Introduction

Personality research (i.e. the study of individual differences in affect, cognition, behavior, experience, and learning) has had a considerable impact across the whole of psychology and its applications. Nevertheless, the study of personality is split by different research foci (i.e. theories and perspectives) that traditionally appear to be incompatible with each other. This chapter aims to contrast the biological, social-cognitive and experiential foci, and propose a hybrid model of personality and learning that uniquely also places similar emphasis on theory and measurement. The scope of this review is limited to approach and avoidance pathways that span these different research foci. Discussion of the different foci is limited to an integrative and measurement perspective as opposed to providing a complete review of the evidence in favor of one focus or the other. It is argued that the proposed hybrid methodology outlined in this chapter will lead to a better understanding of personality, motivation, and learning.

Approach and avoidance are motivational tendencies presumed to account for individual differences in behavior, mood, and cognition and learning (Elliot and Thrash, 2002; Gable et al., 2003). Approach and avoidance motivations differ as a function of valence, such that approach motivation occurs when behavior is instigated by the possibility of reward and positive outcomes, whereas avoidance motivation involves a desire to avoid punishment and negative outcomes (Elliot, 1999). Recently, the significance of approach and avoidance pathways in personality theory has increased because they have been considered as unifying constructs in personality (e.g. Carver et al., 2000; Elliot and Thrash, 2002). It has been argued that the idea of approach and avoidance is "so conceptually
central that it may be used to organize and integrate seemingly diverse approaches to personality" (Elliot and Thrash 2002: 804), and that the dual processes of approach and avoidance collectively provide a conceptual lens through which diverse approaches to personality may be understood. Additionally, the idea that approach and avoidance pathways are associated with learnt responses to environmental stimuli associated with reward and punishment leads to the perspective that approach and avoidance pathways are associated with learning and motivation (e.g. Gray and McNaughton, 2000). This perspective argues that approach and avoidance pathways might provide an explanation of the dynamics of personality as opposed to a simple description of personality.

The fundamental importance of approach and avoidance is clarified by its prominence in almost all major foci of personality research. Biological and Big Five theorists explain approach and avoidance in terms of extraversion and neuroticism (Eysenck, 1967; Costa and McCrae, 1992); Gray (1970) explains approach and avoidance in terms of the behavioral activation system (BAS) and the behavioral inhibition system (BIS); and Zuckerman (1994) makes reference to sensation seeking which he argues is a combination of the two (i.e. high approach and low avoidance). Socio-cognitive theorists, on the other hand, understand approach and avoidance in terms of learning and avoidance goals (Vandewalle, 1997) and the approach engendered by self-efficacy in achieving goals (Bandura, 1997).

Overlaps between the different models associated with the different research foci are illustrated in Figure 4.1. It is emphasized that this represents a simplification since different authors have often taken a variety of perspectives. Eysenck, for example, primarily claims a biological basis for his personality model (e.g. Eysenck, 1967), while also later making reference to socio-cognitive influences from learning. While acknowledging that most of the models listed in Figure 4.1 can be construed to cover multiple foci, the figure still remains useful in listing the primary focus of each model.

Despite the clear centrality of approach and avoidance pathways across these different research foci, the emphasis on their importance differs. On the one hand, Gray's constructs of approach and avoidance are theory driven and well developed a priori explanations of approach and avoidance (e.g. Corr, 2004; Gray, 1970, 1982; Gray and McNaughton, 2000), whereas others are statistically derived, in that approach and avoidance theory was added post hoc to explain dimensions underlying surface level behavior (e.g. Eysenck, 1967; Zuckerman, 1994). There are also personality models with no major theoretical basis (such as the Big Five) and some models of experiential learning with no discernible basis in personality (e.g. Kolb, 1984). All this is pertinent because theory driven models of approach and avoidance learning tend to have weak measurement systems. For instance, considerable research documents the constant problems in measuring Gray's model (e.g. Jackson, 2003; Smillie et al., 2006; Quilty and Oakman, 2004) whereas measurement-first models such as the Big Five (e.g. Costa and McCrae, 1992) tend to have a weaker theoretical basis (see Block, 1995).

As far as is known, there are just two broad personality models that explicitly aim to develop a hybrid model of personality and learning. For the purpose of this discussion, the word 'hybrid' is used to describe a model that is designed from the outset to span more than one of the multiple research foci described in Figure 4.1. The first is Cloninger's personality-based model (Cloninger et al., 1993) and the second is Jackson's learning in personality model (Jackson, 2005). Jackson's proposed hybrid model corresponds more closely to the middle path between learning and personality, resides at the juxtaposition between biological, cognitive, and experiential research foci, and was developed with a focus on theory and measurement. The result is a model of learning in personality which has a basis in approach and avoidance and
which has the additional aim of differentiating between functional and dysfunctional learning.

**IMPULSIVITY-SENSATION SEEKING (IMP-SS) CLUSTER AS THE BIOLOGICAL BASIS OF APPROACH AND AVOIDANCE WITHIN THE PROPOSED HYBRID MODEL**

The central relevance of impulsivity-sensation seeking (Imp-SS) as a trait cluster is highlighted by its centrality in many personality taxonomies (e.g., Cloninger et al., 1993; Gray, 1981; Zuckerman, 1979). Even Hans J. Eysenck, who strongly advocated superfactors of personality (e.g., Eysenck, 1967) developed a specific taxonomy of impulsivity (Eysenck and Eysenck, 1978), and accepted the importance of this dimension (Eysenck, 1993). Considerable evidence suggests that Imp-SS has a particularly strong heritability (Eysenck, 1993; Pickering, 2004) even against a background that there is now reasonable evidence in favor of at least a partial physiological or genetically driven basis to much of personality (Eaves et al., 1989; Fulk et al., 1980; Revelle, 1995).

Researchers however tend to differ in how they view the details of the biological basis of Imp-SS since there is some dispute over its basis in dopamine or serotonin pathways (e.g., Cloninger, 1987; Coscia, 1997; Gray, 1970; Zuckerman, 1979). Dopamine has been argued to be a biological basis for Imp-SS behaviors such as disinhibition, substance abuse, and antisocial behavior (e.g., Davids et al., 2003; Di Chiara, 1995; Goldman and
Fishbein, 2000) and serotonin has also been argued to be related to Imp-SS behaviors such as substance abuse, antisocial behavior and aggression (e.g. Dolan and Anderson, 2003; Moeller et al., 1994). Some research, however, advocate a cognitive basis (e.g. Dickman, 1990).

From this viewpoint, it is not surprising that Imp-SS is seen as predicting dysfunctional approach oriented behaviors such as criminality, gambling, alcohol use, and adultery (Eysenck and Gudjonsson, 1989; Kambouropoulos and Staiger, 2001; McAlister et al., 2005; Parker and Bagby, 1997; Zuckerman, 1994). In organizational settings, Imp-SS has been associated with a variety of negative outcomes, such as propensity to quit, job strain, and low job performance in service workers (Reio and Sanders-Reio, 2006).

There is, however a smaller literature concerning potential positive outcomes of Imp-SS. First, impulsivity may be both functional as well as dysfunctional. Functional impulsivity involves seizing the moment and making appropriate but quick decisions. Dickman demonstrates that functional impulsivity is related to functional outcomes (Dickman, 1990). Brunas-Wagstaff et al. (1994) argue dysfunctional impulsives have difficulty inhibiting inappropriate responses and functional impulsives have a rapid information-processing style, which is advantageous when positive outcomes are dependent on quick decision-making. Jackson (2001) reports that this trait cluster positively predicts work performance.

Second, Imp-SS is associated with successful learning. Ball and Zuckerman (1990, 1992) found people high in Imp-SS learnt faster regardless of the availability of reinforcement, and Pickering (2004) argued high Imp-SS is associated with successful learning and problem solving. Raine et al. (2002) took behavioral measures of Imp-SS in children who were 3 years old. They found support for their prediction that, by 11 years of age, high Imp-SS scorers would have higher IQs. They conclude that young children’s stimulus seeking creates an enriched environment that stimulates cognitive development and learning.

In summary, research indicates substantial evidence in favor of the biological basis of Imp-SS that would reflect an appetitive drive (an approach system presumably related to dopamine) while also reflecting a low inhibition drive (presumably based on an avoidance system linked to serotonin). While Zuckerman (1994) mainly focuses on dysfunctional components of sensation seeking, Dickman (1990) and Arnett (1994) expressively argue that Imp-SS can be related to functional outcomes, especially if a cognitive perspective to Imp-SS is introduced. However, none of these perspectives capitalize on another positive attribute related to Imp-SS which is its potential basis for learning as proposed by Ball and Zuckerman (1992) and Raine et al. (2002). One controversial conclusion from these findings is that Imp-SS is related to 'real-world' learning in which stimuli possess a confusing mix of approach and avoidance reinforcement such that Imp-SS is generally related to high approach and low avoidance learning. Potentially the separate measures of approach and avoidance advocated in Gray’s RST may be better suited to the laboratory in which reward and punishment stimuli can be independently provided.

Based on these arguments the proposed hybrid model (Jackson, 2005) incorporates Imp-SS as a psychobiological construct in a model of 'learning in personality'. Sensation seeking (i.e. the Imp-SS cluster) represents the measurable biological basis of exploratory learning and is related to high approach and low avoidance. Jackson places an emphasis on the capacity of sensation seekers to be exploratory and curious as opposed to the emphasis of Zuckerman’s (1978) model of risk taking and danger seeking. Moreover the design of the scale overcomes many of the criticisms that have been made of Zuckerman’s sensation seeking scales by Arnett (1994) and J. Jackson and Marau (1996). According to the proposed hybrid model, sensation seeking is the biological basis of functional and dysfunctional learning.
In line with the argument that socio-cognitive and environmental influences might lead to functional learning (see Arnett, 1994; Dickman, 1990), Jackson is also influenced by Cloninger et al.'s (1993) notion of temperament and character, with temperament representing the stable, biological basis of personality and character representing the more socio-cognitive components of learning. Elliot and Thrash (2002) advocate a similar kind of split to Cloninger without using this terminology.

For sensation seeking to be beneficial it may need to be focused, controlled, delayed or redirected, thus accounting for its positive and negative consequences. According to Jackson's model, socio-cognitive processes modify sensation seeking to produce functionally learnt outcomes. It is argued that the socio-cognitive processes have developed at a later evolutionary point in time to modify the instinctive urge to explore so that it becomes a functional pro-social activity. Without the positive influence of advanced socio-cognitive processes, the instinctive urge to explore is much more dysfunctional (a classic example being failure to delay gratification resulting in smash-and-grab behavior typical of delinquency).

The socio-cognitive processes developed by Jackson (2005) are very different to Cloninger et al.'s (1993) character components of personality, yet both models claim to have a basis in the socio-cognitive research focus shown in Figure 4.1. To understand Jackson's model of functional and dysfunctional learning it is crucial to examine the strengths and weaknesses of Cloninger's model which might already be thought of as achieving most of these aims already.

**APPROACH AND AVOIDANCE ACROSS TEMPERAMENT AND CHARACTER – A MOVE FROM CLONINGER'S MODEL TO THE PROPOSED HYBRID MODEL**

From a general approach and avoidance perspective, Cloninger et al. (1993) differentiates between biological and social-cognitive constructs based on their respective differences in terms of procedural learning (data-driven habit and skill learning) and propositional learning (concept-driven learning). According to Cloninger's model, perceptual memory processes relating to temperament operate independently of conceptual processes related to character. Research supports this disassociation in the central nervous system (Roediger et al., 1990).

Temperament is argued to be found in the subcortical, primeval part of the brain. Another way of thinking of temperament is that it is thought to be a distal, biologically based cause of personality, grounded in phylogenetically old learning systems (Cloninger, 1987). It may also be defined as the automatic associative responses to basic emotional stimuli that determine habits and skills (Cloninger, 1987). Finally, temperament components are argued to be stable and uninfluenced by socio-cultural learning. Alternative and similar words for 'temperament' used by other researchers include 'biological', 'non-conscious', 'procedurally learnt', 'non-controlled', and 'instinctive'.

Cloninger et al. (1993) contended that neocortical or conscious processes of the brain relate to character and as a consequence associated behaviors are weakly heritable, subject to learning by insight. Character refers to concepts about self and relations to others that develop over time as a function of social learning and maturation of interpersonal behavior. Character influences behavior through conscious decision-making, self-regulation, insight learning and self-awareness (Cloninger et al., 1993). Alternative words for 'character' include 'conscious', 'social', 'learnt', 'controlled', 'agentic doing', 'self-regulated', 'self-aware', 'voluntary', and 'cognitive'.

In terms of measurement, Cloninger developed the Temperament and Character Inventory (TCI) to measure temperament and character dimensions. Cloninger's model divides temperament into four scales. Harm avoidance (HA) represents the avoidance system.
in that it refers to a tendency to avoid punishment, novelty, and omission of rewards. Novelty seeking (NS) concerns a tendency to frequently engage in exploratory activity and to experience intense exhilaration in response to novel stimuli. Novelty seeking represents the approach system, is associated with response to reward and is based on the mesolimbic dopaminergic pathways (Cloninger, 1987; Gray, 1987; Pickering and Gray, 1999). Two other scales are also concerned with temperament, but are much less clearly related to approach and avoidance. These are reward dependence (RD) — which is not as similar to BAS as novelty seeking — and persistence (Cloninger et al., 1993). Character is divided into three scales termed self-directedness (SD) — which measures something akin to conscientiousness; cooperativeness (C) — which refers to something akin to sociability and agreeableness; and self-transcendence (ST) — which refers to feelings about nature and the universe (Cloninger et al., 1993).

Cloninger’s structural model of personality provides a well-defined framework within which to describe potential biological and socio-cognitive influences on personality. Cloninger’s theoretical contribution should not be underestimated. The model, however, has the following limitations:

1. There has not been a great deal of research into the temperament/character split, and whether it can simply be represented by the dichotomy envisaged by Cloninger.
2. Cloninger et al.’s (1993) proposed measurement model argues for a hierarchical structure to personality which is in fact also associated with Eysenck and Eysenck’s (1991) Giant Three model and Costa and McCrae’s (1992) Big Five model. The hierarchical model of personality provides structure by arguing that superfactors of personality are aggregates of primary scales. The hierarchical model is a consequence of these researchers’ model development based on exploratory factor analysis and suggests that there is little real interaction between the temperament and character constructs in Cloninger’s model.
3. While temperament primary scales have a general basis in approach and avoidance and a clear link to Gray’s model, Cloninger’s choice of character variables is based largely on observation and factor analysis (Cloninger et al., 1993). Cloninger’s model fails to build upon well-known cognitive and social models of personality (such as goal orientation as shown in Figure 4.1) and in fact remains firmly within the trait theory perspective of personality.

4. While the temperament dimensions seem heritable, at least one study has found that character is as heritable as temperament (Gillespie et al., 2003). Cloninger’s own theory would suggest that character should be less heritable than temperament.
5. The model has a very clinical orientation and has achieved little impact outside of this field.
6. The model does not attempt to include the research focus of experiential learning.
7. The model does not attempt to measure functional and dysfunctional learning.

Developing Cloninger’s general concepts of temperament and character, the proposed hybrid model argues that sensation seeking is a distal predictor of behavior, and character or conscious scales are proximal mediators of the distal scale. Proximal character components are seen as re-expressions of distal temperament such that functional or dysfunctional outcomes might result. Use of structural equation modeling (SEM) terms is deliberate since SEM provides a theoretical perspective as well as an applied measurement methodology, in which the prediction of actual behavior is expressly built into a theory-based model of learning in personality. Such a perspective extends and develops initial exploratory work by Cloninger et al., (1993), Elliot and Thrash (2002), Humphreys and Revelle (1984), Jackson and Francis (2004), and Ortony et al. (2005). While Cloninger’s theory hints at a possible mediating relationship of character on temperament (e.g. Cloninger et al., 1993), a review of the literature shows such a possibility has yet to be instigated.

The proposed hybrid model deviates from Cloninger in arguing that prior theoretical work from the socio-cognitive and experiential research foci should be incorporated into character and to understand why, it is
essential to review the main socio-cognitive and experiential models of learning in personality.

THE THEORETICAL STRUCTURE OF THE PROPOSED HYBRID MODEL

Chen et al. (2000) propose and validate a socio-cognitive applied model including goals (Locke and Latham, 1990), general self-efficacy, specific self-efficacy for a given situation (Bandura, 1999), goal orientation (VanderWalle and Cummings, 1997) and state anxiety. Their model was not tested outside of the educational domain, and did not include the biological basis of personality. It does, however, provide a very different perspective to Cloninger's character variables. Influenced by Chen et al.'s (2000) choice of socio-cognitive variables, Jackson (2005) argues character can be conceptualized in terms of goal-oriented achievers, conscientious achievers, and emotionally intelligent achievers as well as an experiential learning pathway that includes deep learning achievers. It is argued that sensation seeking is mediated by a series of pathways comprising these scales such that high sensation seeking can be re-expressed as functional or dysfunctional behavior according to the effects of the socio-cognitive and experiential components of the model.

GOAL-ORIENTED ACHIEVER

Goal orientation suggests that people vary in the extent to which they have a learning orientation toward tasks (e.g. Dweck, 1986, 1989). The most useful and adaptive goal orientation is learning goal orientation which refers to a tendency to develop competence by acquiring new skills and mastering new situations - (Dweck and Leggett, 1988; VandeWalle and Cummings, 1997). A learning orientation reflects a desire to develop competence by mastering new skills and developing oneself to deal with new situations. People with a learning orientation tend to pursue an adaptive or learning response pattern which is associated with persistence in the face of failure. They use more complex learning strategies and pursue specific, difficult and challenging goals and tasks. In line with the views of Elliot and Thrash (2002) and Locke and Latham (1990) a learning goal orientation is seen as a socio-cognitive approach mechanism (see Figure 4.1). In the learning goal orientation, effort is instrumental for developing the ability needed for future task mastery.

High goal orientation on its own is unlikely to be enough to redirect sensation seeking toward functional and adaptive learning. Take dysfunctional outcomes, such as substance abuse and binge eating, which involve a process consisting of planning and goal-focused behavior. In concrete terms this consists of a purchase, preparation, and consummation (Dawe and Loxton, 2004). The same can be said for organized crime and white-collar crimes, such as identity theft or fraud, which involve a great deal of carefully considered business-like activity, but is nonetheless dysfunctional and antisocial. Goal orientation provides the motivation to effectively achieve either functional or dysfunctional success but has little to say about what goals are initially set. It is therefore argued that other cognitions are required that guide the goal focus towards functional or dysfunctional outcomes. Therefore, the learning pathway between sensation seeking and goal-oriented achiever is mediated by pro-social cognitions which orient goals towards directing behavior towards functional outcomes.

The cognitions that seem likely to influence goal orientation were chosen to represent three different components of learning in personality. Each can be thought of as mediating the relationship between sensation seeking and goal-oriented achieving such that high scorers will have a tendency towards functional behaviors and low scorers will have a tendency towards dysfunctional behaviors.
CONSCIENTIOUS ACHIEVER – A PROPENSITY TO BE RESPONSIBLE AND TO WORK HARD

Conscientiousness is the second socio-cognitive scale included in the proposed hybrid model and is derived from the Big Five which has a basis in exploratory factor analysis. Conscientiousness refers to behavior that is 'responsible, dependable, persistent, and achievement-oriented' (Barrick and Mount, 1993: 111) and describes a desire for self-regulation and consequently to follow one's conscience (Costa and McCrae, 1992). Moreover, conscientious individuals are represented as being organized, reliable, hard-working, determined, self-disciplined, and achievement oriented (Costa and McCrae, 1992). Several authors maintain that conscientiousness is important to functional learning outcomes, especially in organizational settings (Barrick and Mount, 1991; Hogan and Holland, 2003; Martocchio and Judge, 1997). The idea of the conscientious achiever being dependable, responsible, orderly and cautious fits in well with a model in which conscientiousness is a learned, cognitive based skill.

A great deal of empirical evidence argues that conscientiousness is probably the most predictive of the Big Five personality traits (Byrne et al., 2005; Hogan and Holland, 2003; Liao and Chuang, 2004). Several meta-analyses have also concluded that conscientiousness is related to functional learning outcomes such as job performance and beneficial health (Barrick and Mount, 1991; Bogg and Roberts, 2004; Dudley et al., 2006; Hogan and Holland, 2003; Ones and Viswesvaran, 1996; Tett et al., 1991).

However, conscientiousness can be seen as simply part of a more complex cognitive process. Barrick et al. (1993) report that goals mediate the relationship between conscientiousness and two measures of job proficiency supervisory ratings for sales representatives. Gellatly (1996) finds that goals and expectancy mediate relationships between conscientiousness and performance on arithmetic tasks, and Barrick et al. (2002) report that conscientiousness was mediated by motivational constructs in the prediction of job performance in a sales job. As a result, conscientiousness is seen as a potential pathway, but not the sole pathway, between sensation seeking and goal orientation.

EMOTIONALLY INTELLIGENT ACHIEVER – A RATIONAL AND EMOTIONALLY INDEPENDENT THINKER

Trait emotional intelligence refers to the ability to direct and regulate emotions in a constructive and independent way such that positive outcomes are achieved. It is argued that emotional intelligence refers to an emotional state that leaves constructive behaviors open to oneself (Petrides and Furnham, 2000). According to the hybrid model, a calm, rational, and independent person is better able to choose appropriate behaviors (i.e. emotionally intelligent person), whereas a person dependent upon chance, luck, and others has a limited repertoire of behaviors available (i.e. non-emotionally intelligent person). An emotionally intelligent achiever is a functional learner who has the capacity to be objective in understanding problems, and has emotional independence from others and from chance. In being emotionally intelligent, intuition and chance are rejected and logical and rational ways of understanding are developed. This is a somewhat different definition of emotional intelligence to the more mainstream ones.

While the relationship between emotional intelligence and functional learning outcomes is likely to be positive, its relationship to dysfunctional learning outcomes is likely to be either positive or negative. High-scoring emotional intelligent achievers will tend to be functional learners due to their rationality and independence and low scorers will tend to be dysfunctional due to their dependence on chance and others. However, the
relationship between emotional intelligent achievers with other scales in the proposed hybrid will be more complex with some positive and some negative relationships. It is argued that conscientious achievers tend to be emotionally dependent upon others (thus the relationship between conscientious achievers and emotional intelligent achievers will be negative), because the learning involved in becoming conscientious, hardworking, and striving will be related to emotional neediness. The relationship between emotionally intelligent achievers and goal-oriented achievers is likely to be negative because emotionally independent people will tend to be emotionally independent and therefore reject the self-imposed constraints of goals.

The negative pathways between conscientious achievers and emotionally intelligent achievers and between emotionally intelligent achievers and goal orientation achievers add complexity and depth to the proposed model of learning in personality. These negative pathways provide constraints on the way that both deep learning achievers and conscientious achievers become goal-oriented achievers. The final scale in the proposed hybrid model of learning in personality is experientially based which therefore includes the third research focus as shown in Figure 4.1 and is often used to provide information about preferred learning styles. Each of the four elements of Kolb’s (1984) learning cycle is measured in a simple way that has led to the questionnaire gaining a wide following. The LSQ has, however, been subject to repeated criticisms based on its poor representation of theory and inadequate psychometric properties (Duff and Duffy, 2002; Swailes and Senior, 1999). According to the model of learning upon which the LSQ is predicated, people learn by experience from within four phases of a learning cycle (i.e., activist, reflector, theorist, and pragmatist). These phases reflect activities that people are thought to do when they learn and are associated with their preferences for these activities, as opposed to their achievement orientations.

Within the proposed hybrid model, experiential learning is included as a deep learning achiever scale which reflects the cognitions associated with resources allocated to the study of experiences. Research demonstrates that deep processing (that involves elaboration, critical thinking, and the integration of new information with prior knowledge) tends to produce high performance on cognitively demanding tasks. High ability individuals typically use more complex learning methods. Low ability individuals, however, have fewer cognitive resources and tend to use less complex learning strategies (Kanfer, 1991; Kanfer and Ackerman, 1989; Kanfer et al., 1994).

The proposed hybrid model argues that high sensation seeking is related to high deep learning achieving because the search and curiosity associated with sensation seeking tends to correspond with high experiential learning. Deep learners tend to reflect and think about their learning experiences and will tend to draw pro-social conclusions. Deep learners are likely to seek out useful stimuli and therefore enter a cycle of functional learning that also leads to emotional intelligence (i.e., a rational and logical way of learning). On the other hand people who tend to allocate fewer resources to the study of new sensations will tend to be dysfunctional.

**EXPERIENTIALLY BASED LEARNING**

Similar to the socio-cognitive perspective, another research focus which rejects the biological basis of personality and learning is that of experiential learning (see Figure 4.1). Here, the argument is that ‘we are what we learn from our experiences.’ The concept of experiential learning explores the cyclical pattern of all learning from experience through reflection and conceptualizing to action and on to further experience (Kolb, 1984).

Experiential learning is often measured by Honey and Mumford’s Learning Styles Questionnaire (LSQ), which is designed specifically to measure the way people learn.
learners because they will not be able to draw complex pro-social conclusions (such as how delay of gratification will tend to be a useful pro-social strategy).

PROPOSING THE HYBRID MODEL OF FUNCTIONAL AND DYSFUNCTIONAL LEARNING-SPANNING TEMPERAMENT AND CHARACTER

The proposed hybrid model measures approach and avoidance learning in personality and is designed to span biological, cognitive, and experiential foci (see Figure 4.1). The proposed model argues in favor of a non-directional (i.e. both functional and dysfunctional) biologically based scale of sensation seeking being a distal component of the learning basis to personality. Sensation seeking is a high approach and low avoidance instinctive urge to learn which is the basis of both functional and dysfunctional learning in personality. While Zuckerman (1994) advocates the role of sensation seeking in dysfunctional and risk-taking tendencies, Jackson emphasizes the role of sensation seeking in providing a basic drive to explore and be curious about the environment.

The view that non-directional sensation seeking or impulsivity is a basis for both functional and dysfunctional behavior was perhaps first argued by Arnett (1994) and Dickman (1990). Arnett proposed (but did not test) that the failure to socialize a high sensation seeker could lead to psychopathy, whereas correct socialization leads to leadership, career enhancement, and creativity. The proposed hybrid model of learning in personality adds the flesh to Arnett’s proposal by detailing the socio-cognitive and experiential pathways that lead to functional and dysfunctional learning.

The basis for the proposed biosocial model of personality is mainly derived from the biological theories of Eysenck (1967), Gray (1990), Gray and McNaughton (2000) and Zuckerman (1994); the cognitive theories of Bandura (1999), Dweck (1986, 1989), and Vandewalle and Cummings (1997); conscientiousness from the Big Five (Costa and McCrae, 1992); cognitions of negative emotionality and emotional intelligence (Petrides and Furnham, 2000); and the experiential model of Kolb (1984). It is also based on the integrationist ideas of Chen et al. (2000), Cloninger et al. (1993), Elliot and Thrash (2002), Humphreys and Revelle (1984), and Ortony et al. (2005). In particular, the model suggests that socio-cognitive and experiential factors mediate the biological drive of sensation seeking. Such a perspective is based on a theoretical perspective implicit in the writings of Cloninger et al. (1993), and utilizes a measurement model based on SEM.

Table 4.1 shows the means, standard deviations, and alphas of the five learning-in-personality scales. Each scale has 15 items and can be scored as ‘true’, ‘false’, and ‘can’t decide’.

The proposed measurement model of ‘learning in personality’ shown in Figure 4.2 is based on a sample of 3,124 people who have completed the Learning Styles Profiler (LSP) (Jackson, 2005). The two-step approach to structural equation modeling (SEM) was used to validate the theoretical structure as recommended by Anderson and Gerbing (1988). One-factor congeneric measurement models were specified and tested prior to the testing of the full structural model. The aim in developing the measurement models prior to the full structural model is to assess the validity and reliability of the constructs prior to their use in the full model (Anderson and

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<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>alpha</th>
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<tr>
<td>Sensation seeking</td>
<td>22.15</td>
<td>5.44</td>
<td>0.75</td>
</tr>
<tr>
<td>Goal-oriented achiever</td>
<td>22.29</td>
<td>5.55</td>
<td>0.80</td>
</tr>
<tr>
<td>Deep learning achiever</td>
<td>16.56</td>
<td>6.20</td>
<td>0.74</td>
</tr>
<tr>
<td>Conscientious achiever</td>
<td>21.50</td>
<td>5.60</td>
<td>0.75</td>
</tr>
<tr>
<td>Emotionally intelligent achiever</td>
<td>20.34</td>
<td>6.69</td>
<td>0.81</td>
</tr>
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the subsequent structural model analysis. This procedure followed Holmes-Smith’s (2001) recommendations.

Consistent with the hypothesized nature of sensation seeking (strongly biological, genetic, developed early in evolution), based on the literature review, this scale is considered the most distal. This distal ‘instinctive or temperament’ scale is mediated across a series of pathways in the prediction of behaviors by means of ‘conscious or character’ based socio-cognitive or experiential scales which possess a complex structure with some similarity to that proposed by Chen et al. (2000) and according to the arguments developed in this literature review. In the previous section, it has been argued that the desire to approach sensations and a low tendency to avoid punishment will be cognitively re-expressed both through goal orientation and knowledge accrued from learning experience. Having a tendency to be a deep learner is itself re-expressed in terms of conscientiousness and emotional intelligence. Conscientiousness is re-expressed in terms of goals and the rationality of emotional intelligence is expressed in terms of low goal orientation.

Given that Chi-squared is sensitive to a large sample size, it is not surprising that it is significant. However, excellent ‘goodness of fit’ is achieved on all other widely used measures (RMR = 0.046; GFI = 0.997; AGFI = 0.984; CFI = 0.989, RMSEA = 0.049, RHO = 0.959). All paths shown in Figure 4.2 are significant (p < 0.001) and all indirect paths are significant (p < 0.001). No error covariances were fitted to improve model fit.

Table 4.2 presents correlations between the scales of the proposed measurement model as well as correlations with other measures. Jackson's sensation seeking is significantly positively correlated with all representative biologically based measures of approach (EPQ-extraversion, Carver and White's (1994) three scales of BAS, Dickman's functional and dysfunctional impulsivity, and Zuckerman's four scales of sensation

Gerbing, 1988). The one-factor model was initially calculated using four parcels of items from the relevant scales. Standardized lambda coefficients and standardized error terms were inspected to identify those items considered most important in the one-factor model and those variables considered least important as a measure of the latent construct (i.e. with small lambda coefficients and large error variance according to the specifications provided by Holmes-Smith, 2001). All one-factor congeneric models achieved an excellent ‘goodness of fit’. Factor scores from these one-factor models were used to create composite variables with maximized reliabilities. With the standard deviation and variance of the composite variable, and the maximized reliability value, parameter coefficients and error coefficients for the composite variable were calculated. These values were then used in

Figure 4.2  The proposed hybrid model of learning in personality – testing the theory using SEM
<table>
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<th></th>
<th>SS</th>
<th>GOA</th>
<th>DLA</th>
<th>CA</th>
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<tbody>
<tr>
<td>a) Scale intercorrelations</td>
<td></td>
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f) Correlations with self-reported leadership behavior

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g) Correlations with self-reported dysfunctional behavior

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<th>Drug use DAST20</th>
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Jackson's (2005) LSP: SS = sensation seeking; GOA = goal-oriented achiever; DLA = deep learning achiever; CA = conscientious achiever; EIA = emotionally intelligent achiever
Eyseck and Eysenck's (1991) EPQ-R: E PQ-E = extravagasion; EPQ-N = neuroticism
Zuckerman's (1978) Sensation Seeking Scale: SSS-TAS = thrill and adventure seeking; SSS-ES = experience seeking;
SSS-DIS = disinhibition; SSS -- BS = boredom susceptibility
Caver and White's (1994) BIS-BAS scales: C & W BAS DR = BAS drive; C & W BAS FU = BAS fun seeking; C & W BAS RR = BAS reward responsiveness; C & W BIS = BIS
Dickman's (1990) Functional (Dickman Fl) and Dysfunctional Impulsivity scales (Dickman Df)
Chen et al.'s (2000) General Self-Efficacy Scale (GSE)
VanderWalle and Cummings (1997): Learning goal, Proving goal, Avoidant goal
Learning Styles Questionnaire: LSQ activist; LSQ reflector; LSQ pragmatist; LSQ theorist
Johnson's (1998) Job performance (Job perform.) and Organizational commitment (org. commit.)
Warr and Payne's (1993) Job Satisfaction Questionnaire (Job Satis.)
Multifactor Leadership Questionnaire (Modified MLQ; Bass and Avolio, 1995). Transformational leadership measured in terms of charisma (MLQ Char), intellectual stimulation (MLQ Inte.); individual consideration (MLQ Indi.), and contingent reward (MLQ Con.)
Lilienfeld and Andrews' (1996) Psychopathic Personality Index (PPI)
Lesieur and Blume's (1987) South Oaks Gambling Scale (Gambling SOGS)
Bennett and Robinson's (2000) Workplace Deviance
Bailey et al.'s (2000) Prolific Sexual Activity
Skinner's (1982) Drug-use Scale (DAST-20)
seeking). Jackson's sensation seeking and Zuckerman's sensation seeking measures differ because Jackson's is designed to be neither functional nor dysfunctional, whereas Zuckerman's is purposefully more dysfunctional. It is noted that biologically based models of approach are generally positively correlated with goal-oriented achiever and negatively correlated with conscientiousness. These correlational trends explain why approach measures are generally unpredictable of behavior such as workplace performance since the positive component of goals is cancelled-out by the negative relationship with conscientiousness. The proposed hybrid model uniquely measures all these components.

Like Zuckerman's sensation seeking, Jackson's sensation seeking represents low avoidance as well as approach. This is shown by the negative correlations between Jackson's sensation seeking with EPQ neuroticism. Jackson argues that sensation seeking represents both high approach and low avoidance and this is shown by the pattern of positive and negative correlations with measures that aim to capture approach and avoidance separately.

It is also noted that Dickman's (2000) functional impulsivity is much more strongly related to sensation seeking and goal-oriented achiever, whereas Dickman's dysfunctional impulsivity is more related to sensation seeking, low conscientiousness, and low emotional autonomy. The relationship between the scales of the Learning Styles Profiler and Dickman's impulsivity measures show that the proposed model performed extremely well since both functional and dysfunctional impulsivity relate to high sensation seeking, whereas functional impulsive behavior is positively associated with goal-oriented achiever. Dysfunctional impulsive behavior is negatively associated with conscientious achiever and emotional intelligent achiever.

Also shown in Table 4.2 are the correlations with widely accepted measures of cognitive approach and avoidance (Chen et al.'s, 2001, self-efficacy and VanderWalle and Cummings, 1997, measures of goal orientation). As expected, these two measures correlate most highly with sensation seeking and goal-oriented achiever. In contrast, VanderWalle's avoidance goal orientation correlates negatively with sensation seeking, and so is consistent with Jackson's theory. Its dysfunctional nature is also highlighted by negative correlations with emotional intelligent achiever and goal-oriented achiever. VanderWalle's proving goal orientation shows a combination of both functional and dysfunctional components noted by its positive relationships with sensation seeking, goal-oriented achiever, deep learning achiever, and conscientious achiever, and its negative relationship with emotionally intelligent achiever.

A further section of Table 4.2 provides evidence in favor of the overlap between the proposed hybrid model and experiential learning. The pattern of results between Jackson's model and Honey and Mumford's Learning Styles Questionnaire suggests that sensation seeking overlaps with the activist scale and conscientious achiever overlaps with Honey and Mumford's reflector, pragmatist, and theorist scales. Results further suggest that the activist scale of Honey and Mumford's Learning Styles Questionnaire may generally possess low validity as activist learning is also associated with low conscientious achievement and low emotional intelligent achievement. Interestingly, Honey and Mumford's scales do not seem highly related to the deep learning achiever scale which further demonstrates the well-known psychometric problems with the Learning Styles Questionnaire (Duff and Duffy, 2002; Swales and Senior, 1999).

The validity of the proposed hybrid model is also shown in Table 4.2 in terms of the positive correlations between most of the LSP scales and self-reported functional workplace behavior (job performance, organizational commitment, and job satisfaction). This viewpoint is confirmed by noting that the proposed model is also strongly predictive of transformational leadership.
Finally, the validity of the proposed model can be shown in its ability to predict dysfunctional behavior. It is suggested that dysfunctional behavior should have the following:

1. A positive but not necessarily significant relationship with sensation seeking. The positive relationship indicates that sensation seeking is positively related to dysfunctional learning. However, the correlation between sensation seeking and dysfunctional behavior does not need to be significant because, in line with many others, it is argued that step 1 of Baron and Kenny’s (1986) test of mediation (which tests for a link between the IV and the DV) does not have to be significant to demonstrate mediation.

2. A pattern of generally negative correlations between Jackson’s cognitive scales and dysfunctionally learnt behavior, with the possible exception of goal orientation which may be positive when dysfunctional behaviors involve a great deal of planning. In general these patterns are shown in Figure 4.2. Psychopathy (measured by means of the PPI; Lilienfeld and Andrews, 1996) is positively related to sensation seeking and goal-oriented achievement and negatively related to conscientious achievement and emotionally intelligent achievement. Gambling (measured by SOGS; Lesieur and Blume, 1987), workplace deviance (Bennett and Robinson, 2000), prolific sexual activity (Bailey et al., 2000) and drug use (DAST-20; Skinner, 1982) are significantly negatively related to emotionally intelligent achieveer and generally negatively related to conscientious achieveer.

Collectively, therefore, these results provide reasonably strong evidence in favor of Jackson’s (2005) proposed hybrid model. The five scales of the Learning in Personality model have good alpha reliability (Table 4.1). A structural model of learning is developed in which all proposed direct and indirect pathways are statistically significant (Figure 4.2) and the hypothesized model is consistent with the empirical data, as indicated by the model fit indices. Moreover, the proposed theoretical model is also consistent with other approach and avoidance models of personality as shown by the correlations in

Table 4.2. The model also predicts both functional and dysfunctional behavior as also shown in Table 4.2.

OUTCOMES – FUNCTIONAL/DYSFUNCTIONAL/NON-LEARNER/STEADY

Jackson’s (2005) argues a functional learner is someone who has the instinctive drive to learn (i.e. is a high sensation seeker) and who can harness, redirect, delay, or re-express this drive by means of cognitions to achieve a functional understanding of today’s complex world. This is a self-developed competent learner perhaps best symbolized by an entrepreneur.

A dysfunctional learner is someone who has the instinctive drive to learn, but who is generally a low scorer on the socio-cognitive and experiential learning scales. Such a perspective argues that dysfunctional appetitive behaviors such as delinquency, alcohol consumption, workplace crime, and so on, are the result of cognitive deficits in the regulation of high sensation seeking. To some extent such a view is broadly supported by research in similar areas such as McFall’s (1976) social deficit model, which follows this perspective since problematic behavior is seen as a consequence of an underdeveloped repertoire of socially acceptable skills.

Jackson’s model also identifies a competent non-learner. This is someone who is a low scorer on sensation seeking and is therefore not very curious about the world but who is a high scorer on the socio-cognitive scales. Such a person is likely to be functionally competent and a good worker but not very adventurous. In many jobs, in which mistakes are inappropriate and adventurousness is not valued, the competent non-learner will be an excellent employee. However this person will to some extent get ‘stuck in a rut’. It needs to be emphasized that the low sensation seeking reflects a low desire to
engage in new self-development learning as opposed to a low desire to learn knowledge.

A low scorer on sensation seeking on the socio-cognitive, and on experiential scales is likely to be a non-competent non-learner. This person lacks the cognitive skills to be effective and lacks the drive to explore and self-develop. Such a person may be knowledgeable (since learning in personality is not concerned with the accrual of facts, except perhaps the deep learning achiever scale) but is generally neither curious nor pro-social.

The structure of the model is accepting of psychological interventions, unlike many of the present trait models of personality, such as the Big Five, Giant Three or Reinforcement Sensitivity Theory. The latter models argue in favor of behavioral consistency whereas the proposed hybrid model is dynamic and developmental. It is argued that the socio-cognitive and experiential scales should be more open to training, CBT, coaching, and self-development than the biological (a view also shared by Cloninger et al., 1993). This is a fundamentally important difference since identifying whether or not traits are primarily biological or socio-cognitive provides the theoretical framework for behavioral interventions as desired by Blackburn (2000; see Levine and Jackson, 2004). This allows us to apply personality assessment to not only describe behavior, but to really use it to drive issues such as the management of dangerous offenders, clinical intervention, educational intervention, as well as in the targeting of interventions in training, coaching, and organizational psychology.

A further use could be in personnel selection. At present, personality questionnaires are generally used as a basis for selection or rejection. The proposed hybrid model identifies possible areas for development and training as well as selection. This could be useful for example military officer selection in which there is a shortage of applicants such that there is an increasing desire to pass applicants. Using the Learning Styles Profiler would enable applicants to be split into ‘recoverable rejects’ and ‘rejects’. Recoverable rejects are those people who could meet the person specification if they benefit from training.

**CONCLUSIONS**

The proposed hybrid model of learning in personality provides a significant and innovative opportunity to integrate biological, socio-cognitive, and experiential models of personality (see Figure 4.1). The proposed hybrid model is theoretical and has wide applicability and appeal to personality researchers and practitioners. While innovative in scope, the basis of the proposed hybrid model logically extends and integrates many prior theories (e.g. Chen et al., 2000; Cloninger et al., 1993; Elliot and Thrash, 2002; Gray and McNaughton, 2000; Humphreys and Revelle, 1984; Revelle, 1993, 1995). A considerable influence on the model is derived from biological, socio-cognitive theorists and experiential theorists. It is argued that near-simultaneous development of a measurement model that corresponds to the theoretical structure provides the appropriate balance between previous work that emphasizes measurement at the expense of theory (such as the Big Five model), post-hoc theory to match measurement (e.g. Eysenck’s model), and post-hoc measurement to match theory (e.g. Gray’s RST). It is argued that the focus on approach and avoidance in personality psychology is useful but that a combined pathway has considerable merit compared to the dual pathways as argued, for example, by Elliot and Thrash (2002), Eysenck (1967), and Gray and McNaughton (2000).

The proposed model of learning in personality achieves the following theoretical outcomes:

1. Development of a hybrid model of biological, experiential, and social-cognitive theories of personality, such that social and experiential cognitions are seen as proximal mediators of a distal biological construct.
2 Relegation of sensation seeking to temperament thereby permitting the social-cognitive perspective; and relegation of social-cognitive theory to character to allow sensation seeking room to flourish.

3 Development of the idea that sensation seeking relates to both functional and dysfunctional learning and the opportunity to understand personality antecedents of functional and dysfunctional learning in personality by common biological basis and divergent cognitions.

4 The opportunity to integrate a variety of social and cognitive models along the lines suggested by Chen et al. (2000).

5 A departure from Eysenck's hierarchical model of personality influenced by exploratory factor analysis towards a theory-driven structural model influenced by SEM.

6 A departure from a strict dichotomy of temperament and character envisaged by Cloninger et al. (1993) into more of a continuum flowing from distal biological constructs to proximal socio-cognitive constructs.

7 A departure from the separate measurement of approach and avoidance as extraversion and neuroticism or BAS and BIS by advocating a single biological scale of high approach and low avoidance. Such a perspective does not dispute the biological evidence of separate approach and avoidance pathways (e.g. Depue and Collins, 1999; Gray and McNaughton, 2000). It does acknowledge that it is hard to measure these pathways as orthogonal constructs (as noted by Jackson and Smith, 2004; Smith and Jackson, 2005) and acknowledges that complex and relevant stimuli in the real-world often contain a mix of rewarding and punishing stimuli which lead to both BAS and BIS activation.

8 The development of a model of personality which provides direct advice on how to implement interventions such as by training, CBT, coaching, and self-development as required by Blackburn (2000).

9 Prediction of functional and dysfunctional learning outcomes. The proposed hybrid model focuses on developmental learning outcomes instead of simply describing personality (as the Big Five model, for example, sets out to do).

10 The opportunity to understand personality antecedents of functional and dysfunctional learning in personality in terms of common biological basis and divergent cognitive basis.

11 There are numerous applications of the model in organizational, educational, forensic and clinical psychology as well as in the community.

ACKNOWLEDGEMENTS

The Manual, Paper versions and a Software expert system of the hybrid model of learning ('The Learning Styles Proﬁler') are available from Cytem at (http://www.cymeon.com). Thanks to the excellent endeavors of my notable graduate students including Stephen Levine, Luke Smillie, and Peter O’Connor for their help and assistance with my learning.

REFERENCES


