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Time and adaptation

The Concept of Time in Rehabilitation and Psychosocial Adaptation to Chronic Illness
and Disability: Parts I and II

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The Concept of Time in Rehabilitation and Psychosocial Adaptation to Chronic Illness and Disability

Arguably, the most enigmatic of all human experiences may be the perception of time. Yet, time has also been viewed as the essence of human existence (Bergson, 1971; Kelly, 1955), as universally human (Doob, 1971), and as permeating all of human experience (Cottle & Klineberg, 1974; Melges, 1982). According to Zimbardo and Boyd (2008), time is the most common English noun (whereas year and day are ranked third and fifth, respectively). Time is also intimately interwoven into the most fundamental human perceptions of the internal and external worlds, such as causality, change, growth, maturation, order, self-awareness, and goal directedness (Frank, 1939; James, 1890; Kafka, 1973; Melges, 1982; Slife, 1993). It is therefore of ultimate importance for the meaning and significance we assign to events, objects, and other people (Sherover, 1975).

Still, many centuries of philosophical and psychological speculation and research have failed to resolve the ultimate time-related question, namely, is time a product of the mind (i.e., it is internally-derived, linked to one level of consciousness, and therefore phenomenologically-experienced) as Plato, Immanuel Kant, and Georg F. C. Hegel claimed, or is it rooted in the external world and, as such, is absolute and a product of the universe at large as Rene Descartes, John Locke, and Isaac Newton argued. Regardless, time is the *prima facie* of perceiving and experiencing nature. It is the, according to Kant, universal and fundamental form of all human sensibility. Indeed, it is that *sui generis* concept that is found not only between all events but mostly within all events, and as such is inseparable from space (Davies, 1995; Greene, 2004; Sherover, 1975).

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Time also plays an immeasurably important role during rehabilitation and adaptation to chronic illness and disability (CID). It has been linked, both indirectly and directly, to such concepts as: the process of adaptation (e.g., the arguable existence of universal or individual-linked stages or phases of adaptation), coping with CID-triggered stresses (e.g., anticipatory coping, coping with presently experienced crises, coping with the aftermath of CID), response shift models regarding reconstruction of past experiences and perceptions, and the impact of psychiatric disabilities (e.g., anxiety, depression, schizophrenia, personality disorders) on time orientation. To better appreciate how the understanding of time and its various aspects can facilitate the understanding of psychosocial adaptation to CID, the present two-part paper first seeks to (a) provide a brief review of the nature and structure of time and (b) explore the role that time plays in personality theories and therapeutic approaches. These areas are examined in part I of the paper. In part II the discussion reverts to a more rehabilitation-oriented domain and, accordingly, the second part: (a) briefly explores the literature on time, death, adaptation, and coping, (b) reviews the literature on the relationships between time and psychopathology, and (c) concludes with discussion of the complex relationships between the passage of time and psychosocial adaptation to CID, including a brief synopsis of interventions modalities recommended for time distortions.

The Nature and Structure of Time

Humans typically view the concept of time as reflecting three separate, albeit dynamically interconnected, phases, namely, past, present and future. The complex interplay among these three phases can be appreciated from the fact that an event that has not yet occurred (future), is destined to be experienced at a certain point of time (present),

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and eventually it fades into memory (past). Put differently, personal experiences, although belonging to all three time perspectives, ultimately are anchored in one only, the past. This unavoidable phenomenon stems from the simple order of life events, that whereas the future is “unknown” and certainly unpredictable, and is mostly fraught with either positive (e.g. hope, fantasies) or negative (e.g., anxiety, dread) anticipation, and the present is evanescent and continuously changing, the past, as the reservoir in which memories dwell, affords the individual the stability and immutability of reassessing life events (Cottle & Klineberg, 1974; Doob, 1971; Frank, 1939; Zimbardo & Boyd, 2008). Hartocollis (1972) further suggested that whereas the future can only be understood in terms of “potentialities” and is therefore avoidable to a degree, it is also the harbinger of anxiety. The past, in contrast, reflects events that have already occurred. It is therefore an inescapable and unavoidable finality. As such, it is often associated with experiences of depression and guilt (e. g., grieving lost opportunities, unfulfilled relationships, physical abilities).

The passage of time, however, transcends any simplistic efforts of demarcation into these three primary phases. Regardless of how static or dynamic this tri-modal separation of time is, or how reasonable it appears to be, it still masks some very important and complementary influences among its aspects. For example, a distinction is often made between objective and subjective time (Adam, 1990; Edlund, 1987; Hartocollis, 1972; Henley et al., 2003; Melges, 1982; Pollock, 1971; Rappaport, 1990; Slife, 1993; Whitrow, 1987/2003). Objective time is typically equated with geophysical, public, rational, measureable clock-based, Newtonian time*. This time is conceived for the most part as linear (“the arrow of time”), continuous, uniform, universal, and

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reductionist (for a comprehensive review of the assumptions underlying objective time, the reader is referred to Slife, 1993). This time exists independently of human consciousness. Still, even objective time is not viewed uniformly by all. Whereas classical, deterministic (i.e., both Newton's and Einstein's) physics posit that the past and the future are solidly anchored into the present, quantum mechanics is based on a set of laws maintaining that predicting events in the future can only be *probabilistically* envisioned and occurrences of the past can only be *probabilistically* reconstructed (Greene, 2004).

Subjective time, in contrast, may be conceptualized as non-uniform, internally-determined; private; experiential; affected by fleeting perceptions, emotions, and cognitions; is inherently elastic; and is partially determined by socio-cultural influences and values (Adam, 1990; Edlund, 1987; Melges, 1982; Slife, 1993). It is therefore, "felt time". Accordingly, within subjective or psychological time, the experience of duration and flow of time may be shortened or extended, sequencing and ordering of events may be reversed, and as often experienced, thought processes can reverse to accommodate past events as well as be launched forward into the future (Frank, 1939; Melges, 1982; Piaget, 1969). Subjective time, therefore, does not conform to the more traditional orderly yet simplistic linear progression of clock time (past → present → future), but instead allows for a complex and often unpredictable interaction among various time aspects. The past, within the contest of subjective time is not a passive and immutable reservoir of memories but a sizzling and dynamic platform that is continuously changing as re-emerging personal recollections reinterpret its contents (Berger, 1963; Cottle & Klineberg, 1974; Edlund, 1987). In a similar vein, anticipation and expectation of future

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events, both positive (e.g., hopes, desires) and negative (e.g., fears, concerns), may affect the perception of meaningfulness of the present time as they serve to motivate or stagnate certain experiences and behaviors, and even the interpretation and reorganization of the past (Cottle & Klineberg, 1974; Edlund, 1987; Frank, 1939). Subjective time, then, is influenced by psychological defense mechanisms such as repression, distortion and denial (Pollock, 1971). It further allows us to project our lives into the future and also trace it back into the past (Edlund, 1987). As such, subjective time and meanings attributed to time-linked concepts are influenced by, and change with, age and life stage (Fingerman & Perlmutter, 2001; Lang & Carstensen, 2002; Lessing, 1972; Lomarz, Friedman, Gitter, Shmotkin, & Medini, 1985; Mello & Worrell, 2006; Shmotkin, 1991; Zimbardo & Boyd, 1999), social factors such as social goals and social comparisons (Carstensen, Isaacowitz & Charles, 1999; Jonas & Huguet, 2008) ; and even employment status (Feather & Bond, 1983; Bond & Feather, 1988; Martz, 2003). The subjective assessment of time has also been theorized to be linked to the type and extension of personal goals, such that expansive appraisal of the future is associated with the selection of long-term goals, notably the pursuit of knowledge-based goals while focus on the present is related to the selection of short-term goals, mostly of the affective domain, including emotional meaningfulness and satisfaction (Carstensen et al., 1999). It is also affected by and linked to a variety of personality characteristics (e.g., Type A personality, aggressiveness, self-esteem, ego control, optimism, motivation; Bond & Feather, 1988; Carstensen et al., 1999; Wessman, 1973) and psychiatric conditions such as anxiety, depression, schizophrenia and certain personality disorders (Doob, 1971; Edlund, 1987; Melges, 1982; Rappaport, 1990; Zimbardo & Boyd, 1999, 2008). Renowned physicists

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such as Albert Einstein and Roger Penrose also recognized the existence of subjective (inner, psychological) time, as a separate entity from objective (outer, physical) time (Davies, 1995). Einstein further viewed time as an intellectual creation of the human mind that serves the purpose of inter-linking life experiences (Slife, 1993).

Finally, the experience of time as a primary psychological functioning has been studied from four separate vantage points. These include: (a) **Time Perception**, which focuses on the individual's ability to estimate or reproduce predetermined time units (several seconds, minutes, etc.); (b) **Time Orientation**, which focuses on the person's preference for temporal direction or orientation (i.e., past, present, or future); (c) **Time Perspective**, which focuses on one's timing and ordering of typically long-ranged (extended) personalized events, such as the projection of oneself into any of the three temporal dimensions and, therefore, functions as a mediator between the present and self and that of the past or future; and (d) Time Attitude, which reflects the person's attitude (negative, positive, neutral) toward the past, present, and future (Dilling & Rabin, 1967; Drakulic, Tenjovic, & Lecic-Tosevski, 2003; Frank, 1939; Kastenbaum, 1964; Nuttin, 1985; Wallace, 1956; Wallace & Rabin, 1960). In research and practice, however, it should be mentioned that clear distinctions among the above points of departure have often been blurred if not ignored all together.

Linear and Cyclical Time

The belief that time progresses in a linear fashion is one of the primary cornerstones of Newtonian physics and Western civilization. This notion was espoused by such philosophers as John Locke (the objectivistic view of linear time or time that exists in the external environment), Emanuel Kant (the subjectivist or phenomenological

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view of linear time or time that exists inside one's mind, and Leibnitz (the notion that both time and space are relative and can be ordered such that the former is a universal order of change while the latter is the order of co-existing objects (Sherover, 1975; Slife, 1993). In contrast, the belief in cyclical time has often been linked to the rhythm of earthly phenomena (the annual seasons) and celestial objects (the periodicity of stars and planets in the night sky). The conflicting views regarding time's linear vs. cyclical nature, in addition to being firmly entrenched in models of the presumed origin and end of the universe**, have also exerted a covert, yet omnipotent psychological impact on the relative importance of the past and the future. The past assumes a special and important role in cyclical models as it is often believed to repeat itself, while the future is accorded a prominent role in linear models as it points mainly in one direction (Whitrow, 1972/2003).

CID applications. The contrast between linear and cyclical time is prominently featured in the various models of psychosocial adaptation to CID, all of which heavily rely upon the notion that adaptation is a dynamic, unfolding and continuous temporal process (Livneh & Parker, 2005; Smedema et al., 2009). Earlier models of psychosocial adaptation emphasized the linearity of the adaptation process (i.e., the so-called "stage" or "phase" models) by maintaining that, following the onset of CID, the ensuing process is predictably composed of universal, uniform and trans-condition psychological experiences, reactions, or responses. It was further assumed that more distally experienced reactions, following CID onset, are securely predicated upon, and orderly follow, the emergence of more proximally experienced reactions. Although not directly addressed by the proponents of these models, it is assumed that it is psychological,

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internally-determined time (rather than objective, rational time) that is at the root of these experienced reactions, their pace, and overall duration. These models, by their very nature, paid little or no heed to spatial (environmental) influences that may interact with these internally-driven reactions.

Cyclical (often referred to also as pendular) models of adaptation to CI, although far less encountered in the literature, have generally sought to address the clinical references to those observed alterations in experiences, as well as ‘identities’ of people with CID. These alterations have spanned the gamut of viewing oneself as healthy vs. ill, disabled vs. nondisabled, engaging in adaptive vs. non-adaptive behaviors, and manifesting coping vs. succumbing attitudes (Charmaz, 1995; Wright, 1983; Yoshida, 1993). According to the pendular models the process of adaptation is comprised of a gradual evolution and reconstruction of one’s identity to accommodate the gained awareness of bodily changes and imposed functional limitations. Adaptation, therefore, does not follow a linear, ordered process but a complex, swing-like series of assimilated experiences and evolving emotions and cognitions.

In sum, then, the various sets of models of psychosocial adaptation differ from one another in their efforts to explain those psychological trajectories assumed to ensue following the onset of CID. The notion of time or, more specifically, that of experiential unfolding, accordingly, occupies a paramount role in the development of these models***.

Time, Space and Change

Time, or more accurately the passage of time, can only be experienced through changes that occur within it (Cottle & Klineberg; 1974; Sherover, 1975; Whitrow,

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1972/2003). Indeed, time has been referred to as the “gatekeeper” or “bookkeeper” of change (Greene, 2004). Regardless if these changes follow a repetitive (cyclical) or progressive (linear, unidirectional) trend, time nevertheless “binds the direction of change” (Sherover, 1975, p. 18). As such, time is intimately linked with the motion of causal ordering or sequencing, and with the concepts of developmental stages and unfolding growth processes. An inherent characteristic of time is therefore that it continually negates the present and creating past of it. This continuity of present negation is what causes change to occur and be perceived as such. Moreover, it negates the “no longer” actual past and similarly the “not yet” actual future (Georg Wilhelm Hegel, in Sherover, 1975). Other philosophers (e.g., Rudolf Hermann Lotze, Robin George Collingwood, in Sherover, 1975) have maintained that past and future do not really exist but are merely psychic projections or ideals of humans’ perception of the world around them. Only the present, as ephemeral as it may be, exists. Yet, the present is, undoubtedly, influenced by both past recollections and future expectations.

Time, in its reflection of change through present negation and, therefore, sequencing of physical or mental events must also be directly linked to the concept of space (i.e., the external world) as the latter is the bedrock of all observed changes. Indeed, such joint time-space (often termed spacetime) attributions have been posited by philosophers (Kant, Locke, Leibnitz, Alexander), psychologists (Carl G. Jung, Kurt Lewin, Jean Piaget), and physicists (Paul Davies, Ernst Mach, Albert Einstein, Brian Greene). Locke and Leibnitz, for example, argued that time and space comprise the internal and inherent sequences of events located in the external world as we perceive it. Kant maintained a somewhat similar opinion, arguing that time and space establish the

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boundaries within which all human perceptions are experienced and attain consciousness. Furthermore, Kant viewed time as the form of “inner sense” while space was seen as the form of “outer sense” in which all human consciousness takes place (Sherover, 1975). Similar views were voiced by Alexander who regarded time and space as “ontologically inseparable” (Sherover, 1975, p.175), together constituting the fundamental essence of the universe, namely, space-time. He went on to suggest that whereas space is the embodiment of stability and often even predictability, time is the creator of change, novelty, development, and therefore, unpredictability.

CID implications. The most obvious implications of the concepts of time and space to understanding CID stem from the work of Kurt Lewin (1936, 1943). Lewin’s socio-psychological or “field” theory maintains that “any behavior or any other change in a psychological field depends only upon the psychological field *at that time* (Lewin, 1943, p. 294, Italics in the original). Put differently, behavior refers to any change in the psychological field. Behavior (B) at a certain time (T) is, then, a function of the prevailing situation (S; at times referred to as E, the environment or the social environment) at that time only. The psychological field, therefore, is comprised of one’s simultaneous psychological past, present, and future (expectations, hopes, plans, fears, wishes, etc.), as experienced at a given time. This present-focused “principle of contemporaneity”, then, highlights the role of holistic interaction among simultaneous events that in turn produce a unique effect on behavioral outcomes (Lewin, 1936).

These initial conceptualizations by Lewin were later applied to understanding the psychology of CID through the work of Roger Barker, Tamara Dembo, Gloria Levitan, and Beatrice Wright who collectively initiated the field of Somato-psychology during the

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early 1950's. In their work, these researchers argued that the person with CID encounters a more limited scope of his or her world (i.e., the world in which one functions becomes smaller). And accordingly, the influences of overt behaviors are restricted to these of a fewer number of people and physical conditions. They further claimed that future time perspective may be affected by the nature of the chronic illness (acute vs. chronic, life-threatening vs. non life threatening) and its associated functional limitations such that acute and life threatening conditions, because of the urgency inherent in their very nature, invariably limits one future time perspective and, therefore, the ability to engage in long – term planning (Barker, Wright, Meyerson, & Gonick, 1953/1977).

A second application of the concept of space-time to CID can be found in the work of Beatrice Wright (1983), whose perspectives on value changes during the acceptance process of CID also invoke the concepts of temporality and the environment. For example, Wright's "transforming comparative values into asset values" suggests that in order to successfully adapt to CID, a shift must occur whereby the person no longer focuses on outer-directed past comparisons (oneself to others) and instead emphasizes present strengths and abilities (inherent in oneself). Likewise, the "subordinating physique" tenet suggests a shift from emphasizing physical normalcy and prowess (past – oriented) to non-physical values (spiritual, social, cognitive) and pursuits (present- and future-oriented).

Finally, a further conceptual implication, related to time and change, stems from the work of Sprangers and Schwartz (1999; Schwartz & Sprangers, 1999) on "response shift". Briefly, response shift reflects changes in the meaning assigned by the individual to self-assessment of certain psychological constructs such as quality-of-life (QOL).

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These changes may result from: (a) a change in the individual's internal standards of QOL measurement (i.e., scale recalibration); (b) a change in the individual's values that indicate a change in the relative importance assigned to various QOL domains; or (c) a redefinition of the construct of QOL (re-conceptualization). It is beyond the scope of this paper to address the finer elements of the "response shift" model (the reader may refer to Bishop, Smedema, and Lee (2009) for a succinct yet excellent review of this model). However, even from the above cursory overview of response shift it should be evident that the concepts of time and change are dynamically interwoven into viewing how people with CID assess re-assess their QOL (including its components of life satisfaction and well-being) at different points throughout their lives following the onset of CID.

Time in the Context of Personality Theories and Therapeutic Approaches

The concept of time, albeit only rudimentary explored, is nevertheless inherent in most personality and human behavior theories of the past one hundred years. The earlier mentioned time-linked concepts of linearity vs. cyclicity, objectivity vs. subjectivity, continuity vs. discontinuity, and reductionism vs. non-reductionism, can serve to better grasp differences among the conceptual underpinnings of personality theories. In this section, a brief description of several of the most prominent personality theories that serve as a backdrop to much of the clinical underpinnings of rehabilitation counseling and psychology practice as they, directly or indirectly, address time will be explored.

Psychoanalysis. The work of Freud and his early followers strongly emphasized:

1. The supremacy of the past or antecedent personal life experiences, in determining present cognitions, emotions, and perceptions. These are reflective of the primacy accorded earlier unconscious determinants

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over later, consciously experienced events. Indeed, psychoanalytic treatment modalities seek to actively induce regression in the client.

These modalities, further, refrain from setting time limits on the length of treatment. Coupled with the “timeless atmosphere” espoused by the free association technique, the client’s feelings and thoughts are consistently oriented toward the past (Masler, 1973; Namnum, 1972).

2. The existence of a continuous, temporal sequence of psychosexual (Freud) and psychosocial (Erikson) stages of development.
3. The gradual emergence of the ego, and later the superego, out of the formless id. Freud (1915/1953) and Bonaparte (1940) further maintained that the unconscious processes that are the hallmark of the id are timeless. It is the emergence of the ego, and later the superego, as autonomous systems of mental operations that are responsible for time conceptualization. The experience and pace of perceived time have also been linked to the lack of fulfillment of the id’s instinctual wishes (time moves slowly) and the harshness of the superego demands and expectations (time moves quickly) (Hartocollis, 1974, 1976; Rapaport, 1951; Slife, 1993).

These principles indicate that most forms of psychoanalytic-based theories regard time as a linear, mostly objective, and generally continuous process (Slife, 1993; Rapaport, 1951). More recent developments within the field of psychoanalysis, ego psychology, and object relations, stemming from the contributions of such individuals as: M. Mahler, H. Kohut, J. Bowlby, K. Horney, E. Fromm, D. Rapaport, and R. Spitz, cast a

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somewhat different light on the earlier, more orthodox conceptualizations. In these more recent contributions, the role afforded to strict temporal determinism of human behavior has been diminished and the objectivist view of childhood psyche has been rejected in favor of a more subjectivist one. In other words, these views acknowledge the importance of simultaneous, reciprocal influences of both interpersonal and environmental factors in shaping behavior (Slife, 1993).

Psychoanalytic thinking posits that the origination of the sense of time can be traced to the nature of the infant-mother relationships (Edlund, 1987; Hartocollis, 1974; Mahler, 1975; Orgel, 1965; Rapaport, 1951; Schiffer, 1978). Furthermore, this imposed postponement of maternally-triggered gratification signifies the infant's first experience of trauma and establishes the prototype for later experiences of trauma (Schiffer, 1978). The periodicity inherent in the hunger (frustration, abandonment) and satiation (gratification, stimulation) cycle that is linked to the absence or presence of the mother establishes the prototype of time experience for the infant (Edlund, 1987; Rapaport, 1951; Wallace & Rabin, 1960). The sense of subjective time, then, first emerges when the ego becomes capable of differentiating between present needs and future anticipation (Hartocollis, 1974). This acquired experience, therefore, creates a cyclical or pendular, rather than a linear flow of time for the infant. These early subjective experiences of time perception later pave the way to the development of a sense of objective time. The gradual acquisition of a sense of objective time is further bolstered during the "anal stage" of psychosexual development, during which the infant timing and increased control over the excretory functions gradually signal ego control over both the passage of

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time and the external environment (Edlund, 1987; Fenichel, 1945; Freud, 1914/1953, 1915/1953).

Behavioral psychology. Orthodox behaviorism, as espoused by the work of Skinner, is firmly rooted in the Lockian tradition that views time objectively and linearly. It is based upon the Newtonian positivistic worldview and as such pays homage to time reductionism (Stimulus → Response chains), linearity (past experiences determine present behaviors), and temporal contiguity (environment antecedents directly influence emitted behaviors) (Slife, 1993; Maddi, 1989). In contrast to psychoanalytic models that espouse linear, temporal, stage-like, and psyche-based determinism, orthodox behaviorism discounts the role played by the stage-like, psychological-triggered, and in general, more complex models of linear time entrenched in the human mind. These Behaviorist views, instead, tend to assign greater weight to the influence of existing (at present) environmental-contextual factors and to more automated, psyche-free mediators of behavior in the stimulus-behavior chains (Melges, 1982).

Cognitive psychology. Cognitive models of human functioning (including some cognitive-behavioral theories such as those proposed by Albert Ellis, Aaron Beck, and Albert Bandura), although still retaining some of the Newtonian time postulates, nevertheless embrace Kantian philosophy and as such place more emphasis on the role played by phenomenological aspects in influencing human experience. As such, these models deviate from strict adherence to time's objectivity and linearity and allow for greater emphasis on subjective experience (the meditational role of cognitions) and nonlinearity (present perceptions and future expectations may also impact how the past is

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being interpreted). As a result, the deterministic force inherent in the past is diminished (Slife, 1993; Ford & Urban, 1998).

Humanistic and Existential Psychology. As espoused by the works of such contributors as Carl Rogers, Abraham Maslow, Rollo May, Victor Frankel, Irving Yalom, Medard Boss, Ludwig Binswanger and others, these views are derived from the Kantian tradition. They, therefore, embrace the role that subjective time plays in influencing the human experience. The belief in objective, as well as linear time is rejected in favor of that of such concepts as synchronicity (i.e., influences on psychological phenomena and processes can be contemporaneous rather than solely past-determined), teleology (perceptions and meanings of current phenomena can be caused by future intentions and goals), holism (the psyche or the internal world and the environment or the external world are simultaneous components of a holistic context), and transcendence (humans are capable of self-transcendence and are able to exert their “free will” on the world), to name just a few (Ford & Urban, 1998; Maddi, 1989; Rychlak, 1988; Slife, 1993). Put differently, the role accorded to the past (and therefore to determinism) by earlier theories is minimized if not outright dismissed. The emphasis is on the present moment with acknowledgement of the potential contributions inherent in the future. Furthermore, it is the present, as subjectively experienced, and even the future, as subjectively anticipated, that exert influence on the past (Melges, 1982, Slife, 1993). Simple, reductionist, cause-and-effect sequencing is denied. In a similar vein, the quantitative, continuous, and universal nature of time is rejected in favor of non-continuous, largely qualitative (i.e., meaningful, holistic, transcendent) interpretation of time (Slife, 1993).

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In his detailed summary of the various psychological explanations that underlie the temporal paradigms previously discussed, Slife (1993) contrasts the following themes:

1. The objectivity of time: Time as an objective standard for the measurement of psychological experiences vs. time as a context-bound experience where aspects of a dynamic past can be reconstructed from both present beliefs, attitudes, and environmental antecedents as well as expectations and hopes of the future.
2. The continuity of time: Psychological change is continuous, and mostly linear-like in nature vs. change is not a direct reflection of linear and causal influences of past events and can often assume a discontinuous, abrupt, and even chaotic (e.g., therapeutic insights, psychotic breakdowns) nature.
3. The linearity of time: Accurate explanations of present behaviors require that antecedent determinants are unearthed and examined vs. determinants of psychological processes and outcomes need not follow linear reasoning but could be simultaneous in nature, such as when both past experiences and future goals influence present perceptions and behaviors. According to the latter view, then, humans are not passive, simplistic or, at best, reactive agents to past events but instead can also be active agents capable of certain degree of free will, individual choice, self-transcendence, and are therefore holistic, complex beings.

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CID implications. Several implications of personality theory-driven concept of time to people with CID are noteworthy. First, a careful review of time within the psychodynamic model suggests: (a) the importance of the meaning of one's past (prior to onset of CID) as reconstructed in the present (following the onset of CID) and the commensurate search for bringing pre-CID, unconscious meanings associated with health, holism, disability, sickness, pain, etc. under conscious control; (b) focusing on the process of mourning/grieving triggered by the loss of body parts and functions (past-oriented search reenacted in the present); and (c) paying attention to the symbolic parallelism between present-experienced separation anxiety (stemming mostly from bodily losses and removal from familiar environmental settings) and the prototypical roots of anxiety associated with separation from parental figures and other libidinal-invested objects, as well as the often neglected yet potentially debilitating future-oriented anxiety that could threaten future relationships. The process of adaptation to CID, therefore, reflects a symbolic transition from a "normal" or "whole" body, one that represented the past or the "former self", into a new body, one that is indicative of the present (the "present self") and is no longer "complete" or "whole". Such a transition first requires acceptance of the loss and then a period of mourning for the lost of body integrity before mental and affective energies can be reinvested in a new and reconstructed self-image (Livneh & Siller, 2004; Slife, 1993).

Although spanning a wide range of models and therapeutic interventions, from the more radical, orthodox, heavily-deterministic Skinnerian behaviorism that focuses exclusively on stimulus-response chains of observable behaviors to the more social-cognitive model of Bandura that recognizes the important role played by cognitive

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mediating processes, the behavioral approach, nevertheless, still espouses the *learning model* of human behavior. Also, since behavior is viewed as a function of its temporal and contextual (i.e., spatial) contingencies, therapeutic and rehabilitation modalities attempt to modify these earlier links by inducing novel temporal and contextual contingencies (e.g., repetitious exposure to environmental stimuli in order to minimize anxiety and avoidant behavior, re-enactment of behavioral chains to better master new behavioral patterns, progressive reshaping of desired target behaviors through selective schedules of reinforcement, remodeling of new actions, behaviors, and, if appropriate, thoughts). In accordance with these principles, temporal implications to the understanding the psychology of CID, as drawn from behavioral theory, suggest: (a) that observed CID-linked behaviors such as social withdrawal or aggressive acts and, if appropriate, inferred CID-associated thoughts, such as catastrophizing one's condition or developing failure-prone cognitions, are analyzed as to their temporal (past-oriented) antecedents (trigger points) and contextually proximal (present-based) factors, both of which are primed by the rehabilitation professional for direct manipulation and reshaping; and (b) the need to apply techniques that seek to help the person with CID "unlearn" past connections between specific environmental stimuli and behaviors that are no longer appropriate or useful in the context of life with CID while at the same time learn new connections that successfully link present environmental stimuli and appropriately planned future behaviors, goals and plans (Slife, 1993; Stoll, 2004).

Cognitive models of human behaviors and intervention modalities often overlap with those representing the social-cognitive pole of behavioral psychology (e.g., the contributions of Dollard and Miller, Bandura, Rychlak). The seminal work of such

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individuals as Aaron Beck and Albert Ellis, however, deserves a mention on its own.

Cognitive models, in the context of life with CID, typically focus squarely on the mediational role of cognitive schemata, such as belief systems and world views, as they relate to the impact of CID-triggered changes on one's life. Although both Ellis and Beck advocate present-focused interventions, through the use of cognitive schemata to reconstruct present perceptions, their models indicate the recognition of a pseudo-linear chain of events, where the present "belief system" (e.g., the B in Ellis' model) serves to mediate events of the past (antecedents or A) and the future (consequences or C).

Moreover, since strict objective and linear temporal sequencing is rejected, and the subjectivity of human experience is valued, by these models, the influence of the past in these CID-triggered cognitive schemata is no longer viewed as the primary determinant of present efforts to adapt to CID. Instead, present perceptions and anticipation of future outcomes play a greater role in shaping cognitions and emotions that underlie the individual's efforts to cope with the aftermath of CID. Accordingly, CID-oriented cognitive models suggest: (a) identification of present-focused dysfunctional or distorted cognitions (again, failure-prone assumptions), stemming from the onset of CID, that result in distressing emotions (e.g., anxiety, depression, anger) and maladaptive behaviors (e.g., withdrawal, avoidance, hostile actions); (b) implementation of cognitive restructuring and reframing interventions that seek to minimize presently-experienced feelings of anxiety and depression as well as related catastrophizing tendencies; and (c) assignment of homework activities to better plan for the future while taking into consideration its inevitable uncertainty and lack of cognitive structure (Garske & Bishop, 2004; Slife, 1993; Swett & Kaplan, 2004).

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The hallmark of humanistic and related phenomenological models of human existence is their present orientation. The focus is on concerns and issues that the individual (subjectively) experiences *at the moment*. With their departure from Newtonian time constraints and the embracing of time as a synchronous, psychologically-influenced, and transcendental entity, these models view present experiences and phenomenological schemata as undeniably entrenched in past experiences as well as future hopes and expectations. The very nature of transcending clock time bestows the present with venues for freedom and choice and ultimately, the creation of meaning and acceptance of responsibility for one's actions (Rychlak, 1988, Slife, 1993). The convenient separation of time into three distinct constituents of past, present, and future is, therefore, rejected in favor of a holistic, interactive mode of perceiving the world and coping with the experience of CID. As such, the influence of future meanings, hopes and expectations on past recollections and perceptions must be explored and understood. Psychosocial adaptation to CID is, accordingly, deeply entrenched in the individual's phenomenological field and subjectively perceived self-regard. CID-oriented humanistic models therefore espouse: (a) the importance of present-focused phenomenological contexts and moments that underlie one's CID-triggered experiences that result in a *unique* adaptation process where no two reactions (e.g., anxiety, depression, acceptance) are alike, thereby nullifying any semblance of stage or phase theories of adaptation; (b) the necessity, during therapeutic and rehabilitation discourses, of addressing existential topics that often stem from the onset of CID and include anxiety, death, isolation, grief, loneliness, and alienation; and (c) the need to carefully understand how the individual assimilates the meaning attached to the nature and impact of CID at every moment, and

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how that ever-flowing search for meaning comes to influence perceptions of pain, functional limitations and death (Ososkie & Holzbauer, 2004; Slife, 1993).

In sum, therefore, the above approaches, and other individual approaches not discussed in the present context (e.g., Jung's Analytical Therapy, Adler's Individual Therapy, Perls' Gestalt therapy), with the possible exception of orthodox behaviorism, recognize the importance of subjective time in shaping human perceptions, orientations, and in general adaptation to life crises and misfortunes. Time flow, according to these approaches, is marked by its contemporaneous, recursive, and interactive nature of its constituents of past, present, and future. These various approaches, however, paint different shades of the psychosocial adaptation to CID landscape, its ostensible linearity, continuity, and universality. Yet, all these approaches recognize the relative importance of the subjectivity of perceptions of past events, such as the onset, nature, context and impact of the CID on one's adaptive prowess. They also pay tribute to the complex, non-linear, and often synchronous interaction between CID-triggered experiences and perceptions borne out of the past and their assimilation the present. Finally, they all acknowledge the capacity of future hopes, goals, and expectations (often referred to as *teleological determinants*) to influence past recollections of the CID experience as well as presently-assigned beliefs, meanings, cognitive schemata, and emotional tones.

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The Concept of Time in Rehabilitation and Psychosocial Adaptation to Chronic Illness
and Disability: Part II

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In Part II of this paper

Time and Death

Over half a century ago, Heidegger posited that the inevitability of death lays the foundation to how humans perceive and experience time. Time has been described as “the arch enemy of all living” (Doob, 1971, p. 92) and the “enemy of man” (Frank, 1939, p. 293). Similarly, the American philosopher Dewey (1940) termed time as the “destroyer” while Seymour (2002) maintained that bodily deterioration and its eventual death are directly related to the flow of time. Time has also been reflected and symbolized in mythical figures such as “Father Time”, “The Grim Ripper”, etc., and as such has been both feared and hated (Ingram, 1979). It is of interest to also note that even the world of physics, the Second Law of Thermodynamics, often referred to as the Law of Entropy, indicates that all closed physical systems, with time, move into a greater state of entropy (or increased amount of disorder). Put differently, this process indicates the evolution of initially well-organized, dynamic systems (literally reflecting an active mode of functioning) into disorganized, lifeless systems as time goes on (Davies, 1995; Greene, 2004).

Indeed, for humans and most organic (as well as inorganic) matter time is firmly associated with decay and death. Time, therefore, is closely linked to the concept of mortality. Whitrow (1972/2003) maintained that humans’ awareness of their own mortality is linked to their existential anxiety of the passage of time and, therefore, is closely aligned with the unpredictability of the future. Hans Reichenbach (1956) also posited that an inescapable conclusion emanating from the irreversible flow of time is that gradual approach of death. Accordingly, he suggested, death anxiety transforms itself

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into the fear of time. Similar sentiments were also expressed by Fraser (1975) who posited that the passage of time is intimately associated with the inevitability but unpredictability of death, thus necessitating mastery of future contingencies. The future is, then, the harbinger of feelings of anxiety while the past is more likely to offer a safe haven from such fears. The past, however, is not immune from lingering experiences of anxieties as is commonly observed in such conditions as Post Traumatic Stress Disorder and Dissociative Identity Disorder (previously known as Multiple Personality Disorder).

Yet, the fact that death is an outgrowth of human (and all living things) existence also suggests that death, being the negation of life, is therefore necessary for imbuing life with significance, meaning, and direction (Minkowski, 1970). Furthermore, the insatiable human need for denial of death (Becker, 1973, Greenberg, Solomon, & Pyszczynski, 1997; Rank, 1932/1989), is what facilitates living “in the present” while, at the same time, planning for the future (Minkowski). Adopting a clinical view, Cohn (1957) and Orgel (1961), suggest that the rigid rituals commonly seen in people with obsessive-compulsive disorders are a kind of “time machine” adopted to keep the notion of death in abeyance, thus warding off the finality of life.

CID applications. The role that time plays in the context of death can be traced to the notion that CID has been symbolically equated, at least in the psychodynamic literature, with death and dying of certain body organs and functions (e.g., blindness as the “death of eyesight”; paralysis-linked spinal cord injury as the “death of mobility”; Chan, Livneh, Pruett, Wang, & Zheng, 2009; Livneh & Siller, 2004). If, indeed, certain forms of CID are symbolically reflective of death, then it could be argued that the onset of CID further nourishes the universal human fear of death and its symbolic association

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with normal aging and the passage of time. Although much of the available literature in this field was spawned by research on attitudes toward people with CID, the very nature of psychosocial adaptation to CID suggests that coping with the aftermath of life-threatening medical conditions (e.g., cancer, heart disease) embodies the concept of time and its psychological orientation. For example, the literature on coping with cancer frequently contrasts the impact of two sets of coping strategies. At one extreme we find fatalism (i.e., stoically accepting diagnosis and seeking no other information about condition or making no plans to confront its implications) and helplessness/hopelessness (i.e., engulfing oneself with the diagnosis and adopting a pessimistic attitude about survival). At the opposing pole we find the strategy of fighting spirit (i.e., being determined to fight illness by obtaining information and adopting optimistic attitude about its eradication). Cancer survivors who have engaged in efforts to combat the stressful impact of their condition, by demonstrating fighting spirit, have shown remarkable resilience in the face of their often bleak diagnosis. They have coped with their diagnosis and its implications by actively focusing on their present regimens and pursuing future plans to minimize its impact on their lives. In contrast, those who have passively accepted their condition as a “death sentence”, adopted a hopeless view of their future, and lacked the will to actively cope with their condition, were unable or failed to engage in present-focused efforts or set future goals to successfully combat their condition. Their view of time appears to be past-focused (“I’ve had a good life”) and future-truncated (“I avoid finding out more about it”) in its orientation (Greer & Watson, 1987; Watson, Greer, Rowden, Gorman, Robertson, Bliss, & Tunmore, 1991).

Time and Psychiatric Disorders

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A voluminous body of literature exists, that links time perception and/or time orientation with psychiatric disorders. The distortion of time perceptions, be it a contributing mechanism to the onset of psychiatric disorders, a correlate of their manifestation, or a by-product of their nature, is nevertheless an integral part of their symptomatology. This body of literature can conveniently be discussed under four primary headings, namely (a) time perception and anxiety disorders, (b) time perception and mood disorders (mostly depression), (c) time perception and psychotic disorders (mostly schizophrenia and bipolar disorders), and (d) time perception and personality disorders (mostly antisocial personality disorder) (Cottle & Klineberg, 1974; Edlund, 1987; Melges, 1982; Rappaport, 1990; Zimbardo & Boyd, 2008). It is beyond the scope of this paper to fully address the rich literature that was aggregated over the past 60 years. However, the present section seeks to provide the reader with a succinct overview of the major concepts and empirical findings drawn from the available literature.

Time and anxiety disorders. It has been long thought that images of and anticipation of future events carry profound influence on how individuals experience the present (Barlow & Durand, 2009; Cottle & Klineberg, 1974; Zimbardo & Boyd, 2008). When life events render the future unpredictable, uncontrollable, and mostly foreboding, increased levels of anxiety ensue and temporal integration is threatened (Cottle & Klineberg, 1974; Maslow, 1962; Melges, 1982). Threat and anxiety are, therefore, future-oriented and efforts to manage anxiety may, therefore, focus on past time perception and less on future time perception (Krauss & Ruiz, 1967). Empirical findings on the relationships between time perception and anxiety are scarce but appear to lend some support to these clinical observations. Krauss and Ruiz (1967) reported that scores on

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anxiety were indeed negatively correlated with future time perception among hospitalized psychiatric patients. Terr (1983), in a sample of 30 children and adults who experienced a psychic trauma and exhibited a wide range of PTSD-related symptoms, found frequent alterations in perception and memory of time duration and a pronounced belief in foreshortened future perspective. Rappaport, Fossler, Bross, and Gildea (1993), reported that in a sample of older individuals, future time orientation (in the form of seeking meaningful and purposive future life possibilities) correlated negatively with death anxiety, suggesting that in older individuals with lower levels of death anxiety the ability to focus on the future was more intact.

Time and mood disorders. Symptoms of depression commonly include these of: (a) Hopelessness and helplessness; (b) grief, mourning, and preoccupation with loss and failure; and (c) psychomotor retardation that is typically experienced also as a significant slowing of subjective time (Barlow & Durand, 2009; Edlund, 1987; Melges, 1982; Wyrick & Wyrick, 1977; Zimbardo & Boyd, 2008). Feelings of hopelessness point to a truncated or blocked future (occasionally referred to as foreshortened or constricted future time orientation; Gjesme, 1983; Melges, 1982). They also suggest disregard of future plans and goals (Orbach, 1975). Feelings of grief and loss suggest a disproportional focus on the past and its no longer available rewards. Brenner (1974) and Rappaport (1990) further argue that, in contrast to those who experience anxiety (i.e., the feeling that something bad is about to happen), people diagnosed with depression tend to focus on the past (i.e., something bad has already happened) while consideration of a positive past, and especially future, appears to be no longer a viable option to them. In a similar vein, their estimation of the passage of time is often faulty, such that time is

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experienced to be passing too slowly. It is as if in depression the flow of time has slowed appreciably, even ceased its perceived forward movement completely or is even assuming a backward flow! (Rappaport). Empirical findings of these notions (Blewett, 1992; Dilling & Rabin, 1967; Gil & Droit-Volet, 2009; Melges & Fougrouse, 1966; Tysk, 1984) indicate that the perception of the flow of time among people diagnosed with depressive disorders is, indeed, slowed down and may be, further, directly correlated with retarded psychomotor activity and altered level of physiological arousal.

Time and psychotic disorders. Psychotic disorders are commonly exemplified by bipolar disorders and the various types of schizophrenic disorders. In the former group of people with bipolar disorders, clinical reports (Edlund, 1987; Melges, 1982; Mezey & Knight, 1965; Tysk, 1984; Zimbardo & Boyd, 2008) have indicated that an opposite trend to that observed in people with depression where subjective time estimates appear to reflect the experience of rapid flow of time (e.g., racing thoughts) and an over-expansion of future time orientation (i.e., the individual's span of awareness into the future). The latter group is marked by impaired reality testing, disorganized thinking and behavior, and inappropriate affect. Melges (1982), as well as other researchers (e.g., Edlund, 1987) of time perception among people with severe psychiatric disabilities argue that time distortion in these populations may be at the root of the symptoms encountered among people with these impairments. Entrenched in the symptoms that are associated with psychotic disorders is the collapse of the past (e.g., recollection of prior events) and the future (e.g., expectations of events) into the present. Present perceptions, therefore, appear to be timeless, and they are all experienced as equally real (Melges). Moreover, perceptions of inner events (recollections and expectations) are often confused with outer

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events (ongoing perceptions triggered by environmental-based stimuli and events)

(Melges). Time and space, as such, lose their defining dimensionality and are experienced in a disintegrated, fragmented, and dysfunctional manner.

These distortions or disorganization of psychological (i.e., subjective) time typically encompass distortions of rate (duration), estimation, sequencing (ordering) of time, and temporal perspective. They are all manifestations of disorganized thinking (Lehman, 1967; Melges, 1982; Melges & Freeman, 1977; Zimbardo & Boyd, 2008). Indeed, the so called cognitive “primary processes”, those operating forces within the unconsciousness, that we all encounter during dream sequences and that are characterized by chaotic, diffuse, and disorganized mental images (unlike the more mature cognitive “secondary processes” of well-organized, reality-oriented thinking), strongly mimic the experience of timelessness noted in acute psychoses and infancy (Doob, 1971; Freud, 1933/1965; Masler, 1973; Melges, 1982). Empirical findings (Braley & Freed, 1971; Densen, 1977; Dilling & Rabin, 1967; Johnson & Petzel, 1971; Melges, 1982; Wahl & Sieg, 1980) indicated that for a large number of people diagnosed with schizophrenia: (a) time was claimed to “stand still”; (b) clock and calendar time were inaccurately estimated (often overestimated); (c) future time orientation, as compared to that of non-impaired individuals, was of shorter duration, more incoherent, and mostly disorganized; and (d) experiences of timelessness and personal time fragmentation were evident. These manifestations of temporal disintegration have been observed in psychotic episodes such as failing to properly index the past, accurately perceive the present, and logically anticipate the future (Edlund, 1987; Melges, 1982). More recent research findings suggest that time perception distortions may be linked to more generalized lack of temporal

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coordination in the brain and neuropsychological dysfunction (Carroll, Boggs, O'Donnell, Shekhar, & Hetrick, 2008; Carroll, O'Donnell, Shekhar, & Hetrick, 2009; Lee, Bhaker, Mysore, Parks, Birkett, & Woodruff, 2009).

Time and sociopathic personality disorders. Over half a century ago Cleckley (1959) maintained that criminals often fail in, and may even be incapable of, their efforts to pursue long-term goals in an organized, well-orchestrated manner. Cleckley, therefore, speculated that for these individuals a disruption in the processing of present needs and wishes occurs which then interferes with the capacity to envision future consequences. According to several theorists and clinicians (e.g., Melges, 1982; Smith, 1985; Wilson & Herrnstein, 1985), sociopathic behavior is characterized by foreshortened future time orientation or constricted "time horizon". The present-oriented, impulsive efforts of sociopaths (nowadays typically categorized under the most severely impaired individuals with Antisocial Personality Disorder; APA, 2000), to obtain immediate gratification is linked to their inability to anticipate future events along with their consequences (both potential risks and rewards) (Melges, 1982). Empirical findings lent some support to these notions. Hartocollis (1972), for example, reported that on projective tests (e.g., Rorschach, TAT) patients diagnosed with antisocial personality disorders displayed limited awareness of time, most notably of the future and the past. Black and Gregson (1973) also observed a shorter time perspectives in a sample of prisoners when compared to a non-prisoner sample. Trommsdorff and Lamm (1980) observed that, among male adolescent delinquents, future time orientation was less differentiated, less extended, more pessimistic, and more internally-derived than that of non-delinquents. Lilienfeld, Hess, and Rowland (1996), albeit in a sample of undergraduate students, found that

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measure of psychopathic personality/antisocial behavior were negatively correlated with self-report measures of future time orientation, thus lending further support to prior observations that antisocial tendencies may indeed be associated with the ability to successfully process perceptions of the future .

Temporal Adaptation and coping

The concept of temporal adaptation has received only a scant treatment in the fields of health, psychology, and rehabilitation. In its broadest sense it may be conveniently regarded as occupying a continuum whose anchoring poles describe successful temporal functioning vs. temporal malfunctioning (Cottle & Klineberg, 1974; Kielhofner, 1977). The former pole refers to the capacity for a conscious, meaningful, flexible and balanced integration of past experiences and future expectations into present activities. The successful integration of these three temporal aspects is considered paramount to the continuity of life activities and is informed, among other factors, by situational necessities and available personal resources (Zimbardo & Boyd, 1999, 2008). In contrast, the latter pole reflects poor ability to integrate these temporal aspects and results in unsuccessful efforts to organize life activities. It has also been extensively implicated in the development and maintenance of various psychiatric disorders (reviewed later in this paper).

Successful temporal adaptation is further imbued with such fundamental concepts as change (vs. immutability), evolution (vs. stagnation), and dynamics (vs. inertness). Indeed, its essence derives from the notion that adaptation is a continuous process that requires various internal (e.g., emotional, cognitive) and external (i.e., environmental) life adjustments over time and is not a single instant, static concept

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(Vaillant, 1977; White, 1974). The capacity for temporal adaptation also suggests successful coping behaviors with stressful life events and is associated with positive self esteem (Zeidner & Saklofske, 1996). Although there have been many approaches to viewing and classifying coping (e.g., Carver, Scheier & Weintraub, 1989; Lazarus & Folkman, 1984; Tobin, Holroyd, Reynolds, & Wigal, 1989), the notion of temporality appears to fuel much of their content and functional ingredients. For example, in making a distinction between coping and defensive processes while adopting a psychodynamic approach, Haan (1977) argued that the ego processes inherent in defense mechanisms are mostly past-propelled and distort those psychological facets required for present functioning. In contrast, coping processes were viewed by her as future-oriented, while taking account of present needs and the reality of the present situation. In a somewhat similar manner, Nolen-Hoeksema and Larson (1994, 1999) carefully researched the non-adaptive emotional-focused coping strategy of “rumination” (hers is a different approach to coping than Haan’s) and concluded that unmitigated rumination reflects “being stuck” in the past rather than moving forward toward acceptance of the stressful situation (e.g., loss of a loved one). Put differently, it is those negative memories from the past that result in viewing the present more negatively and in preventing active and adaptive problem solving from combating depression. A final example of the intimate link between coping and temporal orientation can be seen in the 5-tier phase classification of coping. According to this classification (Aspinwall & Taylor, 1997; Folkman & Moskowitz, 2004; Livneh & Martz, 2007; Schwarzer & Knoll, 2003), coping efforts can be directed towards: (a) long range anticipated future events (preventive or proactive coping) such as age-linked illnesses; (b) short range anticipated future events

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(anticipatory coping) such as awaiting the results of potentially life-threatening diagnosis; (c) dynamic or crisis-like (present) situations such as facing intractable pain; (d) proximal (immediate) past events (reactive coping) such as the aftermath of a recent car accident; and (e) distal (remote) past events (residual coping) such as dealing with early life onset CID. The above brief review of the temporal aspects of coping is only meant to alert the reader to the importance of realizing the vital role that temporality plays in understanding the functions and contexts of coping.

Time and psychosocial adaptation to CID

The subjectivity and relativity inherent in perceived (i.e., psychological) time are markedly influenced by a host of personal experiences and environmental conditions, including those associated with the onset, nature, progression, and treatment of CID (Livneh & Martz, 2007). Following the onset or diagnosis of CID, the individual must navigate among personal perceptions and recollections of the pre-CID past, current cognitive schemata including coping modalities and novel biochemical, physiological and physical experiences, as well as the uncertainty and unpredictability of the future. The impingement of these perceptual, motivational, cognitive and affective experiences, combine to impact time perception and orientation and, as a result, the process of adaptation to CID. As discussed earlier in this paper, gradual deterioration of bodily processes and functions, and ultimately the sentence of death, are inextricably linked to the passage of clock time. The onset of CID, however, embodies an unexpected discontinuity in the normal progress of physical aging (Seymour, 2002). CID, therefore, disrupts the passage of both physical and psychological time, results in disorganization of temporal adaptation, and is a concrete testament to the vulnerability of the human body

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(Keilhofner, 1975; Seymour, 2002). With its associative symbolism of death, time assumes a far more urgent role in the lives of people with CID (Adam, 1990; Seymour, 2002). Indeed, Seymour maintained further that “living with a disability is living a life dominated by time” (p. 138).

The notion that normal time flow is disrupted by the onset of CID further suggests the following corollaries. First, with the disruption of the passage of time the individual’s future time perspective, along with personal expectations, hopes, and wishes is likely to undergo a foreshortened flow of time since the future is no longer a “safe place” for psychological dwelling (Kielhofner, 1977; Lilliston, 1985). Second, with distorted time flow, uncertainty about and unpredictability of one’s future, even the proximal future, permeate the entire process of psychosocial adaptation to CID (Seymour, 2002). Third, with the impact of traumatic CID, the subjective experience of time becomes mostly present-oriented with time flow moving gradually slower (recall discussion of depression and the perception of time). Further, leading to temporal disorientation are the often associated experiences of pain, the disruption of the normal sleep/wake cycle, and preoccupation with present bodily sensations and functions (Lilliston, 1985). Fourth, with the resultant uneven temporal flow, the onset of sudden CID frequently leads to distortions of “daily life spaces” because of both the amount of time that is now demanded to accomplish daily activities and the imposed necessity for domestic, social, and vocational changes (Keilhofner, 1977). Fifth, if following the aftermath of sudden onset CID (e.g., SCI, TBI) treating the condition necessitates acute care environment, the affected individual is likely to experience disorientation in time and space because of severe mobility restrictions, continuous sensory deprivation, side effects of medication,

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and interrupted sleep-wake cycle associated with the dispensation of various medical procedures and regimens (Trieschmann, 1988). Finally, since time can be regarded as the mediator between past health status (e.g., wellness, physical intactness, order) and the present CID (e.g., illness, disorder status, chaos), it is also capable of mediating between present feelings of experienced emotional turmoil and the reconstruction of an ordered and more controllable future. Indeed, the ensuing rehabilitation process following the onset of CID may be viewed as the re-embracement of time (Adam, 1990, Seymour, 2002).

Unlike the large body of literature aggregated over the past several decades on the relationships between time orientation and/or time perspective (the two are inexplicably treated interchangeably in the empirical literature on CID) and psychiatric disabilities, empirical data on time orientation and perspective, and psychosocial adaptation to physical CID are scarce at best. In the following paragraphs an attempt is made to summarize these findings. Before doing so, however, it is important that the reader becomes acquainted with those instruments typically applied to measuring time.

The two most frequently used measures are (a) the Zimbardo Time Perspective Inventory (ZTPI; Zimbardo & Boyd, 1999), and the Future Time Orientation Scale (FTOS; Gjesme, 1979). The former measure is a 56-item questionnaire that is composed of five scales that depict the respondent's preference for experiences that are temporally-related (past, present, or future time). Past perspective is divided into two scales, namely, Past Negative (i.e., reflecting an aversive view of the past) and Past positive (i.e., indicating a positive recollection of the past). Present perspective is also broken down into scales. These are Present Fatalistic (i.e., characterized by resignation toward fate and

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holding mostly a negative orientation toward the present), and Present Hedonistic (i.e., depicting a pleasure-oriented, risk-taking attitude toward present life). Finally, the Future scale reflects a goal-oriented attitude toward the future. The second measure, FTOS, is a 14-item instrument that focuses on the respondent's general concern and personal involvement with the future. Lower scores are typically indicative of foreshortened sense of future while higher scores suggest greater orientation toward the future. In addition to these two measures, other instruments have been also infrequently used to address temporal orientation. These include researcher-developed (a) projective scales such as story telling/writing measures, and (b) ad hoc temporally-constructed items selected specifically for that study.

Past time orientation/perspective and adaptation to CID. As discussed above, according to Zimbardo and Boyd (1999, 2008), past time orientation can take the form of either positive or negative valence****. Two studies reported findings on the relationship between scores on the ZTPI and psychosocial adaptation to CID. Hamilton, Kives, Micevski, and Grace (2003), in a sample of older people with cardiac disease, reported that participants who scored higher on positive past orientation also engaged in more health-promoting lifestyle activities and experienced higher levels of spiritual growth. In contrast, those individuals who scored higher on negative past orientation coped poorly in managing their stress. In a sample of people with diabetes, Livneh and Martz (2007) found that positive past orientation was associated with lower levels of anxiety and depression and also with higher levels of psychological adjustment, while negative past orientation was related to higher levels of depression and anger. Finally, in a comprehensive study that sought to examine temporal orientation among people who

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experienced major life traumas (i.e., adult women who experienced childhood incest, war veterans, and survivors of fire-damaged residences), and using responses to open-ended semi-structured questionnaire, Holman and Silver (1998) reported that participants who were past-oriented, also experienced higher levels of distress. An additional observation of interest was that past orientation was linked to temporal disintegration at the time of the traumatic experience. Put differently, those for whom, during the traumatic insult, present perceptions were isolated from both the past and the future (and thus experienced interference with normal assimilation of the traumatic event into their ongoing mental processes) were found to be “stuck” in the past and experience higher levels of distress.

Present time orientation/perspective and adaptation to CID. As discussed, present time orientation has also been divided into two separate, affectively-based dimensions by Zimbardo and Boyd (1999, 2008), namely, pleasure-oriented or hedonistic and resignation-oriented or fatalistic. In their study, Hamilton et al. (2003) found that among cardiac rehabilitation patients present hedonistic orientation was positively associated with health-promoting practices and more intimate interpersonal relations. Livneh and Martz (2007), investigating the relationships between time orientation and psychosocial adaptation in a sample of people with diabetes, reported that hedonistic present orientation was positively and significantly related to successful adjustment while fatalistic present orientation was positively and significantly linked to measures of anxiety, depression and anger, and negatively to psychological adjustment. Using items derived from the Hypertension Temporal Orientation scale (Brown & Segal, 1996), and adopting these items to experiences by individuals diagnosed with osteoarthritis, Alberts and Dunton (2008) examined the relationships between time orientation and illness

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management strategies. Results demonstrated that among older women with osteoarthritis, focus on the present was associated with less proactive illness management coping (i.e., fewer efforts at planning for future benefits) and greater reliance on reactive coping strategies to manage the illness and its symptoms (i.e., focusing mostly on immediate benefits to remove threats and improve symptoms).

Future time orientation/perspective and adaptation to CID. FTO guides many of our psychological processes and functions and is further associated with the development and maintenance of mental health, life satisfaction and perceived well-being (Holman & Silver, 1998; Lewin, 1943; Melges, 1982). Reasonable FTO affords the individual the ability to engage in preparatory behaviors during the present; however when the individual's focus is on the highly remote future the needed present urgency and potency of planning for the future may be lost (Frank, 1939). FTO may not represent a unitary construct but may be comprised of at least two independent aspects, namely, *extension* and *coherence* (Wallace & Rabin, 1960). Whereas the former refers to the quantitative length or span of projected FTO, the latter refers to the logical structure or organization of anticipated events during the future. Three essential factors that have been introduced to explain FTO development include: motives (motivational), delay of gratification (impulse control/affective), and ability to use symbols to conceptualize the future (cognitive) (Gjesme, 1983; Heckhausen, 1977; Nuttin, 1985). FTO, then, refers to the degree of involvement in the future; it is a set of subjective expectations and beliefs about one's future.

In one of the earliest studies that sought to examine the role played by FTO in coping with CID, Agrawal and Pandey (1998) obtained data from a sample of 22 women

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diagnosed with a variety of chronic conditions including cancer, diabetes, cardiovascular diseases, and asthma. FTO was assessed with a combined approach of story writing technique and a semantic differential scale. Results showed that FTO was positively related to measures of optimism, life satisfaction and adaptive coping strategies (e.g., acceptance, planning, positive reinterpretation). Similar findings were reported by Anubhuti (2008), also using a semi-projective technique of story writing to assess FTO. In that study, 30 individuals with Type II diabetes provided data on quality of life (QOL) and life satisfaction. Those who with higher scores of FTO also reported high levels of life satisfaction and perceived social support (one of the QOL measure subscales). The author interpreted these findings as suggesting that the cognitive and motivational aspects of FTO are associated with such personal attributes as hope and optimism, thus resulting in greater perceived life satisfaction.

In their study of individuals who underwent cardiac rehabilitation, Hamilton et al. (2003) reported that those who scored higher on the ZTPI Future Scale also engaged in more responsible health promoting behaviors. This relationship, however, was no longer statistically significant once socio-demographic variables (e.g., chronological age) were controlled for. The authors posited, based on the totality of their findings, that the reason FTO failed to successfully predict indicators of psychosocial adaptation to cardiac condition (i.e., spiritual growth, stress management and interpersonal relations) stems from the fact that the daily stressful experiences typically associated with cardiac disease and the accompanying threat to life, truncate both future and present time perspectives, and concomitantly increase cognitions about the past. This increased attention to the past is seen as reflective of efforts to reaffirm feelings of intrinsic value of one's life,

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especially among elderly cardiac populations. Martz (2004) studied psychosocial predictors of FTO among 317 veteran and civilian with SCI. Her results indicated that the three most salient predictors were those of depression (associated with foreshortened FTO), shock (defined as experiencing feelings of psychic numbness and disorganization during the time of the injury; associated with foreshortened FTO), and acknowledgement (defined as cognitive acceptance of disability; associated with lengthened FTO). In a related study, Martz and Livneh (2003), analyzing data from the same sample of SCI survivors, further found that truncated FTO was also predicted by increased levels of death anxiety and experienced pain after controlling for the influence of socio-demographic (i.e., gender, age, marital status, education) and disability-related (i.e., existence of pressure sores, duration of disability) variables.

Chalfant, Bryant, and Fulcher (2004) examined the prevalence of PTSD in a sample of 58 individuals diagnosed with multiple sclerosis. Although no specific time orientation measures were directly used, from their access to participants' audiotaped reports, the authors categorized re-experiencing symptoms as either past- or future-oriented. Results showed that a foreshortened sense of future orientation was the most predictive symptom of PTSD in this sample. The authors argued that individuals with MS who are threatened by their unpredictable medical condition may also be susceptible to experiencing PTSD. Research based on a sample of 105 individuals diagnosed with diabetes by Martz and Livneh (Martz & Livneh, 2007; Livneh & Martz, 2007), further demonstrated that FTO is negatively related to feelings of anxiety, depression and also anger, while positively associated with successful psychosocial adjustment to SCI. Moreover, FTO was also found to be negatively correlated with all three subscales (re-

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experiencing, hyper-arousal, and avoidance) of the Purdue Post Traumatic Stress Disorder-Revised (PPTSD-R) Scale (Lauterbach & Vrana, 1996), although only scores from the latter subscale reached statistical significance level. Finally, in their study of women with osteoarthritis, Alberts and Dunton (2008), findings revealed that women scoring higher on FTO engaged in more planned proactive and preventive behaviors to manage their illness and resorted to fewer reactive efforts at illness management (focused less on only immediate symptom reduction).

Treatment Modalities and Time Distortions

Reactions of depression and anxiety have been frequently reported to be a linked to the onset of CID (Lee, Chan, Chronister, Chan, & Romero, 2009; Livneh & Antonak, 1997; Shontz, 1975). As was discussed earlier, these reactions are often associated with distortions of both past and future time perceptions. To combat disordered time orientations and perceptions, several approaches have been suggested in the literature.

These include:

1. “Unfreezing the Future” (Melges, 1982, chapter 9). This approach is directed at helping depressed clients focus more on the immediate present and the near future. The client is directed toward combating his or her feelings of hopelessness and, in general, inducing positive expectations about the future into their cognitive schemata.
2. Time projection (Melges, 1982, chapter 6). Having the client project thoughts into the past (by reliving certain past life episodes), but especially toward the future (by visualizing specific future time frames as if they were occurring at the moment), can be beneficial in helping the client to gain a more comprehensive

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- temporal perspective on the source of his or her difficulties and their possible future ramifications.
3. Temporally-oriented psychotherapy (Rappaport, 1990). This approach, although only rudimentary developed and borrowing heavily from other psychodynamic therapeutic modalities, attempts to integrate all three time zones (i.e., it is based on the premise that temporal zones form “irreducible synergism” (Rappaport, p. 189). As such, it addresses all temporal zones in concert, typically by first focusing on the client’s current life issues and then proceeding forward (i.e., “unblocking the future”) and backward (uncovering sources of anxiety, depression, etc.).
 4. Temporal awareness shifting (Silver, Boon, & Stones, 1983). With the use of this approach clients are directed to learn how to consciously shift attention away from distressing past life events and replace them with focused outlook on present opportunities for growth in order to maximize adaptive functioning.
 5. Proactive illness management (Alberts & Dunton, 2008). Individuals who are mostly present-oriented could benefit from a therapeutic approach that is geared toward managing their CIDs more proactively. Included in this approach are such venues as focusing on future benefits and on important life goals yet to be accomplished.

Conclusion

A review of the available theoretical, clinical and empirical literatures on time and psychosocial adaptation to CID suggests the following. First,

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*No elaboration on the scientific accuracy of the concept of “Newtonian” or linearly-rigid time is pursued in this paper. As most readers are well aware of, “Einstein’s time”, first espoused by him during his “Special Theory of Relativity”, introduced the concept that the flow of time is relative to the observer and to his or her motion within space such that time slows down as a function of the observer’s increased speed (Davies, 1995). Furthermore, time also slows down as a function of increased force of gravity (“General Theory of Relativity”), such that time comes to a virtual standstill in the presence of enormous gravity pull as is experienced in the vicinity of such objects as black holes.

** The “big bang” and its companion the “big crunch” models are based on cyclical, repetitive assumptions of time progression while the “heat death” model is anchored in the belief that the universe will continue its expansion forever, resulting in a state of maximum entropy.

***Although implied in both sets of models is the notion of temporal evolvment, neither model fully addresses the notion of spacetime and certainly both are remiss in incorporating spatial elements into their theoretical fabric. Other models, notably termed “ecological”, “interactive” or “reciprocal” models (for review the reader may consult such sources as Livneh & Parker, 2005, Livneh & Bishop, 2011, and Smedema et al., 2009) are more cognizant of environmental influences and their role in psychosocial adaptation to CID.

Time and adaptation

****Although this harsh dichotomy appears at first blush to be a bit unsettling and simplistic, in the context of the ZTPI's continuous scoring on each of these scales/dimensions a more realistic view of each time orientation is achieved.
