminating that discrepancy by making the current and desired states the same, i.e., by achieving the goals. Thus, goal-directed behavior is the key to changing oneself.

HOW THINKING, REMEMBERING AND COMMUNICATION WORK

Since the psychological person is the quarterback for each behavior episode, and since its key role is to use cognitive processes to manage information processing to direct and guide BES, understanding some key ideas about the nature of cognitive functions will be useful in understanding individual's behavioral and developmental processes. Moreover, vocational counseling sessions are largely conducted through exchanges of information and ideas between counselee and counselor, so understanding these processes is a key to creating effective counseling sessions.

Words are the Servants of Meanings

Humans have invented lots of names for different kinds of psychological functioning. Two types represent the use of information and knowledge in guiding a person's actions. Words such as thoughts, ideas, knowledge and memories label the content, organization and combinations of information-based patterns constructed from behavior episode experiences, often referred to as meanings. Words like thinking, planning, decision making and remembering label mental processes by which meanings are constructed from previous experiences, and are interpreted, combined and manipulated to serve current purposes. Words are intrinsically meaningless symbols constructed by humans to serve as handles for manipulating and communicating different packages of meanings.

Therefore, one thinks with meanings, not words. When one uses words to communicate to others, the words do not carry the meanings. Their function is to activate the intended meanings in the listener's mind/brain. International travelers frequently experience this fact. Imagine an American business woman, who only speaks English, visiting China and trying to talk with a person who only speaks Chinese. She asks where she might find a toilet, but the response is a puzzled look. She then draws a little picture of a toilet, and still receives a somewhat puzzled look

(they are designed differently in China). Through a series of gestures, she quickly receives a knowing smile (accompanied by some sounds that are unintelligible to her) and she is pointed toward the desired facility. Obviously, visitor and host shared meaning but not the word or pictorial handle for it. Clearly, it is very difficult to communicate with another person if the other person does not share the same "word handles" for the same meanings.

Fortunately, other kinds of "meaning handles" are internationally shared. There is a large literature for the many forms of nonverbal communication, such as gestures (e.g., pretending to eat) and pictures as used in this example. By using the rules of one's language (e.g., English, German, Spanish, or Chinese), one can combine different words into sentences that can activate a more elaborate pattern of meanings in another person's mind.

It becomes confusing when the same word is used to represent and manipulate different meanings, as is often the case in English (e.g., how many meanings does the word "can" activate in one's brain?). When individuals cannot think of the right name for a meaning package they want to convey, it does not mean they cannot think with those meanings, only that they cannot use that word to communicate their meaning to others (though they may use alternate words, or give an example). In general, in all conversations with another person (like in a counseling interview) it is wise to be cautious about assuming that the meanings aroused in the other person's mind are the same as those that were intended, and vice versa. Such misinterpretations are often called "miscommunication." Miscommunication sources from a disconnect between the meanings held by a sender and the words used to convey them and/or between the words and the meanings that they induce in the receiver of the message.

Memories are Constructions Rather Than Recordings

Conversations (like counseling sessions) often involve thoughts about past experiences, so it is useful to understand how cognitive processes work to produce the kind of thoughts referred to as memories. For every person, all behavior always occurs in the here and now – it cannot occur yesterday or tomorrow. In that sense, every day is a new day and is composed of a set of new behavior episodes unless it is supplemented by memories (illustrated in behavior episodes performed by persons whose memory processes are disrupted-- as in advanced Alzheimer's disease).

Past and future events cannot directly influence current behavior. However, people construct "meaning packages or patterns" representing the activities of each behavior episode. In a new behavior episode they can be reactivated and used in two ways: Focused on past events, they are typically called memories; focused on potential futures, they may be called anticipations, predictions, aspirations or personal goals. In a current behavior episode, such "memories" are used as surrogates for real past or potential future events. But it is not the actual events that influence that behavior episode. It is the cognitively created meaning packages about them that exert the influence. Therein lay potential problems – since they are personal

cognitive creations rather than real events they might be inaccurate or wrong in some way and produce faulty behavior patterns.

Where are Memories When They are Not in Use?

The old (and too often still used) theory is that memories are "stored" somewhere in the brain like books in a library, or letters in a filing cabinet. It is now clear that this is an inaccurate explanation for both psychological and behavioral patterns. Extensive empirical evidence reveals that remembering is a reconstruction rather than a retrieval process. Memories are selectively reconstructed to fit within the content and context of any current behavior episode.

To illustrate, one may use the analogy of a computer "search engine" by which one seeks answers to a question through the internet's huge "memory." For example, one might enter the words "Where could I buy a Frank Sinatra recording of 'Going My Way'?" In research on memory, those words (buy; Frank Sinatra; recording; and Going My Way) are called "retrieval cues." One's computer (or one's mind) creates an answer (memory) that fits those retrieval cues. Note in this example some retrieval cues are vague: What kind of recording – printed, audio or video? What is "going my way" – a book, song or movie? When clearer retrieval cues are specified, one's computer (or mind) will construct a more complete and useful answer (memory). For example, "Where could I buy a CD of Frank Sinatra singing the song 'Going My Way'?"

People actively choose retrieval cues to help their remembering process. The classical example is remembering someone's name. Most people have experienced being at a social event and being embarrassed because they could not remember a person's name. In those circumstances, a common response is to quickly think up more retrieval cues (context cues are particularly helpful): "She lives on the corner; our sons are both in the band; her name starts with an 'M' – oh yes, it's Mary Arnold." Just because a person is having trouble remembering something does not indicate that the pertinent memory (meaning package) is no longer there or available. The useful general principle is that there is more than one "pathway" (combinations of retrieval cues) through which a memory can be reactivated or reconstructed (e.g., introducing more retrieval cues in a counseling session may facilitate a counselee's remembering activity).

Where are Action Patterns When They are Not Being Used?

Creating an action pattern is a form of remembering (sometimes called "muscle memory"). A good example is watching an infant learning to walk. Each try (behavior episode) will be a little different in terms of muscle pattern, context, and guiding thoughts. Over a lengthy series of walking behavior episodes the infant gradually constructs a general schema (BES) of walking. It becomes activated/reconstructed when, in a new behavior episode, the infant adopts a goal of moving his or her body from one place to another. Note this "remembering process" involves not only the

brain but also the parts of the nervous system controlling skeletal muscle activity. It cannot be an automated "habit" because each context will differ, sometimes in unexpected ways (e.g., walking surfaces may vary from flat to sloping to curving, there may be different kinds of obstacles, or someone else may bump into the person). Such differences may be thought of as analogous to retrieval cues, which help guide the continual development and modification of the initial walking schema (BES) into a current behavior episode as it is occurring.

Behavior patterns flow through varying contexts, purposes and time, and therefore must be flexibly adaptive. In the following chapter we will present a theory of vocational behavior and development that incorporates these dynamic processes and demonstrates how application of the LSF has the potential to result in a more comprehensive understanding of this important area of human development.

CHAPTER 3

A LIVING SYSTEMS THEORY OF VOCATIONAL BEHAVIOR AND DEVELOPMENT

In chapter 1, we defined the domain of vocational psychology as *the study of vocational behavior and development.* A more detailed description of the domain was provided by Super (1983):

> Vocational psychology focuses on people thinking about careers, preparing for occupations, entering the world of work, pursuing and changing occupations, and leaving the world of work to devote what knowledge and energies they have to leisure activities that may resemble in content the work that they did for pay or which may involve quite different types of knowledge and skill (p. 6).

Three decades after Super's statement, empirical research has shed light on various segments of his broad vision, but the kind of comprehensive theory that he envisioned as the ultimate goal of theorizing in vocational psychology has yet to materialize. Moreover, in spite of several promising theoretical advances (Sharf, 2013), leaders in the field have voiced concern about its continued viability and called for "a veritable renaissance of its foundational theories . . ." (Hartung, Walsh, & Savickas, 2013, p. xii).

Based on these calls for a theoretical renewal, the task of creating a comprehensive theory appears to be necessary but is also quite intimidating. We undertake this task with humility and the hope that others will join the effort by improving and refining what we propose. As a first step, we will briefly review how theories of vocational behavior and development (often labeled career development theories) have evolved during the course of the twentieth century and into the twenty-first century, producing elaboration of the kinds of phenomena such theories should encompass.

THE NATURE AND HISTORY OF VOCATIONAL BEHAVIOR AND DEVELOPMENT

The first paradigm of the field concentrated on matching a person's competencies with work opportunities generally and more specifically with the competencies required in the types of jobs available (e.g., Hollingworth, 1916; Münsterberg, 1912; Parsons, 1909). Among other things, this led to the creation of early methods to measure vocational interests and abilities, spearheaded by Walter Van Dyke Bingham, James Burt Miner, and Walter Dill Scott at the Carnegie Institute of Technology (Savickas & Baker, 2005). These early efforts laid the groundwork for extensive involvement of applied psychologists in World War I intelligence and aptitude testing (Super, 1983). The years following the war witnessed a rapid expansion of vocational

testing, stimulated by the need to facilitate the rehabilitation of disabled soldiers (Savickas & Baker, 2005).

Knowledge and procedures developed during those early years were applied on a massive scale by the U.S. military during World War II, when the need to efficiently fill a rapidly expanding force was acute. All military jobs and the skills required for each of them were described. The competencies of each inductee were identified. In World War II, each inductee was given a military occupational specialty number (MOS) that identified the kinds of jobs for which they had the necessary skills. If they had two clear areas of competence, they were assigned a secondary MOS. (John Holland served as a personnel interviewer applying this method and he later went on to apply such methods to invent a typology of occupational environments and matching personality types to apply this method to counselees). If the inductees' training changed their expertise, their MOS was changed (e.g. to designate being a pilot or airplane mechanic).

This was the first system that yielded a way of efficiently comprehending and distinguishing the incoming work-related characteristics of a large population of people, aligning them to the needs of a wide array of existing and newly invented jobs, and updating them as the members of the population changed. This was also the first, and perhaps only, system that attempted to understand and align (a) the predispositions of the workforce (as well as individual workers/inductees) with (b) the needs of the employer (military) and specific jobs (military positions) through (c) a system of training pathways (basic to advanced individual training). This system was largely possible because, in this case, the worker was a soldier who ceded choice to the system created by the employer.

After the war ended in 1945, this strategy of matching people to jobs was rapidly applied in the non-military world of employment, largely because it was found to be generally effective. Moreover, the US economy was expanding at a pace commensurate with the military force during WWII. Various strategies and methods (including measures of vocational interests, personality and abilities) for matching job needs with potential employees' financial needs and competencies were created. But, to make the process match the values of a democratic society and a capitalistic economy, it was elaborated to provide the opportunity for individuals to choose and prepare for the job they preferred, rather than being assigned to a job by someone else, as was done in the military. The professions of vocational guidance and counseling emerged to help people with those decisions.

It was recognized that as young people approach adulthood they know what society expects of them in terms of their participation in the world of work, both to support themselves and their family and to contribute to the needs of society. It was also recognized that societies impose age-graded structures (e.g., schooling), prevailing expectations, and opportunity and barrier conditions (e.g., wars, changes in the economy, emergence of new training pathways, and fluctuations in the availability of jobs) influencing peoples' views of work and behavior. Consequently, the time frame for vocational development processes to unfold and become elaborated was

extended from the immediacy of current job placement to the pre-choice period when people think about making vocational choices in relationship to education or training possibilities that would produce expertise needed for making suitable vocational choices.

The post war flood of GI bill veterans (now students) on college campuses brought urgent pressures for veterans to undergo an accelerated vocational development process leading to career decisions and significant increases in the range of career options. Those changes also produced the need for vocational counseling programs for high school and college students during the middle of the 20th century, and stimulated efforts during the last half of the 20th century to create and verify theories explaining how vocational choices were made and to design means to help people make them (e.g., Ginzberg Ginsburg, Axelrad, & Herma, 1951; Holland, 1959; Roe, 1956; Super, 1957).

As theories of vocational choice and development evolved, two ideas were added to the process of matching people and jobs. One was that vocational choice should be viewed as a process that evolves over time and with experience rather than being a "once and done" choice. Thus, a lifelong vocational developmental process, beginning in childhood, was postulated, based in part on the ever-increasing number of people changing their vocational pathways during their adult years, often more than once (e.g., Ginzberg et al., 1951; Super, 1980; Vondracek et al., 1986). This redirection of individual vocational pathways occurs for a variety of reasons, including changes in the individuals' personal goals and life circumstances, in the nature of and opportunities for employment in different kinds of work contexts, and in the emergence of entrepreneurial possibilities.

A second new idea championed (among others) by David Tiedeman and Donald Super (e.g., Super, 1980; Tiedeman & O'Hara, 1963) was the idea that, in addition to the goal of earning a livelihood, a job could serve other personal goals. A person's life satisfactions could be enriched through the expression of personal interests, goals, capabilities, ideas and values (which Super called "self concept"; Super et al., 1963) in work roles, and if this could be achieved, then it could yield a more engaged, satisfied, successful, and whole worker and person. Research revealed that people do not just participate in a job context; they try to shape it to be more interesting and satisfying to them, they endeavor to maximize the rewarding capacity of their work. That research raised issues about the other activity pathways individuals have in their lives such as forms of work for which people do not get paid in money (e.g., "homemaker"; "community service"), and the impact of employment activities on other life pathways (e.g., work schedules and family life).

This continued elaboration of the phenomena to be encompassed by any theory of vocational behavior and development has led some to define work as any "expenditure of effort in the performance of a task" (O'Brien, 1986, p. 1). However, since all of a person's behavior is goal directed (people are always trying to accomplish something, somewhere), that definition of work encompasses everything every person does every moment of every day of their life. All activity, regardless

of its purpose or context, involves work. Career is then defined as one's conception of the totality of work done in a lifetime. If these definitions were implemented in a theory, it would have to integrate all roles (e.g., child, learner, worker, spouse, parent, citizen), contexts (e.g., home, school, work, community) and events (e.g., birth, loss of a parent, graduation from college, marriage, handicap development, first job, retirement) across a lifetime partly because all involve and partly define work and career. Implementing this redefinition would have drastic implications for the existing discipline and professions associated with vocational behavior and development. Gysbers and Moore (1981) call this shift from an occupational perspective to a life perspective *life career development*.

More recent efforts to broaden the scope of the field and to reflect the economic and workplace realities of the 21st century have included a proposal to develop a "life designing process" focused on "'life trajectories' in which individuals progressively design and build their own lives, including their work careers" (Savickas et al., 2009, p. 241). Another approach rejects the very notion of career as an out-dated construct that is applicable to only a small number of individuals in specific socio-cultural contexts, and instead proposes a "psychology of working" that embraces "the wide scope of work-related activities, with a focus on the psychological meaning" that is attached to working (Blustein, 2006, p. 3).

The inescapable conclusion is that the study of vocational behavior and development can no longer remain viable and relevant by relying on the foundations of mid 20th century theories of vocational choice and development. Moreover, interventions into the vocational pathways of individuals must be informed by the recognition that greater attention needs to be given to dynamic processes that shape the individual's behavioral patterns and vocational pathways. A first step in this direction is represented by the recognition that the person-in-context must be the basic unit of analysis.

THE PERSON-IN-CONTEXT AS A HIERARCHICALLY ORGANIZED, INTEGRATED UNIT

The living systems framework (LSF) maintains that all persons function as integrated units in their specific contexts, and that all develop different kinds of complex, integrated activity pathways during their lives. Any of those pathways that bring pleasure and/or satisfaction could provide a starting point for elaboration into a vocational pathway. It does not postulate that all of those pathways are (or should be) extensively interdependent. Living systems are complex organizations of many subsystems: Those subsystems influence one another in selective ways to produce and maintain unified functioning at the person level, but each subsystem also functions semi-autonomously in "doing its own thing." That is a key to humans' amazing adaptability.

For example, a person's physical body functions as an integrated unit and each person can be situated within a (proximal or distal) family context; medicine has a

specialty called family medicine that attends to this person-in-context unit, which in this case is person-within-family. Medicine, however, also has many specialists (e.g., cardiologists; gynecologists; neurologists; kinesiologists) to assist people to care for their body's semiautonomous biological subsystems. Similarly, many specialists exist to assist people with the development and functioning of their psychological/behavioral subsystems (i.e., cognitive; emotional and affective; perceptual; communicative; actions), such as child development specialists, marriage counselors, vocational guidance counselors, career coaches, health promotion counselors, retirement counselors, and elder care counselors.

We need to think of vocational behavior and development as one of several human development fields of specialization, analogous to cardiology or kinesiology in the broad field of medicine. A theory of vocational behavior and development could be designed to serve such a specialized field. The larger theory of humans as self-constructing living systems (LSF), which we are applying to understand vocational development, can be applied to understanding other human development pathways (e.g., psychotherapy; aging).

THE PERSONAL AND SOCIAL IMPORTANCE OF INDIVIDUALS' VOCATIONAL BEHAVIOR AND DEVELOPMENT

One of the principal personal goals of most people's adult life is to engage in work that is personally meaningful, that allows them to use their abilities, and offers opportunities to be personally effective and successful, to be economically self-supporting, and to be contributing members of society. It is a key way in which individuals can simultaneously satisfy the inborn human nature to be both self- and relationally-oriented; to be self-directing, self-organizing, self-regulating and self-achieving, and thus to be active contributors to their own development and participants in and contributors to, various social groups.

Our society provides a diversity of educational opportunities and contexts that serve to more or less help each person achieve ongoing personal agency. As children become adults, most are eager to become physically, socially, and economically independent persons (although there is considerable cultural variability in the pursuit of these objectives). Moreover, the functioning of the culture, economy and social processes of our society and its contexts require that individuals will, in their own way, be successful in their chosen adult roles, and collectively help produce a healthy economy and social life in their society. That is why making a decision about and implementing their first vocational pathway marks such an important transition experience for youth into adult roles.

Concern has been expressed by some vocational and counseling psychologists about what is perceived to be a relative lack of choice experienced by most workers (e.g., Blustein, 2006; Richardson, 1993). While it is widely accepted that white collar careers, consisting of a smooth progression to more and more advanced positions, are not available to most prospective workers, we maintain that most

individuals still have the opportunity to make choices that can result in advancing their most important personal goals through work. Consider the following quote from Hollingworth (1916):

> Modern life, whether in city or country, has become so diversified and labor so divided, that a small community affords the vocational variety which only a few years ago was quite unfamiliar to it. Moreover, the various avenues of communication, transportation and cooperation have become so elaborate that workers in one part of a nation can with little difficulty profit by activities and opportunities existing in distant places. . . . There is thus a tendency for the individual at an early point in his career, not only to adapt himself to an environment already provided, but to a certain degree to select the environment for which his abilities and interests seem best to fit him (p. 12).

This statement, written almost 100 years ago, is largely true today. Stories of significant hardship for immigrants and entrepreneurs, such as those described by Blustein (2006, p. xii), represent a harsh reality in today's global economy. Just as often, however, we encounter stories of immigrants and entrepreneurs who overcome the hardships and barriers they encounter and who move on to realize their aspirations and achieve their goals only to set and achieve more ambitious goals. Unemployment and poverty exist today just as was the case a century ago and now just as then many people rise above and realize their dreams.

There are times, nevertheless, when our society's ideal of personal and social responsibility and effectiveness linked to work opportunities is not functioning properly for significant segments of the population. This can then result in profound dysfunctional consequences that make peoples' lives miserable, symbolized by frightening words like failure, unemployment, poverty, depression, homelessness, divorce, and criminal behavior. The interrelatedness of vocational pathways and other pathways in people's lives makes these consequences a bitter reality for some.

We propose, therefore, that the mission of academics studying vocational behavior and development and of practitioners in the field of vocational and career development should be re-fashioned and elevated from its previous place to become aimed at helping to create the conditions necessary for producing success, satisfaction and effectiveness in the lives of both individuals and of our society. Development of most other life possibilities and pathways depend, at least in part, on each adult's successful and satisfying work life.

DEVELOPMENT OF VOCATIONAL PATHWAYS

In going on a journey, it is wise to choose a destination and a route before actually beginning the journey. Since our goal is a theory explaining how people develop personal vocational goals and developmental pathways, and identifying ways to help them to be successful, it is essential to describe the key developmental processes involved.

We will begin by describing developmental processes that commence virtually at birth with the most basic behavior episodes that result in the acquisition of an ever increasing repertoire of enduring behavior patterns called behavior episode schemas (BES). Based on M. E. Ford's (1992) Motivational Systems Theory (MST), we will then describe the contribution of motivational factors (e.g., goals, personal agency beliefs, emotions) and non-motivational factors (e.g., skills, biological factors, a responsive environment) in the development of effective functioning in general and in the pursuit of successful and rewarding vocational/career pathways in particular.

Developing Activity Pathways Through BES Construction from Similar Behavior Episodes

We have previously noted that the development of imagined, planned, and actual career pathways is likely to be a recurrent or even continuous process for most people because of rapid changes in the landscape of occupations resulting from technological innovation and globalization, as well as major demographic and political shifts. If the developmental processes associated with the formation of vocational pathways operate continuously, when do they start?

Although young children typically do not engage in the conscious pursuit of vocational pathways, they do lay the foundation for the development of such pathways (e.g., Hartung e al., 2005; Watson & McMahon, 2005) through the performance of different kinds of play, educational, and psychosocial activities that increase rapidly in number and diversity from the moment of birth.

A behavior episode is a temporary, time-limited, goal directed activity pattern in a specific situation or more generally in a context. People use their experiences from past behavior episodes to guide their behavior in each new episode. Simply put, people combine their goals and activities in a current behavior episode with memories of similar past behavior episodes. When speaking of similarity in behavior episodes, it is important to remember that the basic behavior episode model is a process model (see Figure 2.2) whose interrelated processes cause it to function as a unit. The functioning of these processes is identical in all behavior episodes. Similarities and differences in behavior episodes result from differences in their content and contexts, i.e., in what they are trying to accomplish where, when and how. It is the content similarities and differences among a set of behavior episodes that are the basis for the construction of a complex repertoire of enduring behavior patterns. In other words, although each behavior episode is a once-and-done event, many behavior episodes are similar, thereby enabling individuals to readily construct generalized versions. Such generalized versions of a type of behavior episode are called behavior episode schemas (BES).

Just as children's bodies developed from a single cell into a very complex organism with many different interrelated parts, their psychological and behavioral repertoires develop into complex schema patterns with many subcomponents. The development of vocational interests serves as an illustrative example. Imagine a young boy who, even as a toddler, appeared to be fascinated by any and all mechanical devices,

ranging from toys to coffee grinders. He would attempt to take them apart, put them back together, and watch them in operation. Each play activity of this kind (which is the work of children) represented a behavior episode that was obviously accompanied by positive evaluative thoughts and pleasing emotions, and apparently produced the desired results for the boy. Because of this, he sought and completed numerous similar behavior episodes (while avoiding behavior episodes that were not experienced in a positive way), gradually constructing a BES pattern (e.g., an enduring interest in mechanical things) contributing to an activity pathway that brought him satisfying goal achievement, pride in his competence, and positive emotions.

It is important to note that BES cannot be observed directly; they can only be inferred from observations and knowledge of a person performing specific activity patterns in the context of specific behavior episodes. These self-constructed schemas then play the powerful role of serving as a starting point for constructing a new behavior episode (for example, a behavior episode guided by the goal of choosing a college major or a first job). BES are subject to continual modification and elaboration through their use in constructing, and incorporating the consequences of, new behavior episodes; hence, behavior episodes serve as the fodder for BES, which in turn serve to guide future behavior episodes.

The motivation patterns behind BES constructed during childhood and early adolescence are usually not guided by the goal of developing or exploring potential vocational pathways. They are typically focused on having fun, sharing experiences with peers (as in athletics), or exploring interesting experiences. In fact, leisure, school, and work interests, expressed as activity preferences, were found to be highly correlated in a sample of 7th through 12th graders, who clearly did not see them as being very different from each other (Vondracek & Skorikov, 1997). However, regardless of the original motivation that led to creation of any satisfying activity pathway, development always starts with what exists. Thus, any existing pattern could provide a starting point from which further development might be transformed into a vocational or career development pathway.

BES based on many instrumental behavior episodes have a special potential for such development because they involve actually carrying out tasks in specific kinds of contexts. For example, a girl developed an interest in weather phenomena. She read about it, did science projects in school about it, practiced using a little "weather station" in her backyard (a gift from her parents), and got a local TV weather person to teach her how to read weather maps and interpret data. Not surprisingly, she chose to major in meteorology in college.

When BES are based primarily on observational behavior episodes (e.g., watching what teachers do; watching lawyers on TV shows; going to work with a parent to watch what they do), they have less predictive potential because they are based only on social modeling processes without task performance experience. BES based primarily on thinking behavior episodes (e.g., reading about activities) also provide a limited base for decision making because they are based on imagining activities rather than actually watching or doing them.

The strongest bases for a potential starting point for further development are BES based on a combination of all three kinds of behavior episode experiences. BES anchored in direct experiences generated by instrumental behavior episodes provide the cornerstones for integrating results from observational and thinking behavior episodes to facilitate a person's decisions about and implementation of vocational pathways.

When a new behavior episode activates a relevant BES, only parts of the BES pattern relevant to the goals and context of the new behavior episode are initially activated, but other subcomponent patterns may be activated if activity conditions change. Activation is not a "once-and-done" process. It is a dynamic selective process with varying results as conditions change. In other words, when one begins another behavior episode, its goal and context activates reconstruction of a relevant BES and progressively shapes it to fit the specific conditions (including unexpected ones) of the current evolving behavior episode.

"Functionally, a BES provides guidance—sometimes very specific guidance, sometimes more general guidance—about what one should pay attention to and how one should think, feel, and act in a specific behavior episode" (M. E. Ford, 1992, p. 27). It is important to understand that BES, just like the behavior episodes from which they are derived, are always anchored in goals and contexts. Thus, one's behavioral repertoire is not composed of rigid automated "traits" or "habits", but rather a collection of flexible BES that provide frameworks and strategies that can be shaped and utilized to fit current circumstances.

This dynamic model of continuous learning and adaptation contrasts sharply with prominent models in vocational psychology that focus on presumably stable and enduring patterns of functioning such as vocational interests and personality (e.g., Holland, 1985). These have been shown to be of limited utility at a granular-level (e.g., predicting specific jobs and vocational pathways of individuals), especially in person-focused interventions such as those practiced by career counselors, primarily because they largely ignore the context specificity and functional variability of behavior patterns, even those that are considered to be relatively stable.

In chapter 5 we will further demonstrate that traditional research on and assessments of vocational psychology constructs such as vocational interests (e.g., Campbell & Hansen, 1981), vocational personalities (e.g., Holland, 1985), and work values (e.g., Nevill & Super, 1986a; Super & Nevill, 1986) have serious limitations because they are based on inter-individual analyses that provide information about the population, which in most cases cannot be applied validly at the level of the individual (e.g., Molenaar & Campbell, 2009).

The Role of Motivational Processes in the Development of Vocational Pathways

We described in the previous section how all behavior occurs in the form of sequences of goal-directed activity called behavior episodes and how learned generalized activity patterns called behavior episode schemas (BES) are constructed

from similar behavior episode sequences. These developmental processes are essential in the formation of ever-expanding behavioral repertoires (including relatively enduring patterns) in children, adolescents, and adults, thus creating the "raw material" necessary for the development of vocational pathways. Having this "raw material" as a starting point is an essential, but not sufficient, condition for the successful development of such pathways. Another necessary ingredient is motivation, consisting of future oriented, anticipatory and preparatory processes that "help people imagine or predict future events and consequences that are relevant and meaningful to them, thereby preparing them to act or react in ways intended to produce desired futures and avoid undesired futures" (M. E. Ford, 1992, pp. 72-73).

In his book *Motivating Humans,* M. E. Ford (1992) presented Motivational Systems Theory (MST), based on D. H. Ford's general living systems model of humans as self-constructing living systems (LSF), which was described in Chapter 2. In MST, motivation is seen as the "leader" of the person-in-context self-constructing "team." A leader has two key roles. The first is to decide what the self-construction psychological team is to create, i.e., the result to be achieved. The LSF and MST call that process self-direction, and specify that a person carries it out through thinking behaviors called goal setting. The second is to specify the criteria and "building codes" or values to be used by the self-construction team to guide decisions about "how to do it" and to evaluate how well the team is doing. The LSF calls those processes self-regulation, which is carried out through evaluative thought processes and inborn evaluative/regulatory affective and emotional processes.

Self-direction and goal setting processes. The complex person-in-context unit must operate so that all the "parts" cooperate as an integrated team to produce the achievements and competencies necessary for successfully accomplishing its personal goals. Goal setting thoughts activate feedforward (i.e., future oriented) signals (see chapter 2) that influence the rest of the system to direct and organize behavior selectively in a specific behavior episode so as to create the specific outcomes that are desired in that specific context.

Goal setting activity involves two sub-processes: First, individuals engaged in goal-setting activity must imagine some future condition that they would like to create. This may involve thoughts about (a) conditions not presently existing that they would like to have exist (which activate what is often referred to as "approach behaviors"), and/or (b) conditions that they would like to prevent from occurring in the future (which activate behavior patterns often called "avoidance behaviors").

For example, when individuals start thinking about what kinds of occupation they might choose, a frequent early step is to eliminate the things they "know" they don't like (avoidance goals). Then they can focus on identifying and prioritizing possibilities they think they might like (approach goals). A useful tool to assist individuals in such goal setting activities is Gati's Prescreening, In-depth Exploration, and Choice (PIC) sequential elimination model, in which career alternatives are chosen according to

the importance assigned by individuals to career-related aspects of a given career alternative (e.g., Gati & Asher, 2001; Gati & Tal, 2010).

Second, individuals must make a commitment to try to produce the future conditions they have imagined. M. E. Ford (1992, p 206) calls this "the principle of goal activation." Combining goal setting with goal activation processes is so important that little else matters until those steps are taken. Thoughts about something one might like to have or accomplish do not function as a directive influence in a behavior episode until the person makes and persists in that commitment. Many dreams die on the lips of the dreamer. Adding commitment to a goal turns it into an intention.

A taxonomy of personal goals. The LSF summary in chapter 2 describes how and why a person always functions as a dynamic system as depicted in Figure 2.2: a person's behavior is always guided by some goal. That means each of us create and use lots of different goals during our lifetime. M. E. Ford and Nichols (1992) have created a useful taxonomy of human goals, including goals that specify desired within-person consequences (Affective Goals, Cognitive Goals, Subjective Organization Goals) and goals that specify desired person-environment consequences (Self-Assertive Social Relationship Goals, Integrative Social Relationship Goals, and Task Goals). A more detailed listing of human goals can also be found in M. E. Ford, 1992, pp. 88-89.

Goals from any of the six categories could involve the attainment (or avoidance) of consequences associated with specific vocational/career pathways. For example, pertinent goals could focus on experiencing joy and satisfaction at work (or avoiding distress and dissatisfaction), engaging in work that includes original thinking (or avoiding work that is boring or mindless), experiencing the freedom to make choices at work (or avoiding feeling constrained or coerced), promoting fairness and justice at work (or avoiding unfair or unjust actions), meeting a challenging standard of achievement (or avoiding incompetence and mediocrity), and increasing one's salary (or avoiding a decrease in salary).

It is particularly important to note that this taxonomy of personal goals explicitly recognizes that people are not only motivated to pursue goals that entail the achievement of desired conditions/circumstances. People are motivated just as often by a strong desire to avoid undesirable conditions and circumstances. The latter may be particularly salient for young people who are formulating their initial career goals. For example, one rationale that guidance counselors often encounter is "I don't want to have the same kind of job as my mother (or father)." It is known that children's first experience with work is usually based on the emotions and attitudes their parents bring home from work (e.g., Hartung et al., 2005; Watson & McMahon, 2005). Although this may result in children developing occupational goals that mirror the careers of their parents (when parents love their work and communicate their satisfaction and fulfillment to their children) it may also result in children

developing an early aversion to the career pathways of their parents and thus in the formulation of avoidance goals.

Goals may also differ in scope or pattern: They may be short term and very specific (e.g., getting to work on time); they may be long term and more extensive (e.g., graduating from high-school, getting admitted to college, getting a job); they may be lifetime goals, sometimes called "core goals" (e.g., becoming CEO of a company; accumulating great wealth; Nichols, 1991).

The strength of motivation. A consistent message in the MST is that salient goals, (i.e., those considered to entail the strongest commitment) bolster motivation and increase the effectiveness of associated behavior, an insight also reflected in Super's research on work role *salience* (Nevill & Super, 1986b; Super & Nevill, 1984). Activated goals enable individuals to effectively function to accomplish their goals only when all the relevant facets of their goal(s) are clearly understood. Vague and fuzzy definitions of an insignificant goal lead to vague and fuzzy content and organization of efforts to achieve the goal. For example, in a class of new medical students, all did well until they got to the "blood and guts" experiences. Some of them were sufficiently distressed by these experiences to leave medical school. They loved the science of medicine but not the trauma sometimes involved in patient care. That is why one of the first steps in vocational counseling should be to help counselees construct a clear and relatively detailed understanding of the goals they want to achieve through their vocational pathway, the associated experiences that will likely occur along the way toward achieving them, and the relative strength of their desire to sustain their resolve as they work to achieve them. While this can be advanced through third-person accounts, there is no substitute for direct experience; hence counselees are often guided toward internships and mentoring opportunities to establish early work behavior episodes to further elaborate BES associated with their vocational pathway.

Vocational goals should not be considered as occurring in isolation from other important personal goals a person may be pursuing at the same time. Indeed, research indicates that the most powerful motivational patterns involve multiple goals organized to function in mutually helpful ways to accomplish all of them (e.g., Wentzel, 1993), a pattern referred to as goal alignment in the MST. The most common way of accomplishing goal alignment is for the person to organize them as a hierarchy of goals. Achieving big goals usually is accomplished by reaching interrelated sub-goals sequentially (e.g., I want to get admitted to college, major in electrical engineering, complete each course effectively, and graduate from college, to get a job in the communications industry). This approach is reflected in the typical structure of strategic planning as involving a hierarchy descending from long-term to short-term end states (e.g., vision→ mission→ goals→ strategy→ objectives).

Interpersonal goal alignment. In addition to aligning one's personal goals so they function cooperatively, there is another form of goal alignment that is very important. When two people are in an interpersonal behavior episode, the interaction is likely

to go awry if their salient goals are not aligned with one another. For example, in a counseling interview, practitioners cannot proceed effectively until they understand what the client may be trying to accomplish (Savickas, 2011), and unless the client understands and agrees with what the counselor is trying to accomplish with them. This is one reason why effective meetings and lectures begin with an outline of the goals of the session. This serves to orient everyone around a common goal set.

Goal conflicts between employees and employers can also create difficulties. M. E. Ford (1992) explained that the generally low correlation between job satisfaction and work productivity may very likely be the result of a commonly observed lack of alignment between the personal goals of employees and the goals of their employers. He noted that when goal alignment between employers and employees is achieved, worker motivation is enhanced and the relationship between job satisfaction (i.e. enabling workers to obtain desired outcomes as a result of their work) and work productivity (i.e., enabling companies to achieve their objectives) is increased.

Within a person's multiple goals, some are valued more than others. There is considerable evidence that motivation is maximized when the desire to achieve the goal is very strong, or the attainment of the guiding goal is evaluated to be quite difficult but still attainable with vigorous and persistent effort (e.g., the concept of "Flow"; Csikszentmihalyi, 1997). This is referred to as an "optimal challenge" in MST. When goals are evaluated as highly desirable and more difficult, their achievement tends to be unusually satisfying and accompanied by positive emotions and thus their achievement is "highly empowering in terms of personal agency beliefs" (M. E. Ford, 1992, p. 212).

Formulating, pursuing, and succeeding in achieving personal goals through behavior episodes provides the experiential basis for all human learning. The achievement of salient goals produces positive evaluative thoughts and usually some form of positive emotion or affect. Success breeds satisfaction, which breeds learning; great success breeds great satisfaction, which breeds more intense learning. Behaviorists (e.g., Skinner, 1974) called that "positive reinforcement" because their "stimulus-response" mechanistic model led them to interpret such consequences as a "reward" coming from "outside the person." The LSF and MST living systems models document that people's evaluations of their own behavior result from their own self-directing and self-regulating processes, i.e., they decide what is "rewarding" for them and what is not and then their acquisition can serve to initiate a virtuous cycle.

Self-regulation and evaluative personal agency beliefs. Once goal-oriented thoughts produce a commitment to pursue a specific goal in a specific context, feedforward processes activate the self-evaluative predictive question "Do I think I can achieve my goal?" Answers to that question are called personal agency beliefs. There are two kinds. The first, called capability beliefs, is the person's evaluation of whether they have, or could acquire, the personal competence and skills needed to achieve that goal. Such beliefs are a form of behavior episode schema (BES) constructed through each person's history of behavior episode experiences in

trying to achieve similar goals in the past. A person's capability beliefs will differ within different kinds of behavior episodes and BES. Capability beliefs are similar to Bandura's (1977, 1982) concept of self-efficacy expectations, although that is a more circumscribed concept because it is "restricted to beliefs about task goals in context specific behavior episodes" (M. E. Ford, 1992, p. 128). Moreover, much of the research on self-efficacy expectations has ignored either their domain- or their context-specificity, or both.

The second kind of personal agency beliefs is called context beliefs. They deal with the evaluative and predictive question "Will my environment support or hinder my efforts?" For example, the person may believe that there are contextual barriers such as high costs; travel or mobility limitations; overwhelming competition; social, cultural, gender or racial biases; or excessive physical requirements. In contrast, the person may believe that the context is supportive of the goals being pursued (e.g., that family or significant other are supportive; that there are ample opportunities to achieve the chosen goal(s); that pertinent education or training are readily accessible).

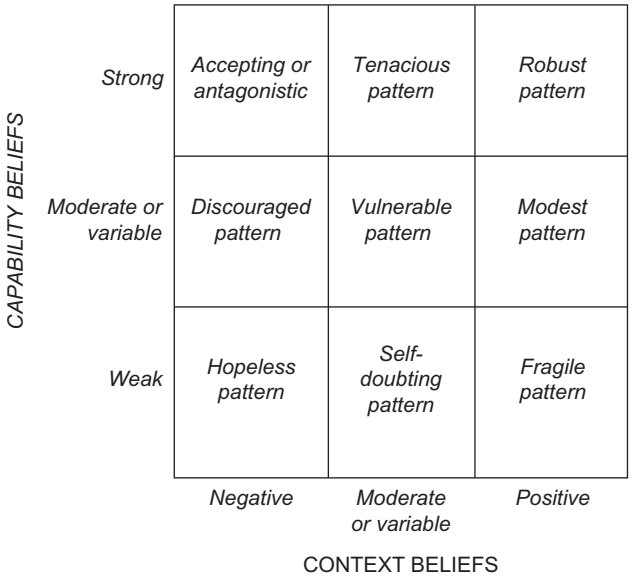

Figure 3.1. Motivational Systems Theory Taxonomy of Personal Agency Belief Patterns.

The full motivational impact of personal agency beliefs is best understood in terms of the combined influence of capability and context beliefs. M. E. Ford demonstrated the utility of an integrative interpretation by examining different patterns of capability and context beliefs. Figure 3.1 (adapted from M. E. Ford &

Smith, 2007, p. 159) summarizes his taxonomy of 10 different personal agency belief patterns. The strongest motivational pattern combines strong capability and positive context beliefs and is named a *robust pattern.* The weakest pattern, named a *hopeless pattern,* combines weak capability and negative context beliefs.

Personal agency beliefs are ephemeral because thoughts about personal and contextual capabilities and possibilities will vary for every person across goals, situations and time. No single pattern is necessarily the best for all circumstances. Since such beliefs are personally constructed thought patterns, they can also be inaccurate. For example, people who think they can succeed at everything, everywhere, every time, would be psychologically pathological, as would beliefs suggesting that they can never succeed at anything. Moreover, people who believe that everyone is against them as they try to achieve their goal(s) or that everything in the context is stacked against them would also be considered pathological in most cases.

Therefore, it is important for counselors to help clients examine the soundness of their personal agency beliefs by examining the kinds of behavior episodes from which they were constructed. For example, beliefs based on what others have said about individual persons are less credible than those based on their personal evaluations of their real life, instrumental behavior episode experiences in the kinds of behavior episodes they are contemplating, which MST calls "the principle of direct evidence" (M. E. Ford, 1992, pp. 212).

Self-regulation through affective and emotion patterns. These are the earliest form of human psychological regulatory processes both in evolutionary and individual development terms. For example, babies automatically display approach-avoidance behaviors to different tastes, sights, sounds, and skin sensations, and to different kinds of emotions or moods in different kinds of behavior episodes. Crying and smiling are the earliest to appear. These emotion patterns represent "gut-level" evaluations (as contrasted with cognitive evaluations) that play a powerful role in people's development. People seek repetition of behavior episodes that produce positive affective or emotional experiences (e.g. food preferences; activities that produce positive emotions like pride, pleasure, happiness, and affection). Evaluative thoughts that one has successfully accomplished a personal goal are typically accompanied by some positive feelings. Therefore, positive personal agency beliefs and affective and emotional experiences in performance and completion of behavior episodes combine (probably in additive and non-additive ways) to play a key role in shaping each person's developmental pathways.

The evaluative regulatory influence of emotions derives from direct subjective qualitatively different experiences with different kinds of valences (e.g., like- dislike; good-bad; happy-unhappy; safe-dangerous), rather than from cognitive processes. Historically, consideration of the effect of emotions on human behavior focused primarily on negative emotions (e.g., fear; anger; depression), but recently there has been a growing recognition of the basic evaluative/regulatory importance of positive emotions such as pleasure, affection, and happiness (e.g., Frederickson, 2001;

Frederickson & Losada, 2005), reflected in what is currently called the "psychology of happiness" (e.g., Argyle, 2001) or "positive psychology" (e.g., Seligman, 2003; Seligman & Csikszentmihalyi, 2000; Shatte, Seligman, Gillham, & Reivich, 2003). Moreover, vocational psychologists and vocational counselors have increasingly recognized the importance of positive affective and emotional experiences in vocational development (e.g., Gati & Tal, 2010; Savickas, 2011).

The stronger the evaluation of activating conditions, the stronger will be the emotional activation. One of the reasons emotions play a powerful role in human behavior is that they are learnable. For example, one can learn to fear anything, to feel affection for anything, and to take pleasure in almost anything. One tends to pursue vocational pathways in which one's behaviors activate positive emotions. Basic knowledge about emotions provides a powerful tool for counselors. Thus, when a client describes experiencing a particular emotion in a specific behavior episode, the counselor can infer that the prototypical conditions for activating that kind of emotion are occurring in that circumstance and can identify these conditions in order to help the client to understand and deal with them. For example, if the client becomes angry it implies that something going on in the interview has activated evaluative thoughts indicating that something is interfering with accomplishing some desired goal.

Non-Motivational Implementation Processes and Vocational Pathway Development

Although both motivational and implementation/achievement processes are integral components of the unified functioning of the person-in-context, drawing a clear distinction between the two is desirable from a theoretical and practical or applied perspective (e.g., the design of person-focused interventions).

M. E. Ford (1992) proposed the use of three criteria to distinguish motivational from non-motivational processes. Essentially, he proposed that motivational processes are qualities of the person, that they are future-oriented, and that they are evaluative. In contrast, implementation/achievement processes are primarily instrumental in character, may be focused on the past or present, and may be properties of the context.

In the previous section we highlighted the crucial role of motivational processes in the development of vocational pathways. In the following section we will describe implementation/achievement processes that are equally important because they focus on actualizing the person's goals in vocational pathways by first engaging in cognitions focused on planning and then taking action to achieve the goals specified by motivational processes.

Self-construction through control processes. These represent information-based perceptual and remembering cognitions focused on how to achieve goals. As shown in Figure 2.2, they represent "how to do it" thinking. Because these thought processes are part of the person-in-context unified system, they are facilitated as

well as constrained by the person's biological condition and by facilitating and constraining contextual conditions that are operative in any given behavior episode. In conventional terminology, these processes focus on planning and problem-solving thoughts, but they also utilize evaluative feedback from the monitoring and regulatory cognitive functions to revise and improve the implementation activities. M. E. Ford (1992, pp. 47-49) proposed that planning and the development of problem solutions involve the integration of perceptual information with the person's knowledge base and behavioral repertoire (essentially, the person's repertoire of BES), and is carried out through completion of three essential tasks:

– *Problem formulation.* This task requires the specification of the desired state (represented by goals established in the goal-setting/directive process) as well as specification of the current state of the person (from perceptions and evaluations of the context). Essentially, this involves clearly thinking about where one needs and wants to be (e.g., "I need more income and I want to be the store manager") and contrasting this to one's current situation (e.g., "I am currently earning minimum wage as one of several cash register operators).
– *Problem solving and plan formulation.* Drawing upon past experience, BES or BES components are activated that may be particularly salient in addressing the "problem" that has been identified (i.e., the task to be accomplished). In the situation described above, this would in all likelihood involve (a) consideration of several possible pathways, such as getting more training to prepare for a managerial position, pleading for a promotion by citing one's outstanding performance as a cashier, or threatening to work for the competition; (b) holding off on actualizing any of these until they can be evaluated (e.g., in thinking and relevant instrumental behavior episodes: "How long will it take to get what I want?" "What would I need to do to pursue any of the alternatives?" "What will be the likely consequences of pursuing one solution over another?"), and (c) coming up with a detailed plan for achieving one of the alternatives considered.
– *Solution/plan execution.* The chosen plan for solving the problem (i.e., achieving the goal) is then executed as control processes organize a behavior pattern that is designed to achieve the desired consequences. In situations where contextual circumstances can change quickly (e.g., in the job market), problem solving and planning thoughts are likely to "guide activity through an iterative process in which feedback and feedforward information are used to revise currently operating solutions and plans and, if necessary, to generate new solutions and plans" (M. E. Ford, 1992, p. 49). Thus, in the example above, a manager in the company may be hired away by a competitor. This would create an opening for the cashier and make a direct appeal for a promotion a more promising pathway to success than starting a lengthy training program. Being able to quickly take advantage of changing circumstances by identifying new options (i.e., being able to "think on one's feet") is an important capability in pursuing vocational plans and solving problems.

Self-construction through transactional processes. Transactional processes represent the person's observable interactive relationships with the environmental components of the person-in-context system. They could be viewed as action patterns that represent flexible means of producing the consequences that are desired, i.e., achievement of a given goal in a specific context. Material-energy-based transactions include material transactions and physical/motor action; information/meaning-based transactions include information/meaning-based transactions and communicative processes and actions. We present a brief summary of these four kinds of transaction (see also Chapter 2):

- *Material transactions*. These are basic ingestive and eliminative actions, which may seem incidental to the task of constructing vocational pathways, but proper nutrition, hydration, respiration, and digestion are clearly necessary for adequate availability of energy in the pursuit of learning, skill acquisition, and work context demands. Some people have developed allergic or learned avoidance patterns to certain kinds of context that make working in such contexts unpleasant or even dangerous. It is not unusual for a counselor to help clients address problems related to such issues in their pursuit of work or vocational goals.
- *Physical (motor) actions*. These actions enable people to directly influence their contexts, for example, by moving to a location with better prospects for the kind of job that is desired, or by demonstrating motor skills required for a desired occupation, such as laying bricks or conducting an orchestra. Some jobs, (e.g., infantry soldier; miner) require much more strength, agility and endurance that others.
- *Information/meaning-based transactions*. These include sensory-perceptual and communicative actions (e.g., observation; speaking). Sensory-perceptual processes are instrumental in the collection of information about the immediate context as well as information about the person's internal states (e.g., fatigue, pain, anxiety). It is important to recognize that people are selective in what they perceive, and this selective attention is guided (again) by the person's goals and contexts. For example, people are much more likely to perceive an opportunity to advance their career if career advancement is represented in their goals hierarchy. In vocational guidance, there is a long history of focus on sensory-perceptual actions as exemplified by Frank Parsons' (1909) call for young people to attend to and obtain better information about their own interests, aptitudes, and capabilities and thus to gain a clearer understanding of themselves, to learn about the advantages and disadvantages of different lines of work, and to attend to and acquire better information about how to make decisions related to their vocational pathway.

Communicative processes and actions include speech, writing, and body language, which represent ways of influencing the (interpersonal) context indirectly by saying or doing something that influences the thoughts, feelings, and actions of the recipient(s) of the communication. Communicating effectively in a job interview, making an effective presentation regarding one's capabilities, and conveying positive

personal attributes such as genuineness or openness to new learning, are examples of important communicative actions in the construction of vocational pathways. Finally, it is obvious that counseling processes designed to facilitate a person's vocational pathway must rely extensively on communicative actions between counselor and counselee.

DEVELOPING SUCCESSFUL AND REWARDING VOCATIONAL AND CAREER PATHWAYS THROUGH EFFECTIVE PERSON-IN-CONTEXT FUNCTIONING

Thus far we have shown how the five key system processes, represented by the interior circles in Figure 2.1, play important roles in the development of vocational pathways. Although we discussed them as distinct processes, we have stressed throughout that they always work together as a "team" in behavior episodes and in BES that form the "building blocks" of such pathways. But, unlike a building being the sum of its parts, the substance and achievements of a team cannot be determined by a simple sum.

In presenting our theory of vocational behavior and development, we endeavor to go beyond describing the parts and the dynamic processes that lead to the formation of vocational pathways. Specifically, based on M. E. Ford's (1992) motivational systems theory, we next describe how individuals can create *successful and rewarding* vocational pathways by engaging in effective person-in-context functioning.

Achievement and Competence in the Development of Vocational Pathways

Previously, we have noted that motivation is a key subsystem pattern of self-directing and self-regulating processes that are part of D. H. Ford's general integrative LSF model of humans as self-constructing living systems. In his motivational systems theory, M. E. Ford (1992) stated "motivation provides the psychological foundation for the development of human competence in everyday life" (p. 16), and described it as a critical ingredient in effective person-in-context functioning (p. 66). The MST focus on how motivational dynamics contribute to the attainment of achievement and competence through individuals' goal-directed activity patterns represents a roadmap for creating successful and rewarding vocational pathways.

Motivation, however, is only one of the essential ingredients in the development of competence and achievement in M. E. Ford's motivational dynamics. Being competent and achieving one's goals in a given domain also requires the presence of the necessary *skills*. Those, in turn, cannot be acquired in the absence of the right kind of *biological endowment*. Finally, achievement and competence cannot be developed in the absence of a *responsive environment*. For example, if Vladimir is motivated to achieve a successful career as a concert pianist, long hours of practice are required from childhood on to become skillful. In addition, the budding pianist would not be able to attain his lofty goal unless he developed the requisite size, reach, and flexibility (i.e., the biological basis) for playing a grand piano. Moreover,

his parents would need to recognize his motivation/talent and promote his taking lessons, enter him in competitions, and place him in environments that could support his aspirations. In short, achievement and the development of competence require a person who is motivated and skillful, possesses the requisite biological endowment, and operates in a supportive environment (M. E. Ford, 1992).

Before proceeding with a more detailed discussion of what it takes to function *effectively*, it will be useful to link the "ingredients" for effective functioning-in-context to the Figure 2.2 graphic example of a person's typical behavior episode described in Chapter 2. M. E. Ford's concept of motivation represents an integrated pattern of various kinds of system processes represented under the heading "goal setting" and "regulation of activity" in Figure 2.2. They specify the answers to the questions "What would I like to accomplish now? "Do I think I can?" "Will the context make it possible?" and "Will it be a positive or negative experience?" His concept of skill represents an integrated pattern of psychological and behavioral processes that include "planning and decision making" as well as "activity patterns to achieve the goal." They specify answers to the questions "How can I do it?" and "What results am I producing?" His concept of biology holds the answers to the question "What are the characteristics of my current biological state that may facilitate or limit the kinds of activity I can use in this context to accomplish what I want?" His concept of responsive environment represents the current context within which the person is behaving and holds the answers to the question "To what extent will the possibilities and limitations provided by my current context facilitate or obstruct achieving what I want?"

When all of those subsystems are functioning as an effective team and producing the specific results the person wants in the specific context of the current behavior episode, it is called *effective functioning.* That produces *achievement,* which is defined as "the attainment of a personally or socially valued goal in a particular context" (M. E. Ford, 1992, p. 66), i.e., achievement results through a specific behavior episode when the person accomplishes the goal(s) guiding that behavior episode. Therefore, achievement is a specific event, not a generalized "trait." Moreover, there are typically alternate ways of accomplishing a specific goal, i.e., similar achievements can be accomplished in somewhat different ways. Over time, a person constructs a generalized pattern for successfully achieving similar goals in similar contexts (called a behavior episode schema – BES in chapter 2). That is called *competence,* defined as *"*the attainment of relevant goals in specified environments, using appropriate means and resulting in positive developmental outcomes*"* (M. E. Ford, 1992, p. 67).

Notice two important implications of those definitions. First, achievement can only be directly observed in a specific behavior episode. Second, competence is acquired gradually through successfully performing multiple behavior episodes of the same type in similar contexts. Competence cannot be directly observed; it can only be inferred from knowledge of achievement in repeated similar behavior episodes. These distinctions are key to methods we will describe later for collecting

and using information about a person's past experiences (i.e., behavior episodes) to identify possible starting points (i.e., BES) from which a person might develop future vocational pathways.

Achievement and competence are the hallmarks of effective functioning, greatly enhancing a person's chances of creating a successful and rewarding vocational pathway. Although the determination of what is "a rewarding and successful vocational pathway" is a unique process for each individual, there are several broad objectives that are likely to be reflected in the personal goals hierarchy of most individuals in the developed world.

Stated simply, the necessary initial steps for most individuals in choosing a vocational pathway involve identifying forms of employment and work activity that would have, for them, four basic characteristics: (1) it would provide compensation (e.g., income, healthcare, vacation/sick time, and other benefits) enabling them to lead the kind of life they want; (2) The work activity (and the contexts within which it occurs) would ideally produce interest, personal satisfaction, and pleasure; (3) opportunities to engage in it would be available in their life contexts (now and in the future as well); and (4) it would consist of activities they believe they could do or be trained to do and their conduct would be personally gratifying. The next step would then be to create a plan about how to prepare and obtain an opportunity for beginning the chosen vocational pathway. While described in a stepwise manner, the sequence and processes over time are likely to be highly variable and dynamic across individuals and groups.

Those are the issues for which people typically seek the help of vocational and career development counselors, and represent the phenomena our living systems theory of vocational behavior and development seeks to describe and explain. Note that in the way they are phrased all those issues are future oriented. They focus on what a person might want and be able to achieve, not the actual achieving of it. In the next section we will document, by means of real-life examples, how behavior episodes and BES can develop into potential vocational pathways. This will be followed by an analysis of how the four basic characteristics of vocational pathways, listed above, were met by the individuals presented in the real-life examples.

BEHAVIOR EPISODE ACTIVITY PATHWAYS DEVELOP INTO VOCATIONAL PATHWAYS

Here are some real life examples of how instrumental, observational and thinking behavior episodes interact to developmentally produce BES that might grow into a potential vocational pathway (modified to shelter individuals' identities). They illustrate why many current career development theorists assert that vocational development processes begin in childhood (e.g., Gottfredson, 1981; Hartung et al., 2005; Porfeli, Hartung, & Vondracek, 2008; Vondracek, 2000; Watson & McMahon, 2005).

Sue: How Shared Friendships Can Lead to New Activity Patterns

As the youngest child in a family of five, Sue was often teased and felt treated as a less capable person. Her childhood behavior episode activities, often restricted and under supervision, limited her possibilities for developing special childhood interests, friendships, and extensively practiced behavior episodes. She sought to become more assertive and independent of family control of her activities as she entered adolescence.

During her high school freshman year she met a girl who had just arrived in school because her father was a new minister in town. They both were unhappy and lonely as they were trying to become interpersonally and scholastically established. They liked one another immediately, soon became close friends, and began sharing many kinds of interesting and satisfying out-of-school activities. This was Sue's first fully gratifying friendship BES.

She often went to her friend's house to play and sometimes ate lunch or dinner with the family. Sue listened with fascination to the parents talk about the things they were doing to serve their congregation and the community, and the difficulties of trying to help church members. They responded warmly to Sue's questions. Sue got a lot of pleasure out of these observational behavior episode experiences.

Sue started going to their church with her friend and became a regular participant. She enjoyed the Sunday services and admired the minister's skill in creating a Sunday service that touched in positive and supportive ways the daily lives of the church members, revealed in their behavior both during and after the service (observational behavior episodes). There was a social period after the service and Sue was gratified by her warm reception and the interest shown in her during those social interactions (instrumental behavior episodes). She joined her friend in participating in the youth program of the church, enjoyed the companionship and particularly the episodes when the youth group planned and carried out community service programs (instrumental behavior episodes).

After a year, Sue found herself thinking a lot about how gratifying her involvement with the church was, and became interested in learning more about it (thinking behavior episodes). She expressed that interest to the minister, who then selected some things from his library for her to read. She found particularly interesting the discussions of strategies and methods for producing a productive role for the church in helping individuals with their personal problems of living, and for creating a constructive role for the church in the community. (Reading involves a combination of imagined observational behavior episodes linked to thinking behavior episodes).

After two years, Sue had developed a strong and fairly elaborate BES with some sub schemas guiding her involvement in church activities. To gain more direct experience, she volunteered to help the minister and his wife with some of their community programs for poor families and the elderly. She enjoyed those activities and was proud of the minister's praise for her effectiveness in helping others. The more she did the more she wanted to do (instrumental behavior episodes).

She realized that for the first time in her life she evaluated herself as a competent adult doing something that was important to the community and valued by others (evaluative thoughts thinking episodes). This pattern of small beginnings producing satisfactions that lead to more diverse satisfying activities, which increase motivation for and participation in more such satisfying activities is an example of a system dynamic called a positive feedback process. The size, complexity and momentum of pattern elaboration are like a snowball rolling downhill.

Sue began thinking about a possible future as a minister. Based on her two years of behavior episode experience in her church she was confident she could do it (capability beliefs). She talked with her minister about whether he thought a woman could become a minister in his church. He said it would probably be tough, but he and other minister friends would help her (possibly leading to positive context beliefs). So, one Sunday evening she announced to her family that she had decided to seek admission to a college program that would prepare her to become a minister in her church. They expressed doubt about that pathway because this was still a time when being a church minister was considered a man's role (possibly leading to negative context beliefs). She persisted (probably in part because her positive context beliefs were stronger than her negative context beliefs), and with the support of several ministers and church members she was admitted to and graduated with a distinguished record from a school of religion. She became one of the first woman ministers in her church, and gradually built a very successful career (instrumental behavior episodes).

Owen: Behavior Episode Patterns Must Serve Personal Goals to Develop into Vocational Pathways

Owen was the only son in his family. His father owned a successful construction firm; his mother was a homemaker. When Owen entered his teen years his father began grooming him to become the future leader of his company. First he began taking Owen to visit with people in the firm to learn what they do, followed by explanations by the father about why they do things that way (observational behavior episodes). Later the father arranged part time and summer jobs working in different parts of the company to learn how it worked and to develop relevant skills, followed periodically by discussions with Owen about what he was learning (instrumental behavior episodes). Follow-up reports from supervisors indicated Owen was doing well. As he neared high school graduation, Owen pleased his father by applying to and being accepted in an engineering degree program in a major university (instrumental behavior episode).

During a summer program for new students and their parents at the university, Owen privately revealed to his counselor that he did not want to be an engineer. He stated his goal in trying to do well in all the experiences his father arranged was to please his father, but he got no satisfaction or pleasure out of those kinds of job activities (affective and emotional evaluations). He revealed that during high school

he was a member of a student organization that tried to understand and help troubled youth. Seeing what their lives were like touched him deeply, and he worked for three years learning how they might be helped (affective and emotional evaluations coupled to observational and instrumental behavior episodes). The results were gratifying, but after many behavior episodes he realized he needed to know a lot more to be really helpful to them (observational and thinking behavior episodes; capability beliefs). He decided that what he really wanted was a major that would help him prepare for that kind of work.

In a family conference with his parents and counselor, Owen revealed his desire and reasons for it. His father became angry and refused to agree to it. His mother, however, supported her son and eventually he changed his major and graduated (instrumental behavior episodes coupled to a responsive environment*)*. His father made the mistake of assuming that because Owen did everything his father asked, and did it well, Owen liked it. He did not realize Owen developed negative evaluative thoughts about that potential vocational pathway because those experiences produced no satisfaction or pleasure.

Alex: Behavior Episodes in Potential Occupations help shape Vocational Development Decisions

Alex grew up in a family that participated in live theater. He performed in his first show in grade school and his knowledge and skill involving acting in, and helping produce, shows continued to develop through theater participation until he graduated from high school (instrumental behavior episodes). Then he decided acting was not a career pathway for him. He was attracted to the idea of learning to produce movies (clarification of goals) so he enrolled in a college major designed to serve his new goals.

In the summer following his freshman year Alex discovered a team that was producing a movie in his home town. He talked to the director and got a job as part of the technical crew (new kinds of instrumental and observational activity patterns in new kinds of contexts). During the summer, he impressed with his potential and was told that the only way to learn the business was as an apprentice. The director offered him a job on the crew, which would be starting a new movie in the fall on the west coast. After meeting with the director, Alex's parents (with some uneasiness) agreed to that arrangement.

Alex worked with that team for two years, shooting several movies and learning several kinds of skills (instrumental behavior episodes). He enjoyed learning how to tell a story with pictures, sound and words, but discovered one life style aspect of that occupational field that was unacceptable to him. Most movies are shot "on location", which meant the crew spent the majority of their time each year away from their home and family. One of his long term goals was to have a family of his own, so he started a search for an alternate pathway.

He chose photojournalism because he could apply his movie making knowledge and skills to create news stories for a diversity of media (a different developmental pathway). He went back to college and got BS and MS degrees in distinguished schools of journalism. Armed with his hands-on experience and additional education, Alex initiated a very successful career in producing cutting-edge multimedia national and international news stories that are regularly published in newspapers, television, and internet media. His vocational pathway is clear and satisfying, but how it may evolve as a long term career pathway is still open to alternate possibilities.

An Analysis of How These Examples Meet the Four Vocational Pathway Criteria

Satisfying work Activities and Contexts. Sue had two years of behavior episode experiences helping with or actually doing the kinds of work in the kinds of contexts her proposed occupation would provide. She loved it. Owen had several years of behavior experience as a volunteer worker in a community agency working with troubled youth. He was very moved and gratified by those experiences, but realized the range of his experiences was limited. Alex enjoyed his daily behavior episode work experiences but found that movie-making as a vocational pathway did not fit some other important personal goals. He chose an alternate vocational pathway that would enable him to build on activity patterns he had become good at and enjoyed.

Satisfactory income. For Sue this was a relatively unimportant criterion. She knew protestant ministers were not well paid, but she could live on whatever it was. Similarly, Owen gave little thought to potential income in making his choice. The nature of the work itself was his dominant criterion. Alex's vocational development decisions were guided primarily by activities he liked doing and was good at. Being a practical man, however, he also examined the alternate vocational pathways available within his chosen field to optimize income possibilities associated with them.

Availability of employment opportunities. Both Sue and Owen knew that the issues for which their potential employers hired people were enduring in society, so those work possibilities were unlikely to disappear. Alex knew that movies were a permanent source of pleasure for people worldwide, and he also learned that the explosion of multimedia news reporting in different media was transforming the news business.

Opportunity to become knowledgeable, skilled and effective. Sue, Owen, and Alex all knew from their previous goal-relevant behavior episode experiences that they had a decent knowledge base and thus the potential to grow in competence in the occupations they had chosen. They also knew that their current level of competence was insufficient and that additional education, training and experience were essential to become more deeply knowledgeable and skilled in their chosen occupations.

Conclusions. The development of a vocational pathway is not a single choice or decision. It is a process that creates unfolding patterns over time and contexts, with short-term goal achievement followed by the achievement (and sometimes revision) of longer-term goals. Not surprisingly, longer term outcomes are often unexpected. Although research has shown that the foundations for our vocational pathways are most often laid in childhood experiences, the pathways of Sue and Owen illustrate how they evolve in the beginning of their adult lives. Alex's pathway illustrates how each person's pathways are likely to evolve and change over time in unpredictable ways. In the chapter that follows, we will explore how vocational and career development counselors can use the theoretical framework we have presented above in designing, implementing, and evaluating interventions that facilitate development of successful and satisfying vocational pathways.

CHAPTER 4

APPLYING THE LSVD TO FACILITATE VOCATIONAL BEHAVIOR AND DEVELOPMENT

"*The road from theory to practice, if it is to be well built and enduring, must be laid on careful foundation."* This quote was taken from the Introduction to Hollingworth's (1916) *Vocational psychology: Its problems and methods,* written by Joseph Jastrow, an early pioneer of scientific methods in psychology. In the previous chapters, we endeavored to carefully lay a solid theoretical foundation. The present chapter will attempt the challenging task of moving from theory to practice.

The typical scholarly approach to describing applications of a theory is to provide an explanation of its general types of methods, elaborated with occasional examples. Here we will reverse that approach. We will start with an example of a person's vocational developmental pathway across several decades of his life (modified to protect his privacy). Periodically during that case description we will pause and insert brief theoretical explanations (written in italics) of the specific methods used. This example is not presented as the "right way" to do things, but to illustrate the way a counselor can use LSVD theory to create interventions tailored to each client. A good counselor avoids getting locked into using the same specific methods for every client.

All descriptions will be written with a first-person voice of either the counselor or counselee. As you read the counselee's description of his activity patterns you will recognize specific patterns representing different kinds of behavior episodes (i.e., instrumental, observational or thinking episodes). They provided specific experiences from which the counselee constructed generalized behavior episode schemas (BES) used to guide creation of effective activity patterns in future similar behavior episodes.

That case example will be followed with a summary of general counseling principles derived from the LSVD, which can be used to guide creation and application of counseling methods to facilitate a person's planning and the course of their vocational pathway and development.

We hope this approach will help the reader gain a more practical understanding of how each part of the theory relates to facilitating integrated patterns of vocational development within the opportunities and limitations of each person's contexts.

Our starting assumption is that individuals always function as complex, integrated organizations of parts and processes through which they produce consequences they desire within themselves or from their environment. We call that dynamic entity *the-person-in-context.*

AN EXAMPLE OF VOCATIONAL COUNSELING PROCESSES: THE CASE OF TED

A Prototypical First Session: Initiating the Counseling Relationship

My next appointment is with a young man named Ted. I have arranged my counseling context to facilitate the kind of counseling relationship I want. When Ted walks in he sees a small private office with a desk pushed against a wall. On one wall are four lovely photographs of spring, summer, fall and winter scenes. On another wall is a double window providing outside light. A small round table sits near the window with two comfortable chairs facing one another. On the table are two pens and two pads of paper.

I greet him with a smile and handshake: "Hello Ted – I'm Bill Snyder. I'm pleased to meet you. Let's sit at this small table – it will be a comfortable place for us to talk."

(We are beginning a new behavior episode together and have yet to identify the shared goals that will guide its activity pattern. The episode has been physically architected by me to reflect my personal interests and to engender a sense of comfort, intimacy and safety for a diverse array of people. Ted is old enough to have had a variety of behavior episodes involving interactions with adults in leadership roles (e.g., parents; teachers). So, he will approach this new episode with some kind of BES he has constructed from relevant past experiences. I don't know what that BES is like, but I know the kind of positive relationship that can facilitate the counseling process. My first step is to help Ted modify his initial guiding BES to fit our counseling relationship. I want Ted to think of me as a caring, knowledgeable consultant, not as a powerful authority who will provide all the answers. For example, if I faced him across my desk, or introduced myself as ***Dr. Snyder*** *I would be implying a status difference. Our first* ***shared goal*** *is to establish a comfortable working relationship.)*

"Ted, since we will be working together as a team, let's get acquainted before we go to work. I grew up in a small town in Illinois where my Dad was a skilled mechanic. I had two older sisters who liked to boss me around. No one in my family had ever gone to college, but I was encouraged to go. I decided to major in engineering because I was proud of my Dad's work. I got involved in a lot of extracurricular activities, found I was good at that and liked it. In my sophomore year I realized I didn't like engineering, so I shifted my major to psychology. I really liked that, so I went to graduate school and got a degree focused on counseling. I have been working here for five years now. How about you?"

("This brief summary of my developmental pathway was designed to facilitate social modeling processes to help him identify with me and to encourage openly discussing the kinds of ideas, uncertainties and self-doubts typical of planning for one's vocational future. I said little about my professional credentials and experience to avoid a focus on status differences. My next step is to help talk openly about his experience, thoughts, feelings and contexts.")

"I was born and grew up in this town. I have an older brother and sister who teased me a lot and with whom I have competed for attention. My Dad is an ex-army officer. I am very proud of him and I guess I sometimes try to be like him. I have had

some health problems as a kid and my Mom has given me lots of encouragement in dealing with them. I will be graduating from high school this year and have begun thinking about what to do then. I am considering going to college, but I am pretty vague about what I might do."

(Ted is now beginning to describe his personal reasons (goals) that he hopes counseling may help him achieve. Since the activity of both the counselee and counselor in counseling behavior episodes is a partnership, it is important that their goals fit together and don't conflict (e.g., is the counselee's guiding goal to choose an occupation? Or, is it to choose a pathway for a field he has already chosen? Or, does he want help in evaluating whether it is feasible to pursue it? Or, could it be all of those? Ted moved to that personal discussion easily. Not all counselees do so that easily, and may need some help from the counselor in overcoming their apprehensions.)

"Is that why you came to talk with me - to try to clear up your thinking about what to do when you graduate from high school?"

"Yes. No one in my family has gone to college so they can't help me learn what's involved and whether it is a good idea for me."

"You said your thinking about it is pretty vague. Does that mean you don't have any strong ideas yet about what you might study in college or why?"

"I made good grades in high school so I am confident I am smart enough to succeed in college. But, there are so many issues to consider. What might I enjoy studying? How much would it cost? How long would it take? What kinds of jobs might I be able to get?" What could I earn?"

(Ted is now starting to explore potential goals and their interrelationships. The goal questions he listed are interdependent and many can't be answered until he identifies potential goals he wants to consider. So, potential vocational goal clarity is an important first step.)

"Ted, when one's goals are vague, making plans for achieving them will also be difficult and vague. So, a priority in personal vocational planning is to become clear about your goals and how you prioritize them. I have a suggestion about a way we might use your history of activities and the pathway you have followed to uncover some potential vocational goals."

"That makes sense. If you don't know where you are going it's hard to figure out how to get there. What's your suggestion?"

"Let's postpone for the moment focusing on vocational pathways and focus on your history of activities you have liked and disliked. From the time each of us are babies we start trying to do some things and not others. Over time, some of those things bring us pleasure and satisfaction and some don't. People tend to develop their interests accordingly. The things we like and do well, we keep doing and we stop doing things we don't like or do poorly. I call those *activity pathways.* As kids we don't think of our interests and activities as potential pathways toward occupations; we just do them because we enjoy them and often our friends and family share them with us.

For example, when I was a kid I played a lot of baseball and basketball, loved it and got pretty good at it. But at the time I never thought of them as potential occupations. In contrast, I was so bad at music that when everyone in my 2nd grade class had to be in a class band, the only thing the teacher found I could do was to play the sticks, you know, like hitting them together to make a rhythm.

As in plants, animals, people, and all living things for that matter, growth and development always start with what exists: new patterns spring from elaborating, combining and modifying patterns that already exist. A person's development is an unfolding process, not one of simply adding new parts. For example, my childhood pattern with music provided no starting point for becoming a good musician, but my sense of rhythm provided a starting point for becoming good at and enjoying social dancing.

Ted, you are nearly 18 years old and have undoubtedly learned to like some activities and to dislike others. Some of those you liked became activity pathways leading you to learn and grow within these pathways. Let's try to identify *activity pathways* with which you have had considerable experience and you have become good at, interested in, and enjoyed so far in your life. Then we can explore whether any of them might provide a starting point for choosing a vocational development pathway. What is the first one that comes to mind?"

(New development can only occur through modifying, reorganizing and elaborating existing patterns. Therefore, I have focused Ted's attention first on activity pathways and their guiding goals with which he has had extensive, satisfying experience because that means he has constructed fairly elaborate BES that could provide a starting point for further development.)

"The first one I think of is art, particularly drawing and painting."

"Describe how you got started with that activity pathway, the kinds of things you have done, and the kinds of pleasure it has brought you."

"I was 5 years old and was watching my older brother draw a car (*observational behavior episode)*. I decided to draw one too *(instrumental behavior episode)*. My brother teased me about my drawing. That made me mad; so, I decided to show him I could draw a better car than he did *(tentative goal)*. I drew cars for several days until I thought I had succeeded *(a series of instrumental behavior episodes)*. My mother (who had some interest in art) admired it and agreed it was better than my brother's *(pleasure from achieving goal)*. I was so pleased I began trying to draw copies of pictures I saw in magazines. Over several months my growing skill drew praise from my parents, their friends and some of my friends."

(Positive evaluative thoughts and emotions led to elaboration of his artistic behavior episode activity patterns and BES through positive feedback processes. Becoming a good artist became a guiding goal which produced a continuing and elaborating art activity pathway.)

"As a little kid I was so hyperactive, my doctor prescribed a medication to control it. My mother noticed that when I was drawing my hyperactivity disappeared. So, she continually supplied me with diverse art supplies and encouragement

(an increasingly responsive environment for his guiding goal). The medication made me feel nauseated, so when my hyperactivity declined she discontinued the medication. Recognizing how drawing helped me, I began carrying my drawing materials with me. I found myself regularly thinking about how to draw things in my daily life."

(The personal pleasure and praise his art activity evoked from others also yielded pleasure from an improved biological state. Ted's art BES became more elaborate and complex and occurred in a greater diversity of contexts, thereby opening up new possibilities for his art activities.)

"I greatly admired my Dad. As the youngest kid, I sought out his attention. At about age 10, I thought my drawing skills had become pretty good *(increasingly positive personal agency beliefs)*. So, in an effort to earn his admiration, I took the risk of drawing his portrait. His response made me happy! He showed it to an engineering colleague who admired it. That led my mother to show some samples of my work to an art teacher who thought I was talented. You can imagine how great that made me feel. It motivated me to increase and diversify my art activities. Mom bought me some self-instruction books, I went to local art shows and talked with others who were interested in art. I began to experiment with different media and drawing and painting methods."

(Positive evaluations by others that signaled competence/agency produced a much stronger commitment to his goal of becoming a very good artist, which led to a major elaboration of his art activity pathway from the narrow focus on drawing to a new emphasis on combining drawing competence with painting different kinds of pictures using different kinds of media.)

"In junior high I developed a serious health problem. That limited my ability to play sports and do other physical activities. This limited my chances of making friends with other boys. Fortunately, my growing artistic competence and reputation opened another way for me to make friends. I learned to draw things that boys thought were neat, like cartoons of girls and teachers."

"That sounds like fun. Did you draw cartoons of the guys to entertain your girl friends?"

"Yes, and they often asked me for copies. By my sophomore year in high school, I succeeded in getting my health condition under control so I was able to have more fun. I was increasingly asked to create, and was paid for, different forms of my art work, e.g., portraits of babies and kids; personally meaningful scenes; murals on bedroom walls of friends and young kids bedrooms."

"I am impressed with your accomplishments. Did you have art lessons?"

"I had a little formal instruction, but I am mostly self-taught. Art teachers often want their students to conform to a certain style and I didn't want to do that…maybe I couldn't do that at the time."

"Your art activity pathway seems both successful and a major source of pleasure. It seems that you faced a tension between what you wanted to do and what formal instruction would require and you choose to pursue your own path through your art.

I would like to see an example of your art work sometime. Now, can you think of another activity pathway you have enjoyed so far in your life?"

"Fire fighting is probably the most exciting one. I can see the local fire station from our home. As a kid, I used to watch the fire fighters and trucks. The fire alerts were very exciting. The volunteers would come running in their fire fighting gear, urgently getting the equipment ready, and go roaring down the street with their sirens screaming.

My father and a neighbor are volunteer fire fighters at that station. I was fascinated listening to them talk about their training and fire fighting experiences and successes *(observational behavior episodes)*. I often dreamed about becoming a fire fighter with my dad and older brother *(thinking behavior episodes)*. At age 16 that station invited me to participate as a fire fighter trainee. For several months, I trained hard to increase my physical capabilities and skills. Then they began taking me to fires to get experience fighting the real thing (*instrumental behavior episodes).* Helping fight a real fire is exciting and gratifying, and the camaraderie among the volunteers is a wonderful experience. I will be 18 shortly and will be appointed as a full-fledged fire fighter."

(Over nearly two years Ted has had an extensive, elaborate and integrated series of many observational, thinking and instrumental behavior episodes from which he has constructed an elaborate, complex BES to guide his behavior in a real life fire fighting episode. This activity pathway has clearly brought him new competencies and a lot of satisfaction, pride and pleasure.)

"Are all members of your fire fighting team volunteers?"

"Most, but not all. It gives me an idea of what military units must be like. I am also part of a somewhat similar kind of volunteer team."

"What kinds of activities or services does that team perform?"

"It is the local emergency medical service (EMS). Do you know what that is?"

"Only vaguely – I've never had to use them. Tell me about them."

(By pleading ignorance I force him to describe that context and his experiences in it in more detail, enabling me to learn more about that activity pathway, the goals it serves, and the satisfactions it provides him.)

"Our EMS is headquartered with the fire department. Their staff is also made up of mostly volunteers. Because of relevant skills he learned in the army, my Dad has served as our local EMS head for many years. The EMS team is called when there is a health problem that urgently needs immediate care. It is often an event in a home or a public building, like a heart attack, a wound, broken bones, a stroke, severe pain, or someone swallowing dangerous things. The team is also called to vehicle accidents where people have been injured. In such circumstances the team must be able to decide on what emergency treatments are necessary and be able to administer them, and to safely move injured people to an ambulance and to an emergency room or hospital.

"Ted, that sounds like a volunteer has to learn a lot of new things to work on such a team."

"I first learned of this activity by listening to my father describe the work, particularly the difficult, exciting and frightening episodes, and asking questions about what they did *(observational and thinking behavior episodes).*

(Teds' father provided a responsive context within which Ted could learn about and gain an opportunity to become an EMS volunteer.)

I was invited to become an EMS volunteer trainee when I was 16, spent several months in formal training and have been a trainee member of the team at emergency scenes for nearly a year. I will be officially appointed to be a qualified EMS team member when I am 18. It is a sobering and awe inspiring experience to have responsibility for dealing with life and death circumstances. It is also intriguing and gratifying helping people deal with their medical emergencies. It is kind of like being a doctor's assistant."

"How often have you gone on a call?"

"We are a small operation so we typically get a call maybe once every week or two. I have been on the team for 30 to 40 calls."

(Ted's description of his fire fighting and EMS training and experiences reveals that once he makes a goal commitment he is willing to work hard and persistently to become good at it. In addition, it reveals he has developed skills, the capacity to follow a regimen, and respect from other men for working cooperatively as a team member. It also implies personal values and goals aimed at helping others in a crisis.)

"Through these two volunteer roles I developed some interest in police work. Police activity occurs at all fires, accidents and emergency medical situations for several purposes, e.g., to control the site and crowd, to initially investigate potential causes of the accident, health emergency or death; dealing with participants in the events and with the families of victims.

When my volunteer work permitted it, I observed the activities of police officers and talked with them about their roles and what they were doing and why. Sometimes they arrested someone right at the scene. I generally admired what they were doing and was intrigued by the way they handled their job." *(Observational and thinking behavior episodes produced learning opportunities.)*

"Ted, are there any other kinds of activity patterns you have enjoyed?"

He grinned and said, "Well, I have enjoyed going out with girls and to the ball game on occasion. But otherwise the activities I have described and school have kept me pretty busy."

(Evaluative thoughts and emotions that occur during a behavior episode regulate whether we like and continue, or dislike and discontinue, activity patterns. In Ted's activity descriptions there are lots of words about the occurrence of positive thoughts and emotions concerning those activity patterns. In helping people make vocational decisions it also valuable to help them identify activity patterns they didn't like.)

"You have described four activity pathways which you enjoyed and with which you have had lots of experience. Are there any activities you've been involved in that you didn't like?"

"Hmmmm. I don't think of any except maybe doing chores and cleaning my room."

"How about things you studied or did in school?"

Ted laughed and said "I didn't like math or having to give speeches. Science was ok, occasionally interesting, but usually kind of boring. I liked English, really enjoyed history, and liked my art appreciation class."

(Humor during a counseling session can suggest that a comfortable, collaborative relationship has been established.)

"That reminds me, since I was a kid I have liked tinkering with mechanical things like mechanical toys or fixing my bike."

(So far our focus has been primarily on what our theory calls ***instrumental behavior episodes*** *which produce experiences by doing things to successfully influence their contexts. That is the most powerful form of learning. However, each of us also learn by observing (****observational behavior episodes****) and/or thinking about (****thinking behavior episodes****) things. Ted spoke of all three types of behavior episodes when he described his experiences with art, fire fighting and EMS activities. Combining all types of behavior episodes is the typical way people develop knowledge, goals, skills and activity patterns in varying contexts.*

However, sometimes individuals are fairly active in observing (e.g., watching movies), reading about (e.g., books; magazines newspapers), or imagining (e.g., cognitively inventing episodes of activity) things that interest them without actually participating in them, sometimes called a person's fantasy life. However, an extensive fantasy pattern that has been a significant source of pleasure might serve as a starting point for further development as a potential vocational goal and vocational activity pattern.)

"Ted, are there any kinds of activities from which you have obtained considerable pleasure by reading about, watching movies and TV shows about, watching other people do, or imagining doing yourself?"

Ted thought for a little and said "Since starting high school I developed a lot of interest in military activity, particularly the civil war and WWII (the one my father was in). I have read about and enjoyed movies about specific battles and the strategies used in them, and have visited military museums and civil war battle re-enactments. I have particularly enjoyed listening to my Dad describe his war time experiences."

"What was it about those imagined experiences that led you to enjoy them?"

Ted hesitated and said "I don't know – I never really thought about that. It isn't the violence – e.g., people killing one another. I guess it is the skill and courage displayed, and the contest between the strategies each side uses."

(People often are no longer conscious of the personal goals guiding their activities, illustrated by Ted's comment. Goal clarity is an essential first step in a vocational development planning process, so helping a person become aware of the personal goals guiding their activity patterns is often a part of early stages of counseling episodes. So far, Ted's counseling session has focused on identifying

goal and activity patterns and pathways that he has enjoyed in the past without considering their possible relationship to vocational development. The next step is to examine whether any of the patterns Ted has identified might serve as potential or tentative vocational goals, i.e., they could be starting points for future development based on their history of producing pleasure and satisfaction.)

"Ted, you have done a good job of describing all the activity patterns you've enjoyed and succeeded at in the past. Now, let's examine each of those to see if any of them might have the potential to serve as starting points for your developing a vocational pathway."

"Well, fire fighting and EMS are mostly volunteer activities, which means they don't provide a pathway in which I could earn a living, although I like the activities and will probably continue them as a volunteer. I like the focus on health in EMS, so some health profession might be a possibility. But I don't know much about health professions. I would have to do some serious investigation of those possibilities.

I think I might really enjoy police work. It's a public service like fire fighting and EMS and has a great diversity of kinds of activities and responsibilities. It would also utilize what I've learned in fire fighting and EMS. There are lots of different vocational pathways in that field, including some that might enable me to use my skills in drawing portraits of people. And, there are lots of jobs. In some ways it is a little like military organizations and activities.

I have enjoyed my art activities more than anything else so far in my life, and have become pretty good at it. I am not sure how I might make a living in art work if I chose it as my vocational pathway. If I was sure I could make a living at it that would be my first choice."

(Sometimes a counselor can see potential educational and vocational pathways in a person's history of interests and behavior episode activities that hasn't occurred to the counselee. It is often desirable to bring such possibilities to the counselee's attention so they can evaluate them.")

"Ted, when you talked about what you liked in school you spoke very positively about history. Later you described how interested you were in some aspects of military history. Is it possible you might like studying history in college with an emphasis on military history?"

"I'm sure I would enjoy studying it, but the only kind of job I can think of would be a history teacher and I don't think I would like that as a job because I don't like public speaking."

(At this point it appears that Ted has pretty thoroughly explored his history of activity pathways. Now we can evaluate them as providing potential vocational pathways and guiding goals that have potential developmental starting points in his past experiences. If he could make tentative commitments to a couple of possibilities, he could explore possible implementation issues.)

"Ted, would it be accurate to say that you have tentatively narrowed down your possibilities to art and police work in that order of priority, with health professions as a distant third?"

"I think that is accurate."

"Perhaps the next step would be for you to get more detailed information about at least your two top priority possibilities concerning how each might be implemented as a vocational pathway, and what employment possibilities might be. That would provide a solid information base on which to base your choice of guiding vocational goals and vocational pathways."

"That would help a lot. How would I do that?"

"Here are some suggestions you could start with:

- Investigate educational and training pathways for each, e.g., potentially relevant college degree programs; specialized programs such as art institutes or police academies. You will find some sources here in our library, and some in public libraries, but the best source to search may be the internet. Those sources can often provide information about job possibilities, including examples of jobs previous graduates have obtained. Talking with heads of training programs can produce useful information about their graduates.
- Try to talk with people who have pursued their own vocational pathways in those fields. They can usually tell you how they (and friends and colleagues) did it, and may belong to professional organizations that can provide useful information.
- Think of creative ways to combine those interests. While art and police work may not have clear ties, don't underestimate the possibilities at this point. Ted interrupts me and states, "Yes! You mean like sketch artists who work for police departments" and I smile.
- Trust your personal judgment. You know yourself better than anyone else does.

And, you can always change your mind.

After you have completed your exploration, I would be happy to talk with you again if I could help you analyze your findings and make a decision about what to do."

"Thank you! You've helped clear the fog from my thinking about what I might do. Now I need to know more about how to do it. Would it be OK if I scheduled another appointment about four weeks from now? I work better if I give myself deadlines."

"Sounds good to me. Nice talking to you Ted."

A Typical Session

Four weeks later Ted came for his second appointment. When he came into my office we greeted one another and sat down. His facial expression, body language and tone of voice gave me the impression he was kind of 'up tight'.

(We are starting our second counseling episode so it is a good idea to try to renew our previous good counseling relationship before beginning our problem solving activities. I decided to start with sympathetic comments about what appears to be some kind of worry or distress to reassure him that it would be OK to talk about it. Otherwise his worries could obstruct useful discussion about his vocational planning.)

"Ted, your 'body language' gives me the impression something is bothering you. If that is true, I would be glad to try to be helpful if you would like to talk about it."

"I have messed up my life and have to change all my plans! I had planned to tell you today that I had decided to go to an art school and to talk about how to implement that decision after I graduate. But, last week my girl friend told me she is pregnant and I am the father. I have to toss my plans for further education out the window!"

"You have good reason to be distressed. That new development disrupts all your plans and goals. Let's see if I can be helpful. Have you decided what you are going to do?"

(LSVD theory says disruption of a current pattern of activity produces one of three kinds of change processes: (1) ***stability maintenance*** *processes operate to overcome the disruption and restore the previous pattern. If Ted and his girl friend decide to have an abortion, or to have someone else adopt the baby, they will be using stability maintaining processes, i.e. their current life patterns and plans could go back to the way their lives were before pregnancy. (2)* ***Incremental change*** *processes operate to change some components that alter the old pattern to deal with the disruption while still maintaining much of the old pattern. If they decide they will not marry and she will keep the baby with some financial aid from him, they will be using incremental change processes. (3)* ***Transformational Change*** *processes operate when only a complete revision of the old pattern will restore a coherently organized system pattern. If they decide to marry and keep and raise the baby together they will be completely reorganizing the relationships between them, with their family and friends, and in the nature of their daily activities and goals for the future."*

"We are going to get married immediately and raise the baby. That means I must get a job where I can make enough to support a family, and I must find a place for my family to live."

"That means you will be reorganizing your whole life. That is a lot of responsibility and stress to handle. I have no doubt you can handle it, but it will probably be tough for awhile. How are you doing?"

(When a person is going through a transformation process, it often helps them to have a supportive relationship and a "caring listener" until the major transformation has been planned and effective implementation is under way. As a counselor it is not my role to tell him how to do it, but to clarify and facilitate his thinking about his new goals and how he will achieve them.)

I am making progress. A friend works for a large manufacturing firm that is hiring. He described the work activity and agreed that with a little training I would be competent to do the work. He explained how to apply and recommended me to his boss. Two days ago I was hired with a salary adequate to support my new family. I start next week. I still have to find a place to live."

(Motivation in the LSVD involves a team of processes. First, there must be ***a clear goal*** *(e.g., Ted wants a well paying job). Second, there must be* ***a responsive environment*** *to the goal directed effort (a potential employer has jobs available*

and Ted's friend guided him to that job possibility). Third, Ted must have ***capability beliefs*** *that he has or can learn, the necessary skills (a friend doing that kind of work explained the skills needed and supported Ted's evaluation that he could do it.)*

*"*Ted, I am impressed with how rapidly and skillfully you are reorganizing your life. You should be proud of your ability to respond to this big change in your life. What does all this mean for your strong interest in art?"

(LSVD theory says that positive evaluation feedback, confirming that efforts are good and successful is the "fuel" that keeps a person motivated to continue those efforts. I don't know how much encouragement Ted is getting from family and friends so I gave him some to be sure he knew someone thought he was doing OK. I decided to try to facilitate further development of his well established personal goals and interests because they can help him live through his transition period.)

"I will do my new job to finance my family, but I don't expect the work to be fun. So, once I get my new family life established I will continue my art work as a hobby, and may continue as a fire fighter and EMS volunteer if I can find the time. Not only do they give me satisfaction, but they continue to make me a part of our local community."

"Ted, I hope your new pathway in life goes well. You seem to be off to a good start."

A Long-Term Follow-Up

I didn't hear anything about Ted's life until several years later. Ted was 30 when he came to see me again. As we sat down around my table he looked discouraged.

"Good morning, Ted. It has been over a decade since we last talked. How has the reorganization of your life worked out?"

"Not good. My world has collapsed and I have to start over again."

"No wonder you look discouraged. The word 'collapsed" is a scary and suffocating one. Tell me what's going on."

"In a nut shell, things started falling apart about three years ago. As a result, I ended up with two young children, a home with a big mortgage, and a divorce. About the time I thought things couldn't get much worse they did. A little over a month ago the company I have worked with for over a decade announced they were moving overseas and our jobs would end in a month."

"I see why you used the word 'collapsed'! How can I be helpful?"

(Ted has so many problems in his life that I need to identify with him the goals that will guide our working together in this counseling session.)

"I have spent the last month looking for a new job and found the job market in this area is in a major slump. Those of us who lost our jobs haven't even been able to get job interviews let alone a job. The few jobs that are available pay so little I couldn't support my family with them. I hoped maybe you could help me rethink possibilities that might open up new ideas about employment."

"I am glad to try to help. Let's start by you updating me on what you have thought about so far."

(New development always starts with some pattern that already exists).

"I have considered trying to find a job with an adequate income in some other part of our state or the country and move my children to a new location. I decided that wasn't a good idea because we would lose all of the friendships and family and community relationships we have here, along with the temporary assistance and support they could provide while I rebuild my employment. I have decided to stay here and preserve as much as possible of our existing life (e.g., our current home, daily routines, and supporting network of family and friends).

While I continue to search for a new job here, I have been thinking about what kind of field I might get into in which the employment future would be much more secure. I wondered if you might be able to help me identify some options. You helped me when I was facing a life crisis and hope you can do it again"

(Ted considered and rejected the idea of solving his unemployment problem with transformational change process. He has chosen to try to keep most of his current life pattern as stable as possible (a typical meta-goal) while job hunting, so he is taking an incremental change approach. Job security now emerges as a specific new goal guiding his activity, which was the goal at the conclusion of our last counseling episode years ago.)

"I will be glad to try. Have you come up with any ideas about fields that seem to have employment security in this geographical area as you have been looking for jobs?"

"The only field around here that always seems to have jobs available is health care. But, all health professions where the pay would meet my needs require some kind of degree or certification, which I don't have."

"If you were qualified do you think you would like that kind of work?"

"I have continued to work as a volunteer in the emergency medical service for the last decade and still find that work interesting and challenging. But urgent crisis health care isn't like regular health care and doesn't involve a lot of paid jobs."

"I remember you had to go through some fairly rigorous training for EMS. Surely you learned some health care skills."

"Oh yes. For example, I can listen to a person's heart, take their blood pressure, give a shot of something, start an IV, use procedures to control excessive bleeding, use resuscitation procedures, and provide protective care while moving a person and transporting them to a hospital."

"That's quite a lot. Those are some of the skills taught in training programs for licensed practical nurses (LPN). You don't need a college degree to train for those positions, and there is a persistent job market for LPNs."

"I think I could be good at that and would like it. How long would it take and how much would it cost?"

"There is a local program sponsored by the public school system in which the cost is small and can be completed in a year or a little less. I am sure you would have no trouble getting admitted."

"That is an interesting possibility, but I can't go a year without income to support my family so it may not be feasible."

"You told me in the past that people sometimes bought your art work or hired you for some art project like a mural. Do you think you could earn some money doing things like that part time?"

"Probably, but not enough. However, I might be able to also do some other kinds of part time jobs to enable us to get along for a year. That sounds like the best possibility available to me right now. Can you tell me who I can talk to about getting into that program?"

"I will have my staff assistant provide you with information about that program and an appropriate telephone number. I will be available if you need any more help. Good luck!"

Postscript to Ted's Case

A year later Ted informed me that just as he was finishing his LPN degree, a new, very successful high tech company with a bright future was hiring and paying salaries much higher than he could earn as an LPN. They were happy to hire him because of his lengthy manufacturing experience (*which produced a strong BES for such work)*. Since his dominant goals were job security that also provided a good salary to care for his kids and later enable them to go to college, he took the job.

However, because he really enjoyed nursing he chose to do some of that kind of work occasionally in addition to his regular job. He said he also continues his art work as an avocation and fantasizes that art might eventually become his full time activity when his kids are grown up and he retires.

Examples of Developmental Processes in Ted's Activity Patterns

Ted's vocational development history provides examples of several aspects of developmental dynamics.

Remember that change and development always occurs through modifying and elaborating patterns that currently exist. Existing patterns will not change unless they are somehow disrupted. For example, Ted's art interest development began when he adopted the goal of being better than his brother, which transformed his observing drawing to trying to do it. Other examples of disruptions in Ted's life included developing a chronic illness in late childhood; his girl friend becoming pregnant; his divorce; his employer going out of business; adopting the goal of becoming a nurse; and a new high-tech manufacturing company offering new job opportunities.

Development of activity pathways (because they are fun) that might later provide vocational development starting points can begin at any age. For example, Ted's art activity began when he was 5 years old.

One activity pathway may provide experiences that begin creation of a BES for a different kind of pathway. For example, Ted's fire fighting and EMS activities

provided experiences with police activities from which he constructed an initial BES about that as a potential vocational pathway.

Everyone develops multiple goals and activity pathways, only some of which provide a vocational pathway. Others are focused on enriching other aspects of one's life. For example, Ted's art activity and activities with his family were a major source of pleasure. However, his work schedule sometimes conflicted with potential family activities or art program schedules.

Context conditions play a key role in shaping a person's development by facilitating some kinds of activities and limiting or prohibiting others.

For example, when Ted was a child, his family context facilitated his growing art competence through providing needed materials and praise for his accomplishments. In contrast, his later job contexts prohibited any art activity, but they provided needed income.

Certain goal patterns can only be accomplished in some contexts. Therefore, if a person changes their goals it may be necessary to also change their contexts, which sometimes happens when a person becomes significantly dissatisfied with their current vocational pathway. The transition to working and retirement are common examples of a change in personal goals.

Context changes alter goal and activity possibilities. For example, for a decade Ted's work context was stable, thus giving Ted's vocational activities and consequences consistency. Then, that work context disappeared and eliminated his current vocational pathway as his means of achieving his financial goals, and that seriously disrupted the rest of his life. This disruption was further exacerbated by the end of his marriage, demonstrating that disruption in one life role is rarely isolated from other roles. To overcome that disruption, Ted needed to find a new context that could provide a different vocational pathway within which he could achieve his financial goals.

In modern society, with rapidly changing contexts that provide vocational possibilities, personal vocational development often continues to evolve throughout adult life, as illustrated in Ted's case. So, personal vocational planning increasingly requires a person cultivating capabilities for alternate vocational pathways.

Change Techniques and Processes Employed in Ted's Case

The counselor's work with Ted offers an opportunity to see the concepts and propositions of the LSVD applied in a real-life counseling situation. The following represents a summary of techniques and processes applied in our sample case study:

1. Modify client's initial guiding interpersonal relationship BES to fit the counseling relationship (p. 82).
2. Arrive at shared goals to establish a comfortable working relationship (e.g., minimize status differences) (p. 83).
3. Assist client to speak openly about past experiences, as well as about thoughts, feelings, and contexts so as to identify activity pathways (p.83).
4. Ensure that the counselor's and the client's goals (in the counseling situation)

are aligned (i.e., make them explicit and address any discrepancies promptly) (p. 83).
5. Explore potential goals; focus on potential goals clarity (p. 83).
6. Make explicit and focus attention on activity pathways (and their guiding goals) with which the client has had extensive, satisfying experience, resulting in elaborate BES that represent potential starting points for further development (p. 84).
7. Recognize and explore how powerful positive feedback processes can produce stronger goal commitments (p. 85) and negative emotions can lead to avoidance.
8. "Pleading ignorance" is one technique the counselor can use to elicit descriptions of the client's experiences, and the contexts within which they occurred. This enables the counselor to better understand the client's activity pathway, the goal it served, and the satisfactions it produced (p. 86) by posturing the client to help educate the counselor.
9. Client descriptions of past experiences permit the counselor to draw conclusions about the client's prototypical ways of dealing with commitments and of acquiring the skills necessary to successfully meet commitments (p. 87).
10. When clients use words describing both positive and negative evaluative thoughts and emotions about activity patterns, they provide important clues that can help counselors to identify potential vocational pathways, and also to identify pathways that should be avoided (p. 87).
11. Counselors should be sure to explore all three types of behavior episodes (instrumental, observational, and thinking) to obtain a comprehensive picture of rewarding and satisfying behaviors in the client's past, which may offer tangible information about vocational pathways that have the potential to be rewarding and successful (p. 88).
12. Sometimes, counselors may identify potential educational or vocational pathways (based on the client's history of gratifying behavior episodes) that may not be apparent to the client. Helping the client to explore such pathways may be a useful strategy (p. 89).
13. After exploring a variety of potential vocational pathways, the client can be encouraged to make tentative commitments to pursue one or more of these pathways, leading to an exploration of feasibility and implementation issues (p. 89).
14. When clients report disruptions in their lives, counselors will view this as opportunities to explore with their clients whether stability maintenance, incremental change, or transformational change (or some combination thereof) is the most suitable strategy for moving forward (p. 91).
15. Disruptions represent opportunities for formulating new goals or revising old ones, processes that counselors can facilitate. Moreover, when new goals are formulated, counselors can help with implementation planning (p. 91).
16. To determine the client's strength of motivation to pursue a specific goal, the counselor can work with the client to determine the clarity of the client's goal, and whether the client's capability (self-efficacy) beliefs and context beliefs

represent a positive and vigorous pattern or whether they may need to be (and can be) strengthened (p. 91).

17. In implementation planning, counselor and client can explore whether a responsive environment exists (in relation to the goal being pursued) and whether the client has (or can acquire) the necessary skills (p. 91).
18. Counselors can contribute to the maintenance of vigorous motivation patterns by (a) offering positive evaluative feedback (p. 92), making client's goals explicit, and affirming competence (p. 93).

Change and development always start with what exists (i.e. previously constructed biological, psychological, and behavior patterns that function in specific contexts to produce desired consequences). New patterns cannot be constructed "from scratch."

GENERAL COUNSELING PRINCIPLES DERIVED FROM THE LSVD

The illustrations above document how counselors, using everyday language, can use the dynamic theoretical framework we have presented in the previous chapters. It may be helpful at this point, however, to come back to some of the key theoretical concepts and propositions that are central to understanding the counseling approach illustrated by the case study of Ted.

Humans have the unique capacity to change themselves or engage in what is called self-construction. Individuals can change the structure and function of their physical and psychological being to produce greater functional efficiency, harmony, and greater degrees of adaptability (D. H. Ford, 1987b, p. 367). Just like other human capabilities, people vary in terms of their capacity to engage in self-construction and in their beliefs about their capacity to do so. Moreover, such self-construction can occur in a number of different ways (which can be facilitated, when necessary, by a counselor).

The LSVD describes the unit to be understood as a person-in-context dynamic system composed of an integrated organization of components that must function cooperatively to create flexible yet unified functional patterns (or activity pathways). This means that if any component in a person's pattern is changed, then the rest of the pattern will be reconfigured in a way that reflects system dynamics to restore unified whole-person functioning.

Individuals may, for example, change their existing patterns by setting new goals, or their patterns of functioning may be disrupted by contextual circumstances. Counselors may assist their clients by helping them to start a change process in any pattern by initially focusing on any of its components, keeping in mind, however, that they must find a way of charting how a change to one part will lead to a change in the whole. Counselors may also help clients to recognize the capacity of other parts to resist changes to parts under focus. For example, achieving weight loss is often difficult because it frequently requires a cascade of changes across a person's life in terms of daily food, activity, and exercise choices set against the biological predisposition to conserve energy.

Adults tend to have well elaborated and well established repertoires of BES (i.e., context-specific behavioral patterns) and re-establishment of steady states (following a disruption) typically takes the form of modifying or elaborating some existing BES (e.g., when people create changes in their functioning, they do not start from scratch). Counselors can facilitate clients' re-establishment of steady states (e.g., by helping them to achieve their goal) through a number of strategies. These may include, for example, changing conditions within the environment or bypassing a problematic BES and activating instead one that can accommodate the discrepant information. For example, a college freshman may have a BES organized around the goal of becoming a physician. As it becomes apparent, however, that the necessary coursework in science is too difficult, and the BES cannot be implemented successfully, the student may activate an alternative BES that avoids the troublesome subjects and allows the continued study in the same domain, such as might be the case in pursuing another, less science-focused health care degree.

The Collaborative Relationship

A collaborative relationship between counselor and counselee is essential. The principal focus of LSVD is the person-in-context. This "person-centered" ecological approach necessitates that the counselor facilitates the development of a *collaborative* relationship. The LSVD-trained counselor brings to this relationship:

- a "big picture" focus, which appreciates that vocational and career development pathways are deeply intertwined with all other aspects of a person's development and functioning;
- an emphasis on processes involved in the construction of these pathways;
- an integrative person-in-context focus, which mandates that a person's vocational behavior and development can be understood only when they are considered jointly with the contexts within which they are occurring;
- a general understanding of the multifaceted world of work and specific knowledge about ways and means to identify vocational opportunities and affordances.

We observed earlier that all behavior episodes are guided by the person's goals (including extended behavior episodes, such as counseling sessions, that may include numerous sub-goals). An important aspect of a collaborative counselor/counselee relationship requires that their goals in the counseling situation "fit together." Thus, when counselor and counselee collaborate in discovering and clarifying the counselee's goals (as in the case example presented above), they work toward accomplishing a common goal. If Ted had expected the counselor to simply tell him what to do, their goals clearly would not have matched, and the counseling intervention would probably have been unsuccessful.

Working with Adolescents and Young Adults Who are New to the World of Work

Counselor and counselee must explore the pattern of existing activities, goals, situations, and the ties between them because change and development always start with what exists. New development can occur only through modifying, reorganizing, or elaborating existing patterns. Identifying and understanding the existing patterns is particularly important because the foundation for vocational behavior and development pathways is laid early in life. Starting in early childhood, behavior episodes that are associated with positive evaluative thoughts and emotions and rewarding contexts lead to the elaboration of behavior episode activity patterns. When these elaborated goal-activity-context patterns include integrated series of observational, thinking, and instrumental behavior episodes, it is likely that they will lead to the construction of complex, durable, and powerful BES, which will guide activity pathways that are capable of producing new interests, new competencies, as well as satisfaction and pleasure within new work contexts and environments.

"Because it is behavior episode schemata that organize and regulate actual behavior episodes, it is those schemata that must be modified to change a person's functioning. However, a BES cannot be modified unless and until it is activated" (D. H. Ford, 1987b, p. 360). Activation and reconstruction of a given BES is triggered by current information that is especially salient for that BES. For example, counseling cannot proceed and the BES organizing the problematic aspects of functioning (e.g., an unrealistic occupational goal) cannot be activated and reorganized unless the client makes a commitment to attend counseling sessions and to change the problematic behavior. Any changes accomplished in this manner will lead to other changes to produce a unified pattern (e.g., changes in how the client feels, thinks, or acts, or even alteration of contexts, such as changing of the college major).

Using a slightly different approach, a counselor might start by focusing on how the client feels about a goal and assist clients who seem emotionally flat or detached in finding some emotional fuel to bolster goal-directed behavior. If the clients' actions become more effective in producing the desired consequences, it could lead to more favorable evaluative thoughts and more favorable feelings about their goals and even about themselves. It should be clear, therefore, that different kinds of intervention can result in similar outcomes. A key task for the counselor is to identify the most promising target of initial intervention, based on understanding the client's current state as well as the desired state, and the likely relative efficacy of the chosen intervention into the client's unique person-in-context system.

Clarification of goals. This occurs through the examination of the counselee's developmental history of successful, satisfying and pleasurable behavior episodes. If a client's guiding goals or evaluative thoughts in the pattern of interest (e.g., choice of a career pathway) are unclear, a counselor could choose to start with the clarification or establishment of career goals or an exploration of relevant self-

evaluative thoughts (e.g., self-efficacy beliefs) and emotions. This is particularly important because understanding of a client's thoughts, feelings, and actions can be achieved only when one knows what the client is trying to accomplish (i.e., their goals) in a particular context or if the client is trying to accomplish anything at all (e.g., the entire absence of a vocational goal). This understanding requires identification of patterns of behavior episodes in order to infer a client's BES (that are relevant to the client's current goals). Recall that BES are abstractions or generalizations derived from many behavior episodes that have occurred in the past. BES are reconstructed to guide the flow of ongoing behavior. Each BES in a person's repertoire is likely to have different content relevant to its particular goals and context, and it is subject to modification based on current goals and contexts.

A critically important feature of any LSVD-based intervention is its focus on the unique, whole person-in-context and on identifying a person's satisfaction/pleasure producing patterns of activity that are already in their behavioral repertoire and that might provide a starting point for vocational development. Sensitive, skillful interpersonal and interview methods are the key tools for helping a client identify these patterns. The implication is that standardized tests, as commonly used in vocational guidance and career counseling, are of limited utility because using them in the absence of a fuller account of the person-in-context is unlikely to generate a unique BES profile, linked to unique personal career goals and unique school and work contexts. Therefore, such traditional methods should be used only as supplemental means for elaborating understanding of the activity BES patterns identified as potential starting points (e.g., specific competence measures such as mathematical, artistic or musical talents).

Goal specification, evaluation, and implementation processes. It is rarely the case that a single, guiding personal goal emerges spontaneously in any domain, including vocational and career development. Consequently, it is important for counselor and client to engage in a process of reviewing and evaluating goal options that were envisioned through a review of the client's developmental history (of behavior episodes and BES) and current circumstances. As counselors elicit descriptions of existing activity pathways and the contexts within which they occur, they will also discover the goals they are designed to serve and the satisfactions they produce. Moreover, such descriptions will offer clues to the strength of commitment to these goals, the agency beliefs associated with achieving them, and the values that underlie their pursuit.

– Potential goals are the consequences of dynamic patterns of preferences, competencies, and personal agency beliefs bearing on the self and the context and occurring as a consequence of ongoing experience over time. These patterns are often referred to as interests. The links between career interests, goals, and eventual occupational choices are strong because people tend to choose options that they prefer, but situations often preclude or diminish the possibility of doing so. Potential goals breed "in-breadth" exploration of these potentials and vice versa.

– Tentative goals usually follow from some form of perceived success in pursuing a potential goal and include the individual's commitment to engage in "in-depth" exploration of such goals (through cognitive and emotional evaluation processes), as well as a tentative commitment to pursue them.
– Guiding goals direct the individual, having made a commitment to a goal, to do what is necessary to achieve this goal across time and situations.

The processes involved are identifying potential goals, mobilizing the person-in-context system to be organized in the evaluation and pursuit of selected goals, and remaining committed and engaged until the goals achieved represent integrated patterns that function as a unit. They can be understood best with reference to the basic system functions that are shown in Figures 2.1 & 2.2: (1) goal specification establishes the parameters that target and organize the selective use of other personal resources (and more than one goal may be simultaneously operative); (2) control functions selectively assemble, organize, reorganize, integrate, and construct possibilities for pursuing the specified goals in specified contexts; (3) evaluative/regulatory functions (both cognitive and affective/emotional) examine the properties, priorities and potential consequences of implementing possible ways of pursuing each goal, which is then used to possibly alter (1) and (2); (4) control functions then guide the implementation of a selected approach; (5) selective attention is focused on collecting relevant information about the progressive personal and context impact of the implementation activity in the implementation context for use by the evaluative and regulatory function. That, in turn, provides evaluative information to the goal specification and control functions, which use them to further or revise the ongoing implementation activity.

This dynamic pattern continues until (a) the goal is achieved, or (b) it is decided that the goal cannot be achieved via the chosen activity pattern, or (c) the entire task is "reframed." It is important to note that all the other functions are constrained, selected, constructed, and applied within the parameters of the goal specification. Vague goals lead to limitations and confusion in all other functional activities. As counselor and client work toward the achievement of core personal goals in the vocational behavior and development domain, they may discover that further goal specification and refinement must emerge from this process before successful implementation efforts can be achieved.

Working with Adults

Working with adults who may want to change their career pathways for a variety of reasons, with some desiring more satisfying work and others needing to find new careers as job options diminish. These changes will involve some of the same processes as those described for work with adolescents and young adults. For example, establishing a collaborative relationship in which both client and counselor are viewed as equally valued participants is essential in both scenarios.

Changing established career pathways. Changing an established career pathway, is different from discovering and implementing an initial vocational pathway in many respects, in large part because the BES repertoires of adults tend to be well established and quite extensive. Attempting such a change is also complicated by a complex constellation of other life roles that are highly dependent on continued gainful employment. It gives new meaning to "working with what exists" because adults who have been in the workforce may need to overcome (i.e., change or reconstruct) BES related to well-established successful work patterns that are no longer useful or to emotional wounds that resulted from having lost work or whose skills or expertise have become obsolete. They must also account for other life role demands that may serve as pressures to sacrifice the pursuit of gratifying work for the pursuit of an income.

Feeling compelled to change one's career pathway because of dissatisfaction (e.g., inadequate income, lack of recognition, mismatch of required and available skills) or because of being laid off or fired may produce a state of disorganization. Such a state is often associated with crises, traumas, or critical life events, and while this is usually distressing for the person who is having these experiences, it also represents an increased potential for alternate possibilities. Whether the change producing the disorganization is constructive or destructive may depend in part on whether effective help is available in the form of mentoring, counseling or crisis intervention.

Individuals who experience disorganization have been recognized as particularly receptive to accepting assistance in promoting personally and socially effective reorganized BES. This is especially important because problems of disorganization, although made acute through some crisis event, may have existed for some time and may be well-defended and habitual. It would be a mistake, however, to assume that *disorganization-reorganization occurs* only as a result of crises that occur as a result of critical life events or unforeseen calamities. Many individuals deliberately create disorganization and subsequently reorganization of their current activity patterns (e.g., resign from current job) by setting new goals, choosing new contexts, redefining their worker identity, accepting new challenges, or discontinuing behavioral patterns or pathways that have become "stale" or that are no longer judged to be desirable. Setting occupational goals, advancing one's career through further training or education, and making a complete career change are examples of deliberate disruption of steady states that serves to promote reorganization.

Summary

We summarize as concisely as possible in the words of D. H. Ford (1987b):

> changes in behavior patterns are achieved primarily through information transactions that produce changes in relevant behavior episode schemata (BES). Because a change in any component of a BES necessarily produces a change in the entire BES, behavior change is usually accomplished by targeting

> a particular BES component or set of components (e.g., personal goals or values; problem-solving strategies; emotional response patterns) (p. 374).

Self-organizing processes, self-construction processes, and disorganization-reorganization processes are the drivers of all change processes, and understanding the organization and dynamics of human functioning and development is essential in developing and applying intervention methods and strategies designed to help people to be all they can be, both personally and occupationally.

CHAPTER 5

METHODOLOGICAL CONSIDERATIONS

Conceptualizing career development from a developmental contextual, holistic-interactionist, or living systems perspective (as in LSVD), has profound consequences for the conduct of relevant research. As noted previously, such conceptualizations maintain that:

- An individual's biological/genetic makeup, behavioral history, and contextual barriers and affordances represent an integral whole. When these components are considered in isolation, it is virtually impossible to comprehend their meaning and ascertain their true contribution to the individual's behavioral course and development. "Yet the most commonly used methods of the last quarter century for examining stability (e.g., panel and cross-lag models) and change (repeated measures analysis of variance, analysis of difference scores, analysis of residualized change) largely preclude this perspective," in part because they assume individuals to be "interchangeable units who, apart from random error, differ neither quantitatively nor qualitatively in behavioral course" (Sterba & Bauer, 2010, p. 239).
- Humans and their resident environments are vibrant and dynamic and thus display considerable intraindividual variation over time.
- Stability in human functioning is best characterized as the stability or consistency in patterns of intraindividual variability (i.e., steady states), which is usually influenced by person-specific contextual conditions. This is distinguished from traditional approaches of assessing stability through discrete characteristics (e.g., unchanging work value or interest domains).
- Human contexts serve as flexible boundaries for, defining features of, and products of human behavior, necessitating that human behavior and its contexts be assessed simultaneously. Contexts serve to weave together features of person and situation to yield a unique whole. Thus, to obtain a valid assessment of the functioning of people, their steady state consistencies must be discovered and explored across contexts. This can only be accomplished on the basis of multiple occasions of measurement within and across specified contexts.
- Apprehension and observation of (and/or reporting) multiple behavior episodes represents an ideal way to accomplish this, as they reflect the person's current behavior-environment organization. In effect, behavior episodes account for both the complex organization of biological and psychological variables that make up the individual person and the complex organization of transactional and environmental variables that account for person-environment relations. "It is not just the nature and status of each variable, but also the pattern of their organization

> in a given context as it flows through time that gives individuals their identity and that makes their functioning predictable across contexts and occasions" (Nesselroade & D. H. Ford, 1987, p.67). It follows that the predominant attention in career development research on studying variation of delineated characteristics *between* individuals (interindividual variation) is unfortunate because studying individual behaviors relative to other individuals without regard to how they are organized in relationship to other characteristics in context cannot result in valid conclusions about how any particular person will change or develop.

Molenaar (2004) has presented persuasive (conceptual and mathematical) evidence in support of this argument and called for a renewed emphasis on studying the individual in depth before pooling across other individuals (as is standard procedure, for example, in regression-based statistical methods). It has been shown conclusively that findings obtained through analysis of interindividual variation are not applicable to individual members of any population studied in this manner, except in rare cases (Molenaar, 2004). Specifically, Molenaar (2004, p. 202) noted that, to obtain valid results concerning all developmental, learning, and adaptive processes, analysis of intraindividual variation is essential.

Using data analytic models that can help identify important patterns of interindividual variability has been and should continue to be an important tool in research in vocational and career development. Criticisms of its use should not be construed as suggesting the abandonment of research that is designed to discover lawful, highly generalized relationships by aggregating data across many individuals. That objective and the data analytic models used to pursue it, can be of significant value. The limitation of traditional analytic techniques lies not in the method but in the kinds of data used and the research questions that are pursued with them. In the most typical use, a few attributes are measured on a large sample of individuals on one occasion in one specific context for each person and then analyzed for patterns.

Systems theory and evidence of intraindividual patterns of variability reveal that the information provided by assessing a single dimension (or variable) on a single occasion of measurement in one specific context is as accurate a reflection of ongoing behavior as is a photograph of someone living at any particular moment in any particular situation. Data snapshots are a highly idiosyncratic representation of the general nature of a given attribute of a person because living system dynamics produce intraindividual patterns of variability on every variable at every moment. Thus, one measure at one time and in one place in absence of the antecedent factors leading to that time and place cannot provide the necessary information to infer what will occur in the next moment for any individual with any degree of precision.

The proper strategy for overcoming this decisive limitation is to get a sound representation of the variables of interest for any given person across time and situations and to seek and discover patterns. That can usually be accomplished only through multiple occasions of measurement because that is the only way to get sound

information about any person's typical pattern of (intraindividual) variability and co-variability across person aspects and situations. Then, indices of each person's patterns can be analyzed for intraindividual patterns. If there is evidence that the range of variability and change in co-variability of aspects is small within the unit of time that is of interest, then a single measurement may be a useful substitute. For example, a person's height, weight, or hair and eye color would not be expected to vary much over a few days or contexts and the association between height and weight would remain fairly stable during the same interval.

The development of modern conceptualizations of career development as dynamic, complex processes (e.g., in LSVD) has been complemented by the development of sophisticated methods for modeling these processes. Examples from related fields include the application of dynamic systems in the study of the development of motor behavior in infants (Thelen & Smith, 2006), the use of dynamic factor analysis for the study of psychological processes such as affect (e.g., Browne & Nesselroade, 2005; Ferrer & Nesselroade, 2003), the development of principles that guide dynamic behavioral pattern formation and change in living systems (Kelso, 2000), quantitative modeling of developmental processes (e.g., Nesselroade & Molenaar, 2003; Newell & Molenaar, 1998), and the use of time-series models obtained in analyses of intraindividual variation to provide feedback-feedforward guidance in real time (Molenaar & Campbell, 2009).

FOCUS ON THE INDIVIDUAL: TWO ILLUSTRATIVE EXAMPLES

The conceptual, methodological, and mathematical arguments for the in-depth study of the individual prior to the study of large samples or groups of individuals are quite persuasive when considered in relation to applied research in the study of career development and career counseling. Nevertheless, as most individuals who are likely to do research in this area are unaccustomed to thinking in terms of behavior episodes and BES, the application of the LSVD in research is not something that will occur without a significant investment of time and effort. Collecting tens, if not hundreds, of occasions of measurement can seem daunting if not impossible, but innovations in mobile technologies empowering and incentivizing people to record their lives in real time are making this a reality in many areas of commerce and science. There are, however, some intermediate steps that can be taken to move from the questionable practice of deducing information about specific individuals from group data toward a more appropriate focus on studying the individual first and then using information about individual patterns of functioning to examine commonalities (and differences) across individuals. In the following sections, we will present two examples of methodological approaches that bring the research focus back to the individual without, however, abandoning the extensive work that has been done on the measurement of vocational variables.

Examining Intraindividual Variability in Work Values Using P-Technique Factor Analysis

One early example of the intensive study of intraindividual variation in career development was a study of work values utilizing P-technique factor analysis (Schulenberg, Vondracek, & Nesselroade, 1988). A brief review of the rationale and methodology used in that study may illustrate one approach to research that is consistent with (and may be guided by) our LSVD. The technical details of the P-technique factor analysis performed in this study are described by Schulenberg et al. (1988) and need not be repeated here. In short, whereas the more traditional R-technique factor analysis samples across many individuals on one occasion (and then applies the findings to individuals), P-technique factor analysis samples across many occasions per individual participant before examining commonalities across individuals. The result of this strategy is that an understanding of the individual participant is the basis of looking for commonalities across individuals. As noted previously (e.g., Molenaar, 2004), trying to deduce individual characteristics and functioning from an understanding of the larger group does not result in valid findings, except in rare circumstances.

Schulenberg et al. (1998) were inspired by the observation that both researchers and practitioners have generally assumed that work values are trait-like and stable over short to intermediate periods of time. Questioning this basic assumption, they proposed to investigate (a) whether work values scores manifest sufficient intraindividual variability to support the conclusion that they contain a significant state component, and (b) whether, if such variability exists, some or all of its dimensions would be shared by different individuals. They recruited seven participants who agreed to complete Super's (1970) Work Values Inventory for 100 consecutive days, varying the time of day to reduce occasion specific sampling error. Participants were instructed to record their present (i.e., on any given occasion) feelings without making any effort to introduce either consistency or inconsistency into their responses.

Results revealed that P-technique factor analysis yielded meaningful factor solutions for six of the seven participants. Responses of the seventh participant were stable across the 100 occasions of measurement, i.e., they showed insufficient intraindividual variability to permit the extraction of meaningful factors. A comparison of the factors obtained by P-technique factor analysis across the remaining six participants indicated that some of the factors were shared by some of the participants, that all participants had at least one idiosyncratic factor, and that for one participant all four factors were idiosyncratic, i.e., not shared by any other participant. Schulenberg et al. (1988) concluded that in their study, work values clearly exhibited state-like variability as well as trait-like variability. Moreover, they noted that for five of the participants, one or more WVI scales manifested low or no variability across occasions, suggesting that trait and state dimensions of work values can be thought of as being distinct, yet intertwined. Thus, distinguishing

between these dimensions is both possible and necessary for understanding the nature of work values and for optimally utilizing an individual's measured work values in career guidance or counseling.

Although Schulenberg et al. (1988) qualified their findings as exploratory and pointed out several methodological and measurement challenges in using P-technique factor analysis, they succeeded in demonstrating that day-to-day variability in the measurement of work values cannot simply be written off as measurement error or error variance. Moreover, their study suggests that the measurement of other presumably stable vocational variables (e.g., interests) may also be subject to short-term changes and systematic intraindividual variability. In particular, the wide-spread practice of one-time testing of individuals in career counseling settings is likely to produce at best results of limited value, and at worst quite possibly contribute to the pursuit of inappropriate career pathways as person-in-context circumstances change. More research is needed that examines the stability and intraindividual variability in widely used measures that assess variables of interest to vocational psychologists and career counselors. P-technique factor analysis represents one methodology that could be usefully employed in research designed to accomplish this, as demonstrated by Schulenberg et al. (1988).

Examining Individuals' Career Patterns Across Domain-Relevant Variables Using Cluster Analysis

Researchers in the field of developmental science have been leaders among those who have stressed that one needs to think holistically, to study individual persons in their natural contexts, and thereby to bring the individual person back into focus in research (e.g., Cairns, Bergman, & Kagan, 1998; Magnusson, 2000). An early example of this "person-oriented approach" in the study of career development is the study of female life careers by Gustafson and Magnusson (1991), who gathered data for three years on 557 female students, beginning when the students were 13 years old (i.e., from third to sixth grade). A follow-up questionnaire, mailed when the participants were 26 years old, had a return rate of 90 percent. Rather than relying on the traditional approach of investigating relationships among variables, these authors focused on "the total individual, embedded in his or her total environment" (p. 3) to understand the change and stability over time that constituted career development. Early on they acknowledged one of the key issues in utilizing such a broad definition of the unit of analysis, namely, that one cannot at once study all facets of human functioning and the contexts within which it takes place. Thus, in their study of female life careers, they resolved that issue by focusing on "individuals' *patterns* across certain person and environmental variables relevant to educational and occupational achievement" (Gustafson & Magnusson, 1991, p. 4).

It should be clear that the selection of variables used in this approach (and their measurement) is of critical importance because it determines the nature of the data to be used in the cluster analyses and thus the component contributors to the patterns to be examined. This selection process could be guided by theory, by accumulated empirical

evidence, or by a combination of the two. Gustafson and Magnusson (1991, p. 4) were guided primarily by their review of the empirical research literature, leading them to select variables that allowed them to focus on patterns of ability and school adaptation, as well as on patterns of the girls' home environments. "By treating individuals' patterns or profiles across these variables as coherent, meaningful wholes, rather than assessing girls' relative standing on a series of group variables and then relating their rank on one variable to their ranks on others, we have defined the *individual-in-the-environment* as the analytic unit" (Gustafson & Magnusson 1991, p. 4).

The utility of identifying a finite number of patterns of individual functioning in a specific domain (e.g., ability, school adaptation) at a given age allowed these researchers to (a) examine circumstances that might account for individual differences in these patterns at different ages (b) predict which individuals are likely to have stable patterns as opposed to changeable patterns over time (assuming "lawful continuity" of development over time), and (c) identify career consequences that these developmental differences might entail across adolescence and into young adulthood. Although patterns represent statistically determined associations (rather than influences or effects) in their study, Gustafson and Magnusson (1991, p. 5) stressed that, "by the very nature of the processes involved, patterns demonstrate a lawful continuity *through their association with other patterns."* Again, because of the assumption that the developmental processes underlying the formation of these patterns are lawful, they were able to posit the existence of both expected presence and absence of associations among patterns across time and across domains.

Gustafson and Magnusson (1991) used cluster analysis to combine individuals with similar patterns or profiles (across the variables specified earlier as variables of interest) into homogeneous subgroups. The analyses revealed nine homogeneous subgroups (at age 13), the most interesting of which (according to Gustafson and Magnusson, 1991, p. 24) were (1) the girls that scored high on all indicators (the High-Ability, High Adapted Achievers); (2) the gifted girls that had a high opinion of their own ability, but were not well adapted to the school environment (the Gifted, Moderately Low-Adapted Achievers); (3) the girls who were extremely well adapted to the academic environment, despite their low-normal intelligence and achievement levels (the High-Adapted Normals), and (4) the girls who had a low perception of their own academic competence even though their actual academic competence and achievement were above average (the Ability-Underestimating Normals). Because some of these patterns reflected disparities between environmental demands and the girls' responses to these demands, it was possible to make predictions about the relative likelihood of pattern stability or change with time. Moreover, it was possible to examine the differential functioning of individuals in the various subgroups, "either with respect to single criteria or in relation to patterns from another domain" (Gustafson & Magnusson, 1991, p. 9).

Perhaps the most important example of patterns from another domain is represented by the patterns of family backgrounds, which were based on three SES indicators (family income, father's level of education, and mother's level of

education) and on two indicators of parental values (parental aspirations regarding their daughter's education, and parental evaluation of their daughter's academic capability). The five indicators (assessed when the girls were 13 years old) resulted in eight family background patterns (clusters). For example, the pattern with the highest frequency was labeled "Low SES Status Quo" and it was characterized by low income, low levels of both father's and mother's education, low parental aspirations and low evaluation of the daughter's capabilities. In contrast, the "Low SES Upwardly Mobile" pattern consisted of the same low income and education levels but diverged from the "Status Quo" group by having high parental aspirations and evaluation of capabilities. Another interesting family background pattern was named the "High SES Brahmin" and was based on high scores on all five indicators.

Examining the relationships between the girls' ability/adaptation patterns and their multifaceted family background patterns resulted in more differentiated and meaningful findings that could not have been obtained in a variable based approach (Gustafson & Magnusson, 1991, p. 73). For example, almost half of the underachievers in the entire sample were girls from the low SES Status Quo families who were characterized by normal levels of intelligence, below average achievement, self-perceived ability, and adaptation means (i.e., the Low Adapted, Normal-Ability Underachievers) (p. 110). Another interesting example is represented by the finding that the girls' achievement levels at age 16 matched parental expectations, and this was true across SES levels (Gustafson & Magnusson, 1991, pp. 118-119).

This brief review of some of the findings of this novel study is merely intended to be suggestive of the rich possibilities created by this person-oriented approach to vocational and career research. Moreover, the technical details of the cluster analysis procedures are described in detail in Gustafson and Magnusson (1991) and will not be addressed here. Most pertinent to our discussion of research methods that bring back a focus on the individual person is the observation by Gustafson and Magnusson (1991, p. 192) that, as they examined their networks of interacting patterns, they increasingly thought in terms of individuals. To them, their homogeneous clusters (e.g., the High-Adapted Overachievers; the Low-Adapted, Normal-Ability Underachievers) came to be meaningful as representing holistic persons: "In a manner that is perhaps similar to that experienced by researchers who focus on case studies, we felt we 'knew' these girls." They go on to emphasize that "the pattern approach . . . yielded findings that were both statistically significant and substantively 'accessible,' in terms of their relevance to people rather than to variables" (pp. 192-193). For obvious reasons, such an approach ought to resonate with both vocational researchers and practitioners.

CONCEPTUAL AND METHODOLOGICAL ISSUES IN STUDYING INTRAINDIVIDUAL VARIABILITY AND CHANGE PROCESSES

More than two decades have passed since the completion of the two illustrative studies described above, and much progress has been made in demonstrating the

importance of intraindividual variability in the study of change processes, prompting some of the leaders in the field to claim that "the study of intraindividual processes has reached its adulthood" (Boker, Molenaar, & Nesselroade, 2009, p. 1). Perhaps more importantly, Nesselroade (2010) proposed that the study of intraindividual variability with its attendant focus on the individual as the unit of analysis may very well represent the emergence of a "third discipline" of scientific psychology, complementing the disciplines of experimental and differential (correlational) psychology. General system theory (von Bertalanffy, 1940, 1950, 1968), living systems theory (e.g., D. H. Ford, 1987), and developmental systems theory (D. H. Ford & Lerner, 1992) are seen by Nesselroade (2010) as having stimulated the development of this "third discipline" and its methodological advances, including the modeling of the individual as a dynamical system.

While these developments may reflect the current status of a number of important areas within psychology, including developmental psychology, there is little evidence to suggest that the study of intraindividual change processes in vocational psychology has kept pace with such advances. We assert this general perspective and set of methodological approaches are still in the early childhood period within vocational psychology. This is the case in spite of the fact that almost all theories of career development are concerned with processes of change over time (cf. Patton & McMahon, 2006) and a focus on the whole person in career counseling (Savickas, 2011). If these processes are to be studied properly, it must be recognized that attending to the whole person in context and to intraindividual variability over time is essential and that it determines how and what one measures, what research designs are used, and even how one formulates research questions.

Whereas differential psychology has been focused on identifying *differences* among individuals, Nesselroade and Molenaar (2010, p. 38) argue for "seeking *similarities* in patterns of individuals' behavior, thereby describing a functional individual of some generality rather than trying to synthesize an individual from the ways people differ from one another" [Italics added]. Although methodologies to accomplish this have continued to evolve and become more sophisticated (e.g., Browne & Nesselroade, 2005; Molenaar, 2004, 2010; Nesselroade & Molenaar, 2003, 2010; Velicer & Molenaar, 2013), the underlying rationale is based on the common-sense notion that knowledge about individual persons must start with a "real" person and not with an abstraction of a person created from data about large groups of individuals. As previously noted, this does not mean that interindividual differences should be ignored, nor that similarities in intraindividual variability patterns can be found in all instances.

Researchers interested in understanding processes of change (due to learning, adaptation, or development) must start by collecting data for the analysis of intraindividual variability patterns, which poses significant challenges, as "capturing the nature of process in a quantitatively rigorous way is not easy" (Nesselroade & Molenaar, 2010, p. 33). This is true particularly when conceptualizing change processes from a living systems perspective, which mandates that one move beyond

simple notions of change, as might be represented by changes on test scores from time 1 to time 2. Many occasions of measurement are needed (as in the P-technique study described previously) and they should occur on multiple variables (somewhat analogous to the previously described cluster analysis study). The rationales leading to the employment of multivariate measurement schemes have been articulated for the study of development (e.g., Baltes & Nesselroade, 1973) and for the study of living systems (e.g., Nesselroade & D. H. Ford, 1987), representing a convergence that is particularly meaningful for the study of vocational development from a living systems perspective.

Table 5.1 (reproduced from Nesselroade & Ford, 1987, p. 59) summarizes four assumptions underlying a multivariate orientation toward the study of living systems. The four assumptions in Table 5.1 illustrate the complexity of living systems and at the same time represent a compelling argument for a multivariate orientation and thus for multivariate assessment in the study of living systems. For example, consider the construct (latent variable) of school adaptation, which played an important role in the study by Gustafson and Magnusson (1991) and was defined to reflect the degree of comfortable fit with the student's academic environment. The construct was assessed entirely by self-report in Gustafson and Magnusson's study, but included a number of measures (manifest variables) representing indicators or attributes of the latent variable *school adaptation,* including feelings (like or dislike of being at school, fear of getting bad grades), interests (interest in school subjects), and cognitions (self- assessment of ability to keep up with required work).

Table 5.1 Four Assumptions Underlying a Multivariate Orientation toward the Study of Living Systems

I.	Any dependent variable (or consequent) is potentially a function of multiple determinants.
II.	Any determinant or antecedent has potentially multiple consequents.
III.	Any determinant or antecedent may also be considered a consequent of other determinants or antecedents, and any consequent may also be considered a determinant or antecedents of some other consequents.
IV.	The study of multiple antecedent-consequent relationships provides a useful model for the organization of complex systems.

Obviously, depending on the selection of attributes of a given construct, a number of different manifest variables or indicators could be measured. Although some constructs could conceivably be measured with a single indicator, it is much more likely that a multivariate approach would more fully represent the defining attributes of constructs used in the study of living systems in general and in the study of vocational development and change in particular.

The focus on constructs represented by latent variables is particularly important when the individual-in-context is deemed to be the appropriate unit of analysis. Nesselroade & Molenaar (2010) have persuasively argued that attempting to discover similarities in intraindividual change patterns entirely on the basis of manifest variables is likely to be inadequate. They go on to note that

> good theory rests on constructs [latent variables] and their interrelations. But without appropriate measurement operations to give the constructs empirical representation either directly through observable indicators of the construct or through other constructs, empirical deductions cannot be tested and hypotheses are not falsifiable (p. 40).

Fortunately, the measurement and analysis of latent variables has benefitted enormously from the wide-spread use of confirmatory factor analysis and structural equation modeling, although much of the emphasis in vocational psychology as well as in other areas of behavioral research has been on studying groups and not on studying process at the individual level. The consequence is that most latent constructs in most fields of psychology are based on interindividual variability captured at one point of time.

While multivariate measurement of latent variables is essential in the study of individual-level process, the collection of data across many occasions is equally important. In previous chapters we explained that human functioning can be conceptualized in terms of steady states associated with circumstances (contexts) in which individuals pursue specific consequences (goals) that may produce changes in or transitions between steady states. Because human behavior occurs in a continuous stream, taking a snapshot (one-occasion measurement) offers no information about any changes that might be associated with such goal-directed behavior. Moreover, different behavioral patterns can produce essentially the same consequences in similar contexts, and similar behavioral patterns can produce different consequences in different contexts, rendering information about a single occasion inadequate as a basis for generalization or as a means for studying change.

Collecting multivariate data to assess intraindividual variability, and doing so over many occasions, greatly increases the likelihood that one can capture the highly structured temporal organizations that are implicit in the term "process" (Molenaar & Nesselroade, 2010). Research of the kind exemplified by Schulenburg and colleagues in this chapter demonstrates an alternate way of defining latent variables as a product of intraindividual variability. Such intensive data collection efforts enable researchers to take advantage of powerful new methods and procedures which are emerging in the study of development, and to more adequately capture processes of change in the complex and dynamic living system that is represented by the individual person-in-context.

Before reviewing some of these advances, we feel compelled to address a frequent concern of researchers who feel that even when multivariate assessments are

employed, assessment of the context is neglected. Recall that Figure 2.1 (in Chapter 2) depicted a model of living system (person) processes, consisting of intraperson organization of multiple biological and psychological processes. The same figure suggested that because persons are open systems, human functioning also involves person-environment organization of multiple transactional and contextual variables. Unitary functioning of the person means that both of these organized patterns are dynamic, spatially and temporally organized, and always involved in the person's functioning. Multivariate assessments of individuals (to identify how psychological and biological variables of interest are organized into patterns), conducted over many occasions (to identify how these patterns are organized and change over time and contexts), represents a well-established way of studying the person-in-context (and collecting the data necessary to accomplish this).

Behavior episodes (and BES) are units of analysis that are capable of capturing the natural organization of person-in-context (behavior-environment) patterns. We observed previously that every behavior episode focuses attention selectively on those current person and context attributes that will serve the current guiding goal(s) and ignores the rest. Moreover, we noted that BES, which represent organized patterns learned from sets of behavior episodes, are used to organize future behavior episodes. Researchers endeavoring to find common patterns of intraindividual variability across several intensively studied individuals would thus selectively measure or observe person and context attributes salient in behavior episodes or BES that deal with the domain being studied (e.g., career decision making; work values development; vocational identity formation).

Practitioners would essentially follow the same format, studying individuals intensively across several if not many occasions and/or several if not many contexts to identify consistencies in functional patterns (i.e., behavior episode schemata) related to the domain of concern (e.g. indecisiveness; lack of career motivation; lack of career opportunities). Both researchers and practitioners could then construct lawful nomothetic knowledge by aggregating empirically identified, similar idiographic patterns. Application of the significant advances and innovations in quantitative analytical methods within vocational psychology will greatly contribute to the development and utilization of such knowledge.

METHODOLOGICAL ADVANCES

The task of modeling and analyzing complex living systems (persons) as they function and change is daunting. The critical processes involved are person-specific, unlike variables such as socioeconomic status, employment status, or sex, which are typically studied in populations or groups of persons (usually referred to as between-subject variables). Whenever person-specific processes are investigated, however, their analysis must be based on intraindividual variation (Molenaar & Campbell, 2009). To many researchers who have focused much of their attention on studying static attributes using regression-based methods that have been dominant in the

social and behavioral sciences, this raises concerns about how to achieve findings that are generalizable. Their default position regarding generalizability is likely to involve efforts to achieve representative sampling. That approach to generalizability, however, cannot work when one is seeking to ascertain the nature of *processes* through intra-person data because processes are likely to play out differently in different persons who operate in different contexts. Averaging these processes across individuals in a given sample in efforts to find features that are generalizable would be unlikely to produce valid findings.

It is possible, however, to utilize intraindividual variability data and still achieve legitimate generalizability by examining similar patterns of intraindividual variability occurring in various populations or subgroups of individuals. The methodology to accomplish this must be capable of handling multiple individuals, multiple variables, and multiple occasions of measurement to examine not only patterns of intraindividual change and stability, but also interindividual differences in those patterns. Several specific methods that meet these requirements have found increasing utilization in recent years, albeit not in vocational psychology. Virtually all of them employ various kinds of time series data. We will briefly discuss some of the more promising approaches in the following section.

Time Series Analysis

Various forms of time series analysis have found increasing use by behavioral and social scientists in recent years. This is due in part to renewed interest in examining process models (i.e., living systems) and in understanding patterns of change over time. Vocational psychologists who are interested in development (e.g., career development, vocational development, identity development, work values development) or in other change processes are likely to find time series analysis to be an invaluable tool in their research. In collecting time series data on patterns of change over time, however, it is important at the outset to identify the current steady state of the pattern of interest as the reference point (baseline) for examining change. This follows from a fundamental principle of change in living systems, namely, that change and development always begins with a pattern that already exists and that change can only occur by producing modification and elaboration of an existing pattern.

Practitioners are already accustomed to tracking client changes (occurring as a consequence of their interventions) mostly through progress notes (which could potentially serve as data for time series analysis) or other more or less informal means. Time series analysis is ideally suited to assist practitioners in mathematically examining the effects of their interventions (as well as any unplanned changes) providing they have data that can be translated into numerical terms. Other reasons for the increasing popularity of time series analysis are evident in the ready availability of high-speed computing capabilities, the increasing accessibility of software for these analyses, as well as the development of mobile and web-based technologies

that enable high-intensity data collection (which is required in many applications of time series analysis). Utilizing these technologies is cost-effective, both in terms of the effort costs imposed on participants and the financial and effort costs placed on scientists and those funding their work.

Traditionally, researchers in vocational psychology and related fields have placed a heavy emphasis on data collection strategies involving standardized tests or survey instruments, which are appropriate in cross-sectional research. Many of these instruments are not suitable for time series analysis because it is not feasible or practical to ask participants to complete these instruments on many occasions at intervals of short duration. Moreover, when using self-report measures (like those commonly used by vocational psychologists) over many occasions with short time intervals separating them, it is likely that participants will respond on the basis of their previous responses rather than on the basis of their current status (Velicer & Molenaar, 2013). These limitations can be overcome, however, by capitalizing on existing innovations in information technology to capture contemporaneous data.

Mobile and web-based technologies are now available that involve ongoing data collection in naturalistic settings and are far less time consuming and costly than more traditional methods. For example, study participants may be asked to carry small computers or to use smart phones to provide a specific response whenever a certain event occurs (e.g., rate their feelings about their job or their boss when they first arrive at work, in the middle of the work day and at the end) or at random intervals whenever they are "beeped" (e.g., Shiffman, Stone, & Hufford, 2008). Other approaches have been to combine checklist and interview procedures for daily assessments (Almeida, Stawski, & Cichy, 2011) or to use historical data (e.g., Simonton, 1998). One way to incentivize participation in such research is to offer information and feedback to participants. Absent such incentives, obtaining the kinds of data necessary for time series analyses will remain a substantial barrier to advancing science in the career and vocational arenas.

Time series analysis is clearly appropriate for the study of the person-in-context, but as we noted previously, legitimate questions can be raised about how results from the study of an individual can be generalized to groups or classes of persons. Velicer and Molenaar (2013, pp. 644-647) offer a succinct overview of some of the most commonly used approaches to the generalization issue, although they note that these approaches are by no means universally accepted. They start by describing an approach they call *logical inference*, which consists of a qualitative judgment of how many studies supported a particular hypothesis. A second approach to generalization is a *pooled time series analysis,* in which it is assumed that a common transformation matrix is appropriate for all units, thus allowing comparison tests between different units. A third approach, *meta-analysis,* is an analytic procedure that involves combining time-series data from several individual cases. It is similar to the procedure that is commonly used to combine and analyze data from numerous studies, although the use of meta-analysis to combine data from multiple single subject designs is relatively novel and requires, among other things, special attention

to effect size calculations. The fourth approach to generalization is *clustering into homogeneous subgroups*. The most important consideration in using this approach is to generalize from single-subject time series data to homogeneous subgroups rather than to the general population. All of these approaches to generalizing from the individual to the group level have shortcomings even when researchers carefully observe the special conditions that must be met before using any of them.

Velicer and Molenaar (2013) make a strong argument for focusing on generalization across occasions (rather than across individuals) as the most appropriate method. For example, if one were to study the effects of an intervention on job search intensity (using an interrupted time series design), the focus of the analysis would be on the pattern of change over time, i.e., across occasions of measurement. Generalizing across occasions is a procedure that most counselors and clinicians employ intuitively. For example, if client A responded to a specific event occurring under specific circumstances in a particular way, it is reasonable to generalize to a similar event occurring under similar circumstances, but only for client A. To generalize to client B would make sense only if clients A and B had been shown to experience very similar events under very similar circumstances and if client B had shown a similar pattern of responses to such events and circumstances.

Multivariate Time Series Analysis/Dynamic Factor Analysis

When two or more variables are measured or observed on each occasion, Velicer and Molenaar (2013) refer to multivariate time series, where

> the variables may be viewed conceptually as including both dependent and independent variables or just dependent variables. If some of the observed variables are viewed as independent variables, the appropriate analysis is the time series equivalent of an analysis of covariance. If the variables can be viewed as a set of dependent variables, that is, multiple indicators of one or more constructs that form the outcome space of interest, the appropriate analysis would be the time series equivalent of a type of multivariate analysis, sometime described as a dynamic factor analysis (p. 647).

Essentially, dynamic factor analysis is an enhancement (in power and versatility) of P-technique factor analysis that permits the modeling of an individual's observed multivariate time series (Molenaar & Nesselroade, 2012). The technical aspects of multivariate time series analysis are beyond the scope of the present chapter, but they are discussed extensively elsewhere (e.g., Browne & Nesselroade, 2005; Lütkepohl, 1993; Molenaar & Lo, 2012; Molenaar & Nesselroade, 2012; Velocer & Molenaar, 2013). The reader is encouraged to consult these or similar resources to more closely examine the applicability of these methods in vocational psychology and counseling psychology research and practice.

Mixed Methods: Combining Qualitative and Quantitative Methods

Time series data are not necessarily restricted to numerical data. They could also consist of qualitative data such as descriptions of experience, observations, narratives, pictures, or meanings attributed to events or behaviors and described in words or images rather than numbers. Such data have been used periodically by vocational psychologists in their research and especially in counseling research and practice. Since the turn of the century, however, there have been persistent calls for a turn away from emphasizing quantitative research inspired by logical positivism and a shift toward qualitative research inspired by an epistemological orientation known as social constructionism. The underlying rationale for this shift is that "reality is constructed in social and cultural contexts and is difficult, if not impossible, to discern using traditional scientific methods" (Blustein, Kenna, Murphy, DeVoy, & DeWine, 2005, p. 355).

It is not quite clear what Blustein et al. (2005) intended to include in "traditional scientific methods." Scientific methods evolve, and advances in measurement and analysis tools have produced a circumstance in which behavioral scientists can avail themselves of more varied and powerful methods than ever before (Nesselroade, 2010). Measuring the distance to the moon was thought to be impossible at one point in time, as was conducting live observations of brain activation patterns. If "traditional scientific methods" is meant to refer to methods favored in the 20th century, it may well be appropriate to be concerned about the prospects of progress in understanding the individual-in-context. In the 21st century, however, more advanced methods that continue to evolve and others that are yet to be invented, may very well make possible what may seem impossible (to some) at the present time.

Savickas (2001) reminded us that Edwards and Cronbach (1952) long ago called for the programmatic application of both qualitative and quantitative methods in psychotherapy research. Thus, the quest to innovate and advance both quantitative and qualitative methods is the continuation of a long, albeit uneven tradition. Today, many researchers in human development, medicine, and psychology believe that using both qualitative and quantitative methods (i.e., mixed methods) offers the best opportunity for acquiring a deeper understanding of human behavior and development in context (e.g., Axinn & Pearce, 2006; Savickas, 2001; Tashakkori & Teddlie, 2003). This argument is buttressed by the fact that "behaviors or contexts relevant to human development are not inherently qualitative or quantitative, but the methods of representation through which behaviors or contexts are recorded in research are" (Yoshikawa, Weisner, Kalil, & Way, 2008, p. 345).

It would thus be more appropriate to refer to quantitative and qualitative data on the one hand, and quantitative and qualitative methods of analysis on the other. For example, even when counselors or clinicians collect qualitative data through interviews, observations, or case studies, they often do statistical (quantitative) analyses (Tashakkori, Teddlie, & Sines, 2013), although a variety of qualitative analyses could also be at their disposal (e.g., see Blustein et al. 2005; McIlween,

2008; McMahon, Patton, & Watson, 2003; McMahon & Watson, 2009). One way to increase not only the collection of qualitative data but also their analysis using qualitative methods would be to ensure the application of rigorous standards for conducting and reporting such analyses. A recent content analysis of qualitative empirical studies in career development suggested that there is room for considerable improvement in these areas: More often than not, standards of academic rigor and procedures were either not followed or they were not reported (Stead et al. 2012).

The collection of both quantitative and especially qualitative data has been greatly facilitated by social networking products like Facebook, which offer a wealth of quantitative and qualitative data captured over time. Depending on the degree of a user's activity, the data may be captured in near real time. In combination with global position satellite (GPS) technology, the goal of capturing participant data across time, space, and social groups becomes entirely possible.

Data collection efforts by firms like Facebook have catapulted ahead of many social science efforts largely because they were able to couple software and hardware innovations into a product that incentivizes users to provide time, space, and information in a way never seen before in the history of the human race. The technology also permits making inferences on the basis of social network information. For example, a user may identify friends who share a strong focus on sports in their personal profiles. Even if the target user does not include sports in their profile, the context of the social network suggests that the user may have an affinity for sports.

This paradigm has been translated into Facebook Graph Search (http://en.wikipedia.org/wiki/Facebook_Graph_Search), which delivers search results less on the basis of matching keywords and more on the basis of shared "friends," similarity of profile content, and shared locations detected by GPS enabled devices. Using this technology to conduct a search on "leisure activities", "work", and "retirement" could provide interesting data inferences for the target user of Facebook who may never have posted any personal information about these topics on their Facebook page. (We are not necessarily endorsing these methods of data collection but note that collection efforts of this type are pervasive and likely to grow in the future.)

Types of studies for which mixed methods are appropriate. Multiple and complementary methodologies (i.e., mixed methods) may be the methods of choice for answering specific questions, especially when the study involves examining developmental pathways and the contexts of children's and adolescents' development (Goldenberg, Gallimore, & Reese, 2005), particularly given the advent of technologies and products that engage them in the ongoing collection of information. Yoshikawa et al. (2008, pp. 345-348) described six specific circumstances in developmental science that call for mixing qualitative and quantitative methods. Specifically they suggested that mixing methods may be appropriate and necessary when:

– the study involves assessing developmental or contextual constructs that are difficult to measure using quantitative or qualitative data alone;

– the aim is to integrate the study of beliefs, goals, and practices in socialization and development;
– the study involves estimating or understanding developmental change at multiple time scales;
– examining reciprocal relationships between contextual and individual factors;
– exploring causal associations and their mechanisms;
– integrating the study of developmental phenomena that occur with high prevalence with those that occur in isolated cases.

Although it is readily apparent that many of these circumstances are likely to occur in the study of vocational development from a living systems perspective, readers should consult Yoshikawa et al. (2008) for a much more detailed discussion of these issues.

When conducting studies that have foci such as those described by Yoshikawa et al. (2008), it would be appropriate and useful to plan the utilization of mixed methods from the outset. In other situations, however, the need for mixed methods may become apparent only after the study has produced initial findings that are unexpected or difficult to interpret. There are, in fact, several possible configurations of mixed methods utilization.

Types of mixed method designs. Tashakkori et al. (2013, p. 434-443) have described four types of mixed methods designs, which they refer to as "sequential, parallel, conversion, and fully integrated." In the *sequential design* the initial data collection and analysis (which could be either qualitative or quantitative) leads to inferences that necessitate a second strand of data collection and analysis. It relies on quantitative data if the initial strand was qualitative and on qualitative data if the initial strand was quantitative.

In the *parallel mixed methods design*, both quantitative and qualitative data and analyses are carried out relatively independently to answer research questions which are judged to require both approaches. Findings are then integrated to produce a more complete answer to the research question than could have been obtained using either approach alone.

In the *conversion mixed methods design*, qualitative data (often collected, coded, and analyzed quantitatively in clinical or counseling situations) are analyzed using both qualitative and quantitative methods, with inferences made and conclusions drawn on the basis of both methods. Finally, in the *fully integrated mixed methods design*, the parallel, sequential, and conversion mixed methods may be used in combination in an interactive and dynamic manner.

Any of these mixed methods approaches, utilizing both qualitative and quantitative data, and analyzing the data using appropriate quantitative and qualitative methods, are well suited to be utilized in a theoretical/research framework that uses behavior episodes as the basic unit of analysis. To illustrate, we adapt an example from a study of social competence presented by M. E. Ford (1987, pp. 199-233).

Using Behavior Episodes to Study Career Competence

Based on the LSVD theoretical framework, a researcher interested in establishing the relative likelihood of an adolescent achieving her career goals could define a construct of *career competence* as *the attainment of desired career goals in specified socio-economic environments, using appropriate means and resulting in positive career development outcomes*. Working collaboratively with the adolescent, a detailed definition and assessment of career competence would be accomplished by:

- articulating the adolescent's desired consequences (goals);
- specifying the environmental/contextual circumstances within which the goal(s) is to be attained;
- establishing the various means that can be used to achieve the goal(s), and
- evaluating the personal and career consequences of such goal-directed behavioral patterns for future functioning.

Using the behavior episode as the basic building block for assembling a comprehensive picture of the adolescent's career competence would require an initial assessment of her career-related goal pattern. Recall that goal patterns are operative in any given behavior episode, and that people create goal hierarchies to organize their goal patterns in such a way that the accomplishment of various sub-goals leads to the fulfilment of larger goals. Goal hierarchies that are detailed and well thought out are likely to be more effective than hierarchies developed around vague and general goals.

Interviews or counseling sessions may be most effective in helping the adolescent achieve a sound understanding of her career goals and how these are related to other important personal goals. This could result in a rich trove of qualitative data.

Structured, individualized procedures like M. E. Ford's (2010) *Assessment of Personal Goals* could produce complementary quantitative data. Traditional instruments for the assessment of vocational interests and work values could also provide useful information for helping a person to clarify and articulate career-related goals and for producing useful information for their analysis.

Context/environment assessment. Because behavior episodes are person-in-context units, an assessment of the context/environment within which the person is likely to be operating is also necessary. In Chapter 2 we noted that contexts (with which the person directly interacts) and environments (which may indirectly affect a person's functioning) may represent barriers to or opportunities for goal directed behavior. Thus, if the adolescent in our example wishes to achieve a particular career goal, she must select or shape, and selectively use a context/ environment that does not represent an insurmountable obstacle, but more importantly, one that offers an optimal opportunity to achieve her goal.

The assessment of behavior-in-context has often been viewed as so difficult as to preclude meaningful quantitative research. There have been promising efforts,

however, to use mixed methods in assessing, for example, "ecocultural context enablers and constraints" on literacy development in Latino children (Goldenberg et al., 2008, p. 25). Goldenberg and colleagues looked at activity settings and daily routines as the unit of analysis and focused on who the child is with during various times of the day, what they are doing, and "what kinds of purposes organize and structure their interactions". Clearly, the analysis of behavior episodes and BES could follow a similar methodology.

Assessment of resources that could aid goal achievement. This assessment domain pertains to the means the adolescent can mobilize to achieve her goal(s). For example, if her goal is to become an aerospace engineer, she must have a context/environment that offers an opportunity to study engineering, and one that is supportive of that goal (e.g., supportive parents and available financing). She must also have the requisite skills and capabilities to work toward achievement of her goal. There are many measures of such means that would be useful for assessing them, either through standardized tests or through individual, qualitative assessments, depending on the specific purpose of the assessment, be it for research or for counseling interventions.

It is important to note that when we speak of skills, capabilities and other means, we are not referring to the adolescent's beliefs of whether she possesses the requisite means, which would ordinarily considered to be self-efficacy beliefs (e.g., Bandura, 1982; Lent et al., 1994) or capability beliefs (e.g., M. E. Ford, 1992; M. E. Ford & Smith, 2007). Similarly, when considering the relative supportiveness of the context/environment, we refer to the *actual* opportunities and resources available and not to the adolescent's context beliefs. As noted previously, both capability and context beliefs are important components of a person's motivational patterns (as are goals and emotions) (M. E. Ford, 1992), which ultimately represent an important determinant of how successful a person's goal pursuit can be. Moreover, the relationships between objectively assessed skills and capabilities and the person's beliefs about her skills and capabilities represent potentially useful information in the analysis of career development processes and in determining person-specific career interventions.

As noted in Chapter 2, when the guiding goals of a behavior episode are achieved, evaluative processes result in positive thoughts and emotions such as satisfaction and pleasure. Behavior episodes that are successfully concluded thus form the foundation of adaptive learning because they are most likely to be repeated, whereas behavior episodes that fail to be concluded successfully are often not likely to be repeated. By examining a person's history of positively evaluated behavior episodes, as was done in Chapter 4, it is possible to identify potential promising career pathways.

Beyond traditional measures and means of research and evaluation, the advent of social networking platforms like LinkedIn and Facebook can enable clients and counselors to assess and leverage their social resources in unprecedented ways. The InMaps technology offered by LinkedIn is one example of how a person's

professional contacts can easily be transformed into a visual display of one's professional social network. This depiction can reveal meta/latent opportunities that emerge from networks like, for example, a cluster of colleagues who know one another. A deliberate consideration of each person in a professional contact list would not necessarily reveal powerful opportunities to advance one's career that exist at the level of the network. Like the earlier example of Facebook Graph Search, emerging technologies offer access to and use of a persons' time, space, and social network data in a way that one or two decades ago seemed like science fiction.

The collection of both qualitative and quantitative data and the leveraging of readily available technologies that people use on a daily basis are likely to offer a more comprehensive picture of the individual's career development and life design than either kind of data alone. Moreover, the combination of qualitative and quantitative analyses (i.e., mixed methods) and associated applied technologies are likely to result in findings that are richer, more nuanced, and more useful for theorists, researchers, counselors, and people moving along their career pathway.

CHAPTER 6

EPILOGUE

The articulation of our Living Systems Theory of Vocational Behavior and Development (LSVD) is a work in progress, although we believe that it represents a serious attempt to outline the concepts and propositions that must constitute a comprehensive theory of vocational behavior and development. It is no accident that the foundation for this work is D. H. Ford's (1987a) Living Systems Framework (LSF), a comprehensive framework of human development and functioning, because any comprehensive theory of vocational behavior and development must link this important domain of human functioning to all other domains. Vocational behavior and development do not occur as a consequence of person parts like interests or self-efficacy, or in isolation from the biological affordances and limitations that are unique in every individual; nor can they be considered apart from family circumstances, social lives, or the variety of contexts represented by communities and economic conditions. In short, the complexity of person-in-context functioning is daunting and has contributed to the reluctance of vocational psychologists to embrace integrative and comprehensive theorizing.

While Super (1994, p. 72) may have been correct in stating "each researcher and practitioner now has a choice between Vondracek's complexity, Holland's simplicity, and this [his] multiplicity of simplicities", it is worth noting that at the time, the internet was in its infancy and "systems thinking" was just beginning to resonate among social and behavioral scientists. Today, it is widely recognized that we live in a new age of complexity (e.g., Wheatley, 1999), and accelerating change processes are "creating a completely new world in which the mastering of complexities will be the key challenge" (Schwab, 2011). Consequently, choosing simplicity or even a multiplicity of simplicities may no longer be reasonable in this new age of complexity and the emerging technologies to cope with and comprehend it. Ultimately, however, those who are perplexed by complexity may find relief in Winston Churchill's prediction that "out of intense complexities intense simplicities emerge."

We are aware, of course, of the risks involved in trying to present something as complex as LSVD in a format that is broadly accessible and which, by necessity, favors brevity. Many ideas could not be fully developed and others were greatly abridged as a trade-off for greater accessibility. We decided to proceed, nevertheless, because much more extensive treatment of the underlying meta-theoretical framework is available in the almost 800-page original presentation of the LSF (D. H. Ford, 1987a) and in subsequent elaborations (M. E. Ford, 1992; D. H. Ford & Lerner, 1992). Those works should continue to be valuable resources to scientists

and practitioners wishing to pursue the direction suggested in the preceding pages. Indeed, it will require years of dedicated effort by many to realize the potential offered by a comprehensive theoretical framework such as LSVD. In spite of the difficulties inherent in accomplishing this, we predict that the contemporary Zeitgeist and the current paradigm shift in science and in the application of science make eventual success in this endeavor all but inevitable.

We were mindful throughout that we wanted to reach scientists as well as practitioners and that we wanted to encourage them to utilize the LSVD in their respective domains. While the scientist/practitioner model in psychology has in many cases been eclipsed by training models that are more research oriented on the one hand and more practice oriented on the other, we firmly believe that science must inform practice and practice must inform science. For that to actually work, scientists/researchers and practitioners have to share a common language and terminology. In other words, if they can employ a common theoretical framework and conceptualize their work using common concepts and process models, it will greatly facilitate the achievement of progress in both areas. It is our hope that the LSVD can serve as a common framework for science and practice in vocational psychology and related areas. At the same time, we do not envision the LSVD as replacing other prominent theories and models in the field. Instead, we would like the LSVD to be seen as a potentially unifying framework that is capable of incorporating concepts and empirical findings obtained from differing perspectives, e.g., what Super (1994) called "segmental theories." Moreover, we believe that the further development and use of the LSVD in vocational and counseling psychology would strengthen connections to other fields that are already more advanced in their acceptance of systems models (e.g., developmental psychology, biology, and medicine).

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INDEX