

Chapter 5. Passion and Reason in Values-Based Learning & Development

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The scientific infrastructure for OBTE provides an integrated view of situated behavior, situated experience, and situated meaning in an individual's engagement with the world. The methods of the recommended lines of scholarship will be helpful in assessing both the practices of OBTE, its immediate influence, and its long-term influence. There is, however, a gap in that conscious experience and values generally are assessed after an event while behavior can be assessed during an event. It may be difficult to assess experience while it is unfolding but it should nevertheless be taken into consideration so that we might come to a deeper appreciation of the uniquely human ways in which conscious experience and concurrent behavior are meaningfully intertwined. This chapter addresses these important issues by reviewing research that is relevant to conscious experience and meaning and that, at least in principle, can be grounded in behavior. In doing so, we delve more deeply into what it means for an individual to be situated in a meaningful context, we explore the reciprocal influences between passion and reason, and we re-examine classical and cutting-edge scholarship on inter-temporal decision making. We conclude with a brief glimpse beyond science into sources of scholarship that can be considered in a more comprehensive approach to the outcomes that are influenced by all teaching and learning.

5.1 *The Nested Self*

5.1.1 *An Alternative to Individual versus Collective*

There is a consistent theme throughout our discussion of the grounded theory for OBTE. We emphasize that the fundamental unit of analysis is not the individual but rather the reciprocal causal relationship, a coupling, between the individual and the surroundings. This could lead to the misinterpretation that we are arguing that the individual is subordinate to a collective or that one should surrender one's identity to a group or a thing. This is definitively not the case. Choice and responsibility ultimately resides with the individual, existence has a deeply personal meaning, and such concepts are at the core of OBTE. At the same time, the intent of OBTE is not to foster egocentrism or narcissism. Nor does OBTE strive for some balance between the individual and the collective, nor some midpoint within a simplistic notion of an individual-collective continuum.

The distinction between individual and collective has become a popular construct in the social sciences (Hofstede, 2001; Hofstede, Pedersen, & Hofstede, 2002). OBTE is unconcerned with classification of personality types, especially decontextualized classification schemes. Individuals are always coupled with their surroundings through information or exchanges of energy (J. Gibson, 1979; Kugler & Turvey, 1987; Shaw et al., 1982), multiple couplings exist at the same time (Riccio, 1993b), and they change from moment to moment primarily as a function of the tasks in which one is involved (Riccio 1993a). This perspective on individual engagements with a broader culture is more consistent with recent research that addresses variability in behavior and experience that is driven by the particulars of a situation and the surroundings in which an individual is embedded (Matsumoto & Yoo, 2006; Heine & Noranzayan, 2006; cf., Idel & McGinn, 1999). Thus, to the extent that it makes sense to conceptualize a continuum from individual to collective, we assume that individuals exist as a changing spectrum along this continuum. The richness of one's experience then would be related directly to one's ability to appreciate the variety in this spectrum of engagement (Figure 1).

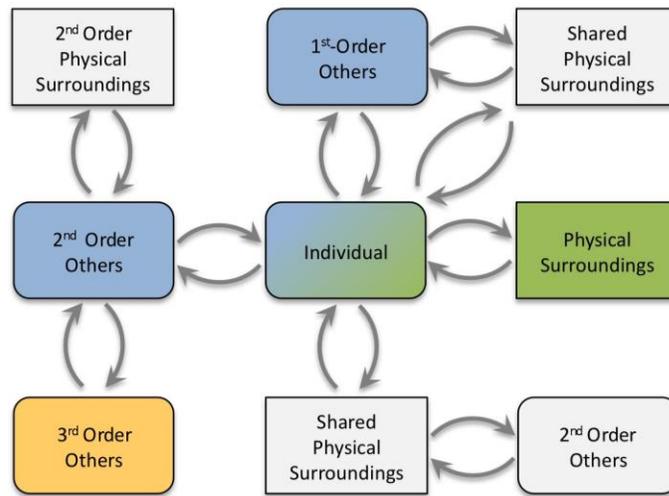


Figure 1. Reciprocal influences in an individual’s interactions with social environment as with the physical environment (see Chapter 4). 1st-order others share the same physical context. 2nd-order others are engaged largely with a different context. Presumably coordination with such individuals is guided by more abstract commonalities such as shared values. Such values exemplify a broader community that includes 3rd-order others with whom one momentarily is not interacting.

The implication for a situated pedagogy is that an instructor should consider the multiplicity of connections between a student and the context of a learning event above and beyond the elements of the learning environment over which the instructor has direct control (Lave & Wenger, 1991; Wenger, 1998; see Chapter 4, section 4.3.2; see also Bransford et al., 2000). Instructors should consider this context of broad engagement because, whether or not they do, the students will. This need not imply that instructors allow themselves to be overwhelmed with the reality of the potentially dizzying freedom of a student’s will. At the very least, awareness of this reality can sensitize an instructor to incidental occurrences that provide clues about the extent to which a student is engaged in the learning event and the extent to which the student’s behavior exemplifies choice and responsibility. In special circumstances such as basic training in the Army, these considerations help bring together a mentor’s roles as an instructor and as a counselor. More generally, it brings the considerations of leadership and leader development more directly into the realm of training and education (United States Army Training and Doctrine Command [TRADOC], 2009).

5.1.2 Cognition and Reality

The preceding discussion implies that there is a multiplicity to the self, not in the sense of the neurotic condition of multiple personalities but in the sense of a persistence and change in a coherent nesting of reciprocal relationships with the surroundings. We use the concept of nesting in the sense of J. Gibson: “they would constitute a hierarchy except that this hierarchy is not categorical but full of transitions and overlaps.” (J. Gibson, 1979, p. 9). Neisser and his colleagues have systematically treated the coherent multiplicity of self from a wide variety of scholarly perspectives including but extending beyond ecological psychology (e.g., Neisser, 1993, Neisser & Fivush, 1994; Neisser & Jopling, 1997). At the outset of this program, Neisser described five kinds of self-knowledge. The first two are the “ecological self” and the

“interpersonal self,” modes of existence that correspond to two of three modes held to be fundamental in existential psychology. The “temporally extended self” enriches the ecological and the interpersonal modes of existence by addressing persistence and change over periods of time that are greater than what colloquially we refer to as the span of attention. It is an aspect of the transcendent mode of existence in existential psychology but just one aspect of it (see Chapter 4, section 4.3.3).

The “conceptual self” gets at the essence of the transcendent mode in that it reflects one’s beliefs about oneself based on interactions with the physical and social surroundings and on shared or negotiated meaning within nested communities in which one has membership (cf., Bandura, 1997; Wenger, 1998; see Chapter 4, section 4.3.2). Finally, the “private self” relates to the inescapable fact that one’s existence is one’s own. While this does not relate to the fundamental modes of existence as such, it emphasizes the causal potency of situations that lead one to consider one’s own death or catastrophic change in one’s identity. The reason for mentioning Neisser’s program is not the mere correspondence with concepts we have already addressed in Chapters 3 and 4, such as related triadic frameworks and the simultaneous modes of existence. His work fosters deeper understanding and further development of OBTE because it is a multifaceted inquiry that points to significant bodies of empirical work in the social and behavioral sciences that are directly relevant to largely neglected issues in Army training and education and to which OBTE is a self-conscious and organized response. Beyond this, Neisser’s program provides an inspiring example of crystallization of a wide variety of scientific perspectives and much more in that it is not limited to science per se. One is left with the impression that this is a necessity rather than an academically interesting diversion. This reinforces our own conclusion that science is not sufficient to understand the meaning of OBTE for instructor and students, and certainly not to appreciate the various perspectives of the progenitors and current champions of OBTE. We thus follow Neisser’s lead by suggesting a similar undertaking for OBTE (see section 5.5).

While Neisser’s program is useful insofar as it touches all three pillars of the scientific foundation for OBTE, its most unique contribution is the body of work on the temporally extended self. Most people have a tendency to think about memory, for example, by way of analogy to storage of information in daily life, such as audio or video recordings and electronic storage media associated with computers. The central issues in this analogical thinking are how much can be stored, how difficult it is to access such stored information, and the extent to which it is accurate or reliable. In ecological psychology, the emphasis is on the existentially richer and more significant activity of remembering. Unlike the analogy to inanimate storage media, remembering is a constructive activity in which one revisits an experience from a new and more current perspective, seeing with new eyes as it were (Neisser, 1993; Neisser & Hyman, 2000). While this invokes the concept of cognitive constructivism, it is important to note that we refer to a constrained construction that is grounded in reality in two ways. First, it is based on one’s actual experience with the real world. It may lead to a remembered experience that is quite different from a prior experience because the relationship is different; the person involved in the experience is different. So what good is a remembered experience that is not an exact replica of a prior experience? One possibility is that it educates the attention; it prepares one to engage the world in a different way. This leads to the second way in which constructive remembering is grounded in reality. It influences how we engage the real world before us, in the present. Constructive remembering that has little validity in the present will quickly be vitiated by direct perception of one’s engagement with the physical and social surroundings (cf., May, 1983).

The profound difference between the natural remembering of human beings and the memory storage and retrieval of inanimate objects and systems has direct relevance to OBTE. Recall that

the best practices of OBTE are organized in terms of planning, execution, and review (see e.g., Chapter 2; Appendix A). After-action reviews (AAR) are important in OBTE as they are in the Army in general. This activity can be trivialized by a mechanistic view of memory, but it can become developmentally significant by an understanding that is existentially more valid. One can reiterate a sequence of occurrences from an artificially detached perspective or one can find meaning after the fact as a result of being changed by the experience or otherwise by revisiting the experience from a new perspective. Collaborative reflection is the easiest way to come to appreciate a different perspective on a shared experience. Collaborative reflection is the intent of an AAR but the potential rarely is realized. The trivializing notion of recalling memories from storage often leads instructors to de-prioritize the AAR, to give it short shrift when there is time pressure, and to lapse into a script that neglects any discovery learning that may have occurred.

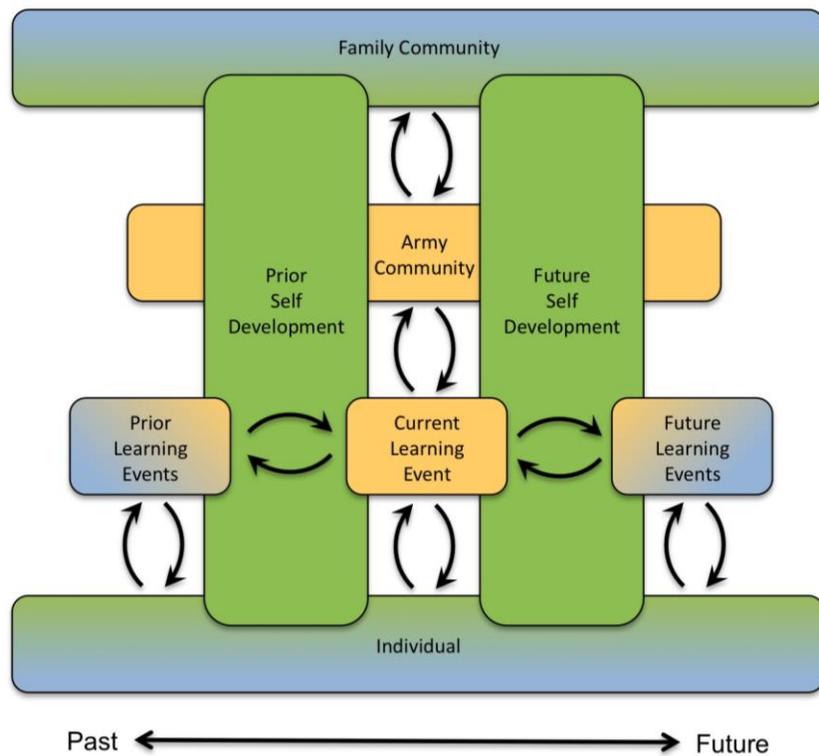


Figure 2. Stylized depiction of the notions of self in the context of reciprocal influences between an individual and both momentary and temporally extended situations. The vertical axis essentially is a level of abstraction (cf., Rasmussen, 1997) with increasingly more pervasive communities. The horizontal axis is time that has no independent meaning psychologically, not linear physical time, in that it recognizes the reciprocal influence between ongoing experience and prior experience. The relationships represented in this figure have direct implications for design and assessment of instruction (see Epilogue; cf., Bransford et al., 2000; Wenger, 1998).

There are two potential benefits of collaborative reflection that are existentially significant. The first is that the inter-subjectivity of co-participants in an event is a powerful constraint on the potential errors or potential meanderings of inductive inference (cf., Neisser & Fivush, 1994). This is not to say that the experience of every participant must converge onto a common experience. Instead we assume that multiple perspectives on the shared experience must fit in the sense or crystallization. At its best, this activity of crystallization during collaborative reflection is

not merely passive learning of someone else's experience or introjection of the meaning that the shared event had for another person. It can be, in a sense, a re-experiencing of the event from a different perspective but grounded in one's own reality. It can be another opportunity for new learning, not just reinforcement of whatever learning had already occurred. Our observations in many different settings over many years have underscored the power that AAR can have with respect to motivation and learning when collaborative reflection is taken seriously and approached within a framework of constructive remembering and inter-subjective crystallization (cf., Brunyé, Riccio, Sidman, Darowski, & Diedrich, 2006; Neisser & Fivush, 1994; Riccio, Sullivan, Klein, Salter, & Kinnison, 2004). It can have a dramatic effect on what students and instructors take away from a learning event.

5.2 Conscious Experience and the Dynamics of Thinking

Typically the relationship between behavior and conscious experience is viewed in terms of the effects of the former on the latter (see e.g., Riccio, 1993a,b). From a less dualistic perspective, behavior and conscious experience can be viewed as different facets of one's engagement with the world, each with a characteristic kind of causal potency. The power of conscious experience certainly is not limited to positive or negative reinforcement for particular behavior or to an associated capability for reactive adaptability. We are interested in experience as a reflection of the dynamics of choice, as a window into the factors affecting the directedness of thinking and personal agency. We believe this is important if instructors are to develop a better understanding of how to foster the development of confidence, initiative, and accountability in their students. Our interest is more aligned with research on naturalistic decision-making than with consciously protracted or laborious algorithmic approaches to decision making (Klein, 1989; Klein, 2008; Klein, Orasanu, Calderwood, & Zsombok, 1993; Klein, Ross, Moon, et al., 2003) but our focus is different. We are more interested in the nature of experience during intentional behavior than in a commitment to particular models for the ways in which the circumstances of contemporaneous and prior experience influence decision-making. These considerations are potentially convergent, however, to the extent that one's experience of a situation reflects the circumstances of one's experience and helps explain the commitment one makes to action in the situation (cf., Klein, 2008; May, 1983).

The subtlety of experience to which we would like to orient some scientific and pedagogical attention concerns the dynamics of thinking. We use the word "dynamics" here, as in our other references to dynamical systems. We are referring not merely to change and transition. Our use of the term is deeper in that it refers to the directedness of a process and the objectives of engagement along with the associated attractions of equilibrium and the exigencies of stability (cf., Henle, 1971; Lewin, 1951; Riccio, 1993a,b; Riccio & Stoffregen, 1988, 1991). A radical implication of this perspective is that it is worthwhile to consider what can be observed and communicated about the product-oriented processes of thinking. It is a point of entry for a pedagogy that is relevant to "productive thinking" (cf., Wertheimer, 1945/1959). The conjecture of scholarly reflection on the dynamics of thinking is that awareness of such dynamics can be useful to the thinker and that it can be a consideration in inter-subjective coordination even though one's awareness of the dynamics of thinking may seem to be difficult to put into words or difficult to reduce to tidy algorithms. Wertheimer presented cogent arguments for taking this seriously, for example:

Many are of the opinion that men do not like to think; that they will do much to avoid it; that they prefer to repeat instead. But in spite of many factors that are inimical to real thinking, that suffocate it, here and there it emerges and flourishes. And often one gets the strong impression that men, even children, long for it. [Wertheimer, 1945/1959; pp. 1-2]

It is important to emphasize that we are neither arguing for practices that would lead individuals to become lost in thought, nor are we interested in inquiry into cognitively laborious operations. Instead, we are concerned with heightened awareness of one's engagements with the real world and one's agency in it. We are interested in the clarity of mind that expedites action (as opposed to a paralyzing ambiguity) by illuminating personal choice, responsibility, and the balance between them that gives meaning to one's existence (cf., Camus, 1942/1988, 1956). Before we can embark on such an existentially significant enterprise, we must begin with an appreciation of the aspects of productive thinking with respect to which individuals plausibly can develop better awareness. The most important early work in this area was conducted by Max Wertheimer (e.g., Wertheimer, 1945/1959) and by the Wurzburg school early in the 20th century (see Boring, 1950; Humphrey, 1951; Wertheimer, 1970). This work was a counterpoise to theories of logic and association that dominated most of the 20th century in psychology and philosophy. Observable characteristics of thinking emphasized by this research include.

- **Inklings** (imageless thought or determining tendencies): Feeling that one is on the verge of a solution or a productive line of thinking. We can set aside for a moment the question about the generative power of such mental phenomena (something that is difficult if not impossible to study experimentally). The point here is that, at the very least, it has an emotional and motivational quality that is worth considering.
- **Perspectival insight** (paradigm shift, phase change, self organization): A change in perspective that is traceable to some stimulating event (e.g., interaction with another person) and that makes one aware of characteristics of a situation or relationships that one previously did not appreciate, often attended by inklings or a sense that the new approach is “pregnant with possibilities.”
- **Gaps** (incompleteness, shortfalls, antithesis, conflict): Awareness of limits or problems to one's current approach to a problem or situation that has the power to influence or re-direct one's approach (thought or action).
- **Ambiguity** (confusion, lack of clarity, disorientation): A conspicuous lack of understanding in situations that cannot be ignored. A persistently unpleasant feeling that begs to be resolved. Unlike gaps, this may not provide a clear re-direction of one's thought or action but it may motivate exploratory thought and action (e.g., queries of others).
- **Seductive simplification** (superficial or presumptive conclusions): The tendency to check the box or otherwise just get beyond the problem at hand because it is unpleasant, frustrating, or unsatisfying. This is a feeling often apparent in one's attempt to resist it because of a sense that the simple conclusion is inadequate.

- **Clarity of end state** (reverse planning, criteria for completion, goodness of a solution or a practice): This is noteworthy when the means to the end is not immediately obvious.
- **Epiphany** (surprise, sudden insight or clarity). A satisfying sense of qualitative developmental progress. This also could be a counterpoint to any of the above.

These kinds of observables, for what Neisser refers to as the “private self,” have shared relevance in the context of coordinated action in a task-organized group, and especially in the context of collaborative reflection. Hunches and intuitions, or other feelings that are difficult to put conclusively into words, can be fodder for collaborative decision-making. Others may be able to bring to conclusion what one cannot. Others may be able to pick up circumstantial or nonverbal information about one’s dispositions and experience of a situation (see e.g., C. Darwin, 1899/2009; Ekman, 2007; Marsh, Richardson, Baron, & Schmidt, 2006). In any case, personal or interpersonal awareness of aspects of experience—such as confusion, distraction, uncertainty, interest, attentiveness, vitality, and emotionality—can provide a nonarbitrary basis for individual or collective intentionality (e.g., what to do next). At the very least, such inconclusive considerations or dynamical constraints on thinking provide a better sense of the confidence one should have in a particular pursuit or in a particular conclusion for the situation at hand. This is critically important in negotiating the boundaries between the known and the knowable, and between the knowable and unknowable (see Chapter 3, section 3.2.1), the ubiquitous characteristic of individual or collective engagements with the world under ambiguous or changing conditions (see Chapter 3, section 3.2.6).

There are fairly direct implications of the dynamics of thinking for AAR. AAR should be instrumental in producing or reinforcing learning. Learning how to do an AAR and giving it suitable priority could be an enabling learning objective in most learning events. One should not assume, for example, that AAR have to be a simple and direct recitation of what was supposed to happen or even necessarily an articulate account of what actually happened. It is okay if it includes an inconclusive concern about the ineffable. Neither should participants in an AAR be overly concerned with being pleasant. There may be nothing wrong with attributional comments as long as it is not presented or perceived as an *ad hominum* attack. It is well recognized in the Army that “bad news doesn’t age well.” Moreover, a certain amount of digression can be valuable if it is a way to articulate what otherwise may be difficult in the context of the learning event at hand. Participants may need to draw on richer experiences to make more explicit the meaning, or lack thereof, that they find in the learning event. In any case, AAR can address things done and not done in the learning event and, more importantly, the reasons why. In other words, AAR can address intentionality and decision-making.

The productive role of immediate experience in intentionality, most notably with respect to changes in intention, have received very little attention in the scientific psychology that explicitly addresses thinking and adaptability. There are many reasons for this theoretically, empirically, culturally, and historically. In general, scholars are inclined to conceptualize thought as something that is deliberative and either momentarily correct or incorrect. Less analytical aspects of private experience typically have been considered to be in the realm of the emotions, clinical practice, or otherwise entirely outside the reach of science. The next section highlights a relevant line of scholarship concerning the role of emotion on thinking and decision-making.

5.3 Emotion, Information, and Engagement

5.3.1 Ecological Perspective on Emotion

A fundamental tenet of OBTE is that motivation and emotion are influenced directly and powerfully by any approach to instruction and, in particular, by interactions between instructors and students. The principles and practices of OBTE tackle this issue head on to ensure that the influence has a positive effect on learning (see Chapters 2 and 3). It is critically important to note that, in addressing emotion, we are not simply referring to the pleasantness or unpleasantness of a learning experience. Nor are we referring to “feelings” or the physiological stimulation and sensory qualities commonly associated with one emotion or another such as anger, fear, disgust, sadness, happiness, and surprise (Colleta, Vernet-Maurya, Delhommeb, & Dittmarb, 1997; cf., Ekman & Friesen 1975; James, 1890). While we don’t deny these sensory experiences, we believe their particular quality is not fundamentally important. Within a commitment to realism, the major concern is that a focus on the sensory qualities of emotions is analogous to a focus on sensations in the scientific inquiry into human perception and action in general. The problem with such a focus is the fact that all engagements with the real world involve the stimulation of multiple sensory systems (J. Gibson, 1966). While the study of single isolated sensory systems or qualities may be useful in understanding physiological systems, it can be exceedingly misleading with respect to understanding perception and purposeful engagement with the surroundings (J. Gibson, 1979; Stoffregen & Riccio, 1988, 1991; Stoffregen & Bardy, 2001; Figure 3).

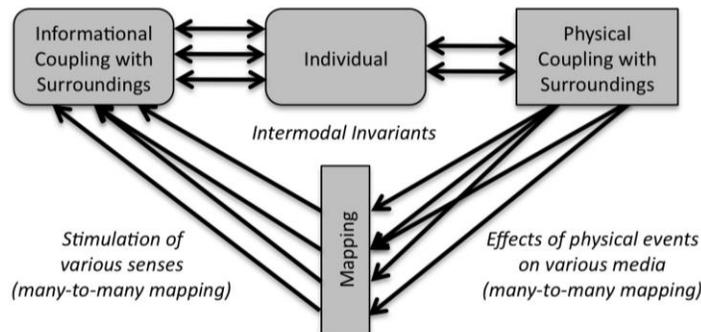


Figure 3. Intermodal invariants in an individual’s engagements with the surroundings.

The focus of ecological psychology, with its commitment to realism, is on information about couplings between an individual (human or nonhuman) and the environment and what they afford for purposeful engagements with the environment. So the question about emotion becomes: What information is available in emotion stimulation, combined with other forms of stimulation (e.g., optical, mechanical, acoustical) about affordances for action in the environment? A clue is provided by another tenet of ecological psychology, specifically that it is difficult if not impossible to understand perception by considering a passive observer or imagining that the observer is passive just because the activity of the perceptual systems are not obvious (see e.g., E. Gibson, 1988, 1991; J. Gibson, 1966, 1979; Kugler & Turvey, 1987; Shaw et al., 1982; Turvey et al., 1981). Multimodal perception enables attunement to intermodal invariants that provide direct information about cause-effect relationships in one’s interaction with the surroundings (Stoffregen & Riccio, 1988, 1991; Stoffregen & Bardy, 2001). One class of invariants is the proximate effects of one’s own actions (E. Gibson, et al., 1987; Riccio & Stoffregen, 1988, 1991). This corresponds to “inner loop feedback” in control-theoretic analysis of dynamical systems

(Ricchio, 1993b). It reflects one's ability to exert an influence on the surroundings. Together with "outer-loop feedback" about the consequences of this influence, these invariants provide information about one's capabilities for action ("affordances"). In ecological psychology, information about one's capabilities for action is highly nuanced and typically includes many nested perception and action systems as well as inter-temporal relationships that informs one's preparation for action (Ricchio, 1993a,b; Ricchio & McDonald, 1998; Ricchio, et al., 2001; van Wegen et al., 2002).

A conjecture that follows directly from these control-theoretic aspects of ecological psychology is that perception and control of one's interactions with the surroundings can become more refined and more elaborate through attention to information that specifies one's preparation for action. Our current elaboration of this claim is that such information is available in multimodal stimulation that includes but is not limited to emotion stimulation. The implication is that the experience of emotion generally refers to choices about one's engagement with the surroundings. This is not especially controversial in the sense that this is a recapitulation of common claims such as those about the value of physiological activity associated with preparation for "fight or flight." Beyond this, however, we posit that such observable preparation for action is considerably more nuanced and multifaceted than suggested by a binary interpretation of physiological activity in provocative situations. Information about one's capabilities for action, and that supports control of such action, is uniquely available in the juxtaposition of emotion stimulation with external stimulation of various perceptual systems obtained through interaction with the surroundings. Emotion stimulation due to a potential lethal confrontation may be attended by optical stimulation that reveals either potential defilade or potential enfilade locations and postures. This difference matters. Our claim is that information in this multimodal stimulation supports one's choices about engagement with the surroundings.

As limited as the various qualities of emotion stimulation might be, considered in isolation, there is an uncountably large variety of affordances that one can come to know based on the equally large variety of possible couplings that one can establish with the environment. And, at any moment, the perception of such affordances can be quite elaborate because of the multiplicity of nested interactions that concurrently are involved in even the simplest interactions with the surroundings (Ricchio & Stoffregen, 1988; Ricchio, 1993a,b). On this view, there is a virtually limitless capacity for perceptual learning and development with respect to emotion experience and its role in engagements with the surroundings (cf., Higgins, 2006; Solomon, 2003; 2004b).

5.3.2 Emotion as Engagement

An ecological view of emotion converges nicely with lines of research that view emotion as engagement or, more specifically, as about preparation for action (see e.g., Frijda, 1986, 2007, 2009; Frijda & Sundararajan, 2007; cf., Griffiths & Scarantino, 2008; Lambie, 2009; Ping, Dhillon, & Beilock, 2009; Solomon, 2003). Nico Frijda describes three aspects to a scientific epistemology that can guide inquiry into emotion: control precedence, wholeness, and valuation. Control precedence reflects the experience of volition, that is, the aspects of experience that take priority in the moment by directing attention and action and that also have a sort of tenacity that transcends the moment by resisting distraction and caprice. Wholeness refers to the emotion experience that reflects engagement of a person as a whole with the surroundings and does so in a way that reveals the person's relationships with the surroundings. Valuation refers to the value one finds in an experience or one's commitment to the attendant engagement with the world. We find a direct correspondence between Frijda's scientific epistemology and our own (i.e., the three scientific pillars for OBTE) as well as existential psychology. Control precedence emphasizes issues that are the focus of ecological psychology such as reciprocal relationships with the

surroundings that are dominated by natural law (situated behavior). Wholeness invokes a breadth of issues commensurate with the considerations of self-efficacy theory such as reciprocal interpersonal relationships that are directly perceivable (situated experience). Valuation clearly addresses the same kinds of issues as positive psychology such as transcendent meaning (situated meaning).

Interestingly, Frijda (2009) also points out that the aspects of emotion experience that correspond to the three components of his scientific epistemology are not always present at the same time and to the same degree. The strength of *control precedence*, for example, is directly related to the extent of one's engagement. This suggests that this aspect of emotion experience could be a good indicator of the extent to which an event is engaging, and it should relate to the motivational exigency of autonomy that has centrality in self-determination theory. *Wholeness* presumably is weak when, and to the extent that, emotion experience refers to others with whom one has an indeterminate relationship, such as in reading a compelling story about a character who is otherwise unknown to the reader. We believe Neisser's notions about the varieties of self presumably will be instructive for further scientific inquiry into wholeness. *Valuation* would be limited if one were thrown into a situation so novel that it would be difficult to identify principled behavior amid a plethora of unfamiliar details. It would be difficult to appreciate the personal meaning or relevance of such situations (e.g., ones characterized by surprise or amazement). Similarly valuation might be short-circuited in situations that force one to focus only on short-term objectives and not also on longer-term outcomes or downstream consequences of one's decisions and actions. Frijda argues that—while there is independent variation in the experience of control precedence, wholeness, and valuation—paradigmatic cases for the role of emotion are characterized by prominence of all three of these aspects of emotion experience.

The work of Frijda, and others who view emotion as engagement with the world (e.g., Solomon, 2003; 2007), is consistent with our ecological view of emotion as one aspect of the multimodal perception that informs and guides an individual's engagement with the world. Consider an analogy to the effect of the intensity of light on visual acuity. Visual acuity, detection, and recognition generally improve with increased light intensity (Boff & Lincoln, 1988). We suggest that emotion is like the intensity of light to the visual system or, for that matter, like the intensity of stimulation for any sensory system. By way of analogy to the colourfulness of light, emotion also is analogous to various sensory qualities but those qualities are not finally the point. Variations in intensity or color within and across objects in our field of regard enable us to pick up information about those objects. Given that the relationship between an individual and the surroundings is ontologically primary in our approach, the information in stimulation is about the coupling, the fit, or the affordances for engagement with the world. We agree with Frijda (2009) that “emotion experience typically consists of the perception of *emotionally meaningful objects, events, or states*” (p. 266) or “affordances” (p. 267). The analogy deepens by considering the control-theoretic aspects of ecological psychology (Ricchio, 1993b). In this respect, the inner-loop information about one's momentary capabilities for action (i.e., the basis in reality for one's self-efficacy), and one's preparation for action (i.e., utilizing one's capabilities), reveals a more direct link between perception of affordances, emotion stimulation, and engagement with the world.

On this view, enhancing the emotion experience is like increasing the intensity of light or, in a control-theoretic sense, increasing the gain on the system. Emotion, however, also increases our attunement to the meaning of our engagement with the world. The learning and adaptation that this attunement enables thus may benefit from increased emotional intensity. The progenitors of OBTE have repeatedly emphasized the importance of “significant emotional events” in Army training and education. At the same time, we understand that this relationship is not monotonic, that too much stimulation can impair perception and performance. Carrying our analogy further,

consider a situation in which one has to track an object to a point where one is looking directly into the sun. One would close or cover one's eyes, and perhaps employ some intermittent looking strategy to keep track of the object without saturating one's visual system. This is a relatively rare situation in which one actually attends to the sensory qualities of one's experience. While this is a limiting case in perception and action, it is possible and thus important to consider in designing or assessing a situation. Similarly, any situation that leads one to focus on the sensory qualities of emotion experience will be problematic for learning and performance to the extent that it distracts attention away from the information in emotion experience about one's preparation for action and one's momentary capabilities for action (cf., Lambie & Marcel, 2002).

We expect further development of OBTE to be guided by a more sophisticated appreciation of emotion that considers it as an essential aspect of an individual's engagement with the world. We believe the control-theoretic aspects of ecological psychology can be helpful in this pursuit. Continuing with our analogy to light and the eye, consider the multicriterion control system that controls even something as simple as pupil diameter (see e.g., Stark, 1968). Optically, pupil diameter influences both the intensity of retinal illumination and blur of the retinal image that is due to imperfections in the lens of the eye. Visually, it influences both brightness and depth of field. It thus is appropriate that control of pupil diameter is influenced by the intensity of light and the proximity of an object of regard. Behavior in the environment resolves the attendant ambiguities by utilizing other actions systems (from the hands to the feet) that differentially modify retinal illumination or proximity to an object of regard. The point is that such many-to-many mappings also exist for emotion stimulation and objects in one's field of regard while engaging with the world. It may be no more difficult to resolve these ambiguities than it is for brightness and clarity of vision.

Lest the reader think that the analogy to pupillary control is a bit arbitrary, it is worth noting that pupil diameter also is influenced by emotional states in ways that are similar to the reciprocal influence between emotional states and facial expressions. Pupil diameter may even complement facial expressions in the perception of emotional states of others (see e.g., Harrison & Critchley, 2007). Moreover, there is evidence that pupillary dynamics can become coupled between two individuals and that the nature and extent of this coupling influences emotion experience (Harrison, Gray, Critchley, 2008). This coupling is reminiscent of coordinative structures that have been observed in other nested action systems and that have been modelled in ecology psychology (see e.g., Kugler & Turvey, 1987). One reason why such an ecological approach to dynamical systems is powerful is that it can easily be extended to interpersonal interactions (Marsh et al., 2006). This is because informational coupling can be as strong as exchanges of energy, they can result in (i.e., enable) the same patterns of behavior, and they can be modelled in the same way. Control-theoretic aspects of ecological psychology, in particular, can be used to understand the nuances of the nested couplings that characterize typical engagements with the surroundings (Riccio et al., 1993b). This allows us to find deep agreement with Frijda on the architecture of engaged experience (e.g., control precedence and wholeness) even though we differ with the epistemological dualism inherent in his adaptation of Sartre's phenomenology of emotion (Frijda, 2009; see also Solomon, 2004). We differ with him because we believe he makes unnecessary assumptions about the role of induction in self-awareness and the perception of affordances (see Chapter 4, sections 4.2.1, 4.2.2). Nevertheless, this difference is not problematic relative to what we agree on; it is inconsequential with respect to the implications of our views of emotion for training and education.

5.3.3 Implications for Training and Education

The most important theme of the scholarship we have highlighted is that emotion is at least as proactive as it is reactive insofar as it guides one's attention and provides information about preparation for action. The implication for training and education is that the learning environment should include situations in which individuals can learn how to pick up information in emotion stimulation that is most relevant to the task at hand. Toward this end, it would be beneficial if some learning events require interactions that have some emotional significance. This could be as simple as targets on a shooting range that include representations of friend, foe, and other (S. Flanagan, personal communication, March, 2008). It also would be useful to design some situations that create emotional distraction (i.e., attention to sensory physiology). Together such experiences foster perceptual learning through which one can become increasingly more sophisticated in differentiating between events that compel attention to sensory physiology and events that require attention to information about existentially significant affordances. If emotion is not considered in the design and implementation of learning events, instructors will miss opportunities to educate the attention of students for performance in emotionally evocative situations, and they may inadvertently mis-educate the attention of students for such situations.

How can a learning event be counterproductive with respect to perceptual skill in emotionally evocative situations? Consider, for example, a learning environment in which the apparent values of one's community of practice suggest that one should control the expression of one's emotion and, implicitly, the experienced qualities of emotion. In other words, what are the consequences of assuming that emotions are irrational and dangerous, especially in lethal or hazardous situations? Undoubtedly, one would be inclined to minimize the stimulation of sensory systems associated with emotion experience, to divert attention away from this experience, or to avoid the pick up of information in emotion stimulation. In control-theoretic terms, this essentially results in decoupling an individual from the surroundings, to some extent, by eliminating a feedback loop or reducing observability of an individual's states relative to the surroundings. In any case, the result is that one's capabilities to make informed decisions or execute informed actions with respect to the surroundings are reduced. Moreover, with respect to coordinated action within a unit, individuals would be less likely to benefit from the information in the emotion experience of others. We are not encouraging the unfettered expression or the uncontrolled experience of emotion in learning events and certainly not in operational settings. Instead, we emphasize the importance of sophistication in the control and experience of emotion. On the view that emotion is engagement with the world, emotion can and should be controlled by controlling one's engagement with the world, not by ignoring experience. Sophistication in the experience of emotion is fostered by learning events that explicitly address (a) the information in emotion about one's momentary preparations for action, (b) the affordances of such preparations for action with respect to individual and collective tasks, and (c) unintended consequences of one's actions.

5.4 Emotion, Decision-Making, and Inter-Temporal Choice

5.4.1 Toward a More Integrated Theory

Frijda's notions of control precedence and wholeness in emotion experience each have relevance to Neisser's notions of the ecological self and the interpersonal self. That is, it is important to perceive one's proclivities to act with respect to others as well as the physical surroundings and to perceive the social and physical consequences of one's actions. This helps one understand one's relationships to others and to the physical surroundings, it helps one understand that the whole that is greater than the sum of the parts and, in a more nuanced way, it helps one understand the nested self as a spectrum of concurrently available capabilities ranging from the purely individual

to the purely collective. Frijda's notion of valuation in emotion experience has relevance to Neisser's notions of the temporally extended self and the conceptual self. While control precedence and wholeness have immediate relevance and salience in the moment, valuation comes into play to a greater extent over larger time scales within which the task at hand is nested. This is reminiscent of the reciprocal influences between nested time scales in adaptive dual control (see Chapter 4, section 4.1.2, 4.1.3). The accumulation of micro-experiences from moment to moment provides information about causes and consequences in one's engagement with the world over larger time scales. The information about such affordances also can influence the choices one makes in the moment.

The interplay of control precedence and wholeness presumably plays an important role in the weaving of nested time scales that reveals value and meaning in one's engagement with the world. We believe there is a scientifically useful correspondence between this triad of emotion experience and other psychologically potent triads we have discussed. In particular, control precedence relates to initiative and autonomy, wholeness relates to accountability and relatedness, and valuation relates to confidence and competence. On this view, Frijda's three aspects of emotion experience are important indicators of the extent to which an individual is engaged in a situation in ways that motivate a deeper and more sustained engagement (cf., Deci & Ryan, 2000, 2008; Guay, et al. 2008; Ryan & Deci, 2008). Viewing emotion as engagement thus can lead to a deeper scientific and philosophical understanding of motivation within a commitment to realism. It more completely situates theories of motivation in the verifiable coupling of individuals with the physical and social surroundings and in the reality of nested time scales and the nested self (cf., Higgins, 2006).

5.4.2 Emotion and Decision-Making

Our perspective on valuation in emotion experience is that it both drives and reflects the choices one makes. Thus it is useful to consider research that looks at the role of emotion in decision-making. Research on decision-making in recent decades has been dominated by the bounded rationality theories of behavioral economics (Kahneman, 2003; Kahneman & Tversky, 1979, 1984; cf., Simon, 1955/1957) and an associated preoccupation with cognitive biases or errors with respect to models of rational choice. In fact, studies that require individuals to utilize terminal inductive inference in making decisions show consistent effects of emotional bias (Lerner, & Keltner, 2001; Lerner & Tiedens, 2006; Loewenstein & Lerner, 2002). Anger, fear, sadness, and happiness can bias one's assessments of past, present, and future situations; and different emotions do so in different ways. Angry people tend to attribute blame to others for negative events while sad people tend to attribute causes to situational factors. Angry people have been shown to make more optimistic risk assessments for the same conditions in which fearful people make pessimistic risk assessments. In the moment, angry people and happy people both tend to think in more superficially, presumptively, or heuristically than do sad people who are more inclined to engage in deliberate thought. These effects are complex, however, in that they depend on various situational factors. For example, the outcomes of decision-making in emotionally evocative situations may or may not be appropriate. The takeaway point is that emotion matters with respect to inferential bias, thus it is wise to consider such effects in coming to a better understanding of decision-making (Lerner & Keltner, 2001; Lerner & Tiedens, 2006).

Research on the role of emotion in decision-making is in a relatively early stage of development. There have been some interesting trends though. In particular, with progress in the understanding of emotion, the biasing effects also have become more differentiated. The biasing effects at a more refined level of abstraction frequently are counter to what would have been predicted at a higher level of abstraction. For example, biases of "negative" emotions are not necessarily more

similar to each other than to “positive” emotions. The experience and effects of any particular emotion (e.g., anger) are influenced by factors such as certainty, control, and responsibility (Lerner & Keltner, 2001; Lerner & Tiedens, 2006). Presumably, the effects of emotion on decision making also will be influenced by even more nuanced situational factors such as the momentary nested couplings between an individual and the surroundings. In the context of these couplings, concepts such as certainty, control, and responsibility have greater specificity and clarity with respect to affordances for action and the downstream consequences of one’s decisions.

5.4.3 Emotion and Nested Time Scales

The methods used in decision-making research generally don’t involve prolonged engagement of an individual (the so-called research “participant”) with the surroundings. The individual typically has little or no personal agency to influence the surroundings and unusually has little time or opportunity to come to know reality. The situations typically are inferentially truncated (i.e., biased toward terminal induction) and don’t provide reality-testing feedback to individuals. As the research on the role of emotion in decision-making matures, and more naturalistic decision-making is observed (see Klein, 2008), we expect that the effects of various emotions may not necessarily be problematic in the sense of forcing departures from rationality. Momentary bias in attention or presumption may be outweighed by an increased salience of disconfirming feedback, or more elaborate feedback, especially if others typically present in existentially significant situations provide that feedback. Differences in emotions may even benefit collaborative reflection in a task-organized unit to the extent that it fosters productive diversity within the group (cf., Druskat, 2005; Jehn, Northcraft, & Neale, 1999; Bowers, Pharmer, & Salas, 2000). This benefit may be realized through the collaborative reflection among individuals who collectively provide diversity of perspectives or in the additional information picked up as a result of attention to more facets of a situation. This suggests that group learning may be facilitated by intentionally creating different emotion experiences for different individuals in the same learning event. Different emotion experiences thus are not viewed as biases to be cancelled out. Collectively, they reflect a set of complementary perceptual skills that enable attunement to a variety of affordances in collective engagement with the world. They enable a richer understanding of the world (cf., Lambie, 2009).

Emotion can influence the meaning one makes of prior events (Lerner & Tiedens, 2006; Neisser & Fivush, 1994; Neisser & Hyman, 2000). Changes in emotion thus can provide a powerful set of lenses through which one can appreciate multiple facets of a prior experience (cf., May, 1986) as long as one has come to understand such effects of emotion (Lambie, 2009). Emotion also can influence expectation and decisions about future events (Camber, Loewenstein, & Prelec, 2005; Lerner & Tiedens, 2006; Loewenstein & Lerner, 2002; Loewenstein, Weber, Hsee, & Welch, 2001). The effects of emotion on experience are not simply a linear sequence of causal influences that progress from past through the present to the future. In essence, such cognitive biases momentarily establish a temporally extended self. The temporarily extended self is a momentarily coherent influence on perceiving, remembering, and imagining that is causally symmetric forward and backward over a sequence of events (cf., Neisser, 1996; Neisser & Fivush, 1994; Neisser & Hyman, 2000; Neisser & Jopling, 1997). Exposure to different perspectives, to different emotion experiences, could establish a new temporally extended self and a new coherent influence on the meaning one makes of the past, present, and future (cf., May, 1983). Emotion experience that is well grounded in reality, such as through reflection on current behavior and awareness of the surroundings in which it is situated, presumably can help reduce biases away from reality. If so, inter-subjectivity and collaborative reflection can enrich this grounding in reality.

5.4.4 Neuroeconomics and Inter-Temporal Reasoning

The reciprocal influence between current events and future outcomes is of particular interest in the context of outcomes-based training and education. The most relevant research on these reciprocal effects is in behavioral economics and the recent interdisciplinary niche called neuroeconomics (Camber et al., 2005; Loewenstein, Rick, & Cohen, 2008). From the perspective of OBTE, one of the most interesting developments in this area is the conjecture that intangibility may be essential to explain patterns observed in the most common inter-temporal choices that people make (Rick and Loewenstein, 2008).

The discounted utility model has dominated research in behavioral economics (see e.g., Kahneman, 2003; Kahneman & Tversky, 1984). In its various forms, this model assumes that people have a bias toward options that are available sooner and tend to discount options that would be available later. More specifically, delaying a desired objective by a day, for example, has greater importance today than the same delay one hundred days from now (i.e., “hyperbolic discounting”). This is generally considered to be one of the most common if not canonical ways that human decision-making is irrational (given a shared assumption that all descriptions of the future are reliable and accurate). Rick and Loewenstein replace discounted utility with the face valid assumption that future outcomes are always less tangible or less certain than near-term outcomes. Given this new assumption, their innovation is the conjecture that emotions associated with anticipated outcomes make near-term outcomes and future outcomes commensurable, that is, they allow one to make comparisons in terms of emotions instead of using other frameworks that confound time delay with tangibility or certainty. They suggest that emotions are the “common currency” for inter-temporal decision-making. This helps explain choices in which value is not discounted hyperbolically over time (Rick & Loewenstein, 2008).

In a logical extension of their thesis, Rick and Loewenstein suggest that emotions may be the common currency for decisions involving cognitive comparisons among any outcomes that differ in tangibility whether or not the outcomes differ with respect to time delay. In particular, they offer an example in which outcomes differ along what we have referred to above as the spectrum of individual-collective. The idea is that attention to emotions evoked by collective objectives may be commensurate with those evoked by individual objectives amid otherwise problematic differences in tangibility or certainty of collective objectives relative to individual objectives. In this manifestation, we believe the conjecture of Rick and Loewenstein in behavioral economics dovetails in an elegant way with Nico Frijda’s triadic relationship among control precedence, wholeness, and valuation in emotion experience as well as with other triads we have considered (e.g., Rollo May’s modes of existence). Decisions influenced by emotion in the way described by Rick and Loewenstein are not necessarily more rational than decisions based on discounted utility; however, our various discussions of collaborative reflection in this chapter suggest a way that they might become more rational over time. Emotions and their effects on behavior (and, by implication, their effects on thinking and decision-making) are relatively easy to talk about because they are concrete and, to some extent, because they are directly perceivable. Thus they may be a much easier way for a group to compare and contrast perspectives than by using a more abstract framework (e.g., one that is not closely tied to the unpredictable unfolding of a shared event). A small group of individuals engaged in a shared experience may provide the most rational unit for decision-making if information in emotion experience is considered along with other concurrently available information about individual and collective engagement with the world.

The new perspective in behavioral economics offered by Rick and Loewenstein is pregnant with possibilities for cross-fertilization across scientific subdisciplines. An equally important consideration is the admirable caution by Frederick & Loewenstein (2008) about the preference literature that “many of the widely cited, stylized ‘facts’ remain facts only by virtue of an unwitting convergence in research methodologies” (p. 232). We would add that, in addition to a diversity of methodologies, a research community should ensure that the collective research portfolio includes paradigms that are as close as possible to the natural situations that the research seeks to understand (see e.g., Flyvbjerg, 2001; Riccio, 1993a; Schrim, & Caterino, 2006). In the case of OBTE, we are compelled to consider research that does justice to the nature and extent of collective engagement of small units in Full Spectrum Operations FSO. Our claim is that such research on learning and development in formal programs of instruction will be more likely to be relevant to FSO. Furthermore, we claim that any program of research that is guided by such research also is likely to result in learning and development that is more likely to transfer to FSO.

5.4.5 Inter-Temporal Reasoning and Adaptive Dynamical Systems

The scientific foundation described in the last three chapters (i.e., the three pillars and connecting lines of thought) reflects a commitment to a more naturalistic approach to learning and development, one that closes the gap between FSO and formal programs of instruction. In particular, the commitment emphasizes that (a) the interaction between an individual and the physical and social environment is the fundamental unit of analysis on an individual’s engagement with the real world, (b) the interplay of exploratory and performatory behavior is critical in coming to know reality, (c) perceptual learning is ubiquitous and relentless over time scales that are greater than a typical designed learning event, (d) inter-subjective collaboration facilitates learning and development with respect to valued outcomes within a community of practice, and (e) collaborative learning is characterized by crystallization of multiple perspectives about the manifestation of shared values in the behavior of individuals and its consequences with respect to common tasks and intent.

The methods we have utilized given this commitment are convergent with independent lines of research in adaptive dual control theory (see Chapter 4, sections 4.1.2 and 4.1.3). In this respect, it is noteworthy that inter-temporal reasoning recently has been viewed from the perspective of dynamical systems (Scherbaum et al., 2008). The critical importance of the dynamical systems approach is that it directly addresses both coupling within a system (e.g., a subsystem coupled with its surroundings) and trajectories in system performance (Riccio, 1993b). A contribution of this perspective is insight into potential causal explanations about what drives the trajectories. In dynamical systems, the influence can be described as a layout of systems states that vary more or less continuously in terms of being relatively attractive and relatively repelling with respect to some objective for system performance (Riccio & Stoffregen, 1988; 1991; Riccio, 1993a,b; Riccio & McDonald, 1998; van Wegen et al., 2002; Sherbaum et al., 2008). Typically, this objective function derives from a causal relationship between important dimensions of variation in a subsystem (i.e., its capabilities for action) and changes in its surroundings; that is, it reflects the potency of a subsystem in effecting change in its surroundings, most notably in its relationship with its surroundings (Riccio, 1993a,b). Nonlinear control-theoretic aspects of ecological psychology emphasize the detectability of these dimensions of variation and the implied stabilizability of the system (Riccio & McDonald, 1998). Consistent with adaptive dual control theory, in particular, this approach also reveals that detectability and stabilizability are fostered by information in variability of system behavior over time scales that are short relative to the demands on system performance (Riccio, 1993a; Riccio & McDonald, 1988; van Wegen, et al., 2002; see Chapter 4, sections 4.1.2 and 4.1.3).

Two questions emerge in the analysis of dynamical systems. First, what is the relevant state space, the relevant capabilities for action that it parameterizes? Second, what are the objectives for system performance with respect to which such states are evaluated? In adaptive dual control, there is a further implication that observable effects on short-time scales are commensurate with observable effects on longer time scales. Observation of the former enables the system to adapt to varying conditions to achieve desired system performance irrespective of the variation in conditions. How would we extend this to inter-temporal reasoning? First, consistent with Rick & Loewenstein (2008), we believe that consideration of emotion associated with long-term outcomes will be essential in making them more tangible. Consistent with our ecological approach to emotion and intermodal invariants, emotion stimulation must be part of the state space that describes one's capabilities for action. Second, it will be essential to address long-term outcomes explicitly in the moment, in the task at hand, however small or mundane the task seems to be when considered in isolation (cf., Riccio et al., 2004; see also Appendix D). In other words, the micro-experiences we emphasize in OBTE are experiences that can be explicitly considered and discussed in the context of long-term outcomes, and emotional engagement in these micro-experiences is critical to make intangible outcomes more concrete and immediate.

5.5 Beyond Science

5.5.1 Existentialism

In our attempt to engage the practical wisdom of Soldiers as instructors and leaders, and to shine a light on it, we were taken to bodies of work that we had not fully anticipated. In some cases, we were taken to lines of thought that were surprising. The most important example of this is the path we followed from the science associated with motivation, emotion, and values to the philosophy and literature on existentialism (see e.g., Barnes, 1959; Cotkin, 2003; Solomon, 2004a). As it turned out, this was a natural path because of our commitment to experience as emphasized by James, Dewey, and the Gestalt Psychologists (see e.g., Heft, 2001; Maslow, 1968; Reed, 1996a,b, 1997; Riccio, 1993a); that is, meanings one makes of conscious experience of the world rather than the mere fact of experience in the world. Our inquiry into the meaning Soldiers, and especially leaders, make of training and education led us to question common assumptions about the dichotomy of passion and reason (M. Darwin, 2008a,b; Hume, 1740/2009; Smith, 1759/1976; Solomon, 2003, 2004a,b, 2007). Consideration of existential thought was relevant because of consistent themes in the practical wisdom of Soldiers that suggest the need to foster life-long development of attributes that prepare Soldiers for emotionally evocative ambiguity, not to develop programs intended to help Soldiers (think they can) necessarily resolve ambiguity and do so dispassionately. Thus, there is value in exploring ideas about sources of dauntlessness that have emerged in changing or oppressive societies in various historical periods (see e.g., Augustine, trans. 1991; Heidegger, 1927/1962; Kierkegaard, 1846/1992; Lévi-Valensi, 2006; Nietzsche, 1888/1967; Sartre, 1943/1956; Solomon, 2004a).

Consider the conceptual triads listed in Table 1 that suggests where engagements with the humanities can be helpful (this is not intended as an exhaustive or representative list of relevant concepts). The use of triadic frameworks and relationships is not unique in science (see Chapter 3, section 3.2.3) or the humanities (see e.g., Hernade, 1995). Based on innumerable conversations with many stakeholders in OBTE at a variety of sites and programs of instruction, we believe the various personal meanings that will be found in OBTE are likely to dovetail with the philosophies embodied in one or another of these triads. The value of such triads is that they reveal concepts that are not separable and that, in combination, have emergent properties (see also, Chapters 3 and 4). Juxtaposing the triads is not to imply a one-to-one mapping between concepts in each column. Rather, frameworks such as this are intended to reveal ways in which the concepts can be

broadened, especially beyond the common connotations, and to reveal where the boundaries of the concepts are. In other words, there will be complementarities and inconsistencies that sharpen the use of each concept in capturing the meaning that OBTE has for various individuals. Such frameworks also will have implications for further development in the thinking of OBTE stakeholders with respect to its local implementation and value. They will be important because OBTE does not dictate to stakeholders precisely what meaning they should make of it. It simply asks that one become aware of the meaning one makes of OBTE and that one can trace it to the principles and practices of OBTE.

Table 1. Examples of conceptual triads that are relevant to experience and adaptability in Full Spectrum Operations in the context of values-based requirements in Army doctrine (cf., Chapter 4, section 4.4.1, table 2).

OBTE Intangibles	Confidence	Initiative	Accountability
Aristotle	Eudaimonia	Reason	Virtue
Aristotle	Phronesis	Episteme	Techne
Augustine	Teaching	Signs	Significance
Augustine	Love	Grace	Charity
Soren Kierkegaard	Aesthetic Existence	Religious Existence	Ethical Existence
Soren Kierkegaard	Subjective Truth	Existential Dialectic	Ethical Individual
Friedrich Nietzsche	Urbemensch	Slave Morality	Master Morality
Friedrich Nietzsche	Will to Power	Self Expression	Self Mastery
Martin Heidegger	Being-in-the-world	Being-unto-death	Authenticity
Martin Heidegger	Existence	Fallenness	Facticity
Jean-Paul Sartre	Self	Transcendence	Facticity
Jean-Paul Sartre	Being in Itself	Being for Itself	Being for Other
Albert Camus	Self Identify	Reflection	Self Awareness
Albert Camus	Emotions	Rationality	Lived Experience

5.5.2 The Soldier-Scholar as an Emergent Property of a Collective Pursuit

The AWG’s scientific engagement in OBTE seems to be a departure from the predominant use and view of science in the U.S. Army. Typically, the intent of scientific engagements in the Army is to retain scientists or obtain scientific subject matter expertise that is related to an operational problem. As useful as this might be, it does not capture the most important attribute of science, that it is the emergent activity of a community over time, a collaborative coming to know. Science has both historicity and a social dimension (cf., Godfrey-Smith, 2003). We do not take the position that scientific knowledge is socially constructed. We do, however, emphasize that it involves dialectical inter-subjectivity in a collective search for converging evidence, for meaningful evidence from an authentic multi-faceted inquiry. This is reflected in the iterative activity and mutually influential tasks documented in this monograph (see Prologue). Practical wisdom was not simply identified and translated into scientifically valid and verifiable concepts. Practical wisdom also was elaborated and refined in this investigation. The understanding of both Soldiers and scientists about OBTE evolved. Both communities benefited from the reciprocal influence, and both were left with enhanced capabilities for continued development. Science should not be thought of in terms of nouns; it embodies verbs and most if not all verb tenses.

The present investigation was even more unusual in that it was interdisciplinary or trans-disciplinary. It was not merely a compartmentalized multidisciplinary enterprise. It was self-consciously holistic and replete with internal reciprocal influence. Drawing from various

disciplines and stances, a plurality of methods was employed to inquire into the practical wisdom of Soldiers as instructors and leaders (cf., Flyvbjerg, 2001; Schram & Caterino, 2006). It is important to note, however, that the intent was not an indiscriminate pluralism or the cultural relativism it implies. Cultural relativism is fundamentally incompatible with the vision and purpose of a military as well as the political conditions that give rise to its employment (cf., Clausewitz, 1976 trans.). Indiscriminate relativism is unlikely to foster a clear sense of virtue that is essential to decisions based on practical wisdom when life and death are the consequences (cf., Aristotle, trans. 1925).

Although we alluded to some of the connections to existentialism made in the constant comparison documented in this chapter as well as in Chapters 3 and 4, this exploration largely was not documented in the manuscript because it was beyond our charge. Our conclusion is that, even with the extensive grounding in science we have suggested for the practical wisdom of Soldiers, scholarship in the humanities also is necessary to understand the variety of assumptions and commitments we encountered. In a sense, the realization that the humanities should accompany the sciences in the collaborative reflection on practical wisdom is a corollary of our claim that science is a collective pursuit considerably richer than the typical scientific engagements in the U.S. Army. Most science is conducted in academic communities that also are populated by scholars in the humanities. While faculty in the sciences and humanities rarely receive grants to conduct collaborative research together, and while formal scholarly interactions are the exception, there are some reciprocal influences simply by virtue of the fact that these individuals live and work together as part of a common community. In any case, the point is that there are opportunities for reciprocal influence even amid some apparently insurmountable obstacles. It can be argued that social and programmatic decision-making can benefit greatly from both the sciences and the humanities (Flyvbjerg, 2001; Schram & Caterino, 2006).

We highly recommend that the humanities be included alongside the sciences in a collective pursuit that informs continuous adaptation of Army training and education to a changing world. Our expectation is that this journey through increasing levels of apparent complexity, perhaps even some esoterica, will lead us to a simple core that we can communicate in a way that is immediately meaningful and uncontroversial to Soldiers. This expectation is based on the assumption that only the core truths, or at least inescapable realities, persist over millennia. Thus we considered threads of wisdom (not superficial positions) that can be traced from antiquity to the present. We also expect that this pursuit will be characterized by theme and variation. This is important because of the pluralism of perspectives that will be encountered in the increasingly broad consideration and interpretation of OBTE. There will be immediate practical value to being able to identify themes amid variation and to recognize when variations are inconsistent with the principles and practices of OBTE.

We believe that Soldiers who engage in this kind of collective pursuit, and an academic community that engages with Soldiers, are what it means to pursue the ideal of the Soldier-scholar. The point is not for all Soldiers to become students of the great ideas any more than it is for scientists to feign understanding of “in extremis” conditions faced by Soldiers. The point is to strive for a dialectic that includes both groups and in which deep questions are posed and pitfalls are avoided because of collaborative consideration of knowledge and experience that is not easily accessible to each group alone. In this vision, the Soldier-scholar is an emergent property of task organization among Soldiers, scientists and scholars in the humanities.

5.6 References

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