

EMOTIONAL INTELLIGENCE AT MID LIFE: A CROSS SECTIONAL INVESTIGATION
OF STRUCTURAL VARIANCE, SOCIAL CORRELATES, AND RELATIONSHIP TO
ESTABLISHED PERSONALITY AND ABILITY TAXONOMIES

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Emotional Intelligence (EI) has been relatively unstudied after young adulthood. Yet there are a variety of reasons to expect that EI may be different at mid life than in young adulthood. Normative life experiences may lead to increases in EI, and as the array of different environments and experiences increases with age, one might expect greater individual differences in EI. Similarly, if EI is located somewhere at the intersection of personality and intelligence, as some have speculated, it may follow a course of structural differentiation similar to cognitive abilities. EI may be more closely linked to social variables such as loneliness and friendships at mid life, and its relation to established personality and ability factors such as the Big Five (Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness) and fluid and crystallized abilities may also vary with age.

These hypotheses were investigated in samples of 292 young adults and 246 mid life adults, using the Schutte Self Report Emotional Intelligence Inventory, the NEO-Five Factor Personality Inventory, markers of crystallized and fluid ability from Horn's Crystallized/Fluid Sampler, and a variety of other measures. Mid life adults scored higher on overall EI scores, but evidenced no greater range of individual differences than did young adults. A series of exploratory and confirmatory factor analyses revealed no greater differentiation in the mid life sample either among dimensions of EI or between EI and personality and intelligence variables. Finally, EI appeared equally predictive of social variables in each sample.

Results are discussed from the perspective of lifespan and aging literature on emotion, personality, and social functioning. Qualifications for the inference of age-related change in cross sectional designs are considered, along with advantages and disadvantages of factor-analytic and covariance structure modeling methodology. Implications, particularly for psychotherapy with each age group, are discussed.

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CHAPTER 1

INTRODUCTION

EI: Antecedents and Origins

Emotion has been the object of curiosity since the earliest writings of pre-Socratic philosophers (Lundun, 1995). Speculation about the cause and nature of emotions flourished in Greek thought, receiving perhaps their most famous treatments in Plato's Republic and Aristotle's Nichomechan Ethics (e.g., Durant, 1927). Through medieval times, interest in emotion persisted among scholastics such as Acquinas, and even during the Enlightenment, passion became a countervailing force against rationality in the writings of Rousseau (1979/1762) and the romantics, as well as in Nietzsche (1886/1969).

During the end of the 19th century, William James (1890) produced one of the most famous chapters ever written on emotion in his *Principles of Psychology*, effectively establishing psychology's stake in the study of man's "tender minded" side. Though psychology's attention to and approaches toward emotion waxed and waned throughout the ensuing decades, by the 1970s interest in mood, affect, and other non-rational processes had risen again with the tide of the cognitive revolution (e.g., Mahoney, 1991). By the last decade of the 20th century, a new theory uniting emotions and cognition had emerged: Emotional Intelligence (EI).

The EI literature has evolved at a dramatic rate, in both the popular press (e.g., Goleman, 1995; 1998) and the field of academic psychology. The appeal of EI to the layman and popular press seems to be the assurance that it may be "as important or more important" in life success than intelligence; this view was immortalized in a 1995 Time magazine cover story (Gibbs, 1995). Scholarly researchers seem drawn to EI because it is a new individual difference construct with intuitive appeal, located somewhere between the traditionally divorced realms of

intelligence, personality, and emotion. Before we examine the construct in more detail, let us turn to other conceptions of alternative intelligences that prefigured it.

Antecedents of EI

David Wechsler felt that intellectual abilities, *qua* tests of cognitive performance, composed only a portion of general intelligence, a suspicion confirmed by large portions of uncaptured variance in factor analyses of the Wechsler Adult Intelligence Scale ® (WAIS; Harcourt Assessment Inc., San Antonio, TX) series (Kaufman & Kaufman, 2001). General intelligence, according to Wechsler, must also include conative factors independent from rational reasoning and abstract thinking. In the long tradition of multiple intelligence theories, many attempts have been made to capture the “non-rational” contribution to general intelligence, including Gardner’s (1983) concepts of interpersonal and intrapersonal intelligence, Sternberg’s (1988) notions of creative and practical intelligence in his triararchic model, and perhaps to some degree the behavioral domain of Guilford’s (1959) structure of intellect model. The closest forerunner of EI, however, is probably social intelligence (Thorndike, 1920).

Thorndike originally conceived of social intelligence as the third branch of his own tripartite model, which also included an abstract or scholastic branch, and a mechanical/visuospatial branch. Thorndike’s social intelligence involved the ability to manage other people and social interactions, and to exercise appropriate social judgment. Measures were developed to operationalize social judgment, but after decades of empirical effort, the construct proved too difficult to disentangle from verbal or crystallized abilities (Kantor & Kihlstrom, 2000; see also Mayer & Salovey, 1993; Mayer & Greher, 1996; Roberts, Zeidner, & Matthews, 2001). EI, in turn, was an attempt to define a narrower construct than social intelligence--one that was empirically more independent of traditional verbal or crystallized abilities (Salovey &

Mayer, 1990; Mayer & Salovey, 1993).

The Creation of EI

In their seminal paper, Salovey and Mayer (1990) defined EI as “the ability to monitor one’s own and others’ feelings and emotions, to discriminate among them and to use this information to guide one’s thinking and actions” (p.189). The general notion was that emotional perception, regulation, and knowledge existed somewhere in cognitive ability space, but was largely unique from established mental abilities.

Salovey and Mayer (1990) chose to label their organizing construct an “intelligence” for several reasons. First, cognition and affect may often exert mutual influence on one another, despite the traditional bifurcation of these dimensions of human experience. Second, some evidence strongly suggests that emotions are processed and managed at higher cognitive levels, similar to abstract thought, analytical thinking, and other mental operations traditionally classified under the purview of intelligence. Third, Salovey and Mayer wanted to distinguish EI as a higher-order *potential* or *capacity* for adaptive living, rather than a manifest tendency to simply behave in a certain optimal way, such as a trait or acquired competency (Salovey & Mayer, 1993; Mayer & Salovey, 1995). This third point has been the subject of considerable contention. Many researchers have found EI more fruitfully conceptualized as a trait or pattern of typical behavior (e.g., Bar-On, 1997; Petrides & Furnham, 2000a, b; 2001), and a recent synthesis of the literature has settled upon a conceptualization of EI as an adaptive competency (Matthews et al., 2002; see also below).

The period from 1991-1995 saw a modest growth in scholarly interest in EI, highlighted by the first of what would later be called “ability” measures of EI (Mayer, DiPaulo, & Salovey, 1990) and the introduction of the Trait Meta-Mood Scale, the first in a line of self-report

measures of EI (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). Mayer (2001) reflected that this early period was a time of exploration and experimental measurement in EI. But despite its germinal status and lack of research, EI soon attracted a flood of popular attention.

The Influence of Daniel Goleman

In 1995, Daniel Goleman's book *Emotional Intelligence* was published. Though Salovey and Mayer (1990) defined the construct clearly and thoroughly, Goleman (1995) and various others (e.g., Bar-On, 1997; Cooper & Sawaf, 1997) quickly promulgated their own theories, which held less scientific rigor but greater popular appeal (see, e.g., Barret, 2001; Mayer, 2000).

Goleman, a popular science journalist, enjoyed blockbuster success with his treatment of the new theory. Under his writing, EI was redefined in the public's eye by motivational and even moral components; Mayer (2001) later labeled this a "mixed model" of EI because it mingled established personality traits and behavioral patterns which had little in common, save for the fact that they were all desirable characteristics. EI was also often referred to as "EQ" after the famous *Time* magazine piece (Gibbs, 1995) that, following Goleman's lead, offered dramatically overstated claims for the construct (see Mayer, 2000, for a more thorough treatment of this).

EI researchers, somewhat befuddled by this rendition of their efforts, continued on after 1995 with their original ideas. Goleman's notion of EI was seized upon by the corporate sector, where a cottage industry of EI or EQ books, articles, and management workshops quickly proliferated. Oddly, the divergence of Goleman's definition of EI from original versions escaped systematic comment until 2000 (Mayer, Salovey, & Caruso, 2000a).

Competing Conceptual Models and Measurement Paradigms of EI

Ability v. Mixed Models

The models of Goleman (1995; 1998) and others (e.g., Bar-On, 1997; Epstein, 1998)

generally consider EI as a combination of personality characteristics valued by Western society (Johnson, 2002; Mayer, 2001). For instance, Goleman (1998) actually includes the established personality trait of extraversion as one of five general domains of EI. Others domains include motivation, social skills, self-confidence, and so forth.

In order for a new construct to be useful, it should be sufficiently different from existing ones. Critics have argued that there appears to be little theoretical rationale for the collection traits under such mixed models (Mayer, 2001). Mayer and his colleagues have also criticized mixed models for wedding motivational concepts, behavioral patterns, established personality traits, and emotional abilities under the rubric of an intelligence.

By contrast, the ability model of EI proposes a set of more specific set of skills supposed to be located somewhere within the positive manifold¹ of established mental abilities. One such definition of EI is:

Emotional intelligence involves the ability to perceive accurately, appraise, and express emotion; the ability to access and / or generate feelings when they facilitate thought; the ability to understand emotion and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth. (Mayer & Salovey, 1997, p. 10).

EI therefore comprises four circumscribed domains; these are ordered by advancing degrees of cognitive sophistication: First, EI involves the ability to appraise and express one's own emotions, as well as to assess the emotional states of others (e.g., Mayer & Greher, 1996). Second, EI entails the ability to utilize emotional states in an adaptive manner (e.g., Mayer & Salovey, 1995), including allowing positive moods to drive creativity, interrupt fruitless cognitive sets, serve as motivation for achievement, and facilitate thinking (Mayer & Salovey, 1997). Third, EI involves a higher-level understanding or meta-awareness of emotions, including

¹ The use of the term "positive manifold" has been used by contemporary EI researchers (Roberts, Zeidner, & Matthews, 2001) as simply reference to a positive correlation matrix, somewhat different from Thurstone's (1931) original use of the term.

the ability to analyze their origin, transitions, future course, and mechanisms that may alter them (Mayer & Salovey, 1997). Fourth, EI encompasses the regulation of emotion in one's self through techniques such as self-soothing, as well as in others, through strategies such as persuasion, inspiration, and manipulation, in a way that promotes one's own and others' general well-being (e.g., Salovey, Hsee, & Mayer, 1993).

After a definitive review of existing intelligence, emotion, personality, and EI literature, Matthews and colleagues (2002) offered a definition synthesizing the various EI models: EI is considered an adaptive competency for dealing with emotional events. This competency may reflect both abilities and preferred modes of behavior, and though it has links to cognitive and neurological architecture, is largely acquired. We will consider EI from this perspective from here on out, because it bridges most of the different conceptualizations and is founded upon a thorough synthesis of several relevant bodies of literature. However, there is another point of contention in the field: How is EI to be measured?

Measurement Paradigms

A wide variety of measures exist based on various conceptualizations of EI (for reviews, see Carriochi, Chan, Caputi, and Roberts, 2001; Matthews, Zeidner, & Roberts, 2002; Schutte & Malouff, 1999). In evaluating measures of EI, a distinction has been proposed between "performance" (sometimes called "ability") and self-report measures (Ciariochi et al., 2001). The former evaluate EI based on "objective" criteria, whereas the latter ask individuals to rate their own level of EI.

The Performance Measurement Paradigm

Efforts to operationalize EI as an ability have lead to the development of a test by Mayer and colleagues (Caruso, Mayer, & Salovey, 2002; Mayer, Caruso, & Salovey, 1999; Mayer,

Salovey, Caruso, & Sitarenios, 2001) that is based upon traditional efforts to assess intelligence. The Multifactor Emotional Intelligence Scale (MEIS; Mayer et al., 1999) consists of several subtests, each containing a series of emotion-related tasks that the test taker performs. Responses are then evaluated for their “correctness,” rendering an “objective” measure of EI.

The MEIS, and its supplanting instrument, the Mayer-Salovey-Caruso Emotional Intelligence Test ® (MSCEIT; Multi Health System, Inc., Buffalo New York) by Mayer et al. (2001), have received some favorable construct validation, displaying relative independence from the 16 PF global factors (Caruso, Mayer, & Salovey, 2002) and mild correlations with other proxies of crystallized ability (Gc; Mayer et al., 1999; Roberts et al., 2001), suggesting its distinction from established personality traits and possible connection to cognitive ability. However, the ability measurement paradigm has also raised considerable controversy.

At an empirical level, some of the subscale reliabilities are quite low (in the .30s), suggesting a relatively large standard error of measurement. The test’s observed factor structure also appears to waver across samples, and does not entirely map onto the intended content domains. However, the major point of criticism has been the putative “objectivity” of scoring.

It has been hard to conceptually justify a set of veridical answers for the test, given that emotional experience and functioning may be highly ipsative (Matthews et al., 2002; Roberts et al., 2001; Zeidner, Matthews, & Roberts, 2001). Scoring methods involve either comparing answers to responses deemed “correct” by experts (namely, Mayer and Salovey), or assessing the degree to which responses concur with the majority. The first method, expert scoring, is inherently informed by the values and biases of the experts who decide the “correct” way of feeling, assessing, labeling, or responding to an emotion (e.g., Matthews et al., 2002; Roberts et al., 2001; Zeidner et al., 2001). The second method, consensus scoring, judges the merit of

emotion based on culture-bound standards, which may or may not reflect emotionally intelligent behavior for a given individual in a given situation (e.g., Matthews et al., 2002; Roberts et al., 2001; Zeidner et al., 2001). Furthermore, these two scoring methods have not converged well in critical investigations by neutral parties, correlating only .48 thus far (see Roberts et al., 2001). These conceptual and psychometric difficulties have made some researchers leery to use ability tests of EI (e.g., Petrides & Furnham, 2000b; Roberts et al., 2001), but curiously have not stopped MEIS creators from mass-marketing the MEIS to the organizational consulting sector.

The Self-Report Measurement Paradigm

In contrast to efforts to assess EI by objective evaluation of performance, self-report measures tap an individual's characteristic ways of perceiving, utilizing, and directing emotion. Petrides and Furnham (2000b) have suggested along similar lines that self-report measures reflect "trait EI," much as common objective personality tests reflect personality traits and patterns.

A variety of self-report measures currently exist to measure EI (see Ciarrochi et al., 2001; Matthews et al., 2002; Schutte & Malouff, 1999 for reviews). The measures range in their quality, but two commonly used ones are the Trait Meta Mood Scale (TMMS Mayer & Salovey, 1990) and the Schutte Self-Report Inventory of Emotional Intelligence (SSRI; Schutte et al., 1998). The TMMS assesses perception, appraisal, and repair of mood, and has generally good convergent validity with related constructs (e.g., Mayer & Salovey, 1990; Schutte & Malouff, 1999). It has recently been used to predict life satisfaction (Palmer, Donalson, & Stough, 2002), and TMMS scores mediate the relationship between stress and mental health (Salovey, Stroud, Woolery, & Eppel, 2002). However, its reliability and distinctiveness from the Big 5 personality factors seems less clear (see Davies, Roberts, & Stankov, 1998).

The SSRI has good evidence of construct validity, correlating appropriately with related measures such as the TMMS and the Toronto Alexithymia Scale (e.g., Schutte et al., 1998), and good criterion validity, predicting task persistence (Schutte et al., 2001a) and interpersonal skills (Chapman & Hayslip, in press; Schutte et al., 2001b). Furthermore, the SSRI has consistently high reliabilities, reported in the .80s to low .90s (Schutte et al., 1998; Petrides & Furnham, 2000a), and diverges from the Big 5 more than other leading self-report measures (Matthews et al., 2002). The development and psychometrics of the SSRI will be considered in detail in Chapter 2.

However, like all self-report measures, self-report measures of EI reflect an individual's perceived EI. People may be honest or dishonest, accurate or poor judges of their own qualities and characteristics. Thus, one consideration of the self-report measurement paradigm is that of response sets, particularly social desirability (e.g., Matthews et al., 2002; Petrides & Furnham, 2000b). There is some evidence, however, that different types of social desirability do not have differential effects upon self-reported EI (Furnham, Petrides, & Spencer-Bowdage, 2002), and Chapman and Hayslip (2002) found no correlation between the SSRI and the 20-item version of the Marlowe Crowne Scale of Social Desirability.

Performance v. Self-Report Measures of EI: Some Conclusions

Cronbach (1970) has considered the distinction between ability tests and others tests to be one of maximal performance vs. typical performance. Self-report measures then may be seen as indicators of typical or characteristic EI, while performance measures, in principle, should reflect maximal ability EI². Thus, one may be measuring different manifestations of EI with different

² This may be true to an extent, but skills and abilities are measurable (albeit imperfectly) through self-report inventories as well, and ability measures may not reflect maximal performance at all. Cronbach (1970) acknowledges this: "The difficulty we find is a reflection of the theoretical inadequacy of the age-old distinction between intellect and emotion. The classification scheme [of tests] is a convenience in organizing our discussion,

methods: on the one hand, characteristic or everyday EI is probably tapped, while on the other hand, true mental-emotional abilities may be accessed.

It is hard to categorically dismiss one or the other form of measurement, as EI is a conceptual bridge linking cognition and personality, with roots and purported processes in both domains (cf. Matthews et al., 2002). Performance measures face several challenges, the first and foremost being the development of a conceptually sound scoring method (Roberts et al., 2001; Zeidner et al., 2001). Performance measures also require better construct validation, including improvements in scale reliability and validation against better criterion measures of intelligence (Matthews et al., 2002).

Response biases are clearly a concern for self-report measures of EI. However, correlations with measures of social desirability can be partialled out, and the conceptual and empirical problems encountered with the MEIS have dissuaded many researchers from its use (e.g., Furnham et al., 2002; Petrides & Furnham, 2001). If EI is an ability, it does not appear objectively or reliably measurable at the present; however, there is general agreement that EI can be reliably measured from a characteristic or typical performance paradigm (Roberts et al., 2001). Despite all these differences in measurement philosophy, one result of the recent spate of EI measures has been empirical explorations of the construct's relation to other individual difference characteristics. It is to these issues that we now turn.

Explorations of EI Construct Validity

Efforts to establish EI's place among other individual difference constructs has traditionally dealt with three challenges: first, demonstrating that EI is not simply social

not a basis for theory." (p. 35; italics mine). Also germane here is that measuring maximal EI ability through verbally based performance tests may be especially difficult, because emotional skills may occur at a largely non-verbal and intuitive level (Zeidner, Matthews, & Roberts, 2001). Additionally, performance may not always reflect true ability (e.g. Baltes, 1997).

intelligence relabeled; second, delineating EI's relationship to personality superfactors (i.e., the Big Five), and showing that it does not overlap too much with extant traits; and third, clarifying EI's relationships to established cognitive abilities (Ciarrochi, Chan, & Caputi, 2000; Davies et al., 1998; Mayer, 2001; Matthews et al., 2002; Roberts et al., 2001; Zeidner et al., 2002). A fourth imperative has emerged as well: articulating the developmental course of EI. This includes both demonstrating EI's relationship to other individual difference characteristics and establishing its predictive validity over the course of the lifespan (Izard, 2001; Mayer, Caruso, & Salovey, 1999; Mayer et al., 2001; Schaie, 2001). Let us examine each of these issues in turn.

EI and Social Intelligence

Questions have been raised about whether EI is simply another name for social intelligence (e.g., Roberts et al., 2001). EI's proponents argue that it is a narrower construct that deals specifically with the affective dimensions of intra and interpersonal processes only (Mayer, 2001; Mayer & Salovey, 1993; 1997). In another regard, social intelligence seems so heavily intertwined with verbal intelligence that it is difficult to distinguish them empirically (Roberts et al., 2001). On this note, Mayer and Salovey (1993) suggested that EI should diverge from verbal ability more so than social intelligence did.

One important point is the role of mixed models in this controversy. Objections that EI and social intelligence are redundant seem to have dwindled after Mayer and Salovey (1993) clarified the domain of abilities to which EI is limited, and later re-iterated the emotion-specific nature of EI ability models (Mayer, 2001). Mixed model theorists on the other hand tend to incorporate social abilities in their definitions of EI, and take the opposite route by arguing that EI is broader than just social intelligence (e.g., Goleman, 1995). For mixed model theorists, EI is an overarching framework incorporating social abilities and various other characteristics

assumed to be related (Bar-On, 1997; Goleman, 1995; 1998).

A few published studies have examined the relationship between measures of EI and measures of relational functioning, satisfaction, or relationship skills. Van der Zee, Thijs, and Schakel (2002) found that empathy and autonomy dimensions of EI predicted significantly self- (*rs* of .43-.59) and, and to a lesser degree (*rs* of .33-.39) other-rated social competence.

Ciarrochi, Chan & Caputi (2000) found a performance measure of EI mildly correlated with relationship quality (*r* = .19). Salovey, Stroud, Woolery, & Epel found EI (2002) predictive of interpersonal functioning (*rs* of .17-.31).

Unfortunately, all these studies examined relational satisfaction or social functioning with five or six items devised secondary to other purposes. Only three studies took a more systematic approach. One directly examined EI and social functioning with a variety of established and validated measures, and found that EI predicted empathic perspective taking and self-monitoring in social situations, social skills, cooperative responses toward partners, more affectionate relationships, and more satisfaction in relationships with partners who had higher EI (Schutte et al., 2001b). Chapman (2002) found that EI was highly correlated (*rs* = .6) with a dimension of relational competence pertaining to the maintenance and optimization of current relationships. EI was not correlated with a second dimension of Relational Competence that involves striking up new relationships and instrumental behavior within relationships (such as assertiveness). Mayer, Caruso, & Salovey, (2002) found mild correlations between EI and the FIRO-B factors of inclusion, wanted inclusion, and expressed inclusion, affection, and wanted affection (*rs* between .16 and .26), indicating that EI might bear some mild relation to both needs for affiliation and for affection.

These studies suggest that EI bears some link to social functioning, at least in the age

groups assessed, and most agree that social functioning and relational competence are probably behavioral manifestation of EI. The nature of this relationship remains to be elaborated by more studies using comprehensive measures of interpersonal functioning and other populations. EI's relationship to social abilities is no longer so hotly contested in the literature, however; a more contentious debate has involved the relationship of EI to personality factors.

EI and the Big Five

The second prevalent criticism of EI is that it offers no descriptive or explanatory power beyond existing personality constructs (Davies et al., 1998; see also Matthews et al., 2002). In particular, the dimensions of Extraversion (E), Neuroticism (N), Agreeableness (A), and Openness (O; Costa & McCrae, 1994; 1995) may adequately encompass the appraisal, management, and expression of emotions in the self and others (Matthews et al., 2002).

Conceptually, EI has been proposed as more narrow than personality superfactors (Mayer, 2001; Mayer & Salovey, 1993). For instance, while Openness to Experience (O) may encompass emotional acuity, it also involves a sense of aesthetics and values, an appreciation of phenomenological experience, and a general receptiveness to new ideas (Costa & McCrae, 1995). Similarly, while E often encompasses empathy and the ability to read and manage others at an emotional level, it also involves a general level of external stimulus seeking and broader sociability. The emotional components of these supertraits are both more specific than the traits themselves (Mayer & Salovey, 1993), but emotional competencies may underlie multiple traits (Matthews et al., 2002). In this vein, modest correlations between EI and conceptually related personality domains have generally been taken as evidence of convergent validity for EI (e.g., Ciarrochi, Chan, & Caputi, 2001a). Clearly, over-large correlations may also reflect redundancy (e.g., Matthews et al., 2002; see also Ciarrochi et al., 2001b). Conceptually, EI has been

hypothesized to relate to four of the Big 5.

N reflects a disposition toward negative affectivity. One would expect emotionally intelligent individuals, who are by definition more adept at regulating emotion (e.g., Mayer and Salovey, 1995), to evidence less trait neuroticism (Matthews et al., 2002). E, or positive affectivity, would also be expected to be somewhat correlated with EI (e.g., Ciarrochi et al., 2001b), because emotionally intelligent individuals would be expected, through their adeptness at emotional regulation, to maintain a positive affective state. Emotionally intelligent individuals would perhaps also be expected to be high in O, since this factor reflects a disposition toward emotional and intellectual receptivity (e.g., Schutte, 1998), though others disagree (Matthews et al., 2002). Some have argued that EI would also be expected to manifest in high A (Matthews et al., 2002; Van Der Zee et al., 2002), because this factor reflects friendliness and warmth, although interpersonal abilities may mediate or moderate the relationship between EI and A. There seems to be no conceptual ground for expecting correlations between Conscientiousness (C) and EI, however (Van Der Zee et al., 2002), although the elements of persistence, reliability, punctuality, and so forth seem to be included in some of the mixed models of EI (e.g., Goleman, 1998).

Empirically, research suggests that various measures of EI correlate with the O facet of personality (Davies et al., 1998; Mayer & Greher, 1996; Schutte et al., 1998), though Ciarrochi and colleagues' (2000) data did not support this; moderate to strong correlations with E (Ciarrochi et al., 2000; Mayer & Greher, 1996) and N (Davies et al., 1998) are the most well-established. The magnitude of the correlations depends largely on the study, with Davies and colleagues (1998) finding strong correlations between some EI dimensions and personality factors (approaching .5 and in one case near .6). Davies and colleagues (1998) were also able to

demonstrate only emotional awareness and clarity factors distinct from the Big Five, finding no evidence for a general EI factor independent of established traits. Mayer and colleagues (2001) objected that Davies measured EI with an early experimental scale and several other measures of emotion constructs not expressly intended as measures of EI.

Other researchers have found some moderate overlap between measures of EI and A and C (Chapman & Hayslip, in press). Caruso, Mayer, and Salovey (2002) report very mild (e.g., *rs* of .21 and .16) overlap with 16 PF global factors of E and Tough mindedness, but no correlation between EI and Anxiety, Independence, or Self-control.

The wide divergence in these findings is probably a function of different measures for both EI and personality. Though the NEO Personality Inventory, Revised TM (NEO-PI R; Psychological Assessment Resources Inc., Odessa, Florida) and the NEO Five Factor Inventory TM (NEO-FFI; Psychological Assessment Resources Inc., Odessa, Florida) has been commonly used, the 16 Personality Factor Questionnaire [®] (16PF; NCS Pearson, Inc., Minneapolis, Minnesota) and Eysenck Personality Inventory [®] (EPI; Educational and Industrial Testing Service, Inc., San Diego, CA) have also been implemented in these studies, along with trait anxiety, optimism, and empathy scales. And so-called “ability” measures, lacking common method variance (Campbell & Fiske, 1959) with the self-report personality inventories, show only mild to modest correlations with personality factors (e.g., *rs* in the .2 range for Caruso et al., 2002 or around .3 for Ciarrochi et al., 2000, and Roberts et al., 2001).

Among self-report inventories, correlations tend to be higher, perhaps due to common method variance. The Trait Meta Mood Scale seems to correlate most highly with the Big 5, from .35 (with E) to .57 (with O) (Davies et al., 1998). Van Der Zee and colleagues (2002), however, found that the Big 5 predicted EI but seldom accounted for more than half the variance

in their EI scores; this time, consistent with Schutte and colleagues (1998), O emerged as the strongest empirical associate of EI. The SSRI, which may be more distinct from personality traits than other self-report inventories (Matthews et al., 2002) correlates in the .2 with N, E, A, and C, .54 with openness (Schutte et al., 1998), and -.43 with trait anxiety (Ciarrochi et al., 2001b). Chapman and Hayslip (2003), in a larger n study, found correlations between the SSRI and each of the Big 5 to be in the .4s, except for O, which was .54.

This welter of results makes EI's distinctiveness uncertain. Empirically, EI's place among personality factors may be solidified by 1) mild correlations with theoretically convergent factors, especially O, N, and E, and perhaps A; 2) zero order correlations with unrelated dimensions of personality such as C, self-control, independence, and tough mindedness; and 3) the consistent emergence of (an) EI factor(s) independent of existing personality factors. Results have varied on the third point: Davies and colleagues (1998) reported that EI-related measures loaded mostly on existing personality factors, but Petrides and Furnham (2001) were able to demonstrate a separate EI factor at the primary level of both Eysenck Personality Questionnaire and NEO trait hierarchies. EI has not only to establish its relation within established trait taxonomies, however, but also with the domain of cognitive abilities. Let us turn now to EI's relationship to various measures of mental ability.

EI and Intelligence

The status of EI as an intelligence is the third, and perhaps most contentious issue at the moment. Specifically, its proponents (Mayer, Salovey, & Caruso, 1999) argue that three standards must be met if EI is to be considered an intelligence. First, there is the so-called *conceptual* criterion: an intelligence must reflect mental performance, and not simply behavioral skills or tendencies. Second, an intelligence must relate to the *positive manifold* of other

established mental abilities, thereby conforming to Guttman's first law of intelligence (Guttman & Levy, 1991). Third, a *developmental* criteria is espoused: intelligence should vary across ages.

These three standards are in some ways arbitrary and have not escaped criticism (e.g., Kaufman & Kaufman, 2001; Matthews et al., 2002; Roberts et al., 2001; Zeidner, et al., 2001). Rather than rationally derived or a priori standards for an intelligence, the second and third criteria are fundamentally empirical (Roberts et al., 2001). And because Mayer, Salovey, & Caruso (1999) have interpreted the first as demanding demonstration of objective measurement, they have effectively rendered the conceptual criteria an empirical one as well³.

These philosophical issues aside, Mayer, Caruso, and Salovey (1999) may have essayed a bigger undertaking than they had anticipated with their three standards. The first "conceptual" standard has proven recalcitrant due to the problems with measuring EI as an ability (discussed above). The third, or developmental criteria, forms the thrust of the present investigation, and will receive extensive consideration below. Let us turn now to an examination of the second standard.

In principle, not only should EI exist within the positive manifold (here used to mean positive correlation matrix) of general mental abilities, it should also demonstrate a positive manifold with regard to its own components, consistent with hierarchical models of mental ability (Mayer et al., 1999; 2001). Some descriptions of EI propose that as an intelligence, it should bear some relation to *g* (Davies et al., 1998; Mayer, Salovey, & Caruso, 1999; Mayer et

³ One runs here into the problem of defining a construct on the basis of its measurement. Psychometricians have distinguished between formative measures, which are seen as the causes of constructs, and reflective measures, which are seen as the effects of constructs (Edwards & Bagozzi, 2000). One risk of performance measures of EI is that because all scoring criteria are ultimately arbitrary, they run the risk of defining EI (i.e. becoming formative measures). However, the assumption that a measure is reflective rather than formative underlies classical test theory and factor analysis (Edwards & Bagozzi, 2000).

At a logical level, if performance tests are to be considered reflective, they must presume that EI is an intelligence. Yet the evidence for EI as an intelligence has come mostly from performance tests. Such an argument seems circular, because the measurement tool presupposes what it is invoked to establish.

al., 2001; Mayer, 2001). It has been somewhat unclear whether EI is supposed to be orthogonal to Horn's (1988) fluid (Gf) and crystallized (Gc) abilities, or located under Gc (Matthews et al., 2002; Mayer 2001). The latter possibility seems likely in that EI probably reflects culturally acquired competencies, even if it is considered to have fluid processing components (Matthews et al., 2002).

Overlap with crystallized abilities proved to be an insurmountable barrier in demonstrating the uniqueness of social intelligence (Kantor & Kihlstrom, 2000). Although EI was intended to overlap less with Gc than social intelligence, EI measurement is highly dependent upon culturally acquired verbal skills (Roberts et al., 2001). Several empirical investigations suggest that performance-measured EI probably does share some variance with rough measures of crystallized abilities such as the Armed Services Vocational Aptitude Battery (ASVAB; Roberts et al, 2001)⁴, Army Alpha (Mayer, Caruso, & Salovey, 1999), and standardized achievement test scores (Mayer & Greher, 1996). Many researchers generally agree that there is good evidence for a modest relationship between EI and crystallized ability (Mayer & Greher, 1996; Mayer et al., 1999; Roberts et al., 2001). Davies and colleagues (1998) concluded that EI is indistinguishable from crystallized abilities, although this conclusion was derived from data which may have inadequately operationalized EI (see Mayer et al., 2001). Schutte and colleagues (1998) found EI, measured with the SSRI, was associated with college grades but not standardized achievement test scores.

In contrast, EI seems relatively independent of Gf. In another study using a self-report inventory (Bar-On, 2000), EI failed to correlate with Gf, assessed by Raven's progressive

⁴ These authors suggested that the ASVAB was actually a measure of g. Kaufman and Kaufman (2001) took them to task for this, pointing out that the ASVAB is a measure of vocational aptitude reflective of acquired knowledge (Gc) and that Herrnstein and Murray made many of the claims in *The Bell Curve* (1994) based upon ASVAB data, leaving them open to criticism (e.g. Gould, 1997).

matrices. This lack of correlation also has been observed when EI was measured with a performance measure (Ciarrochi et al., 2000). Thus, the available evidence, though a bit inconsistent, suggests that EI probably bears some relationship to crystallized abilities but not to fluid abilities.

The extent of EI's relationship to crystallized ability, as well as its relation to true measures of *g*, remains open to speculation. The two studies purporting to assess *g* (Caruso et al., 1999; Roberts et al., 2001) used the ASVAB and Army Alpha. The ASVAB is loaded heavily with culturally acquired knowledge (e.g., Anastasi & Urbina, 1997), and the Army Alpha is antiquated (e.g., Kaufman & Kaufman 2001).

The lack of research addressing EI's relationship to a general intelligence factor at the top of Carrol's (1993) hierarchy leaves open another possibility: EI may exist independently of *g*. Perhaps EI is a general factor of emotional cognition subsuming a positive manifold of more specific emotional cognitive abilities. Empirical efforts to uncover a general EI factor have generally been successful with performance (Ciarrochi et al., 2000; Mayer, Caruso, & Salovey, 1999; Roberts, Zeidner, & Matthews, 2001) and self report measures (Petrides & Furnham, 2001; Saklofske, Austin, & Minski, 2003; Schutte et al., 1998), though the general factor usually correlates with some proxy of *Gc*. A few others have been unable to identify a general EI factor (Davies et al., 1998; Petrides & Furnham, 2000b), but in general the evidence is favorable and discrepancies are likely a function of divergent measurement techniques and varying sample characteristics.

If a general EI factor (*Gei*, as it has been called by Mayer et al., 1999) exists, and it is anything like the superordinate *g* of mental abilities, there are several implications. On one hand, Zeidner et al. (2001) suggests that such independence might establish EI as a distinct intelligence

with a lower order manifold of related emotional abilities. On the other hand, if a *Gei* is completely uncorrelated with *g*, it would be difficult if not impossible to empirically validate EI as an intelligence (given existing measurements of intelligence).

Regardless of EI's relation to *g*, most argue that the abilities characterizing EI should form a positive manifold of their own (Davies et al., 1998; Mayer et al., 1999; Mayer 2001; Mayer et al., 2001; Matthews et al., 2002; Roberts et al., 2001; Zeidner et al., 2001). Several specific abilities might potentially characterize EI.

EI first comprised three domains (Salovey & Mayer, 1990): the appraisal and expression of emotion, the regulation of emotion, and the utilization of emotion. Each of these three domains involved subcomponents: for instance, the regulation of emotions domain involved both regulation in one's self and in others. Empirical evidence from the SSRI, the items of which were generated from the three domains of the 1990 model, tentatively suggests four factors which roughly correspond to these domains: emotional perception, utilizing emotion, managing self-relevant emotions, and managing other-relevant emotions (Ciarrochi et al., 2001; 2002; Petrides & Furnham, 2000b; Schutte, personal communication; see also Matthews et al., 2002).

Petrides and Furnham (2000b) found these factors only mildly related, and were unable to find a second order EI factor uniting these four domains. Ciarrochi and colleagues (2001; 2002) found a factor solution very similar to Petride's and Furnham's. A subsequent study extracted four factors similar to these, but found modest relationships between them and a higher order EI factor (Saklofske, Austin, & Minski, 2003). Thus, at least in the SSRI, evidence for a positive manifold between specific EI abilities is somewhat mixed.

Mayer and Salovey's (1997) revised model of EI posited four factors arranged along a dimension of increasing cognitive sophistication. At the lowest level, EI entailed a distinct

domain of emotion perception. One step up is the domain of using emotions to facilitate thinking; above this, the third domain is emotion regulation, and the fourth is a metaknowledge about emotions and emotional processes. Results using the MEIS at first appeared to support four distinct but modestly intercorrelated factors similar to these (Emotional Identification, Assimilating Emotions, Understanding Emotions, Managing Emotions; Mayer et al., 1999), but the authors recommend a more parsimonious three factor structure which collapses the Assimilating and Understanding branches. Roberts and colleagues (2001) extracted three modestly correlated factors in an exploratory procedure, Perception, Management, and Understanding, but found that the tests of the Assimilation factor loaded almost evenly across all three of these factors, providing little evidence for collapsing Assimilation and Understanding as previously suggested by Mayer and his colleagues. Furthermore, Roberts and colleagues (2001) data fit a four-factor model better than a three factor model. However, the dimensions of EI represented by these factors seem consistently related, providing better evidence for a positive manifold of abilities.

In comparing the nature of factor solutions between these instruments, the three or four factors derived from the MEIS (Perception, Management, and Understanding, with a possible distinct Assimilation factor) are in some ways similar to those derived from the SSRI (Perception, Managing Self-Relevant Emotions, Managing Other Relevant Emotions, and Utilization). Both sets contain a dimension defined primarily by the ability to perceive and appraise emotion (both in oneself and in others). Both sets also contain a factor which loosely deals with using emotions to drive thinking (Utilization on the SSRI and Assimilation on the MEIS), although both these factors tend to be weak in their respective solutions. Also, the MEIS combined Understanding/Assimilation factor favored by Mayer and colleagues (1999) is defined

more by an emotional metaknowledge than the SSRI Utilization factor. One clear difference is that whereas the MEIS contains only a single perception factor, the SSRI evidences distinct factors for the perception of one's own (PSE) and the perception of other's emotions (POE). The POE factor also contains some items pertaining to managing others emotions, which lead Petrides and Furnham (2000b) to name it social skills.

Thus, the number character, and relationship of abilities defining EI is somewhat unclear at this point. But such a manifold of EI abilities is a function of several things. First, the dimensional nature of EI will vary based upon the model that measurement instruments sample from. Second, the specific type of rotation, item loading cut offs, scree criterion, and even factor interpretation of exploratory analyses all dictate the nature of empirically derived EI dimensions. Third, the ratio of Ss to variables clearly impacts the factor solution. Fourth and perhaps most importantly, other sample characteristics such as age and education may influence the patterns observed in variance-covariance matrices, making the results of modeling-fitting (and exploratory procedures) contingent upon participant demographics.

Although the factor structure of an individual difference construct should be robust across similar samples, underlying theory sometimes posits changes in the organization of a construct along some continuum such as age. This is true in the case of age-related changes in taxonomies of both mental abilities (e.g., Schaie, 1996) and, to a lesser degree, even traits (e.g., Costa & McCrae, 1994). These considerations lead us to the next dimension of this discussion, the developmental trajectory of EI. Within the EI literature, no serious attention has been turned toward the development of EI across the lifespan.

Unexplored Issues: EI and Developmental Trajectory to Mid-life

The abilities to perceive and regulate emotion clearly play a role in a variety of

developmental outcomes (e.g., Masten & Coatsworth, 1998). Yet there has been a surprising lack of research examining developmental issues in EI, despite EI theorists' assumption that EI is malleable (Mayer, 2001), their appeal to age-related change as evidence that EI is an intelligence (Mayer et al., 1999), and the assumptions already informing educational policy on EI (see Mayer & Cobb, 2000).

Empirical work specifically addressing developmental issues in EI has been limited to occasional studies with adolescents or preadolescents. Mayer and colleagues (1999) reported for instance that college students score higher on the MEIS than high school students, and Ciarrochi and colleagues (2001b) found EI in 13-15 year olds was associated with social functioning. But the remainder of the literature has almost invariably used young adult samples ranging from young college age (e.g., 19; Caruso et al., 2002) to the late twenties (e.g., Schutte, Schuettpelez, & Malouf, 2001), and virtually no research has assessed the course of EI after this age period. This relative lack of interest in later-life EI seems odd, given that intellectual, social, emotional, and even personality characteristics continue to change across the lifespan.

Research on the developmental course of EI might address several issues. First, it is necessary to assess Mayer and colleagues' (1999) contention that EI will increase with age, but to do so across a wider developmental span than merely high school and college, as they did. Second, the degree of individual variability in a construct may change with age. Third, the structure of EI across different age groups is of interest, because many multidimensional psychological constructs tend to change in composition across the life-span (e.g., Schaie, 2001). Fourth, EI's relationship with other important constructs needs to be explored across different age groups. No extant research has examined these issues in a mid-life sample, where many psychological traits and abilities are likely to be functioning at optimal capacities and maximally

differentiated (e.g., Magai & Halpern, 2001; Schaie, 2001; Sternberg, Grigorenko, & Hon, 2001). Despite the absence of research on EI at mid-life, there are many clues in the cognition, emotion, and personality literature that permit some speculation about how this age group may differ in EI compared to young adults. Let us first consider the issue of developmental change.

Developmental Increases in EI

EI, as an adaptive competency, is likely to change in light of life experiences (e.g., Matthews et al., 2002). There are several relevant literatures that might predict positive change or increase in EI, at least to mid-life. For instance, EI was originally posited as an “intelligence” falling under the general rubric of practical skills, i.e., those mental abilities not captured by traditional psychometric intelligence tests like social intelligence, real-life problem solving, etc. Despite broadening concepts of EI, most authors continue to conceptualize it as some type of practical competency for dealing with emotional events (Mathew et al., 2002); therefore, it is not unreasonable to look to the literature in practical intelligence (e.g., Sternberg, 1986) for a potential picture of how EI might appear at mid-life.

Practical intelligence tends to continue rising in the face of fluid declines (Sternberg et al., 2001), which may begin as early as the late 20s (Mathew et al., 2002). Practical intelligence also tends to peak at midlife, when exposure to different environments, each with its own set of demands, has been maximal (Denny & Pearce, 1989). One theory of aging which accounts for the continued rise in practical intelligence is the Selective Optimization with Compensation (SOC) model (Baltes, 1997). Briefly, the SOC model posits that as adults age, physical, biological, and neurophysiological declines produce decrements in functioning; these can be offset by selecting certain areas in which to focus one’s energy. Functioning in these areas is optimized through redoubled effort, therefore compensating for declines in other areas.

As with other practical intelligences, increases in EI may compensate for declines in fluid skills. As processing speed, retrieval and encoding abilities, and other “mechanical” (cf. Baltes, 1997) aspects of intelligence begin to flag, alternative skills may become more important. Such alternative skills (especially in the emotional arena) are particularly salient in light of the nature of challenges and adaptations at midlife. The everyday problems posed by things such as career issues, caring for one’s aging parents, and changing family structures may be embedded with more emotional stimuli than life tasks normative to young adulthood (Magai & Halpern, 2001). The emotional nature of these task demands may call for greater utilization of EI skills at mid-life.

The differing nature of problem solving at mid-life is also reflected in Neo-Piagetian perspectives on post-formal reasoning. Post-formal reasoning is a stage of cognitive development proposed to exist beyond formal operations. It is characterized by the abilities to generate multiple or divergent solutions to a problem, define a problem in a variety of ways, and incorporate non-logical, emotional, relational, and intuition-based resources in problem solving.

Evidence suggests that young adults focus on logical operations in problem solving; however with age, adults begin to solve problems with a more-relativistic style, using irrational, personal, and emotional factors (LaBouvie-Vief, 1992). Adults at midlife are also more attuned to social and interpersonal aspects in defining problems (Schmidt, 1989). Mid-life and older adults also tend to report more emotion-related goals in problem solving, whereas the goals of younger adults may be more instrumental or objective (Straugh, Berg, & Samsone, 1996). EI, because it reflects one’s own and others’ emotional processes, may be increasingly relied upon as a tool in post-formal reasoning. As the social and emotional dimensions of life problems become more elaborate at mid-life, the ability to process and understand emotions may assume a

greater role.

From yet another standpoint, we have also seen that EI has been considered as a specific set of crystallized abilities (e.g., Davies et al., 1998; Mayer & Greher, 1996; Mayer, Caruso, & Salovey, 1999; Roberts, Zeidner, & Matthews, 2001). If EI is largely a culturally acquired skill, it seems likely that it would involve the acquisition of emotional knowledge through socialization processes. In fact, nearly all definitions of EI entail an understanding of emotions, or emotional knowledge (EK) component. EK involves processes such as emotion perception and labeling, and is a joint function of the cognitive and emotion systems (Izard 2001; Izard et al., 2001). These processes serve to facilitate person-environment fit, contribute to emotional adaptation and social competence, and increase with age (given a normal developmental trajectory). Thus, one might expect EI to increase with age simply because it entails EK dimensions that continue to develop through life-long socialization and learning.

In addition to these considerations from the standpoint of practical intelligence, post-formal reasoning, and emotional knowledge, we might also expect EI to increase with age based on personality trait research. EI is characterized by low levels of negative affectivity, and by high levels of interpersonal cohesiveness (Matthews et al., 2002). Some findings indicate that N, which embodies negative affectivity, tends to diminish with age (Costa & McCrae, 1994; Markus & Lachman, 1997). Similarly, A, which entails a strong degree of interpersonal cohesiveness and a somewhat laid-back demeanor, tends to increase with age (Markus & Lachman, 1997). To the extent that the processes underlying these personality factors also underlie EI, one might expect EI to increase with age as a result of diminishing negative affectivity and increasing agreeableness. (Alternatively, increasing abilities to deal with one's own and others' emotions may cause decreases in negative affectivity and increases in

interpersonal cohesion.)

In sum, the practical intelligence and post-formal reasoning literature, as well as work on emotional knowledge and relevant personality factors all support the notion that EI should increase with age, at least through mid-life. Specifically, we hypothesized that EI scores in a mid-life sample will be higher than in a young adult sample, and also that age will be positively correlated with EI scores. The developmental course of EI may entail other changes rather than mere increases in absolute scores, however. Another issue we therefore wished to investigate was the stability of individual differences in EI.

Stability versus Change of Individual Differences in EI

The stability of a characteristic within individuals may dictate the degree of differences between individuals on that characteristic over the life span (e.g., Riegel, 1976). In particular, characteristics that are more malleable in the face of environmental influences may vary increasingly between individuals over the course of development (e.g., Nelson & Dannefer, 1992). As a cohort ages, the contextual influences upon their development diverge. Accordingly, larger degrees of difference are expected among individuals in traits, abilities, and other characteristics that are not exclusively a function of genetics.

EI, considered as an adaptive competency or a dimension of practical intelligence, might be expected to reflect this increasing variance, because the development of practical intelligence is a function of both person and context variables (e.g., Sternberg et al., 2001). As people age, they are exposed to greater variation in contexts, particularly after completing formal education, which in many ways constrains individuals to a relatively common set of experiences (Schaie, 2001). This contextual divergence necessitates the development of different practical abilities, because the types of problems individuals will be facing become increasingly varied depending

on their ecological niche (Sternberg et al., 2001). Therefore, as a cohort develops, members may find themselves in life spaces requiring EI to a greater or less degree, depending on factors such as career path, romantic relationships, social roles, economic status, and living environment. Some niches will demand or facilitate the development of skills embodied by EI, whereas others will not. The net effect might be a wider degree of individual differences in EI among an older sample.

The same increasing divergence of life events that call for the development of differential practical abilities also contributes to increasing inter-individual differences in the emotion systems (Magai & Halpern, 2001). At midlife, an individual's unique experiences along emotionally salient dimension like vocational choices and transitions, residential changes, role shifts in both family of procreation and of origin, and non-normative life events such as accidents, traumas, and tragedies will all impact emotional processing, appraisal, and regulation. The aggregate results of such emotional events may necessitate the development of EI (or different aspects of EI) to different degrees across different individuals.

So in light of contextual effects on practical intelligence and the emotion system, EI might be expected to vary more between individuals further along in the life course; some will have had lives necessitating the development of EI or certain aspects of it, while for others EI may have been less necessary. I hypothesized that these increasing inter-individual differences would be reflected in greater variance in EI scores among a mid-life sample than among a young adult sample. But in addition to the stability of individual differences in EI, I am also interested in whether the structure of EI itself changes with age. It is to this consideration that we now turn.

Differentiation of EI

The factor structures of multistratum ability and trait taxonomies have been observed to

shift with age (Baltes, 1997; Schaie, 1994, 1996; see also Schaie, 2001). Such factorial variance may reflect processes of hierarchical differentiation, where increasingly specific abilities (and traits) emerge from (a) more ambiguous psychological structure(s) as people mature and gain life experience. At the other end of the age continuum, specific traits and abilities may converge again into ambiguous clusters, a process called de-differentiation. If EI is to be a meaningful individual difference construct, it is reasonable to ask if it shows such patterns over the lifespan. Consistent with the general lack of lifespan considerations in the EI literature, this issue has escaped attention. However, the literature on cognitive and emotional changes across the lifespan may again permit speculation about whether EI might proceed through a process of differentiation with age.

Early discussions of differentiation by Schaie (1962) and Werner (1948) hypothesized that psychological structures exist in a relatively formless and general way early in life because they and their functioning are highly contingent upon common neurophysiological or physiological underpinnings. However, as organisms develop and physiological maturation peaks, traits and abilities may become increasingly determined by environmental inputs, becoming hierarchically differentiated and specialized according to environmental demands. The gradual de-differentiation observed after mid-life and particularly in old age may reflect the deterioration of common neurophysiological architecture (Baltes, 1997; Schaie, 2001).

The issue of EI's relation to neurophysiological architecture is somewhat unclear, though Matthews and colleagues (2002) have recently provided credible arguments that EI is linked to cortical emotion processing. Specifically, they reject the notion of separate modules for discrete dimensions of EI; this anti-localization argument is consistent with contemporary parallel-distributed processing models of cognitive and cortical function (e.g., Kolb & Whishaw, 1995).

Matthews and colleagues also argue that EI is indirectly, rather than directly, linked to neural architecture. They propose that the appraisal, regulatory, and knowledge functions of EI are responses of higher order executive systems overseeing more fundamental neurophysiological processes.

This consideration of EI, though complex, renders conceivable the notion that EI may reflect the rise and decline of neurophysiological architecture. So in this sense, one might argue that the components of EI could emerge and differentiate with age-related changes in brain structures, similar to other cognitive abilities. This is somewhat speculative due to the indirect and uncertain nature of EI's neurophysiological underpinnings. One may gain a better perspective by considering EI as some interface between the cognition, emotion, and (possibly) personality systems (Mathew et al., 2002).

Literature on these systems suggests that links between emotion, cognition, and behavior increase in complexity over time as a result of adaptation to new environments (Izard & Ackerman, 1998; see also Magai & Halpern, 2001). EI, as an adaptive competency for emotions, may reflect this increasing complexity in a number of ways. With age, EI may be defined by an increasing number of more specific skills. For instance, EI may exist as relative ambiguous cluster of emotional skills and tendencies in children (such as general awareness of emotions), then gradually develop into more distinct abilities as connections in the emotion and cognitive systems mature and environmental demands increase over the lifespan (i.e., facial and vocal emotional recognition in others, self-recognition, regulation of positive vs. negative affect, etc).

Another line of reasoning concerns the way in which emotions are experienced with increasing age (Magai & Halpern, 2001). Emotions appear to become more rich and complex with age, at least through mid-life (LaBouvie-Vief, 1996). Labouvie-Vief has characterized this

as a complex process of intrapsychic emotional differentiation in which life experiences bring about greater refinement and clarity in emotion and lead to changes in the quality and meaning of various emotional experiences. Such considerations have been supported by a recent experience sampling study conducted by Carstensen, Pasupathi, Mayr, and Nesselroade (2000), who found that older adults' subjective experience of emotion is reported as more complex than that of younger adults.

These increases in the complexity of emotional experience may be reflected by changes in EI. EI, as a competency for adapting to emotional stimuli, may be characterized by a greater subset of specific skills to aid in the processing of and coping with this emotional complexity. For instance, a general emotional appraisal skill may evolve into distinct abilities to examine emotional information in oneself and to infer the emotional states of others, and these two branches in turn might each develop into specialized area of immediate emotional perception, past recall of emotional experience, and prediction of future emotions. Research on childhood emotion development tends to support increasing emotional sophistication. Emotion perception is evident in early infancy (Scharfe, 2000), and emotion perception and labeling seems to be the most fundamental dimension of emotional knowledge in children (Izard, 2001). Factor analytic EI work in young adults is not inconsistent with this because emotion perception or appraisal seems to be the most reliably demonstrated factor, and usually accounts for the most variance (Ciarrochi et al., 2000; Davies et al, 1998; Mayer et al., 1999; Petrides & Furnham, 2000b; Roberts et al., 2001). This makes sense, given that emotion perception or appraisal is also the earliest skill to develop, and therefore the least sophisticated component in EI theory (Salovey & Mayer, 1990; Mayer & Salovey, 1997; Mayer, 2001).

Following the formation of emotion perception abilities, as maturation occurs the

understanding dimension may then emerge, paralleled (or possibly followed) by the increasing evolution of independent emotional management skills, another component of EI. As early as the second year of life, children begin to develop some understanding of emotion, roughly in concert with beginning language skills. This increases rapidly through ages 3 and 4 (Denham, 1998), and emotion regulation skills of a primitive sort are evident in pre-school children (e.g., seeking support from attachment figures). These regulation skills become more cognitive in older children and adolescents may even show some manifestations of emotion utilization (Saarni, 2000).

The expression and self-regulation of emotions continue to refine through midlife, reflecting ongoing emotional experience and adaptation (Izard & Ackerman, 1998). For instance, older adults tend to use more mature defense mechanisms (Diehl, Coyle, & Labouvie-Vief, 1996; Vaillant, 1997), possibly reflecting more evolved emotional regulatory abilities, and adults over 50 also exhibit more facially expressive displays of anger, fear, sadness, and interest (Malatesta-Magar, Jonas, Sheperd, & Culver, 1992), possibly reflecting greater expressive abilities. Regulation and expression factors of EI may therefore be more clearly defined in a mid-life sample than in a young adult sample, or may even branch into more specific subdomains.

As we have seen, most researchers have found two (Ciarrochi et al., 2000), three (Roberts et al., 2001; see also Mayer et al., 1999) or four (Mayer et al., 1999; 2001; Petrides & Furnham, 2000b; Ciarrochi et al., 2001; 2002) factors in young adults, and the nature of these factors tends to vary slightly depending on the measures used. A general perception factor seems common across methods and instruments; however, regulating emotions has at times emerged as a general “clump,” grouping self- and other-regulatory skills together (Matthews et al., 2001; Mayer et al., 1999). Others have found these areas differentiated (Ciarrochi et al., 2001; 2002; Petrides &

Furnham, 2000b). Factors dealing with the utilization and assimilation of emotions have been notoriously difficult to identify and differentiate empirically (Ciarrochi et al., 2001; 2002; Davies et al., 1998; Matthews, 2001; Mayer et al., 1999) in these samples, despite key places in most EI models; and finally, a strong emotion expression factor has yet to be identified in published work. Such findings may change in a mid-life sample if the structure of EI changes in response to increasing complexity in the nature and experience of emotions.

Another way in which EI may change pertains to elements directed outwardly, or toward others, and those directed inwardly, or toward oneself. Schulz and Heckhausen (1997) have conceptualized primary control as instrumental, outward directed responses to environmental challenges, while secondary control involves adaptation through alteration of one's feelings, expectations, and ways of thinking. Primary control peaks at mid-life and secondary control continues to develop through midlife, reflecting a change in adaptational style linked to decreases in agentic power over one's environment.

Because EI is an adaptational competency, its structure may reflect this pattern. For instance, self- and other- emotional management dimensions may be more clearly defined in a mid-life sample, reflecting both the mid-life peak in primary control and increases over young adults in secondary control. In a young adult sample, where both primary and secondary control mechanisms are perhaps not as well developed, managing other's emotions may not emerge as an independent factor, or may be highly correlated with (i.e., less differentiated from) managing one's own emotions. Other-directed facets in areas of perception and utilization may also be more evident in a mid-life sample than in a young adult sample, where both types of control processes are less developed and may clump together.

To recap, literature on ability differentiation, increasing complexity between cognition

and emotion systems, changes in the nature of emotional experience, and changing dynamics in primary and secondary control lead me to hypothesize that EI will be defined by a different factor structure in mid-life. Specifically, I hypothesized that the factor solution for EI in a young adult sample will not be confirmed in a mid-life sample, and that exploratory analyses will reveal a greater number of more specific factors; factors which are conceptually clearer; or factors which are more independent from one another. Finally, in addition to changes within the EI construct, there may be changes between EI and other related individual difference constructs.

Relationship of EI to Social Functioning, Personality, and Gf/Gc

Laura Carstensen's (1992; 1995) socio-emotional selectivity theory provides a framework for studying the relationship between EI and social abilities in mid-life adults. Specifically, the theory posits that with age, individuals will alter their pattern of social behavior due to decreasing socio-emotional resources. Carstensen's data indicate that mid-life adults contract the breadth of their social engagements and focus instead on the depth of significant relationships to meet emotional needs.⁴ The purpose of this increasing selectivity is to maintain an optimal emotional equilibrium, and emotional regulation becomes increasingly tied to relational considerations.

Socio-emotional selectivity therefore represents a confluence between adaptive functioning in the interpersonal and emotional domains. With age, emotional regulation may depend more and more on the ability to regulate the character, breadth, and depth of one's relationships. And because emotional regulation is a chief component of EI, it seems likely that

⁴ In some ways this is similar to disengagement theory (Achenbaum & Bengtson, 1994), which proposes that in late life, older adults may move away from previously close relationships in response to increasingly limited socio-emotional resources. One may also see socio-emotional selectivity as a specific form of Baltes' (1997) selective optimization and compensation, and the intentional narrowing of one's relational field entails both primary (selecting some relationships and rejecting others) and secondary (shifting one's attitude toward the relative importance of relational breadth v. depth) control processes (Magai & Halpern, 2001).

EI will be increasingly tied to or dependent on relational competence as people age. EI may also become increasingly tied to markers of interpersonal functioning, such as loneliness.

(Alternatively, the converse has often been assumed among younger adults—that indices of social functioning are dependent upon EI. Naturally, correlational data cannot settle this.) In a mid-life sample where socio-emotional selectivity appears more pronounced (e.g., Carstensen, 1992; 1995), it is conceivable that there will be a higher correlation between EI and interpersonal functioning and EI and loneliness; in a younger adult sample, they are probably related, but perhaps not as intimately as Carstensen's theory suggests they may be for middle age and later life. Thus I hypothesized a significantly greater negative correlation between EI and loneliness, and a significantly greater positive correlation between EI and a dimension of relational competence reflecting the nurturance of existing in older adults, compared to their younger counterparts. Also, in younger adults, I expected a greater correlation between EI and a dimension of relational competence reflecting the proactive establishment of new relationships, than in mid-life adults.

Two related issues, the connection between EI and established personality traits, and between EI and Gc/Gf, have both been discussed at length above. However, since all empirical efforts in these areas have employed younger adults, we were interested in exploring EI's convergence and divergence from the Big 5 and Gc/Gf in a mid-life sample. There are some reasons to suspect that EI's pattern of relations to other traits and mental abilities may change with age.

First, EI may change in relation to other personality dimensions. Emotion has been conceptualized as a subset of the personality system (Magai & Halpern, 2001), and, as noted above, EI shares some specific features with N, A, E, and C (Matthews et al., 2002). Others have

also argued that rather than a mental ability, EI is best conceived of as a trait or typical mode of behavior with emotional stimuli (Petrides & Furnham, 2001). But traits themselves are not entirely invariant, and may change in their prominence and organization with age (Costa & McCrae, 1994); Schaie (1996; see also 2001) reported that as age increased, an increasing number of first order factors were necessary to define traits in the Seattle Longitudinal Study. Others have argued that trait “consistency” may not peak until 50-59 (Roberts & DelVecchio, 2000). Finally, emotion-related changes in personality are linked to interpersonal dimensions and events (Magai, 2000) which accrue over the life course, resulting in changes in the affective organization of personality. More and more, concepts of personality at midlife suggest that adults’ personalities are “open systems that remain susceptible to pressures of life and the potential socialization effects of life experience” (Roberts, 1997, p. 208, quoted in Lachman & Bertrand, 2001).

Thus, there is some reason to expect that the relation of traits to one another, the relative prominence of various traits, and even the type and number of traits, may be different in a mid-life sample than in a young adult sample. Specifically, EI--as a reflection of affective processes and emotion systems--may bear a different relationship to the Big 5 in a mid-life sample than in a young-adult sample. The increase in first-order traits observed by Schaie (1996) suggests that it may emerge as more independent of established personality traits in a mid-life sample, but alternatively, as EI skills become more diversified themselves, they may potentially become distributed across personality superfactors, resulting in increasing correlation between overall EI scores and various traits. A third possibility is that with age, EI will become subsumed under one of the Big 5, such as neuroticism. There is little evidence to suggest one possibility over any other, so we wished merely to explore any changes among these relationships.

To consider another issue, if EI is some sort of mental ability, there is ample reason to suggest that its relation to other mental abilities may change with age. Both the Berlin Aging Study (e.g., Baltes, 1997) and the Seattle Longitudinal Study (e.g., Schaie, 1996) have observed shifting relationships among mental abilities with age, as discussed above in the section on differentiation and dedifferentiation. In a previous section, we considered EI both as a construct relatively independent from *g* (e.g., Salovey & Mayer, 1990; Mayer, 2001; Mayer et al., 1999), but also reviewed arguments that if EI is an “intelligence” it must bear some notable relation to other established intelligences (e.g., Davies et al., 1998; Roberts et al., 2001). Chapman (2002) found EI unrelated to *Gc* or *Gf* in a young adult sample, and so as an exploratory endeavor I wish to see if overall EI will show a different pattern of relationship to measures of *Gf* and *Gc* in a mid-life sample.

In sum, I hypothesize that the correlations between overall EI scores and each of the Big 5 and *G/c* and *G/f* will be significantly different between the samples, and that an exploratory factor analysis with EI, the Big 5, and *G/c* and *G/f* in a young adult sample will not be confirmed in the mid-life sample.

Summary of Hypotheses

Regarding the picture of EI at midlife, I have hypothesized several things based on relevant adult development literature on practical intelligence, emotion, and personality. They will be briefly summarized here, and expanded upon in the proposed analyses section of Chapter 2.

H1: Emotional Intelligence will be higher at mid life.

H2: There will be more variability in EI scores in a mid life sample than in a young adult sample.

H3: EI will show evidence of greater differentiation in a mid-life sample: it will be defined more

factors, and/or by factors which are more specific and internally coherent (i.e., more readily interpretable), and/or by factors more independent of one another.

H4: In a mid-life sample, EI scores will be more highly correlated with the enhancement dimension of interpersonal ability and more highly (negatively) correlated with loneliness than in a young adult sample. In a young adult sample, EI will be more highly correlated with a dimension of relational competence reflecting proactive skills aimed at establishing new relationships than in a mid-life sample.

H5: The correlations observed between EI and each of the Big 5, Gc, and Gf will also change from a young adult sample to a mid-life sample. Consequently, the factor solution for EI, the Big 5, and Gc/Gf will not be confirmed in a mid-life sample.

CHAPTER 2

METHODS

Participants

The first sample consisted of 292 undergraduates from a public university in the South. These young adult (YA) participants were recruited from large introductory psychology classes in the fall semester of 2001 and spring semester of 2002. Their mean age was 19.68 ($SD = 2.75$; range 14-29), and 66% are Caucasian, 14.5% African American, 8% Hispanic, and 11% some other ethnicity. This sample consisted of 217 (74%) women and 75 (26%) men. 61.2% of the participants reported that their parents were still married, while 38.8% reported that their parents were divorced. Parents' mean education in years for the sample was 13.5 for fathers ($SD = 4.6$), and 13.0 for mothers ($SD = 4.5$). 50% of the sample reported living on campus, while 50% lived off campus.

The second sample consisted of 246 middle-aged adults. Participants were recruited through contacts in undergraduate psychology classes at a large university and community organizations. The mid-life adult sample (MLA) had a mean age of 49.2 ($SD = 7.23$; range 30-65) and contained 94 men (38.2%) and 150 women (61%); 2 individuals did not report their gender. The ethnic composition of the MLA sample was approximately 75.6% caucasian, 8.9% African American, 8.5% Hispanic, 4.5% other ethnicities, and 2.4% did not indicate their ethnicity. They had a mean education level of 15.29 years ($SD = 3.51$); men were more educated ($X = 16.01$) compared to women ($X = 14.81$) ($t(228) = 2.29, p = .024$).

Finally, chi-square tests indicated that the YA and MLA samples were significantly different with respect to gender ($X^2(1) = 10.15, p = .001$) and ethnicity ($X^2(4) = 13.25, p = .01$).

Instruments

Demographics Questionnaire

The demographics questionnaire contained items assessing age and ethnicity; place, length, and satisfaction with employment; and, consistent with previous investigations in EI, items about life satisfaction, artistic pursuits, marital satisfaction, and length and type of leisure activities. Other items assessed number and type of significant relationships, and the degree of closeness and satisfaction with each relationship. An identical set of items assessed these relational dimensions retrospectively, asking participants to respond based on their memory of themselves at age 21.

EI

EI was assessed from a trait perspective with the Schutte Self-Report Inventory (SSRI). It should be noted that this inventory was not named in its seminal article (Schutte et al., 1998), has been referred to as the Emotional Intelligence Scale by its authors in two subsequent publications (Schutte & Malouff, 1999; Schutte, Schuettpelez, & Malouff, 2001), has been called the Assessing Emotions Scale in another (Schutte, Malouff, Bobik, Coston, Greeson, Jedlicka, Rhodes, & Wendorf, 2001), and also the Self Report Measure of EI (SEI; Ciarrochi, Chan, & Bajgar, 2001) elsewhere.

The SSRI is a self-report measure based on Salovey and Mayer's (1990) original model of EI. Initially, the authors generated 62 items designed to sample from the three domains of EI: the appraisal and expression of emotion, the regulation of emotion, and the utilization of emotion (Schutte et al., 1998). After evaluation, revision, and piloting, an orthogonal principal components analysis yielded four factors, of which the weaker three were rejected because they were not interpretably different from the first factor. The first factor comprised the 33 items of

the final scale (3 negatively worded), of which 13 items came from those sampling the appraisal and expression of emotion, 10 came from those sampling the regulation of emotion, and 10 came from those sampling the utilization of emotion. The final scale showed an internal consistency of .87 and .90 on two different occasions, and a two-week test-retest reliability of .78 (Schutte et al., 1998). Multiple factor models exist for the SSRI (see below).

The SSRI possesses good convergent and discriminant validity. Higher scores on the SSRI are significantly associated with lower self-reported alexithymia, pessimism, depression, and impulsivity and are also moderately to strongly associated with greater attention to, clarity, and repair of mood, as well as higher optimism (Schutte et al., 1998). Therapists show significantly higher scores of emotional intelligence than either clients at a substance abuse treatment center or prisoners (Schutte et al., 1998), and women achieve higher SSRI scores than men (Ciarrochi, Chan, & Bajar, 2001; Petrides & Furnham, 2000a; Schutte et al., 1998). The SSRI correlates moderately with year end GPA for college students (Schutte et al., 1998), and has been used to demonstrate links between EI and cognitive task persistence (Schutte et al., 2001a), as well as between EI and a variety of desirable interpersonal skills and outcomes (Schutte et al., 2001b). Others have found that in adolescents it is associated with amount of and satisfaction with social support, with mood management, and with skill at identifying emotions (Ciarrochi et al., 2001a); in adults, SSRI scores moderate the relationship between stress and mental health (Ciarrochi et al., 2001b).

In the initial validation studies (Schutte et al., 1998), the SSRI evidenced discriminant validity because it failed to correlate with SAT scores; it was also unrelated to fluid and crystallized abilities in a young adult sample (Chapman, 2002). The SSRI was initially found to correlate mildly only with the NEO factor O (Schutte et al., 1998), although Chapman (2002)

found correlations in the .4s between the SSRI and all NEO factors (including a correlation of .5 with O) with a larger sample. Still, it generally diverges from the Big 5 more than other leading self-report measures (Matthews et al., 2002). Although Petrides & Furnham (2000b) have questioned the SSRI's susceptibility to impression management, Chapman (2002) found insignificant zero-order correlations between the SSRI and the 20-item version of the Marlowe Crowne scale of Social Desirability. Higher scores on the SSRI denote more EI.

Personality

Personality was assessed using the NEO-FFI, form S (Costa & McCrae, 1995b). This 60 item self-report instrument assesses the so-called Big 5 personality factors (Neuroticism, Extraversion, Openness to Experience, Conscientiousness, and Agreeableness). It has reported internal consistencies of .86, .77, .73, .68, and .81 for the N, E, O, A, and C subscales, respectively. The scales of the NEO-FFI form S show good concurrent validity with those of the NEO-PI, correlating .92, .90, .91, .77 and .87 (N, E, O, A, C, respectively) with their counterparts on the longer form (e.g., Costa & McCrae, 1995b). The five factors of the NEO have proven fruitful in conceptualizing the personality of non-pathological individuals and have spawned a prolific empirical literature (see Anastasi & Urbina, 1997; Costa & McCrae 1995a). Higher scores on each factor denote more of that trait.

Crystallized and Fluid Abilities

Crystallized ability was assessed using the vocabulary subtest of Horn's sampler of fluid and crystallized ability (Horn, 1975), and fluid ability was assessed using the matrices subtest. The G/c/G/f sampler is a paper-and-pencil instrument derived from Horn and Cattell's (1967) fluid/crystallized framework of intelligence. Fluid intelligence is thought to be largely determined by an individual's neuropsychological capacity, and is related to more diffuse and

abstract tasks such as perceiving relationships, reducing correlates, and span of awareness in concept formation and problem solving (Hayslip & Sterns, 1979). Crystallized abilities are largely dependent on concrete learned knowledge, and may be impacted considerably by education and acculturation. Fluid-crystallized theory has garnered considerable empirical support (see Kaufman, 1990). Horn's measure has been widely used with results consistent with fluid-crystallized theory (see Hayslip, 1988; Hayslip & Brookshire, 1985; Hayslip & Sterns, 1979). Higher scores on the vocabulary test denote greater crystallized ability, and higher scores on matrices denote higher fluid abilities.

Relational Competence

Relational Competence was measured using a short form of the Relational Competence Scale (RCS; Carpenter, 1993; personal communication, March 13, 2001). The full length RCS is a 100 item self-report measure that has been used to assess individuals' interpersonal functioning. About 1/3 of the items are negatively worded. Its reported internal consistencies have been sound, and it has successfully discriminated between high and low socially functioning individuals (Carpenter, 1993), as well as between poorly and well adjusted individuals in a geriatric population (Hansson, 1986; Hanson, Jones, & Carpenter, 1988). The RCS renders scores on ten subscales assessing different aspects of interpersonal functioning: assertiveness, dominance, instrumentality, shyness, and social anxiety; and intimacy, trust, interpersonal sensitivity, altruism, and perspective taking, with internal consistencies ranging from .73 (perspective taking) to .88 (shyness) in the present sample. The subscales produce two overall factor scores: Initiation, a composite of the first five subtests and global measure of one's assertiveness and social instrumentality in relationships; and Enhancement, a composite of the last five subtests and an overall measure of one's ability to nurture, maintain, and cultivate

existing relationships.

To create the short form, the five items correlating most highly with each subscale score in the data from my young adult sample were selected, producing a 50 item instrument sampling from the same 10 domains of interpersonal functioning. The RCS-Short Form exhibited good concurrent validity with the full-length version. Correlations between the short form subscales and those of the full-length version ranged from .90 (Instrumental Competence) to .93 (Intimacy). Initiation factor scores on the short form correlated .97 with those of the long form, and Enhancement factor short form scores correlated .97 with those of the long form. The entire short form had a coefficient alpha of .69 in the current sample, quite acceptable considering the multidimensional nature of its subscales. Finally, overall RCS-Short Form scores correlated .98 with overall scores on the full length version. Higher scores in a given domain indicate more interpersonal competence in that area.

Loneliness

Loneliness was assessed using the Revised UCLA loneliness scale (Russell, Peplau, & Cutrono, 1980). The Revised UCLA Loneliness Scale consists of 20 items associated with 4-point Likert scales, 10 worded negatively, and 10 worded positively. The Revised Scale has a reported internal consistency of .94, and correlates from .91 to .96 with the original UCLA Loneliness Scale. In addition, the scale evidences convergent validity by moderate correlations with measures of depression (e.g., $r = .62$ with the Beck Depression Inventory; $r = .55$ with the Costello-Comrey Depression Scale), anxiety ($r = .32$ with the Costello-Comrey Anxiety Scale), and with feelings of isolation, abandonment, and unsociability, and with the amount of time spent alone each day. Finally, the instrument successfully discriminates between students involved in a close dating relationship and those who are not. Higher scores on this measure

denote more loneliness.

Response Bias

To assess response bias, a short form of the Marlowe-Crown Social Desirability Scale (MC-10) was included as a control measure. The MC-10 has shown high convergence (e.g., r^2 s in the .90s) with the full form of this widely used measure, as well as internal consistencies between .73 and .83 (Strahan & Gerbasi, 1972). Higher scores indicate more socially desirable responses.

Supplementary Instruments

Three other instruments were included to permit future analyses of the relationship between EI and other relevant constructs: the Sense of Support Scale (SSS; Dolbier & Steinhardt, 2000) to assess social support, the Self-Regulation of Withholding Negative Emotions Questionnaire (SRWNE; Kim, Deci, & Zuckerman, 2002) to assess emotional regulation, and two subtests of the Sternberg Triarchic Abilities Test (STAT; Sternberg, 1993) to assess practical intelligence.

The Sense of Social Support Scale (SSS) consists of 21 items assessing perceptions of available support. Responses are given on a four point Likert scale (0-3) reflecting the degree to which items were true for them; six items are negatively worded. The scale has a reported internal consistency of .86, and a two week test-retest reliability of .91 (Dolbier & Steinhardt, 2000). The SSS evidences convergent and discriminant validity through positive correlations with measures of hardiness ($r = .58$) and approach coping ($r = .57$), and negative correlations with measures of avoidance coping ($r = -.46$), perceived stress ($r = -.40$), and negative affectivity ($r = -.30$).

The Self Reported Withholding Negative Emotions questionnaire (SRWNE) consists of 28

items answered on a 7 point Likert scale, and taps four different types of emotional regulation (Kim et al., 2002). Subscale one, external regulation (seven items; reported alpha of .75-.79) assesses the degree to which emotional control involuntarily conforms to expectations from external sources, such as perceived social norms. Subscale 2, introjected regulation (eight items, reported alphas of .78-.83) taps regulation that is driven by people's internal expectations for their own behavior. These two subscales involve controlled regulation, i.e., regulation that is coerced rather than volitional, and can be added together for a "control index." Subscale 3, identified regulation (eight items, alpha of .67-.77), involves the voluntary regulation of one's emotions in ways that are valued by a larger social system. Subscale 4, integrated regulation (five items, alpha of .73-.76), assesses voluntary regulation of one's emotions, e.g., regulation free from any constraints. The last two subscales involve autonomous regulation, and form an "autonomy index." A "relative autonomy index" may be calculated by subtracting scores on the control index from those of autonomy index. Evidence for convergent validity comes from the control index's associations with negative affect, pessimism, social anxiety, mistrust, psychosomatic disturbances, denial, rumination, and lack of trust in others (Kim et al., 2002). The relative autonomy index is related to optimism, emotional awareness, problem focused coping, acceptance, and internal locus of causality. The factor solution for the SRWNE was also confirmed in a Korean sample, suggesting a stable underlying structure.

The Sternberg Triarchic Ability Test (STAT; Sternberg, 1993) contains 12 subtests tapping analytic, creative, and practical intelligence, respectively. Each subtest consists of four multiple choice items. The practical-verbal subtest asks about everyday life problems; the practical qualitative subtest involves scenarios requiring mathematics reasoning in everyday life; and the practical-figural subtest asks questions about navigating around a provided map. The

STAT is not standardized and is used for research purposes only, but its three factor structure has been confirmed in a high-school sample (Sternberg, 1999), and found to fit data better than a unidimensional model (Sternberg, Castejon, Prieto, Hautamaeki, & Grigorenko, 2001). The three intelligences are only moderately correlated (e.g., r 's in the .40s; Sternberg, 1999), consistent with Sternberg's (1988) Triarchic theory. The practical intelligence scores on the STAT showed a median correlation of .27, the analytic subtests a median correlation of .50, and the creative subtests a median correlation of .54 with several measures of traditional psychometric intelligence, suggesting that they are tapping a somewhat different domain, consistent again with Sternberg's theory. Additionally, practical intelligence scores correlate lower ($r = .30$) than creative ($r = .41$) or analytic ($r = .46$) scores with course grades, but provides incremental variance in predicting academic success (Sternberg, 1999). The map reading and everyday math subtests of the STAT were administered in the present sample to assess practical intelligence.

Procedure

Data for the young adult sample was collected from large sections of introductory psychology classes in the fall semester of 2001 and spring semester of 2002. Students were offered extra credit for their voluntary participation. Data for the mid-life sample was collected through contacts from undergraduate classes and community sources in the summer and fall of 2003. Identifying features were removed from questionnaires, which were entered by the University Data Entry Services upon a CMS account. Subsequently this data was transported into and analyzed upon SPSS, save for structural modeling procedures, for which EQS 5.7 was employed.

Analyses

Hypothesis One

This hypothesis conjectured that EI will be greater at mid life. Because I hypothesized that the factor structures of EI will not be comparable between samples (see H3), this hypothesis was tested by comparing the samples on the sum of items which load .4 or better across factors in both samples. An independent samples t-test compared the overall EI scores thus derived. As an additional exploratory test of this hypothesis, I compared the overall EI scores between the samples with an independent samples t-test.

This hypothesis was also explored by examining the correlation between age and both overall EI scores and EI scores derived from summing items common to the factor solutions of both samples (i.e., all items loading .4 or better on some factor). To more rigorously test the hypothesis that EI increases with age independent of other individual difference constructs, a series of partial correlations was also conducted, controlling for personality factors.

Hypothesis Two

The hypothesis that there will be more variability in EI scores in a mid life sample than in a young adult sample was investigated by a comparison between the variance-covariance matrices of each sample's EI factor solution. Additionally, the variance of overall EI scores in each sample was compared using Levene's test for heterogeneity of variances (Howe, 1997).

Hypothesis Three

The differentiation hypothesis suggested that EI it will be defined by more factors, and/or by factors which are more specific or internally coherent (i.e., more readily interpretable), and/or by factors more independent of one another in a mid life sample, compared to a young adult sample. A multiple group CFA was conducted to test this hypothesis. Multiple factor models have been derived for the SSRI, and it is important to note here that these models were derived through slightly different techniques. Schutte and colleagues began with an initial pool of 66

items, conducted a PCA, rotated it orthogonally, and retained only the first component (approximately 20% of the common variance) as a general factor. They claimed the remaining three factors were uninterpretable and that the initial factor was a general factor which contained items from all relevant domains of Salovey and Mayer's (1990) theoretical model of EI. Petrides and Furnham (2000b) took exception to this, noting that a PCA rotated orthogonally would distribute variance away from a central factor, and conducted their own MLE with both oblique and orthogonal rotations, which yielded few differences because their factors were not highly correlated. They settled on a varimax solution to clean up the factors, retained four factors based on an *a priori* rationale, and then interpreted them based on item loadings of .3 or higher (rather than the .4 criteria applied in the present sample). Finally, Saklofske and colleagues conducted a PCA but rotated it obliquely and forced a four-factor solution quite similar to Petrides and Furnham's. Noticing that the oblique rotation produced modest correlations among the factors, they assessed Schutte and colleague's initial claim that the scale represented a general EI factor, by testing several different solutions with CFA, obtaining the best fit for a four-factor solution in which all four factors loaded on a second-order general factor. Additionally, I derived a two factor structure for the young adults and a three factor structure for the MLA adults, using exploratory factor analysis (described below)

After finding the best fitting model for the young adult data, a multiple groups CFA was conducted with the mid life adults.

Hypothesis Four

This hypothesized that in a mid-life sample, overall EI scores will be more highly correlated with the Enhancement dimension of the Relational Competence Scale and with loneliness than in a young adult sample, and that EI would be more highly correlated with the

Initiative dimension of relational competence in young adults than in mid life adults. This hypothesis was tested by comparing the correlations in the young adult sample between EI, the RCS Enhancement and Initiation dimensions, and the UCLA Loneliness Scale, with those obtained in the mid-life sample. Z-tests for significant differences between independent correlations were used (Guilford, 1956).

Hypothesis Five

This hypothesis suggested that the correlations observed between EI and each of the Big 5, Gc, and Gf would be different in a young adult sample, compared to a mid-life sample. Consequently, the factor solution for EI, the Big 5, and Gc/Gf would not be replicable in a mid-life sample. The pattern of relationships among these specific variables were assessed with an exploratory factor analysis in the young adult sample. The obtained solution was then tested in the mid-life sample via EQS 5.7. In the event it did not replicate, a subsequent exploratory factor analysis was planned with these variables in the mid life sample, and that solution would then be fit to the data for middle aged persons.

CHAPTER 3

RESULTS

A variety of exploratory and descriptive analyses were conducted based on demographic sample differences and other, ancillary variables in the mid life sample like life satisfaction. The results are displayed in Tables 1-6 (all Tables and Figures are in Appendix C). Rather than belabor the reader with a detailed account here, these analyses are described in Appendix B.

Hypothesis 1

The hypothesis that trait EI would be higher at mid-life was initially tested by comparing the mid life and young adult samples on total scores of the SSRI. The mid life sample was more emotionally intelligent ($t(530) = 3.40, p = .001$) than their younger counterparts ($d = .24$). However, because the third research question hypothesized that the composition of trait EI might be different between the two samples (i.e., the SSRI factor structure would shift), a comparison of overall SSRI scores between the samples was a somewhat statistically naive test. Therefore, after exploratory factor analyses of the SSRI for each sample (see below), items loading on factors in both samples were selected and summed to create a measure of EI items common to both samples (e.g., items 2, 3, 4, 10, 16, 17, 18, 25, 28, 29, 30, 31, and 32). Mid life adults still scored higher than their younger counterparts on this common-item index of trait EI ($t(533) = 2.00, p = .05, d = .17$).

The hypothesis that SSRI scores would vary by age was also tested by examining correlations between age and overall SSRI scores, and between age and the common-item index. It is worthwhile to reiterate here that this was a rough and exploratory test. Combining the two samples created a large sample bimodal rather than normal with respect to age, which was expected to attenuate the correlation. Additionally, given that this age distribution was derived

from combining cross-sectional samples rather than from a single longitudinal sample, any correlation between age and SSRI totals still would not reflect change associated with aging; True age related change could only be inferred from longitudinal data, where cohort effects are constant. Nonetheless, I ran the analyses in the interest of exploration.

For the sample as a whole, age was mildly correlated with overall SSRI scores ($r(532) = .13, p = .003$), but was not associated with scores on the common-item index ($r(537) = .08, p = .07$). The coefficient of determination in the first case was minimal (1.7 % of the variance), and the correlation was significant only because of a large sample size--no meaningful relationship appeared to exist here.

After looking at the data in its entirety, I also examined within-group correlations between age and SSRI indices. In the mid life sample, age showed no correlation with overall SSRI scores, scores on the SSRI common-item index, or with scores on three SSRI factors derived through EFA (see below). In the young adult sample, age was also unrelated to overall SSRI scores, the common-item index, or SSRI two factor scores. This was not surprising, as the restriction of range was noteworthy for age (and to a lesser extent EI) in both samples.

In general, however, results supported the first hypothesis that mid life adults would be more emotionally intelligent. This conclusion was supported not only by differences between the samples on overall SSRI scale scores, but also held true when the samples were compared only on items common to both of them.

Hypothesis 2

This hypothesis tested whether variability in EI scores in a mid life sample would be greater than in a young adult sample. This would provide preliminary evidence of a widening distribution of EI at midlife, was tested using Levene's test for heterogeneity of variances

(Howe, 1997). There were no differences in the variances of total SSRI scores in the mid life and young adult samples ($F = .01, ns$). Variances for the common-item index of the SSRI were then compared ($F = 1.0, ns$), and again no difference was found. H2 was rejected: the distribution of EI in the midlife sample appeared no more heterogeneous than in the young adult sample

Hypothesis 3

The hypothesis that EI would show greater differentiation in a mid life sample, compared to a young adult sample, was investigated in several steps. First, exploratory factor analyses of the SSRI were conducted for each sample.

Exploratory Factor Analyses

In the young adult sample, maximum likelihood principal axis factoring was used, and eigenvectors were rotated obliquely to a simple structure¹. Nine factors emerged with Eigenvalues over 1, but Kaiser's (1960) stopping rule seemed an inappropriate method for retaining factors because communalities were generally not near the .70 he recommended, and the number of items loading saliently on each factor decreased dramatically after the first two factors. I retained the first two factors, based on Cattell's (1966) scree test, which Stevens (1986) recommended for cases where Kaiser's rule is not appropriate (the scree criteria will be used in subsequent factor analyses as well). The first factor had an Eigenvalue of 7.78, and accounted for 23.58% of the common variance, while the second factor had an Eigenvalue of 2.32, explaining 6.77% of the common variance (the third had an Eigenvalue of 1.71, 5.7% of the variance). I

¹ I used an oblique rotation for several reasons. First, at a conceptual level, multiple domains of a single construct should be related. For instance, with respect to emotional intelligence, it would be difficult to regulate one's emotions without first appraising them, as Petrides and Furnham (2000) have noted. Second, Schutte and colleagues (1998) suggested that the SSRI tapped a General EI factor. Highly correlated factors might suggest a second order general factor (but an orthogonal solution would obscure such correlations), and a hierarchical solution has recently been fit to the SSRI (Saklofske et al., 2003). Finally, an orthogonal rotation could always be rerun in any event if the factors were essentially uncorrelated, but I suspected from previous work with the young adult data (Chapman, 2002; Chapman & Hayslip, in press) that an orthogonal rotation would add nothing to the factor solution's interpretability.

interpreted these two factors based on a slightly conservative item loading criteria of .4, which produced more conceptually clear factors than including items loading .3. No cross loadings were observed on the first two factors. The factor solution for the young adult sample is shown in Table 7, and the complete list of SSRI items can either be referred to in Appendix B or in the section of this chapter below on parceling.

The first factor emerging in the young adult sample consisted of items 2, 3, 10, 16, 17, 28, and 31. These items generally referred to maintaining positive moods and using positive moods to motivate oneself, so the factor was labeled “Optimism.” For instance, item 2 is “When I am faced with obstacles, I remember times I faced similar obstacles and overcame them,” item 10 is “I expect good things to happen,” and item 31 is “I use good moods to help myself keep trying in the face of obstacles.” Items 4, 18, 25, 29, 30, 32, and 33 loaded saliently on the second factor. These items dealt with understanding others’ emotions, and to a lesser degree, attempting to improve them. For example, item 4 is “Other people find it easy to confide in me,” item 18 is “By looking at their facial expressions, I recognize the emotions people are experiencing,” and item 30 is “I help other people feel better when they are down.” The second factor was labeled Empathy. Of note, the communalities in the young adult factor solution were generally in the .3s and .4s, with only a few over .5. The two factors were correlated .25.

Next, an identical maximum likelihood factor analysis with oblique rotation was conducted for the mid-life adults. This time, the scree solution suggested retaining three factors with Eigenvalues of 8.25, 2.23, and 2.08, accounting for 25%, 6.76%, and 6.32% of the variance, respectively. Again, an item loading criteria of .4 was used for interpretation, and though some items crossloaded, in interpreting factors, prominence was given to primary-loading items. Communalities in the mid life sample were only slightly higher than in the young adult sample,

with a few more items in the .4 range and over .5. The SSRI factor solution for the mid life sample is represented in Table 8.

Factor 1 comprised items 2, 3, 10, 12, 14, 17, 22, 23, and 28, and items 4, 16, 19, 24, and 30 had secondary loadings on the first factor. These items encompassed the maintenance of positive moods and use of positive moods for motivation, but also involved more active mood regulation in oneself, with a couple items pertaining to awareness and regulation of other's feelings. Items tapping more active regulation included, for example, number 12, "When I experience a positive emotion, I know how to make it last," and number 14, "I seek out activities that make me happy". This factor was labeled "Optimism/Mood regulation" to reflect both its similarity to and greater breadth than the first factor in the young adult sample. Of note, the factor was conceptually similar to the first extracted by Petrides & Furnham (2000b) and Saklofske and colleagues (2003), each of whom used slightly different extractions, rotations, and item-loading criteria.

The second factor in the ML sample was characterized by items 4, 9, 15, 16, 18, 19, 24, 25, 26, 29, 30, and 32. These items dealt with the recognition of emotion in others, in making a positive impression on others, and in helping others with bad moods. Thus, it was named "Empathy/Social skills." Positive impression items included 16, "I present myself in a way that makes a good impression on others," and 15, "I am aware of the non-verbal messages I send other." This factor was similar to a combination of the second (Appraisal of Emotions) and third factors (Social Skills) extracted by Petrides and Furnham (2000b) and Saklofske and colleagues (2003).

The third factor was defined by items 7, 8, 27, and 31, and items 12, 23, 26, 27, and 32 had secondary loadings on this factor. These items involved using emotions to facilitate thinking

and to maintain or increase motivation. For instance, item 7 is “When my mood changes, I see new possibilities,” and item 27 is “When I feel a change in emotions, I tend to come up with new ideas.” Thus, the factor was labeled “Utilization of Emotion,” and was similar to the fourth factor of previous researchers (Petrides & Furnham, 2000b; Saklofske et al., 2003). Factor 1 correlated .37 with factor 2, and .33 with factor 3. Factor 2 correlated .43 with factor 3.

The exploratory factor analysis solutions for each sample were then added to other models tested by confirmatory factor analysis (CFA).

Item-Level Confirmatory Factor Analyses

I hypothesized that the factor structure of EI in the young adults could not be fit to the mid life sample, due to fundamental differences in the structure of EI at mid life. To test this hypothesis, I adopted a procedure where the best-fitting model of EI would first be determined in the young adult data. Once this had been accomplished, that model would be submitted to a multiple groups CFA in an effort to assess its degree of fit with mid-life sample.

Five different EI factor structures were initially tested in the young adult sample using the items of the SSRI: the unifactorial model of Schutte and colleagues (1998), the two factor model derived in the present study from the young adult sample, the three factor model derived in the present study from the mid life sample, the four factor model Petrides and Furnham (2000b) produced, and the model of Saklofske and colleagues (2003), in which Petrides and Furnham’s four factors are subsumed beneath a second-order General EI factor. The arrangement of items in these competing models is summarized in Table 9.

Each of these models was tested using a maximum likelihood robust estimation procedure, and all subsequent EQS runs were conducted in this manner as well (except for multiple group analyses, which can only be conducted with maximum likelihood estimation).

Maximum likelihood is conventionally used in latent variable modeling (Bentler, 1995), and its accuracy is less dependent upon sample size or non-normality. The “robust” option provided by EQS is less sensitive to multivariate kurtosis than standard ML estimation.

EQS also supplies one with several fit indices for assessing the model’s correspondence with the observed covariance structure. Hu and Benler (1998) provide various guidelines on the selection of fit indices. The Chi Square statistic is a conventional method of assessing fit. However, it is very sensitive to non-normality (Dunn, Everitt, & Pickles, 1993). Multivariate kurtosis in the distribution of SSRI scores in the young adult sample was quite pronounced, and even after two cases were deleted due to clear bipolar response bias (and one case in which data had been mis-keyed), Mardia’s coefficient still remained extraordinarily high (e.g., 267). Therefore, the Satorra-Bentler Chi Square (more robust to multivariate non-normality; Bentler, 1995) will be reported here instead.

Models should not be evaluated exclusively on the basis of the Chi-Square statistic, since it will almost always indicate lack of fit in even modest sample sizes (Bollen & Long, 1993). Therefore, I primarily based evaluation of model fit on incremental (i.e., “comparative,” or those that provide values between 0-1) and absolute (i.e., those that evaluate lack of fit by examining residual elements in the data not reflected by the model) fit indices. With regard to the former, the Nonnormed Fit Index (NNFI) was rejected in favor of the Comparative Fit Index (CFI), which is less affected by sample size (Byrne, 1995). The multivariate kurtosis of the data also suggested the use of the Robust Comparative Fit Index (RCFI) as the most accurate incremental fit index in the present data. Absolute indices used to evaluate the model included the Root Mean Square Error (RMSEA), which is sensitive to the number of free parameters, and the Standardized Root Mean Square Residual (SRMR), which is susceptible to under or over

parameterization. In other words, if the model was misspecified, it would be difficult to achieve acceptable values on these indices.

Cut-offs for incremental and absolute indices, like the selection of alpha levels, are dictated by convention: the degree to which the model reproduces the covariance matrix of the data can never be completely perfect, so the amount of deviance considered acceptable must ultimately be an arbitrary decision. However, for incremental indices, values of .90 (e.g., Bollen & Long, 1993) or a more conservative .94 (Hu & Bentler, 1998) have been suggested. RMSEA less than .08, and SRMR less than .06 have typically been considered indicative of good fit (e.g., Bryant & Yarnold, 1995; Klem, 1995). Let us turn now to the evaluation of the five models themselves.

Item level models

In all models except those including second order factors, factor variances were fixed at one and all other item loadings were considered free parameters to be estimated, as were correlations between factors and error variances. Consistent with prior research (Schutte et al., 1998; Petrides & Furnham, 2000b; Saklofske et al., 2003), and in order to fairly compare the different models, all 33 scale items were used in each model. Items were specified as loading on a given factor either based on their loadings in prior studies, or based on their highest loadings in the present exploratory factor analyses described above. No items were permitted to crossload in this set of models.

For the one factor model, all items were estimated as loading on a General EI factor. The one factor model clearly did not fit the data ($S-B X^2 = 1147$, $df = 495$, $p < .001$, $CFI = .63$, $RCFI = .64$, $RMSEA = .09$, $SRMR = .08$). This is consistent with the results of Petrides & Furnham (2000b), who rejected Schutte and colleagues' (1998) notion that the SSRI taps a general EI

factor.

For the two factor model, items were estimated as loading on either an Optimism or Empathy factor as shown in Table 9. This too proved to be an inadequate representation of the data ($S-B X^2 = 1035$, $df = 494$, $p < .001$, $CFI = .69$, $RCFI = .70$, $RMSEA = .08$, $SRMR = .08$). The lack of fit was not surprising, given that the exploratory factor analysis on which the model was based captured only 30% of the common variance in SSRI items.

The three factor model was actually derived from the mid life sample, so a lack of fit in the young adult data was expected ($S-B X^2 = 1073$, $df = 492$, $p < .001$, $CFI = .67$, $RCFI = .68$, $RMSEA = .07$, $SRMR = .08$). As can be seen, the chi-square worsened somewhat and the CFI and RCFI decreased compared to the two factor model, although the RMSEA improved slightly. I tested this model only as an exploratory venture, but the fact that a model derived by EFA in the mid-life sample could not be confirmed in the young adults was in line with my hypotheses.

The four factor model specified items as loading on either an Optimism/Mood Regulation, Appraisal, Social Skills, or Utilization factor, as depicted in Table 9, after Petrides & Furnham (2000b). Although incremental indices and chi-square indicated that fit was slightly better than the other models, it still remained inadequate ($S-B X^2 = 982$, $df = 489$, $p < .001$, $CFI = .71$, $RCFI = .73$, $RMSEA = .08$, $SRMR = .08$).

Finally, Saklofske and colleagues' (2003) four factor hierarchical model was tested. Here, items were specified as loading on four factors very similar to Petrides and Furnham's, but these four factors were all specified to load on a second order, General EI factor. The first order factors became both dependent and independent variables in the model, and so did not have variances fixed at one. Instead, the lowest-loading item on each first-order factor was fixed to one, and the variance of the second order factor was fixed at one. The first order factors' disturbances, like the

error variances for indicator variables, were also estimated. Yet again, the model did not fit ($S-B \chi^2 = 1029$, $df = 494$, $p < .001$, $CFI = .69$, $RCFI = .70$, $RMSEA = .07$, $SRMR = .08$). Comparative fit indices remained essentially the same and chi-square worsened slightly, but the RMSEA improved just slightly. Fit indices for these respective models are summarized in Table 10.

One possibility for the poor fit of these models was the relatively high number of items (33), particularly compared to the sample size ($n = 289$). Free parameters in these models varied between 65 (for the 1 factor model) and 70 (for the hierarchical model), and the sample did not quite reach the suggested 5 subjects per free parameter generally given as guidelines in SEM literature (e.g., Klem, 1995)².

In light of the poor fit of these item-level models, several recourses were considered. EQS provides the Wald test for potentially eliminating parameters from a model if they are not significantly different from zero, and the LaGrange Multiplier test suggests parameters to add or free (Bentler, 1995). Based on these indices, one possibility was to drop items, but very few items loaded below .4 on any factor in any of the models, and the Wald test never suggested dropping any. An examination of LaGrange Multiplier output revealed that often, suggested changes were not conceptually defensible, and would have produced only negligible changes in chi-square. Over reliance on LaGrange Multiplier can also compromise a model's theoretical viability (Bollen & Long, 1995; Dunn, Everitt, & Pickles, 1993; Klem, 1995). Rather than tamper so extensively, an alternative approach was utilized.

² Elizabeth Austin, one of the researchers who confirmed the Saklofske et al. (2003) hierarchical model initially, also stated that CFA had been difficult with this scale due to the relatively high number of items (personal communication via e-mail, March 18, 2004). She had to "tweak" the model considerably, and was eventually reduced to correlating error terms in order to get the CFI to .90. She noted that rather than try to replicate her model exactly, a more relevant question would be whether 1, 2, 3, or 4 factors constituted the "least worst-fitting model." It was interesting that she appeared to have encountered similar difficulties modeling at the item level, and said she preferred EFA for "that type of scale," noting that the merits of "good old EFA" in personality research were not to be underestimated.

Item Parceling

One useful strategy in personality research, where modeling at the item level can be difficult, is to test “partially disaggregated” models of latent personality constructs (Bagozzi & Heatherton, 1994; Kim & Hagtvet, 2003; Little, Cunningham, Shahar, & Widaman, 2002). Item level modeling tests “fully disaggregated” models, where a latent personality construct is broken down into first order factors that are then treated as the cause of the variance of individual items. Item level modeling also tests “fully aggregated” models where a single latent personality construct is treated as responsible for the variance of all individual items on a scale (Bagozzi & Heatherton, 1994). A “partially disaggregated” model considers latent personality constructs as the cause of the covariance observed in item *parcels*, or groups of similar items tapping similar content³. Parcels can be formed by summing the scores of similarly worded items or items rationally tapping the same content. Thus, error variance, skewness, and kurtosis are minimized because they are distributed across multiple items, and parcels serve as more reliable indicators of latent constructs than individual items, making them particularly useful indicators for modeling scales in which many items that are not normally distributed (Kim & Hagtvet, 2003; Little et al., 2002).

In the present data, parcels were constructed based on a rational analysis of items on the SSRI. Fortunately, many of the items are worded very closely and were created to assess similar facets of the same content domains (i.e., verbal as well as non-verbal appraisal of others; see Schutte et al., 1998). The parcels, as well as the items that constitute them, are listed below. Parcels were named to reflect the common content of items (abbreviations in parentheses are provided because they are used in various tables that follow). Following each item is the item-

³ A “partially aggregated model” simply considers the subscale scores or first-order factors to be indicators of a latent personality construct.

parcel correlation in the young adult sample, followed by the item-parcel correlation in the mid-life sample. Note that items worded negatively were reverse-scored, which is why they correlate positively with other items.

Efficacy Expectations (EffEx):

3; .82; .78
10; .86; .87

Persistence Through Obstacles (PersOb):

2; .82; .80
31; .82; .81

Positive Outcome Imagery Use (PosIm):

23; .75; .69
28; .80; .80

Mood Change Use (MdCh):

7; .84; .86
27; .80; .81

Positive Mood Use (MdPos):

17; .88; .87
20; .88; .86

Helping Others' Moods (HlpOth):

13; .87; .83
30; .76; .28

Listening & Complimenting (LisCom):

4; .82; .84
24; .78; .81

Impression Management (ImpMg):

15; .83; .84
16; .74; .77

Mood Management (MdMg):

12; .80; .86
14; .73; .78
21; .74; .74

Empathy (Emp):

26; .75; .69
33; .76; .73

Appraising Others 1 (ApOth1):

18; .82; .80

29; .81; .80

32; .76; .76

Appriasing Others 2 (ApOth2):

5; .90; .88

25; .86; .81

Emotion Expression (EmEx):

1; .77; .63

11; .85; .83

Self-Appraisal (SfAp):

9; .83; .78

19; .78; .78

22; .82; .81

Existential Living (ExLiv):

6; .71; .72

8; .77; .76

As can be seen, item-parcel correlations were all quite reasonable (e.g., in the .7s and .8s), providing empirical support for the manner in which they were rationally derived. Parcel intercorrelations ranged from the .2s to the .5s (see Table 11) indicating that the parcels were related, but tapped different content domains of EI. Also of note, the final parcel, Existential Living, represented two left over items which did not seem quite appropriate for any of the other parcels, yet appeared to tap something similar themselves. Both items reflect something like emotional *dasein* (Heidegger's term, "being in the world"), or attunement to and comfort with emotional experience in the broad context of life. Therefore, I used Carl Rogers's (1959) term "Existential Living" to characterize the parcel⁴.

⁴ Existential Living was a mode of living which reflected thorough awareness of phenomenal experience, an attunement with goals, and strivings toward growth. Though Rogers (1959) described many modes of living, Existential Living was most often contrasted with Maintenance Living, which involved a truncation of one's phenomenal experience, a preoccupation with banal or superficial goals, and mundane or materialistic strivings.

Partially Disaggregated Models

The first model tested was a partially disaggregated version of the four-factor model of Petrides & Furnham (2000). The Efficacy Expectations, Persistence through Obstacles, Positive Imagery Use, and Mood Management parcels were all hypothesized to load on an Optimism/Mood Regulation factor; the Appraising Others 1, 2, and Self Appraisal parcels were hypothesized to load on an Appraisal factor; the Helping Others' Moods, Listening and Complimenting, Empathy, Impression Management, and Emotion Expression parcels were hypothesized to be indicators of a latent Social Skills factor; and the Positive Mood Use, Mood Change Use, and Existential Living parcels were hypothesized to load on a Utilization factor. This proposed model is depicted in Figure 1. An examination of the items composing these parcels revealed that they were similar to the items composing Petrides & Furnham's four factors.

For the EQS run, all factor variances were set to 1, and item loadings, factor covariances, and error variances were estimated. Results indicated that the parcels suffered from a significant amount of multivariate kurtosis (Mardia's coefficient = 54.78), but much less than the items themselves. The four factor model did not quite fit the data, ($S-B X^2 = 198.43$, $df = 84$, $p < .001$, $CFI = .88$, $RCFI = .87$, $RMSEA = .08$, $SRMR = .06$). Parcel loadings were all .5 or higher, but several factor correlations were quite high (e.g., factors 1 and 3 $r = .89$, factors 3 and 2 $r = .94$, factors 3 and 4 $r = .80$), so I re-ran the model with a second-order General EI factor.

In this model, one parcel loading was set to 1 for each first order factor, the second order factor's variance was set at 1, and all other loadings, error variances, and factor disturbances were estimated. This model fit slightly worse than the previous one ($S-B X^2 = 206.94$, $df = 86$, $p < .001$, $CFI = .87$, $RCFI = .86$, $RMSEA = .09$, $SRMR = .07$), and although all first order factors

loaded .8 or higher on the General EI factor, EQS estimated factor 3 (Social Skills) to load 1.00 on the general EI factor, with an according factor disturbance of 0. This appeared to be a potential Heywood Case: EQS constrains parameter estimates at upper and lower bounds of 1 and 0, preventing, for instance, negative variance estimates that might occur in the common factor model. Nonetheless, the implication of perfect measurement (i.e., no error associated with the Social Skills factor) seemed problematic, so the hierarchical factor was removed.

Returning to the initial model, an examination of the LaGrange Multipliers suggested that variable 5, Positive Mood Use, be freed to cross-load on factor 1, Optimism/Mood Regulation. Conceptually, it is entirely possible that utilizing good moods to direct motivation and enhance problem solving might be function of Optimism (Factor 1), as well as an emotion Utilization (Factor 4). Results of this model indicated just adequate fit ($S-B X^2 = 174.72$, $df = 83$, $p < .001$, $CFI = .90$, $RCFI = .89$, $RMSEA = .08$, $SRMR = .06$), but Positive Mood Use now loaded .26 on Factor 4 (Emotion Utilization).

Because this loading was particularly low in light of the others (all .5 and up), and because I wanted to avoid cross-loadings in general, I respecified the model so that Positive Mood Use would load only on factor 1. This did not attenuate fit at all ($S-B X^2 = 179.17$, $df = 84$, $p < .001$, $CFI = .90$, $RCFI = .89$, $RMSEA = .08$, $SRMR = .06$). Correlations between factors remained quite high (.5 to .9), so again I tried the model with a second order General EI factor. Results indicated that the second order factor attenuated fit slightly ($S-B X^2 = 182.78$, $df = 86$, $p < .001$, $CFI = .89$, $RCFI = .89$, $RMSEA = .08$, $SRMR = .06$). Additionally, the standardized solution suggested that the Social Skills factor (Factor 3) was again measured perfectly, with all its variance accounted for by General EI and none by error.

Rather than abandon this model, which was quite close to that of Saklofske and

colleagues' (2003), it was respecified. Dunn, Everitt, and Pickles (1993) discuss a similar example of a Heywood Case where an error term hit lower boundaries (e.g., 0) when various equality constraints they had imposed between errors were removed. When they respecified their model again with a constraint on the error term in question, the parameter estimates returned to normal. Adopting this approach, the problematic Social Skills Factor disturbance (D3) was specified to be equal to the next lowest disturbance, that of the Appraisal Factor (D2). At a theoretical level, the assumption that error associated with Emotion Appraisal might be similarly associated with Social Skills is tenable because appraising one's own and other emotions is necessary in effective interaction; there is a contingent relationship between the two (Mayer, 2001; Mayer & Salovey, 1997). The results indicated a slight attenuation of fit ($S-B \chi^2 = 195.275$, $df = 87$, $p < .001$, $CFI = .88$, $RCFI = .87$, $RMSEA = .08$, $SRMR = .06$), but parameter estimates were within normal bounds (though Disturbances 2 and 3 remained low).

This hierarchical four factor model is depicted in Figure 3. Although it fit slightly worse than the three factor hierarchical model, this model was held in consideration for future analyses because it represented a near approximation of the most recent model in the literature. But because the fit indices were marginal, I decided to try an alternative, empirically derived model.

Based on the results of an EPIC exploratory factor analysis⁵, a three factor model emerged (shown in Table 12). The first factor (Eigenvalue 5.56, 37.07% of the common variance) consisting of the Efficacy Expectations, Persistence Through Obstacles, Positive Imagery Use, Positive Mood Use, Impression Management, Mood Management, and Emotion

⁵ EQS exploratory factor analysis uses a little-known method to reach the initial solution, proposed by Kaiser (1990; cited in Bentler, 1995). It is called Equal Prior Instant Communalities, or EPIC, and is robust to problems such as lack of convergence and linear dependence among variables. EPIC assumes that the unique variances of the correlation (but not covariance) matrix are equal, and is an expedient method that is characterized as a compromise between principal components and maximum likelihood factoring (Bentler, 1995). Bentler notes that PCA solutions are often misleading because they create components whose variance is unique, and MLE solutions tend to be computationally cumbersome and may produce negative variance estimates; EPIC, however, has neither problem. EPIC initial solutions can be rotated with conventional orthogonal and oblique rotations.

Expression parcels. This factor was labeled Optimism/Self-Regulation. It was slightly broader in content than the Optimism/Mood Regulation of the previous model, with parcels reflecting behavior (i.e., Impression Management and Emotion Expression) that had previously loaded on a Social Skills factor. The second factor that emerged (Eigenvalue 1.39, 9.26% of the common variance) was defined by the Helping Others' Moods, Listening and Complimenting, Empathy, Appraising Others 1 and 2, and Self Appraisal parcels; it was named Appraisal/Compassion, and was similar to the Appraisal factor of the previous model, but included the remaining parcels from the Social Skills factor dealing with more active assistance to others. The third factor (Eigenvalue 1.18, 7.87% of the common variance) consisted of the Mood Change Use and Existential Living parcels, similar to the Utilization factors above, and so was labeled Emotion Utilization. The correlations between these factors were modest (.3 to .5).

A confirmatory factor analysis revealed that this factor structure represented a marginally acceptable fit with the data ($S-B X^2 = 189.21$, $df = 86$, $p < .001$, $CFI = .89$, $RCFI = .89$, $RMSEA = .08$, $SRMR = .06$), but factor intercorrelations were again .5 and higher, so the model was rerun with a second order General EI factor. This resulted in a slight improvement in fit ($S-B X^2 = 178.92$, $df = 87$, $p < .001$, $CFI = .90$, $RCFI = .90$, $RMSEA = .08$, $SRMR = .06$).

This three-factor hierarchical model fit just slightly better than the four-factor model above (i.e., RCFI of .90 v. .89) or the four factor hierarchical model (CFI and RCFI of .90 v. .89). The three factor hierarchical model was favored for three conceptual reasons, however. First, it was a more parsimonious representation of the dimensions underlying EI. Essentially, the parcels that had composed the Social Skills factor in the previous model were distributed across the Optimism/Self Regulation and Appraisal/Compassion factors in this model. Second, fitting the data to a model with fewer factors is more empirically rigorous because fewer latent

variables are proposed to account for the covariance structure. Third, the three-factor model included a second-order General EI factor. (Although this was true of the four factor hierarchical model, that model also initially had a factor loading of 1, whereas no such problems were encountered with the three factor hierarchical model.) Accounting for the association between different dimensions of EI with a second order factor is consistent with theories of Emotional Intelligence as a broad general competency characterized by several related but distinct domains. The final three factor hierarchical model and its standard solution are depicted in Figure 2, and the four factor hierarchical model with its standard solution is depicted in Figure 3.

Factor Structure of EI in the Mid Life Sample

In order to ascertain how EI was represented in the mid life sample, I next conducted an EPIC factor analysis upon the EI parcels. The resulting structure matrix is depicted in Table 13. Factor 1 (Eigenvalue = 5.72; 38.13% of the variance) was defined by the Efficacy Expectations, Persistence through Obstacles, Positive Imagery Use, Mood Management, and Self-Appraisal parcels. It was named “Optimism and Mood Regulation.” Factor 2 (Eigenvalue = 1.42; 9.47% of the variance) was defined by the Listening and Complimenting, Empathy, Appraising Others 1 and 2, Emotion Expression, and Impression Management parcels. It was labeled “Social Skills.” Factor 3 (Eigenvalue = 1.12; 7.47% of the variance) was defined by the Mood Change Use and Existential Living parcels and was named “Emotion Utilization.” The final factor emerging from the mid-life sample (Eigenvalue = 1.02; 6.8% of the variance) consisted of the Positive Mood Use and Helping Others.

This factor was more difficult to interpret than the others, which were essentially similar to previously derived factors in the young adult sample. The items in the Positive Mood Use cluster reflect tendencies to use positive emotions to direct motivation and problem solve, and

the items in the Helping Others' Moods cluster tap cheering others up or helping them with their moods. But in the mid-life sample, item 31 in the Helping Others' Moods parcel had an anomalously low correlation with the parcel total (.28) and with the other item in the parcel (.15), suggesting that this parcel may not be internally consistent for the mid-life adults. However, the underlying conceptual similarity in items across these two parcels is that they all involve taking some form of action, or engaging in goal directed behavior, either as a result of or as a precursor to positive moods in oneself or others. Thus, the final factor in the mid life sample was named "Mood Instrumentality." It was, essentially, a second type of Utilization factor.

This four factor model was then submitted to a confirmatory factor analysis. As in previous models, factor variances were fixed to 1, and item loadings, error variances, and factor correlations were estimated. The results indicated that this model fit the mid life data well ($S-B X^2 = 161.84$, $df = 84$, $p < .001$, $CFI = .91$, $RCFI = .91$, $RMSEA = .08$, $SRMR = .06$). Factor intercorrelations were in the .5s through .7s, so the model was rerun with all four factors loading on a second order General EI Factor to render a model most commensurate with EI theory. Fit was attenuated slightly, but still adequate ($S-B X^2 = 168.27$, $df = 86$, $p < .001$, $CFI = .90$, $RCFI = .90$, $RMSEA = .08$, $SRMR = .06$). This hierarchical four factor model is depicted in Figure 4.

Multiple Groups Confirmatory Factor Analysis

The crux of H3 was that the factor structure of EI would not be the same in the mid life sample as it was in the young adult sample. Multisample analyses were conducted for each model in a series of nested comparisons. First, the hierarchical three factor model in Figure 2 was tested across samples. An initial test of the equality of variance-covariance matrices revealed that they were quite similar ($X^2 = 232.89$, $df = 115$, $p < .001$, $CFI = .95$, $RCFI = .96$, $RMSEA = .04$, $SRMR = .06$), providing some preliminary suggestion that the young adult model might be fit to

the mid life adult data.

In the initial multiple groups run of the second-order three factor model, both the first and second order factor loadings were constrained to be equal across groups, leaving the error terms free to vary. Equality of measurement errors is generally considered the least important hypothesis in multisample covariance structure modeling (e.g., Bentler, 1995), and an argument can be made that expecting indicator residuals to be identical across samples does not make sense. For exploratory purposes, error terms would have been constrained had fit been achieved with constraints on all factor loadings, but this did not prove necessary. The results of the multisample analysis constraining first and second order factor loadings indicated less than optimal fit ($X^2 = 517.766$, $df = 189$, $p < .001$, $CFI = .87$, $RCFI = .87$, $RMSEA = .06$, $SRMR = .07$), not surprising given that the fit in the young adult sample was also below conventional standards. This model served as the first, or baseline model, against which the next two progressively less restricted versions were tested. However, the LaGrange Multipliers revealed that no particular constraints were significant or were attenuating overall fit across groups. Nonetheless model testing proceeded as planned and, in the second nested model, constraints were relaxed first on the first order factors' loadings on the second order factor, while retaining constraints on parcels' loadings on the first order factor. This resulted in hardly any noticeable improvement ($X^2 = 514.508$, $df = 186$, $p < .001$, $CFI = .87$, $RMSEA = .06$, $SRMR = .07$), and again, LaGrange Multipliers did not suggest that any existing constraints were significantly attenuating fit. All constraints were relaxed for the third, least restricted nested model, but not surprisingly, no substantial improvement in fit was noted ($X^2 = 502.506$, $df = 174$, $p < .001$, $CFI = .87$, $RMSEA = .06$, $SRMR = .06$). Table 16 summarizes these comparisons, including chi-square change and degrees of freedom change statistics, for this and the subsequent models tested.

The next model tested was the modified four factor model (with Positive Mood Use loading on factor 1) that had fit the young adult data nearly as well as the hierarchical three factor model of Figure 2 (there had been only a small difference only in the RCFI). A baseline model was established this time by with no constraints at all. This unconstrained four factor model did not achieve fit across groups ($X^2 = 460.739$, $df = 170$, $p < .001$, $CFI = .86$, $RMSEA = .06$, $SRMR = .06$) either, and its fit was essentially comparable to the unconstrained hierarchical 3 factor model. Subsequent nested comparisons constraining the first, and then the first and second order factor loadings, resulted in virtually no change in overall fit, and constraints were all non-significant (see Table 14).

After this, the four-factor hierarchical model was also tested with no constraints, and did not fit any better ($X^2 = 470.156$, $df = 172$, $p < .001$, $CFI = .86$, $RMSEA = .06$, $SRMR = .06$). The subsequent testing of models with first order loadings constrained, then both first and second order loadings constrained, again resulted in no changes or significant constraints (see Table 14).

As a final alternative, the hierarchical four factor model derived from the mid-life sample was considered tested, both first and second order factor loadings were constrained. The results revealed inadequate fit ($X^2 = 496.212$, $df = 189$, $p < .001$, $CFI = .88$, $RMSEA = .06$, $SRMR = .08$). Nested comparisons with progressively less restricted models produced no changes in overall fit or significant constraints (see Table 14).

Regardless of the model, these results indicated structural and metric invariance across groups. However, while the nature and structure of the factors was quite similarly across models, a few parcels loaded on slightly different factors in different models. A comparison of each group's best-fitting factor structures in Figures 2, 3, and 4 reveals many similarities: a strong first factor of Optimism and Mood or Self Regulation, a smaller Emotion Utilization factor, and a

higher order General EI factor. Not much can be made of the fact that the indicators composing the mid-life Social Skills factor were essentially distributed between the first and second factor of the young adult three-factor hierarchical model; in the four factor model that fit the young adult sample nearly as well (not depicted in a diagram) and in the hierarchical four factor young adult model (Figure 3), a Social Skills factor almost identical to the one in the midlife solution was present. The major difference between these samples' factor structures seems to lie in the emergence of a relatively unique fourth factor, Emotional Instrumentality, in the mid life adults. However, this factor accounted for a relatively small amount of the common variance, however, and alone does not provide strong evidence of the sort of differentiation documented by Schaie in intelligence (1996; see also 2001). In the context of so many closely fitting alternative models, there was really no definitive evidence for structural variance across the models or for metric variance within a single model tested across groups. Slight shifts in the loadings of parcels from one factor to another across models was also substantively minimal. Therefore, H3 was rejected.

Hypothesis 4

This hypothesis tested whether EI scores in a mid life sample would be more highly correlated with the Enhancement dimension of Relational Competence and with loneliness, compared to young adults. It also tested whether EI in a young adult sample would be more highly correlated with the Initiation dimension of Relational Competence than in mid life adults. Fisher's z-test for significant differences in independent correlations revealed no significant difference between the SSRI common item index—Relational Competence Enhancement correlation of ($r(240) = .52, p < .001$) in the mid life sample and the SSRI common item index—Relational Competence Enhancement correlation of ($r(287) = .57, p < .001$) in the young adult sample ($z = .80, p = .21$). With respect to the the SSRI common item index—UCLA-

R Loneliness total correlation of ($r(232) = -.44, p < .001$) in the mid life sample and the SSRI common item index—UCLA-Loneliness R total correlation of ($r(272) = -.47, p < .001$) in the young adult sample, again no significant difference was observed ($z = .45, p = .33$). Finally, the SSRI common item index—Relational Competence Initiation factor correlation of ($r(286) = .53, p < .001$) in the young adult sample was not significantly different from the same correlation ($r(242) = .48, p < .001$) in the mid life sample ($z = .80, p = .22$).

In short, there was no support for the hypothesis that in mid life as compared to young adulthood, EI would be more closely associated with social competence aimed at nurturing existing relationships, and with loneliness. There was also no evidence that in young adulthood, as compared to mid life, EI would be more correlated with social competence aimed at relational initiative, proactivity, and assertiveness.

Hypothesis 5

This hypothesis stated that the relationships observed between EI and each of the Big 5 personality factors, Gc, and Gf would not be replicable in a mid life sample. This hypothesis was tested in several steps.

Exploratory Factor Analysis in the Young Adult Sample

As a first step, I assessed the relationships between these constructs with an EPIC factor analysis in the young adult sample. The oblimin rotated solution was used, because in addition to the dimensions underlying 1) a collection of personality constructs, 2) a pair of ability constructs, and 3) an unknown individual difference variable (EI), the relationship between these dimensions was of theoretical interest.

Four factors emerged with Eigenvalues above 1 (see Table 15). The first (Eigenvalue = 3.44; 34.4% of the variance) was defined by EI, Relational Competence Enhancement,

Extraversion, Conscientiousness, and a negative loading for Neuroticism. This factor was characterized by personality traits related to an outgoing and happy disposition, emotional stability, Emotional Intelligence, diligence and organization, and by trust, comfort, and nurturing in close relationships, so it was labeled Emotional/Relational Maturity. The second factor (Eigenvalue = 1.60; 16% of the variance) was defined by fluid and crystallized abilities, and was labeled Intelligence. The third factor (Eigenvalue = 1.27; 12.7% of the variance) was defined by Relational Competence Initiation and Agreeableness; both tap a degree of broad social competence, and comfort and affability with people, so this factor was labeled Sociability.

The fourth factor (Eigenvalue = 1.05; 10.5% of the variance) was defined by Openness. Four seemed a large number of factors to characterize 10 variables, and the fourth factor appeared problematic because it had only one salient loading. Therefore, for the model tested by CFA, the fourth factor was discarded and Openness was moved to the factor on which it loaded next highest (about .3), Factor 2, Intelligence. Theoretically, Openness reflects intellectual curiosity, and empirically, it tends to correlated more than any of the other Big Five with measures of intelligence (Costa & McCrae, 1994a), so this decision was well-grounded theoretically and empirically.

The resulting three factor model (Emotional/Relational Maturity, Intelligence, and Sociability) was then tested via confirmatory factor analysis in the young adult sample. Factor variances were set at 1, and all other parameters, including factor correlations were estimated. Results revealed that multivariate normality had not been violated (Mardia's coefficient = 3.88; standard chi-squares are reported therefore), but the model did not fit well ($\chi^2 = 240.362$, $df = 32$, $p < .001$, $CFI = .65$, $RCFI = .73$, $RMSEA = .19$, $SRMR = .10$). LaGrange Multipliers suggested fit could be substantially improved by permitting Relational Competence Initiation to crossload

on Factor 1 (Emotional and Relational Maturity) in addition to Factor 3 (Sociability), and by permitting Relational Competence Enhancement to crossload on Factor 3 in addition to Factor 1.

Conceptually, both these modifications made sense for a couple reasons. First, the Relational Competence Enhancement and Initiation factors themselves were highly correlated in both samples. Second, the factors tap complementary content: Initiation encompasses assertiveness, comfort with strangers, and developing new relationships, while Enhancement taps trust, nurturance, and maintenance of existing relationships. Finally, both dimensions of Relational Competence could be permitted to crossload between the Emotional/Relational Maturity and Sociability factors without substantially changing the meaning of the factors themselves.

For the modified version of the three factor model, Relational Competence and Enhancement were specified as loading on both Factors 1 and 3. The Wald test on the initial run had also suggested that all except one correlation between factors could be dropped: Factor 1 and 3 correlated .35 (and this was expected to go up with crossloadings), but Factor 2 (Intelligence) correlated only in the .1s with the other factors. Thus, in the modified model, only Factors 1 and 3 were allowed to correlate.

Results indicated a somewhat improved fit ($X^2 = 114.203$, $df = 32$, $p < .001$, $CFI = .86$, $RCFI = .86$, $RMSEA = .12$, $SRMR = .08$). Item loadings ranged from .47 to .9, suggesting that the crossloadings were justified, and factors 1 and 3 were correlated .45. However, in an effort to meet conventional levels for fit criteria, I modified the model once more. The LaGrange Multiplier Test suggested permitting Extraversion to crossload on Factor 1 in addition to Factor 3. Though this would mean that several traits encompassed by Factor 3 were also encompassed

by Factor 1, differences in loadings, as well as the presence of other constructs on Factors 1 and 3 still sufficiently differentiated them.

At the same time, the meaning and fundamental nature of the Emotional/Relational Maturity and Sociability factors did not appear threatened by this modification. Consider that Extraversion assesses both positive affect and a socially outgoing disposition; these socially outgoing qualities fit with the relational skills and the agreeable disposition tapped by the Sociability factor. And the Emotional/Relational Maturity factor was still considerably broader because it involved not only relational competence and social affability (e.g., the constructs on the Sociability factor), but also emotional stability (negative loading of Neuroticism; positive affect items on Extraversion were probably relevant here as well), Emotional Intelligence, and diligence, organization, and responsibility (i.e., Conscientiousness). Thus, the Emotional/Relational Maturity factor was distinguished by EI, Conscientiousness, and Neuroticism (in addition to the Relational Competence and Extraversion crossloadings), while the Sociability factor was distinguished by Agreeableness (in addition to the Relational Competence and Extraversion crossloadings). This modified three-factor model was then tested.

Results indicated a fit just short of conventionally acceptable ($X^2 = 100.437$, $df = 31$, $p < .001$, $CFI = .88$, $RCFI = .89$, $RMSEA = .11$, $SRMR = .08$). Extraversion loaded only .32 on the Sociability, but all other loadings were in the upper .4s to .9s, and Factors 1 and 3 correlated .57. Ultimately, this proved to be the best fit that could be obtained, although other modifications and alternative models were tried⁶.

⁶ For instance, adding a higher order factor to account for the Factor 1 and 3 correlation resulted in a run in which EQS could not converge after 100 iterations, suggesting severe misspecification. An alternative two factor model—essentially, one factor for personality, one for ability--was tested in which Emotional Intelligence, Relational Competence Initiation and Enhancement, Neuroticism, Extraversion, Agreeableness, and Conscientiousness (formerly distributed across factors 1 and 3 in the model above) all loaded on a single factor, with a second Intelligence factor (Openness, crystallized and fluid abilities). This fit the data poorly, ($X^2 = 241.312$, $df = 34$, $p < .001$, $CFI = .64$, $RCFI = .65$, $RMSEA = .19$, $SRMR = .10$). Finally, the four factor model suggested by the original

This three factor model was then fit to the mid life adult data via multiple groups CFA, again using a nested approach with increasingly stringent constraints. An initial test for the equality of covariances matrices revealed that the two samples had quite similar covariances structures ($X^2 = 85.79$, $df = 55$, $p < .005$, $CFI = .97$, $RMSEA = .04$, $SRMR = .06$). For the initial run, factor covariances and factor loadings were constrained, but error terms were not. Results indicated that the model fit both samples well ($X^2 = 174.584$, $df = 76$, $p < .001$, $CFI = .92$, $RMSEA = .06$, $SRMR = .08$). Given this, the multiple groups CFA was rerun with error terms also constrained. Results still indicated good fit across groups ($X^2 = 187.960$, $df = 86$, $p < .001$, $CFI = .91$, $RMSEA = .06$, $SRMR = .09$; $X^2\Delta = 13.37$; $df\Delta = 10$; $p > .05$). It is extremely rare for model like this that fit poorly in a single sample to fit better across samples. One possibility is that the model might have fit the mid-life adults extremely well, the young adult much less well, and when tested simultaneously on the two covariance matrices, an “averaging” effect occurred. The model, with its loadings (for each sample) is depicted in Figure 5.

In order to test an alternative model across groups, a factor structure was derived via exploratory factor analysis in the mid life sample. The resulting solution (Table 16), perhaps not surprisingly, was similar in many ways to the three factor model that fit both samples. The first factor (Eigenvalue = 3.62; 36.2% of the variance) was defined by Emotional Intelligence, Relational Competence Enhancement, Extraversion, Conscientiousness, a negative loading for Neuroticism, and a secondary but loading for Relational Competence Initiation. The factor was titled “Mid Life Emotional/Relational Maturity,” to distinguish it from the similar factor extracted from the young adult sample. The second factor (Eigenvalue = 1.61; 16.1% of the variance) was defined by Openness and fluid and crystallized abilities, and named “Mid Life

exploratory factor analysis in which Openness loaded on a single fourth factor (table 15) also did not fit well ($X^2 = 238.471$, $df = 30$, $p < .001$, $CFI = .70$, $RCFI = .70$, $RMSEA = .18$, $SRMR = .10$).

Intelligence.” The final factor (Eigenvalue = 1.15; 11.5% of the variance) was defined by Relational Competence Initiation, Agreeableness, and a secondary loading of Emotional Intelligence, and was named “Mid Life Sociability.”

A confirmatory factor analysis was then conducted with this model in the mid life sample. Because the previous model could only be fit by allowing crossloadings, and because of salient crossloadings in the exploratory factor analysis factor structure matrix, both Emotional Intelligence and Relational Competence Initiation were specified to load across factors 1 and 3. Based on observed factor correlations in the EFA oblique solution, only factors 1 and 3 were allowed to correlate. The resulting model was quite similar to the original three factor model, permitting a cross loading for Relational Competence Initiation. It differed by allowing an additional crossloading only for Emotional Intelligence, rather than for Relational Competence Enhancement and Extraversion, as the three factor model depicted in Figure 4 did.

Results indicated that this alternative three factor model fit the mid life sample quite well ($X^2 = 67.851$, $df = 32$, $p < .001$, $CFI = .94$, $RCFI = .94$, $RMSEA = .08$, $SRMR = .07$). It was then tested across samples, initially with only factor loadings and covariances constrained. Results indicated it did not quite fit across groups ($X^2 = 235.599$, $df = 77$, $p < .001$, $CFI = .87$, $RMSEA = .08$, $SRMR = .09$). Relaxing constraints on the factor covariance did not help ($X^2 = 233.212$, $df = 76$, $p < .001$, $CFI = .87$, $RMSEA = .08$, $SRMR = .09$; $X^2\Delta = 2.39$; $df\Delta = 1$; $p > .05$), nor did relaxing constraints on the factor loadings ($X^2 = 230.011$, $df = 66$, $p < .001$, $CFI = .87$, $RMSEA = .08$, $SRMR = .09$; $X^2\Delta = 3.2$; $df\Delta = 10$; $p > .05$).

In the end, the fully constrained (i.e., factor loadings, factor covariance, errors equal across both samples) three factor model of personality-ability constructs represented in Figure 5 fit both groups considerably better the unconstrained alternative three factor model described

above. Though the models were similar in many ways, the fact that the original model fit better in the face of such a similar competitor is perhaps more of a testament to its validity than if it had fit better than a radically different one.

At a broader level, the fact that the structure underlying personality and ability relationships was synonymous across samples ran contrary to hypothesis five. Based on literature suggesting change in personality in general and hierarchical trait taxonomies in particular across the lifespan, I had hypothesized that the relationships between dimensions of personality and ability would not maintain across samples. On the contrary, in both samples, the same three latent variables—Emotional/Relational Maturity, Intelligence, and Sociability—seem to adequately describe the relationships between the Big Five personality traits, Relational Competence, Emotional Intelligence, and Fluid and Crystallized Abilities.

CHAPTER 4

DISCUSSION

The impetus for conducting this project was Schaie's (2001) call for greater attention to EI at mid life. Schaie chose to confine his comments to EI measured as an ability, but offered several considerations and recommendations that are equally relevant to EI measured at the typical, or trait level. First, Mayer and colleagues' (2001) postulate that EI should vary with experience and with age requires investigation¹. The vast majority of (if not all) EI literature to date has either used college samples or community/corporate samples with a mean age around 30. Another relevant question posed by Schaie (2001) concerns the structure of EI at different points in the life span. Differentiation (and dedifferentiation) "is particularly germane to the understanding of the development of EI if it should turn out to be a set of constructs that are located somewhere between the domains of intelligence and personality" (p. 246). Schaie went on to recommend that "A first approximation of structure changes can and should be conducted with cross-sectional data" (p. 246). Finally, Schaie also raised the issue of EI's relationship to established personality and intellectual domains.

This project addressed these issues questions in hypotheses 1, 3, and 5, respectively, as well as two other research questions relevant in light of life span principles (hypotheses 2 and 4). This chapter will first discuss these results in the context of EI and life span literature. Then, the broader implications of the results will be explored. Finally, limitations of the present study and directions for future research will be outlined.

¹ This contention could be assessed either longitudinally or cross-sectionally. They have also implied *intraindividual* change as a function of age in various other statements. This is a slightly different claim, and would require a longitudinal study to assess.

Support for Research Hypotheses

Hypothesis 1

Data in the present study supported this hypothesis. Whether EI was operationalized by the total score of Schutte and colleagues' (1998) 33 item scale or whether it was measured in a more rigorous manner by the index of items common to both samples, mid-life adults scores significantly higher. Cohen's d indicated a mild effect size (e.g., .24) for the overall scale score difference, and this shrank slightly for the common-item index ($d = .17$). Nonetheless, a statistically significant difference remained, and these effect sizes, while not profound, are neither trivial. The non-significant correlations between age and EI in each sample were both a very indirect test of H1 and an artifact of range restriction in both variables. On the whole, results strongly support the notion that adults at mid-life (mean age of 50) are more emotionally intelligent than young adults (mean age of 20).

This difference must be construed carefully, however. At the most general level, differences across the life span are a function of what Baltes (e.g., 1987) has characterized as ontogenetic, or age-graded factors (e.g., physical maturation), and "evolutionary" factors (e.g., cohort effects, historical context, time-specific cultural factors). With a cross sectional study, it is impossible to disentangle cohort effects from age-related change. Therefore, the present results are best seen as a function of cohort factors. While they do not preclude age related change in EI, neither are they exclusively consistent with this perspective. There are numerous theoretical frameworks that may be brought to bear in explaining the age difference in EI, however.

First, one may consider things from an evolutionary standpoint. A mid-life sample is, by definition, more ontogenetically evolved than a young adult sample. Higher EI in a mid life sample is not surprising in this light, given that EI is an *adaptive* competency (Ciarrochi et al.,

2001; Goleman, 1995; Matthews et al., 2003; Mathew et al., 2002 Mayer & Salovey, 1997; Mayer, 2001; Mayer, Salovey, & Caruso, 1999). EI may therefore be higher in the mid life sample as a result of adaptation to various normative and non-normative life events, both of which have occurred with greater frequency by mid life (Danish, Baltes, & Danish, 1980).

Normative life events such as marriage, securing and advancing through a career, and parenting all pose a variety of emotional challenges (Danish, Smyer, & Nowak, 1980). Non-normative life events often manifest as crises, including things such as unexpected illness or injury, financial reversals, and unemployment (Reese & Smyer, 1983). Such changes are often accompanied by intense emotion (Viney, 1992) and are integral to ongoing growth (Reigel, 1976). Those who cannot develop sufficient emotion-related coping skills in response to life demands typically suffer a variety of negative outcomes (Masten & Coatsworth, 1998). Therefore, both normative and non-normative life events may act somewhat like evolutionary selection pressures that necessitate adaptive increases in EI for most of the population⁷. Indeed, since its early articulations (Darwin, 1877/1998), evolutionary theory has provided one of the most cogent and fruitful frameworks for understanding the adaptive role of emotions.

A second body of literature also rooted in notions of adaptation is that of practical intelligence at mid life (Sternberg, 1986; Sternberg et al., 2001). Practical intelligence, which is often contingent on breadth of experience, tends to peak at mid life when environmental exposure has been quite varied (Denny & Pearce, 1989). Due to this, and on the basis of the domain shared by EI and practical intelligence--interpersonal skills--I had predicted that EI

⁷ The present mid life sample was all college educated and most had children in college, so they may be taken in some broad sense as a “well adapted” sample. A sample of mid life adults from prison or drug rehabilitation—casualties of social selection pressures, so to speak—would be expected to have lower EI, and indeed prisoners score lower on the EI scale used in the present study than a community sample or psychotherapists (Schutte et al., 1998). This is not to advocate a Social Darwinist perspective on EI, which may have grave consequences (see below).

would be higher in mid-life adults².

Higher mid life practical intelligence and EI may be specific response to declines in fluid (e.g., Horn, 1967) and/or other abilities (Sternberg et al., 2001), consistent with gain-loss relationships characterizing life span development (Baltes, 1987). Such a dynamic is best encapsulated by Baltes's (1997) Selective Optimization with Compensation (SOC) paradigm. As certain abilities, such as processing speed or working memory decline, others, such as emotion regulation and interpersonal skill, may be enhanced through selective practice. This compensatory response permits continued functioning, adaptation, and growth in the face of situational demands. For instance, if a corporate professional notices declines in certain qualities that had previously served him or her well—quick parallel processing, youthful appearance, or physical stamina—successful adaptation may involve heightened emotional utilization to direct attention and motivation on tasks, increased emotional adroitness in managing supervisees, and greater emotional regulation to cope with the stresses of higher responsibility.

A third explanation for the superiority of EI at mid life lays in the literatures on post-formal reasoning. Mid life adults tend to be more attuned to the interpersonal and emotional dimensions of life problems (Schmidt, 1989) and to solve problems with less rational, more emotive processes (LaBouvie-Vief, 1992) relative to younger adults. Mid life adults also report more interpersonal and emotional goals in confronting the same problems than younger adults, who tend to be more interested in objective or instrumental outcomes (Straugh et al., 1996).

Perhaps the tendency of mid life adults to turn more to affective intra- and interpersonal

² It should be noted here that EI scores did not correlate with a truncated measure of practical intelligence, the sum of two practical intelligence subtests from the Sternberg Triarchic Abilities Test (STAT). But this is because only practical math and map reading subtests were used. Clearly, these skills share little variance with a trait EI scale, and a more complete measure of practical intelligence tapping other interpersonal domains would probably show mild to moderate associations with EI.

dimensions of information processing promotes (or is a function of) higher EI. The young adult sample, on the other hand, is probably characterized more by formal than post-formal reasoning, and their according de-emphasis on socio-emotional considerations in problem solving may manifest in lower EI.

A fourth potential reason mid life adults scored higher on EI than young adults may be EI's relationship to broad personality factors. In both samples, EI was moderately correlated with Neuroticism and Agreeableness, and Neuroticism tends to decrease with age as a result of improved emotion regulation skills, while Agreeableness tends to increase with age due to the maturation of needs for interpersonal cohesion (Costa & McCrae, 1994a; Markus & Lachman, 1997). These cohort differences in Neuroticism and Agreeableness were born out in the present data (see Table 6). Because EI encapsulates both elements of Neuroticism and Agreeableness (Schutte et al., 1998; Matthews et al., 2002; Petrides & Furnham, 2001; Saklofske et al., 2003), the same changes in emotion regulation and social cohesiveness driving changes in these personality factors may also manifest in higher EI at mid life. The exact structure of causal relationships here is ambiguous at best, and as noted in Chapter 1, there is considerable contention over whether EI “underlies” these personality factors, is “caused” by them, or whether both are functions of some third variable like temperament.

A fifth and final explanation for cohort differences in EI lies in the socio-cultural experiences of the cohorts themselves. Cohorts are best defined by their distinctive experience (Rosow, 1978), and cohort effects may be a function of historical events or contexts (Schaie, 1984). In particular, the quality of the education system, availability of quality and health care, technological advances, and salient domestic and international events (i.e., economic depression, war) tend to shape the experiences of cohorts. A brief reflection on these factors (i.e., defining

events) may shed some light on cohort differences in EI in the present data.

The mid life cohort was born in 1954 (on average), and came of age during the cold war. Television during their early adolescence was dominated by American Bandstand, the Carol Burnett Show, and early MASH. Certainly they recall the assassination of John (1963) and Robert Kennedy (1969) and the moon landing. During this period, Timothy Leary also issued his famous injunction to “Tune in, turn on, and drop out,” and their late high school and early college years arguably represented the apex of the Vietnam conflict. Most had probably found first jobs by the time Nixon took office, and they were certainly ensconced in the world of work by the time he was impeached. When the Reaganomics-induced recession of the early 80s began to lift, most of the mid life cohort had born their own children (who correspond to the young adult cohort).

The complex socio-cultural tapestry of the mid life cohort certainly represents a period of “event density” (Rosow, 1978) that may have a variety of implications for EI. The messages of peace and love propounded by radicals in the 1960s may have promoted a more tolerant view of emotional experience in general; this zeitgeist was felt in psychology with the emergence of Esalen and other encounter groups. But a stark contrast existed between such permissive, person-centered currents and the intolerance toward desegregation, conscientious war objection, socialism, homosexuality, and various other groups and ideologies identified as threats to democracy. The result of such polarization was a climate of massive cultural dissonance around emotionally charged issues, and for these reasons alone, the mid life cohort may have been forced to hone their EI skills to understand, assimilate, and navigate the tumultuous 60s, 70s, and 80s.

The young adult cohort was born (on average) in 1984. Rather than the repressive police

state represented in Orwell's eponymous novel, this was a time of growing individual entitlement. Their early years also represented a period of increasing economic stratification between the wealthiest and poorest Americans, of whom many were urban minorities. With the 1989 release of Public Enemy's album *Fear of a Black Planet*, rap emerged as a hip, rebellious form of music giving voice to anger over race-based wealth disparities. It was also appropriated by a generation of white suburban youth as an expression of middle class anomie. The young adult cohort also probably logged onto the World Wide Web for the first time when they were 10 or 12. Although the availability of information may have been advantageous to them in some ways, such technology also decreased the need for interpersonal interaction and produced engrossing video games. The increasing prosperity of the tech boom also came at the expense of 50 to 60 hour work weeks on the part of this cohorts' parents. *Columbine* was in many ways emblematic of the increasing alienation fostered by this congeries of influences.

This contextual ethos may cast light on the lower EI of the young adults. Although one might expect that increasingly free expressions of violence in both society and the media would stimulate compensatory EI development, such an adaptive response could not occur in an interpersonal vacuum. The depersonalization of communication and relationships associated with technological advances therefore may have had deleterious effects on EI. Socialization deficits in this cohort may also be a product of family bonds attenuated by parental work demands.

These possibilities constitute only a small set of potential explanatory variables. But in explaining the small but significant difference between cohorts on EI scores, one cannot help but consider such broad-based, contextual influences. In the end, it would be an impossible task, and probably an irrelevant one, to attempt to isolate specific causal variables. Cultural influences upon a cohort are by definition amalgamated. Brofenbrenner (1976) has noted that striving to

isolate single putatively causal variables through experimental approaches ultimately renders ecologically invalid conclusions about life span development.

Hypothesis 2

The second hypothesis had conjectured that a broadening array of work environments, relationships, family experiences, and other life events would promote wider variation in EI in a mid life sample. By contrast, the young adults, who were more limited in life experience and confined to a similar and somewhat common developmental trajectory by the educational system (e.g., Schaie, 2001), were expected to show less variation in EI. The data did not support this hypothesis, as the variance of the EI scores in the mid-life distribution was no greater or less than that in the young adults.

This hypothesis was based on the so called “fan effect” (Neugarten, 1979) observed in environmentally malleable traits over time. The stability of traits within individuals impacts the degree to which individuals will differ on such traits over the life-span (Riegel, 1976), and such increasing heterogeneity tends to be a function of age (Baltes & Willis, 1978). Stated another way, characteristics that are relatively invariant *within* individuals--such as height or eye color--will show roughly the same degree of variation *between* individuals at different points in adult development. On the other hand, traits that are strongly shaped by environmental influences and hence change within individuals throughout their developmental trajectories will show considerably more variability between individuals with age (Nelson & Dannefer, 1992). With respect to emotional experience, Magai & Halpern (2001) report some evidence for increasing inter-individual differences in emotion systems with age.

This trend was not reflected in the present sample. Equal EI variances between the samples may be a function of several things. First, the measurement properties of the SSRI might

truncate potential variance because items are rated on only a five point Likert scale. In another study Petrides & Furnham (2000b) administered the SSRI with a seven point scale to facilitate greater variance for their factor analysis. If a seven point scale would have been used in the present study, it would have extended the range of SSRI scores, possibly revealing any differences in variance between the samples. This was not feasible though, as Chapman (2002) had already collected data from the young adult sample with a five point Likert scale; administering the scale to the mid life sample with a seven point scale anyway would have produced greater variance the mid life adults simply as an artifact of measurement.

The lack of support for H2 may be explained by another measurement consideration. Cronbach (1976) made a distinction between measures of typical (i.e., trait) and maximal (i.e., ability) performance. It is certainly possible that EI measured as an ability might show greater variance in a mid life sample: Some mid life adults have doubtless experienced life courses where the maximal performance of EI skills has been critical, whereas others have found environmental niches that permit emotional abilities to languish and wither. A maximal performance measure used longitudinally within a cohort might more accurately assess Neugarten's (1979) fan effect. By contrast, it is possible that both over time within a cohort, as well as across cohorts, people will self-report roughly the same distribution of EI scores.

A third possibility why H2 was not supported is that the mid life and young adults samples are not representative of the underlying population distributions of EI, in which greater mid-life variance may be evident. A sample of college students (e.g., those intelligent and resourceful enough to make it into the higher education system) is more homogenous than the entire population of young adults. A sample of mid life adults with some college education and almost all of whom had children in college (suggesting more affluence and congenial attitudes

toward higher education) is also more restricted than the broader population. The result may be that increasing interindividual differences expected in underlying population distributions of EI were obscured in the present study by sample selectivity.

A fourth consideration revisits the caveats of cross sectional data. Increasing interindividual differences within a construct over time may be masked by comparing two different cohorts at a single point in time. The variability in EI scores in the mid life adults might be significantly greater than it would have been if they had been assessed 30 years ago. Likewise, the young adult sample, retested in 2034, might well showed greater between-person differences than they currently do. The best test of H2 would clearly involve assessing two cohorts at regular intervals from age 20 to 50 (e.g., a cohort sequential design; see below).

A final possibility is that H2 was unsupported because it is simply untrue—perhaps there is not greater between-individual differences in EI at mid life than in young adulthood. Interindividual differences increase with age only when characteristics are environmentally malleable (Nelson & Dannefer, 1992). Recent EI scholarship has made a convincing case for the potentially large contribution of temperament (cf. Rothbart & Bates, 1998) to EI, based on substantial heritability coefficients for things like emotional intensity and regulation (Matthews et al., 2002; Zeidner, Matthews, Roberts, and McCann, 2003). The degree of interindividual differences in EI may then parallel that of temperament, which is generally considered invariant (or at least more stable than not).

However, others (Arsenio, 2003; Fox, 2003) objected to postulating a strong link between EI and temperament, arguing that socialization was more important in phenotypic expression of EI. One possibility is that a small degree of plasticity permits age-related increases in the population mean of EI (due to environmental influences), but that EI's heritable biological

underpinnings constrain the population variance (i.e., interindividual differences) to be relatively constant throughout the lifespan. This is consistent with behavioral geneticists' conceptualization of a highly heritable characteristic retaining a relatively constant population variance, but capable of shifting mean or average scores according to environmental influence (Bouchard & McGue, 1990; see also Robinson, 1995)³.

Hypothesis 3

An extensive series of exploratory and confirmatory factor analyses lead to an eventual rejection of the differentiation hypothesis. Initially, exploratory factor analyses of SSRI items provided some evidence of a more differentiated EI structure in the mid life sample. A readily interpretable two factor (Optimism, Empathy) solution emerged in the young adults, compared to a three factor (Optimism/Mood Regulation, Social Skills, Utilization) solution for the mid life adults. Not only were there more factors in the mid life sample, but they seemed to tap broader content domains. Although one might expect the dimensions of a construct to become more specific (rather than broad) with differentiation, an argument could also be made that the greater number of items comprising the mid life factors reflected more complete or developed versions of the EI dimensions than those in young adults. For instance, the first factor in each sample was characterized by items assessing optimism, but in the mid life sample, items assessing mood regulation also loaded saliently. A unique third factor in the mid life sample, Utilization, also suggested another branch of EI not present in young adults. In addition, the item-level exploratory factors were more highly correlated in the mid life sample, possibly indicative of a General EI factor not evident in the young adults. Hierarchical integration sometimes

³ This was actually one successful point of attack on Arthur Jensen's infamous (1969) article, to which Hernstein & Murray's (1994) intellectual roots trace. Jensen had mistakenly assumed that high heritability coefficients implied an invariant population *mean*, suggesting that the average intelligence of a given group could not be improved through environmental interventions. In reality, high heritability indicates only a relatively constant population variance.

accompanies differentiation in personality and ability development.

The fact that these factor models could not be fit during initial CFA runs has little bearing on a discussion of differentiation because they fit *equally poorly in each sample*, and none of several other item-level models fit. It seems instead that the uniformity of poor item-level fits was a function of methodological issues, including a high number of items in the scale and the researcher's refusal to correlate elements of the residual matrix simply to improve fit. Other issues with item level modeling were discussed in Chapter 3 and for the sake of brevity will not be revisited here.

The next phase of testing this hypothesis involved examining various empirically and a-priori derived models in the samples. In the young adult sample, three models essentially fit equally well: a hierarchical three factor structure derived through EFA of item parcels (Optimism/Self Regulation, Appraisal/Compassion, and Utilization, subsumed by a General EI factor), a four factor a priori model (Optimism/Mood Regulation, Appraisal, Social Skills, Utilization), and a hierarchical four factor a priori model (same factors subsumed by a General EI factor). But none of these models quite achieved conventional fit standards in the multisample analysis. The mid-life sample was best characterized by a slightly different hierarchical four factor model based on a preliminary EFA. In turn, this structure did not adequately fit the young adults in multi-sample analysis. However, in multiple groups testing, no constraints on either first or second order factor loadings were significant in either sample, indicating that despite sub-par overall fit, factor loadings on the structures tested were not significantly different between the young adults and mid life adults.

Given the absence of major structural differences in the models characterizing each sample, and the absence of variance on factor loadings within each model across samples,

sample differences were evaluated with respect to the few parcels which loaded on one factor in one of the young adult models, and on a different factor in the mid-life model. It should be noted that these differences were slight, however, and might reflect measurement error or arbitrary specification as easily as meaningful sample differences.

The samples were actually quite similar with respect to parcel loadings on Optimism/Mood Regulation and Appraisal factors. Utilization factors were also identical. There were essentially three points to note in parcel loadings differences between the hierarchical four factor models characterizing the young adults (Figure 3) and mid life adults (Figure 4). First, most of the parcels comprising the Social Skills factor in the young adult model appeared on the Appraisal factor in the mid life adults. Second, one parcel that had appeared on the Appraisal factor in the young adults (Self Appraisal) was specified on the Optimism/Mood Regulation factor in the mid life adults. Finally, the most substantive difference was the shift of two parcels—Helping Others’ Moods and Positive Mood Use. In the young adult sample, Helping Others’ Moods had been specified on the Social Skills factor, and Positive Mood Use had been specified on the Optimism/Mood Regulation factor. In the mid life adults, however, these two parcels loaded on a unique Mood Instrumentality factor. Conceptually, this factor was essentially another branch of emotional utilization representing a linkage between emotion and goal directed behavior in *both* others and oneself.

This difference may indicate that the manifest domains of EI (i.e., the construct’s structure) are different at mid life in two minor but meaningful ways. First, rather than appearing as a distinct domain at mid life, social skills (e.g., assessing other’s emotions, empathy, presenting oneself well, helping others feel better) tend to be interwoven with one’s own mood regulation and with a general awareness of emotions in oneself and others. This suggests a

greater integration between social considerations and emotionality, vaguely consistent with Carstensen's (1992; 1995) work on socio-emotional selectivity (see also below). Second, the ability to *use* emotions productively may be represented by two distinct branches at mid-life—one concerned with a strictly *intrapersonal* appreciation and use of emotions (Utilization), and one that involves connecting emotion to productive action both within oneself *and with others* (Mood Instrumentality). While this may seem like evidence of a differentiation specifically within the EI branch of emotion utilization, these factors were relatively small in the preliminary EFA (e.g., Mood Instrumentality accounted for 6.8% of the common variance in EFA), and were represented by only two parcels each in the CFA model (indicating that the lion's share of variance in indicators of EI is accounted for by the other two latent variables). At a broader level, the sample covariance matrices were also very similar (e.g., $CFI = .95$), and though no model could be fit to both samples simultaneously, the results provide no real evidence of differentiation in the construct as a whole.

H3 was based on the notion that potential neurophysiological structures underlying EI (see Goleman, 1995; Matthews et al., 2002; 2003; also relevant, D'Amasio, 1994) might produce a differentiation similar to that observed in intellectual development (e.g., Baltes, 1997; Schaie, 1962; 1994; 1996; 2001; Werner, 1948). Schaie (2001) also speculated that because EI would seem to involve both fluid (e.g., speed of emotion processing, pattern recognition and inductive reasoning based on abstruse emotional stimuli) and crystallized (emotion knowledge, verbal facility in interaction) skills, and therefore should show maximal differentiation at mid life like other intellectual abilities. Literature on the increasing complexity of cognitive-emotive interactions (cf., Izard & Ackerman 1998; Magai & Halpern, 2001) and on the increasing detail, refinement, and richness of emotional experience (Carstensen et al., 2000; LaBouvie-Vief,

1996), regulation (Diehl et al., 1996; Izard & Ackerman, 1998), and expression (Malatesta-Magai, et al., 1992) at mid life also provided a basis for hypothesizing that EI would be characterized by more components and/or more specified components in this age group.

Though they were not born out in the present data, these trends might not be evident in cross sectional data. It is impossible to know the factor structure of EI in the midlife sample 30 years ago—it could have been a single, undifferentiated global EI. The same argument applies to the young adults: In 30 years, the sample may yield an eight factor solution. An alternative possibility is that EI reaches full differentiation by adolescence and remains relatively structurally stable until it dedifferentiates at some point after mid life (if it dedifferentiates at all). Zeidner and colleagues (2003) have discussed a possible differentiation process throughout childhood, on the basis of general literature on child emotional development. The samples used in the present study obviously could not reflect such a process.

Another possibility is that EI tends to manifest as four rather similar factors throughout the life span, and mid life differences in emotional experience and emotion-cognition interaction may not result in structural variance. If the small shift in parcel loadings between one factor and another in the two hierarchical four factor models (i.e., resulting in essentially two mid life utilization factors) is not a function of measurement error, one might consider it consistent with greater mid life sophistication in cognition-emotion interaction. Emotion utilization has been characterized as the prime interface between cognition and emotion (e.g., Mayer, 2001; Mayer & Salovey, 1997; Salovey & Mayer, 1990). Thus, it is possible that the increases in emotional sophistication and complexity described by life span researchers (e.g., Carstensen et al., 2000; LaBouvie-Vief, 1996) may simply be reflected in small shifts in parcel loading from one factor to another or in slight increases in average EI scores (i.e., the results of H1).

Another possibility is that EI measured through a maximal performance paradigm—essentially, emotion knowledge and processing—might show some degree of differentiation over the life span, just as crystallized and fluid skills do. Performance testing, for all the conceptual and methodological (and perhaps ethical) difficulties it poses, may tap an intellectual strain of EI qualitatively distinct from typical or trait-level EI.

In studies where performance measures have been factor analyzed, Mayer and colleagues (1999) report a four factor structure (Appraisal, Regulation, Understanding, Utilization) for the MEIS and MS-CEIT (Mayer et al., 2001) performance EI tests in mixed samples with mean ages near 30, although three factor models also seem to fit at least the MEIS in a similar sample (Roberts et al., 2001). However, no one has examined the factor structures in different age samples or in the same sample over time. If ability EI—with elements of both fluid processing and crystallized knowledge—is tied to neurophysiology, a differentiation-dedifferentiation pattern similar to that observed in Thurstone's Primary Mental Abilities (e.g., Schaie, 1996) may be evident.

A final issue worth considering deals primarily with the use of factor analysis itself. Exploratory and confirmatory factor analysis are powerful methods for examining the structure of individual difference constructs throughout the lifespan. However, confirmatory factor analysis can be used to construct multiple models that all fit the data adequately according to conventional standards, resulting in an “exploratory” flavor (Bryant & Yarnold, 1995). Given that an infinite (or extremely large finite) number of possible models exist for the present data, it is possible that some would reflect differentiation. However, the present study tested a specific subset of these models, based on the best available empirical and a priori indications. Given this, one cannot utterly dismiss the possibility that EI differentiation occurs, but it is not readily

apparent in the present data using the most sensible and justified factor models.

H4: In a Mid Life Sample, EI Scores Will Be More Highly Correlated With the Enhancement Dimension of Interpersonal Ability and More Highly (Negatively) Correlated with Loneliness; In a Young Adult sample, EI Will be more Highly Correlated With a Dimension of Relational Competence Reflecting Proactive Skills Aimed at Establishing New Relationships Than in a Mid-life sample.

This hypothesis was rejected—there were no significant differences between the samples with respect to any of these correlations. H4 was based on Carstensen’s (1992; 1995) Socioemotional Selectivity Theory, which posits that with age, emotional well-being becomes increasingly dependent on maintaining an optimal social balance. Therefore, people narrow the breadth of their relationships and cultivate a greater depth in existing relationships. In the present data, EI in the mid life sample (compared to young adulthood) was *not* more closely associated with the Enhancement dimension of Relational Competence, which deals with nurturing existing close relationships, or with Loneliness (negative correlation), than in the young adult sample. Likewise, EI in the young adult sample (compared to mid life adults) was not more closely associated with the Initiation branch of Relational Competence, which reflects the sort of general sociability conducive to a broad social network.

These variables reflected a rather indirect assessment of Socioemotional Selectivity Theory. To supplement this, one might also examine mid life adult’s current and retrospective reports of the number of friendship (including family members⁴) and *close* friendships (including family members) depicted in Table 1. One would expect the current number of friendships to be smaller than at age 20, and the number of *close* friendships to either be now slightly higher than

⁴ Carstensen includes family, as well as friends in here assessment of both significant relationships and close relationships. One may have family who constitute part of one’s general social network, but with whom one is not necessarily close. Obviously, other family relationships will be of the “close” variety.

or equal to those at age twenty. The average of 28 friendships reported currently was significantly more than the recollected 23 friendships at age 20 ($t(232) = 3.80, p < .001, r = .69$), and the 9 current *close* friendships was significantly more than the 8 recollected at age 20 ($t(233) = 2.66, p < .01, r = .55$). While this increase in number of significant close relationships is not unexpected, mid life adults appeared to broaden their *general* circle of relationships as well, contrary to the predictions of Socioemotional Selectivity Theory. One also notes in the r 's a degree of stability in retrospective and present reports of relationship quantities.

However, this comparison also constitutes an indirect test of Carstensen's theory, which has been supported by specific and direct assessments of socioemotional selectivity (Carstensen, 1992, 1995). Carstensen's thinking merely served as a relevant conceptual framework from which to make predictions about the nature of relationships between EI and social variables in the mid life sample. The stability of these relationships across samples speaks to the fundamentally interpersonal nature of EI. EI proponents have adamantly insisted that EI is not social intelligence relabeled (Mayer & Salovey, 1993; 1997), and that while some correlations are to be expected, EI is more fundamental than and gives rise to social abilities (Mayer, 2001). Conceptually, EI does appear to be more narrowly defined than social intelligence, but even "pure" ability models deal in part with emotion in the context of social encounters. The few studies that have examined EI's relationship to social dimensions have also found strong correlations (Schutte et al., 2002; Van der Zee et al., 2001).

Hypothesis 5

The hypothesis that the correlations observed between EI and each of the Big 5, Gc, and Gf will also change from a young adult sample to a mid life sample⁸ was rejected. It was essentially an exploration of personality-ability relationships, assessing EI's place among a

⁸ As mentioned in Chapter 3, Relational Competence factors were also modeled with this group of constructs.

constellation of similar constructs. This was of theoretical interest given some scholars' claims that EI lays at the "no man's land" between personality and intelligence (Roberts et al., 2001; Schaie, 2001), or represents a synthesis between cognition and emotion (e.g., Mayer, 2001). This was also an important issue in light of previous empirical findings that trait EI correlates modestly to strongly with personality factors, but mildly to not at all with measures of intellectual ability (Barchard, 2003; Ciarrochi et al., 2001b; Davies et al., 1998; Newsome, Day, & Catono, 2000; Saklofske, 2003; Schutte et al., 1998; Van Der Zee et al., 2001). A closely related corpus of findings indicates that ability EI correlates only mildly with personality traits, mildly to modestly with verbal ability, and mildly to not at all with fluid or performance skills (Caruso et al., 2002; Ciarrochi et al., 2000; Matthews et al., 2001; Mayer et al., 1999; Mayer et al., 2001).

Something about the nature of these relationships is evident in the difficulties encountered in modeling them, and by the necessity of permitting Extraversion and Relational Competence to cross load between the Emotional/Relational Maturity and Sociability factors to obtain satisfactory model fit, and initial convergence failures and linear dependence problems. Though the linear dependence could not be isolated, the final model suggests that there is considerable overlap between EI and, respectively, Neuroticism, Extraversion, Conscientiousness, and Relational Competence. Agreeableness appeared on a different factor, but an examination of bivariate correlations (Tables 2 and 5) reveals modest EI-Agreeableness overlap in both samples. Crystallized and fluid intelligence (and to an extent Openness to Experience) represent a relatively independent domain.

Most interesting, however, was that the three dimensions underlying these variables (Emotional/Relational Maturity, Intelligence, and Sociability; see Figure 5) were structurally and

metrically invariant across samples, leading to a rejection of H5. The expectation that the interrelationships among these variables would shift was based variously on Schaie's (e.g., 1996) Seattle Longitudinal Study findings that more first-order traits were required to define personality with age, on Costa & McCrae's (1994) finding that trait organization sometimes changes with age, on Roberts and DelVecchio's (2000) conclusion that trait consistency may not be fully achieved until age 50-59, and on Magai's (2000) contention that the accumulation of various interpersonal events and histories over the life span leads to changes in the organization of affective experiences underlying personality.

However, the structural and metric invariance of personality-ability dimensions in the present data does not mean that there are *no* meaningful changes in any personality-ability organization across the life span. If personality-ability organization shifts in a way not tapped by the current instruments, this series of analyses could not detect the changes noticed by prior researchers. For example, this study measured only the so-called Big Five broadband traits, which are usually considered second order, not first order traits. If Schaie's (1996) personality shifts occurred at the level of first order traits, one would not necessarily expect the organization of second order traits to be different at mid life. Although Neuroticism decreases slightly and Agreeableness increases slightly with age, the relationships between broadband traits may be fairly consistent across the lifespan.

The present study also did not assess these relationships within a cohort over time. If, across multiple cohorts, at multiple times of measurement, personality organization or personality-ability relationships shifted in a similar way, a true pattern of age-related change

would be evident. Naturally, the scope of the present study was limited by practical constraints⁵.

One final consideration regards factor interpretation. The nature of the Emotional/Relational Maturity, Intelligence, and Sociability factors should be considered in light of the factor naming fallacy and the problem of factor indeterminacy (e.g., Gutman, 1956; Meyer, 1976). The names derived for the personality-ability factors may not accurately describe them because other constructs, unmeasured in the present study, could load on them that might change our perceptions of what these factors tap. This is further complicated by the fact the factors in the current study represent only one of a limitless subset that might characterize the data. Ultimately, Emotional/Relational Maturity, Intelligence, and Sociability are only helpful heuristics with which to characterize the present data.

Implications of Results

Emotionality and Psychotherapy at Different Points in the Lifespan

Conceptions of young adults as less emotionally mature may be somewhat founded. As a group they have been less challenged by both the expected and unexpected trials of life, whereas in older adults, life experience may have bred greater calm and maturity. Clinicians intuitively appreciate the positive role such maturation plays in self-regulation. Emotionally dysregulative personality types, such as the borderline, tend to decrease in symptom severity with age (Linehan, 1993); defense mechanisms become more functional and ego-mature (Vaillant, 1997); and the emotional difficulties represented by Neuroticism decrease (Costa & McCrae, 1994).

Even Jung (e.g., 1965) asserted that a greater sense of emotional calm characterizes the mid-life

⁵ A longitudinal study of any meaningful length would have delayed the author's doctorate interminably. This difficulty was compounded by financial limitations, ultimately placing a longitudinal study beyond the pale of feasibility.

period as personality becomes more individuated (i.e., integrated)⁶.

However, for clinicians who work with clients around the age of the young adult cohort, therapy goals may well involve facilitating EI skills. Emotional recognition and regulation has long been a fundamental component of a number of rationalist cognitive therapies (e.g., Beck, 1976; Ellis, 1963). Post-rationalist cognitive or constructivist schools of therapy (e.g., Greenberg, 2002; Guidano, 1991; Mahoney, 2003) reflect more sophisticated views of emotion, and are less concerned with strict control (because undue emphasis on control suggests that emotions are threatening and to be feared). Such approaches are more oriented toward awareness, understanding, acceptance, and the derivation of meaning. Self-organizational processes that give rise to emotional experience are surely part and parcel to EI, and post-rationalist and constructive approaches therapy strive to facilitate it the adaptive ordering of these processes. It is possible that low-EI clients would develop better emotion regulation skills (or, at a deeper level, begin to organize their experience more adaptively) with no therapy, simply by navigating the crucibles of the lifespan from 20 to 50 (note here that the present data do not preclude such age-related change). But therapy of any sort would most likely augment such a process, and a younger population may have a slightly higher need than a mid-life population for EI-facilitative therapy.

On the other hand, therapy is useful to people across the life span. Clinicians working with mid life clients may see them grappling more with issues of meaning and purpose. Such issues are invested with tremendous importance and even with identity itself, so strong emotions pervade them. From a constructivist standpoint, profound existential issues often involve core ordering processes, which, when examined or destabilized, may result in high emotionality (cf.

⁶ It should be noted, however, that Jung's own later mid life confrontation with his unconscious (cf. Jung, 1965) was anything but unemotional.

Mahoney, 2003). In working with a mid life population, existential, humanistic, and constructivist approaches to psychotherapy (e.g., Bugental, 1987; Mahoney, 1991; 2003; May, 1953; May & Yalom, 1989; Rogers, 1959) may be effective. Such approaches strive to facilitate an awareness, appreciation, and understanding of emotional experience in a variety of ways that dovetail with conceptions of EI.

The form or style of therapy most likely to be effective with different cohorts brings us to a final issue on which the present results may bear. One useful way to conceptualize the level of work in therapy is the constructivist trichotomy of problems, patterns, and processes (Mahoney, 2003). Given their slightly lower EI, therapy with young adults may require more work at the “problem” level, providing more basic assistance with daily issues of living. In the emotional realm, more time may be spent on fundamental processes of self-regulation (e.g., identifying antecedent-behavior-consequent relationships or depressogenic cognitions, then developing cognitive and behavioral coping strategies to help clients sooth or redirect deleterious emotions). Such “problem” level work is epitomized by the crisis-oriented client, whose appraisals and coping styles tend to be ineffective (and correspond to lower levels of EI). A tremendous amount of therapeutic time and energy may be spent with such clients teaching basic self-soothing skills.

By contrast, mid life adults’ higher EI skills may permit them to handle more “problem” level work on their own, leaving therapy sessions for “pattern” and “process” oriented work. Stated another way, because mid life adults have better emotion recognition and regulation skills, are slightly less lonely, and are more proactively socially skilled, they may present with fewer “everyday” problems involving basic emotion regulation and social difficulties. With less time and energy in session required for basic mood management and generic support, attention might be turned more toward exploring and altering underlying patterns which bring about problems, or

in turning inward to one's own process of being in the world—which, in turn, gives rise to patterns of experience and daily problems.

The Training of Psychotherapists

The finding that mid life adults have significantly higher EI as a group has another implication for psychotherapy. *Ceteris paribus*, a middle-aged clinician *may* be a better clinician than a young adult clinician, assuming that EI is important for clinicians⁷. It is difficult to know whether potentially higher EI in older therapists is a function of life experience or professional training; the two are somewhat difficult to disentangle (Mahoney, 1976; 2000; 2003). This does, however, raise the issue of whether EI skills are trainable for therapists, or whether professional psychology programs should just start admitting older adults who on the whole may be slightly more emotionally intelligent.

The professional training literature is equivocal with respect to how effectively certain “intuitive” clinical skills can be trained. Some have found inconclusive evidence for the general notion that therapists improve over the course of professional training and experience (Beutler, Machiatto, & Neufeldt, 1994). More research tends to support the notion that professional training can enhance therapeutic empathic responding (e.g., Anderson, 1992; Hatcher, Nadeua, Walsh, Reynolds, Galea, & Marz, 1994; Wolf, Savickas, Saltzman, & Walker, 1984). However, there is some evidence that more fundamental qualities of warmth and genuineness are not as easily trained (Mitchell, Bozarth, & Krauft, 1977). These are critical correlates of EI, and trainees lacking such foundational qualities will likely perform poorly as therapists, no matter how formidable their arsenal of “techniques.” Bereft of EI, therapists are likely to wield psychotherapeutic techniques with all the sensitivity of a frustrated mechanic battling an

⁷ A slightly different conceptualization would be that the same clinician will be better at mid life than young adulthood. The present data can neither support nor disconfirm this, however, because the study did not assess intraindividual change.

intractable engine block.

Whatever one's beliefs about the trainability of EI-related qualities in therapists, the current findings have some implication for the way that professional training programs view mid life applicants. Given that on the whole mid life applicants may be slightly more emotionally intelligent than typical applicants (who may be as young as 21 or 22), programs that produce practicing psychologists may wish to place a heavier premium on older applicants with life experience. It is probably safe to say (without further foray into the professional training literature) that quantitative indicators such as achievement test scores and GPA are typically lent more credence in admissions decisions than life experience and maturity, which is not easily quantifiable. Perhaps for this reason, there have not yet (to this author's knowledge) been any studies on the predictive validity of life experience (or EI) for important criteria such as clinical competence, successful program completion and licensure, or post-graduate successes (e.g., professional positions, diplomates, publications, etc.).

Leadership Positions

Aside from psychotherapy issues, these results also suggest that mid life adults are better suited to positions involving management and leadership, because such posts inevitably draw on some degree of emotional appraisal, regulation, social skills, and mood utilization. In light of the results of this study, the U.S. constitutional requirement that the president be at least 38 years old seems quite well founded. One would not want the president of any entity to be insensitive, affectively ignorant, impulsive, or prone of wild emotional dysregulation.

The position of academic dean may epitomize the relationship between EI and competent management. Although it seems like one should be able to distinguish between how much a dean is *liked* and whether a dean is *effective*, in practice, these may covary considerably. This is

because colleges run more effectively when faculty are happy and feel treated fairly. For deans, balancing the concerns of the president, provost, and trustees with one's own motives, and with the morale of one's college faculty requires considerable emotional awareness, regulation, sensitivity, and social savoir-faire. Deans who micromanage department affairs, override faculty and committee decisions, and eliminate programs, lines, or individuals on the basis of personal bias or academic prejudice do so to the ultimate detriment of educational quality, scholarly productivity, and faculty morale. Effective deans are able to make difficult decisions while maintaining faculty confidence. Low EI deans may be less tolerated at institutions where strong faculty-governance (i.e., a faculty senate with authority and power) prevails.

A final consideration with respect to management and administration concerns training for younger adults. In positions where individuals are selected for emotionally taxing jobs at a younger age, the use of mentors or preceptors seems warranted.

Early Intervention

Age-related change in the development of EI cannot be inferred from the present data. But if the sociocultural explanations for sample differences are even partially true and the trend evident in this study continues, the next cohort may show another decrement in EI. This raises the question of introducing specific EI early intervention programs. Zeidner and colleagues (2003) have noted that such interventions would be most effective in childhood, speculating that there may be a "critical period" for EI development not unlike that for language development.

Effective early interventions programs consider a variety of dimensions, including the population, systemic level, and type of intervention (Brim & Phillips, 1988; Danish et al., 1980; Ramey & Ramey, 1998). An early intervention EI program would naturally want to target at risk populations—those from families of high conflict, fewer material advantages, or other correlates

of low EI (these are mostly unknown at the present). One might intervene at the primary preventive level of school and after school programs, for instance, or identify children through schools for outreach workshops aimed at family units. Obviously, remedial interventions such as individual and family therapy will continue to be important, but may stand the greatest chance of success with younger clients and/or clients who have experienced some previous form of primary prevention.

The content of interventions should be dictated by developmental research on emotion in children, until specific childhood EI research begins to accumulate. EI skills workshops and psychoeducational programs should not, for instance, address emotion utilization in a young childhood population because utilization is the last branch to emerge in theory (Mayer & Salovey, 1997). Rather, very young children may benefit most from skills involving emotion perception and labeling, the most basic element of emotional development (Izard, 2000; 2001; Zeidner et al., 2003), while older groups may benefit more from psychoeducational approaches stressing emotional knowledge, then later emotional regulation and eventually utilization strategies.

Ramifications of Interindividual EI Differences

The similarity of variances between samples in the present study raises broader issues of how EI is distributed in different groups within the general population. Even if this distribution is invariant and tends to be negative skewed (as in the present data; i.e., more people reporting high EI), it is axiomatic that there will always be low EI individuals in any sample. If the demographics of the low end of the curve are significantly different with respect to SES, one is confronted with a difficult dilemma. Are such differences a true reflection of group differences in a universally expressed characteristic? Or does the meaning of “emotionally intelligent”

behavior differ across cultures?

This raises special problems for the performance testing paradigm. The “correct” answers of the Mayer-Salovey tests have already been attacked on grounds of cultural bias by Roberts and colleagues (2001; Zeidner et al., 2001). These same authors have raised the concern that SES and ethnic differences already evident in normative samples may be used to fuel Social-Darwinist discrimination against “low EI” individuals, who may be disproportionately represented by disadvantaged and marginalized groups. One would hope psychology has moved beyond such agendas after Herrnstein and Murray (1994) have been so cogently rebuked (Gould, 1996). But it seems that data on the population subgroup distributions of important individual difference variables are at constant risk for abuse. This places an important responsibility on research psychologists, because the way in which society handles such data is in part a function of how it is presented.

Measurement of EI

Two final implications of these results pertain to the measurement of EI. First, as noted throughout, the prevailing paradigms are performance testing and self-report assessment. The advantages and disadvantages of each have been discussed in Chapter 1 and Appendix A and will not be revisited here. The essential point to note here is that EI, or some construct with a pattern of correlations consistent with EI theory, appears measurable by the Schutte Self Report Inventory, in both young and mid life adults. Like with the NEO and other scales, people tended to rate themselves favorably on the SSRI, resulting in negatively skewed distributions. However, correlations with the Marlowe-Crown 10 item scale were trivial, indicating that individuals’ positive assessments of themselves may be independent of socially desirable response bias as traditionally measured.

Second, while the skewed distributions of EI in the present distributions could reflect sampling bias, researchers may wish to entertain the notion that they actually depict underlying population distributions. After all, it is possible that in an educated and civilized society, a disproportionate number of the population fall in the upper range of EI. A truly normal population distribution is only a conventional assumption for psychological characteristics. One cannot appeal to established constructs, such as IQ, to support claims that traits and abilities are normally distributed because IQ tests have been standardized to yield roughly normal distributions of scores. In other words, one cannot point to evidence contingent upon a certain assumption as support for the assumption itself.

A third measurement issue concerns the SSRI's convergence and divergence from other constructs. Research has been more concerned with overlap with the NEO personality factors (e.g., Mayer & Brackett, 2003; Schaie, 2001), and the present study yielded problematic correlations (e.g., .5) with Openness in the young adults sample and with Extraversion and Conscientiousness in the older adults. The fact that the degree of this overlap varies across different cohorts may be a function of the slightly different nature or expression of EI in each sample, evident in the small differences between the hierarchical four factor models best characterizing each sample (and in the slightly different EFA solutions). But in both samples, the SSRI also overlapped highly with Relational Competence. As previously discussed, this is probably a testament to the social underpinnings of EI, but it may pose some future problems for researchers using the SSRI (see below).

A final measurement issue is that the SSRI seems to factor well into distinct, theory-consistent domains. With respect to confirmatory factor analyses, parcels make better indicators than individual items. This is an important finding given Mayer and Brackett's (2003) recent

report that the SSRI did not factor into interpretable domains. That may have been a function of their sample characteristics, but it is important to note that Mayer has a vested financial stake in establishing the validity of performance, rather than self-report, EI measures.

Limitations and Future Directions

Limitations

The principal shortcoming of the present study was its cross sectional design, which was a function of practical considerations noted previously. Many of the hypotheses of interest were spurred by speculations about the potential developmental course of EI, which implies age-related change. But inferring age-related or true developmental change from cross sectional data is a perilous venture (Schaie, 1992; Schaie & Baltes, 1975): While in some cases, age related intraindividual change may translate into mean differences between cohorts, it is impossible to reject other explanations related to cohort effects. Therefore at best, these results *are not inconsistent with* a potential process of age-related change in EI, but constitute no real support for such a process. The present study should be considered an important *preliminary* investigation of age differences in EI at one point in time, consistent with Schaie's (2001) initial call for exploratory cross-sectional work.

Another caveat concerns the use of correlation-based research methods. In his 1957 presidential address to the APA, Lee Cronbach described research in psychology as divided between correlational and experimental approaches. Personality and life span research is driven by correlational techniques in order to assess individual differences and their temporal stability. This is a considerably more ecologically valid approach than experimental design, which obscures important individual differences and creates trivial and irrelevant situations in an effort to increase internal validity (Brofenbrenner, 1979; Hultsch & Hickey, 1978).

But despite these advantages of correlation-based approaches, they still preclude causal conclusions. Ultimately, they lend themselves to description, rather than explanation. While the present study tested no causal hypotheses, correlation-based statistics reduced its explanatory power. These results do not explain the causes or results of EI within or between cohorts, but must rather be considered as a depiction of relationships, upon which one might make some limited predictions. Information throughout this last chapter has been adduced to “explain” these relationships, but obviously such interpretations are speculative and based on rational, rather than empirical, analyses.

Finally, the potential Heywood Case noted in one specification of the young adult hierarchical four factor model brings to light one class of difficulty in the factor-analytic techniques used. When prior communality estimates are askance in most forms of factor analysis, such negative variance estimates may result. Another statistical issue is the use of maximum likelihood estimation with data that is not multivariate normal. Although an ML correction for departure from multivariate normality is available in EQS 5.7 for single group models, multi-sample analyses in this statistical package implement standard ML estimation, which may result in biased parameter estimates and fit indices with non-normal data.

Additionally, the use of self-report instruments to assess personality constructs was a limitation in the present study (ability constructs were assessed objectively). People may be accurate or inaccurate, honest or dishonest judges of their own behaviors, thoughts, and attitudes. Although the Marlowe Crown provides some gauge of socially desirable response bias, acquiescent, bipolar, random, or denying response sets may be more difficult to detect. Also, other response bias inventories, such as the Balanced Inventory of Socially Desirable Responding (BIDR; Paulhus, 1991) assess self-deceptive as well as impression management

forms of response bias. For these reasons, Schaie (2001) has cautioned against validating new constructs only against self-report measures, noting instead the need for behavioral criteria.

Future Directions for EI Research

Future research should address the course of EI differentiation throughout childhood. It seems unlikely that EI manifests from birth as four distinct domains, so longitudinal research needs to investigate the course of EI development from infancy through late adolescence.

Without a thorough knowledge of what domains emerge when, interventions aimed at facilitating EI development in childhood may be designed inappropriately. Investigating this issue will also require the development of age-appropriate tests.

Also, in order to examine EI's relationship to other traits across the lifespan, future research might employ a cohort sequential design (Schaie, 1992), in which personality and ability data are gathered at multiple points in time in two or more cohorts. Methodologically, Schaie (2001) has also noted that Dwyer's (1937) factor extension method could be helpful. Essentially, this involves a CFA of a correlation or covariance matrix composed of new and established constructs; factor loadings and variances of established constructs are fixed based on previously established values, while the loadings and variances of new constructs are freely estimated to ascertain the degree to which they map into the factor space of existing constructs.

Another way to investigate the distinctiveness of EI from other constructs could be factor location studies. Here, one uses EFA to see if a construct can be isolated in the factor space of similar constructs (cf. Petrides & Furnham, 2001). For instance, in an effort to distinguish EI from the Big Five, one might administer the full NEO-FFI and the SSRI, then submit the 30 NEO facets and 4 SSRI factors to principal axis factoring to see if the facets and factors map as they should onto dimensions of Neuroticism, Extraversion, Openness, Agreeableness,

Conscientiousness, and EI. Displaced facets in the resulting (assuming oblique rotation) structure matrix (i.e., Neuroticism facets loading on an EI factor) indicate empirical overlap between the broadband constructs. If a distinct EI factor could be isolated in this way in the young adults, one could try to replicate these results in the mid life adults to ascertain the continuity of EI-Big Five distinctiveness⁸.

Researchers have rehashed the fact over and over again that EI measured as a trait correlates moderately with other traits, and performance measure correlate moderately with other intellectual ability measures. In the performance measurement paradigm, this is used as evidence of EI's presence within a "positive manifold" of related intellectual abilities, but on the trait side, correlations with theoretically related traits are interpreted as evidence of a lack of distinctiveness for EI. Curiously, researchers have not paid much attention to the fact that personality constructs in general tend to correlate more with other personality constructs, while ability constructs also correlate higher with other abilities, at least in part as a function of method variance. Only Schaie (2001) seems to have noticed the need for an MTMM study (cf. Campbell & Fiske, 1959).

Multiple measures of EI—self report, performance tests, perhaps even an experimental EI "projective" test could be used to assess EI, with objective and projective personality inventories, and self-report and performance tests of various dimensions of intelligence. In this way, one could disentangle similarities due to shared method variance from true variance between trait EI and personality, and ability EI and intelligence. Similarly, one would gain valuable information on the relationship between trait and ability EI, an area that needs further investigation.

⁸ I considered doing this in the present study with the short form of the NEO by creating two item "facet" parcels to go with either the 4 EI factors or 15 EI parcels; however, neither sample would have been quite large enough to do these exploratory factor analyses, and the subsequent CFA models would have encountered the same problem as item-level modeling of the SSRI—too many indicators.

Another important point concerns the continued refinement of prominent trait EI inventories (the SSRI and Bar-On's (1997) EQi) and ability tests (the MEIS and MS-CEIT) is critical. This can be in part achieved through MTMM studies, EI factor location studies, and incremental validity studies (e.g., Chapman & Hayslip, in press). Trait EI inventories have still not achieved the status of instruments such as the NEO-FFI or 16 PF, and the Mayer-Salovey ability tests (MEIS, MS-CEIT) are far from the psychometric quality of the Kaufman or Wechsler scales.

An important point to note here is the need for continued *independent* investigations of ability tests: the most laudatory results tend to come from studies run by Mayer, Salovey, and their colleagues (e.g., Caruso et al., 2002; Mayer et al., 1999; Mayer & Brackett, 2003). Less complimentary results emerge from investigators without vested financial interests in the tests (e.g., Zeidner et al., 2001). Mayer and his colleagues are aggressively marketing their tests toward the organizational consulting industry, which, in the flurry of popular interest over EI, has implemented them in personnel selection despite questions about the specific tests and EI ability testing in general (see Appendix A for a thorough review). The field desperately needs a meta-analysis on the reliability and predictive validity of the MEIS and MS-CEIT, controlling for "experimenter allegiance effects" in the same way psychotherapy outcome studies do (cf. Wampold, 2001).

Finally, further investigation is needed on the course of EI over the lifespan. In addition to tracking ontogenetic development, cohort effects on EI could also be isolated through a cohort sequential design. Most characteristics are a joint expression of genetic dispositions and environmental influences, but the nature of this interaction and the plasticity of EI require considerably more elaboration than the present results have been able to provide. For instance, EI

change across cohorts cannot be ascertained based on present data. Although it was conjectured that EI might decrease in the next cohort due to various sociocultural trends, one might as easily reason that successive cohorts will exhibit higher EI due to increasing societal emphases on diversity, trends toward androgynous gender roles, and impending early-intervention EI programs.

Likewise, consequents or outcomes of EI within cohorts need to be investigated across the lifespan. For instance, EI may predict certain dimensions of undergraduate college adjustment (Chapman & Hayslip, in press), but not work success in college students. In the absence of what EI dimensions predict what elements of life success, one is left with Goleman's (1995) rather vague global contentions that EI is more important in life success than IQ. Such hyperbole may gain attention from the popular media and sell many books, but it is unhelpful to psychological science. However, scholarly EI research is proceeding at a furious pace. Within the six months after the proposal of this dissertation in April of 2003, over 30 publications on EI appeared. If one criteria of a construct's value is fruitfulness, EI certainly shows promise.

APPENDIX A

A CONCEPTUAL AND PSYCHOMETRIC CRITIQUE OF PERFORMANCE

TESTS OF EMOTIONAL INTELLIGENCE

A Conceptual and Psychometric Critique of Performance Tests of Emotional Intelligence

In this section, the conceptual and psychometric problems of EI “ability” tests will be considered. These issues have been raised in the literature to some degree (Roberts et al., 2001; Zeidner et al., 2001), with respect to the Multiscale Emotional Intelligence Test (MEIS), and have been answered by Mayer and colleagues (2001). Many of their claims refer to the superiority of the MEIS’s supplanting instrument, the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT). But psychometric and validity information on the MSCEIT is rather scant, and based on descriptions published by Mayer and colleagues (2001), this test does not appear to have addressed the criticism leveled at the MEIS. In the following sections of this appendix, it will be argued that the notion of EI “ability” testing rests on conceptual and psychometric quicksand.

Conceptual Critique

The rationale of the “ability” testing paradigm is based on the first of three “standard criteria” Mayer, Caruso, & Salovey (1999) invoke in considering EI as an intelligence:

The first, conceptual criteria, includes that intelligence must reflect mental performance rather than simply preferred ways of behaving, or a person’s self-esteem, or non-intellectual attainments (Carroll, 1993; Mayer & Salovey, 1993; Scarr, 1989); moreover, mental performance should plainly measure the concept in question, i.e., emotion-related abilities. (pp. 269-270)

Though Mayer and colleagues (1999) refer to the MEIS as an “ability test”, it is more appropriately considered a “performance” measure (Ciarrochi et al., 2001). Behavioral tasks and verbalizations are yielded during the testing process, and this performance is assumed to reflect an underlying ability. Three specific objections to this assumption are relevant here. First, performance may not always reflect ability (e.g., Baltes, 1988; Cronbach 1970). Second, performance may reflect acquired behavioral tendencies rather than latent mental abilities

(Zeidner et al., 2001). Third, the status of EI as a cognitive “ability” cannot be accepted *prima-facie*, but is what is under investigation (Roberts et al., 2001). Logically, in constructing tests of EI “intellectual ability”, Mayer and his colleagues have presupposed the very claim such tests are designed to evaluate (i.e., that EI is an intellectual ability). Although this circularity flagrantly contravenes the logic of modern science (cf. Popper, 1959), the present discussion will focus on more specific problems. A brief overview of the MEIS will begin to illuminate some of these.

The MEIS contains four “branches”, the items of which were derived conceptually to correspond to the four branches of the EI model (Mayer & Salovey, 1997). Each branch, in turn, contains subtests. Branch 1, Emotion Identification and Perception, contains four subtests: Faces, Music, Designs, and Stories. For this branch, respondents rate the degree to which a given emotion is present in each stimulus item, using a five-point Likert scale. Branch 2, Assimilation of Emotions, contains two subtests. In the Synesthesia test, subjects imagine a given emotion and then respond on a five-point scale reflecting the semantic differential between such adjective pairs as warm-cold, yellow-purple, and fast-slow. In the Feeling Biases test, participants are asked to take into account their current mood state, then judge how they would feel about a character in the vignette, and rate the character on various trait-adjective scales. On branch 3, Understanding Emotions, the first two tests, Blends and Progressions, involve multiple choice questions about combinations of emotions equaling or leading to a third emotion. The third test, Transitions, asks participants to rate how likely it is that certain emotions will follow one another in a character in a given vignette. The fourth test on this branch, Relativity, asks respondent to judge how likely it is that characters in vignettes will experience various emotions. The fourth and final branch, Managing Emotions, comprises two tests. On the first, Managing Others, participants are presented with vignettes of people requiring help, and asked to evaluate various

courses of action by rating them on a Likert scale from extremely effective to extremely ineffective. In the Managing Self subtest, the vignettes focus on one's self, rather than others. All these responses are then scored for their "correctness". Immediately obvious is presumption that the "correctness" or relative merit of responses can be somehow determined. It is the issue of objectively correct responses to emotional stimuli that test begs careful consideration here.

Objectivity in ability testing depends on the extent to which an answer is demonstrable as a fact. A fact must be true either a priori, by the principles of logic or mathematics (what philosophers since Hume have referred to as an "Analytic Proposition"), or empirically (a "Synthetic" proposition). Empirically, one way in which facts are established is by their reference to phenomena that occur with an extremely high degree of regularity. While fields dealing with observable phenomena may rely on empirical investigation to establish things as facts, this recourse may be less effective for fields dealing with subjective phenomena. The general absence of unswerving "laws" in (non-physiological) psychology is a testament to this.

Consider the following example. If physicists across the world forgot that dropped objects fall at a velocity of 9.82 meters per second squared, this could quickly be ascertained again through experimentation. Results would be observable and invariant. Likewise, on the arithmetic subtest of the WAIS, answers to questions are logically demonstrable and invariantly true. Questions on the information subtest, such as the distance from New York to Paris, are empirically demonstrable and invariantly true. No such invariance could ever exist in the relationship between colors and emotions, for instance. It is difficult to conceive of the form a proof would take for an objectively true answer to the question "What is the correct emotion to associate with the color blue?" Certainly one might say sadness, but this would be the equivalent of a "popular" response on the Rorschach, because it reflects conformity to or knowledge of

sociocultural norms. It might be conceivable to construct a projective test of EI, and indeed the color cards on the Rorschach probably approximate this. But the concept of an “intellectual ability” EI intelligence test, implying as it does factual criteria against which responses are compared, seems logically impossible.

These problems were anticipated three years before the development of the MEIS, by Mayer and Greher (1996) in a study examining the ability to perceive affective content in ambiguous stimuli. Mayer and Greher outlined three potential methods of scoring the “correctness” of a response in such a test: target, expert, and consensus scoring. Target scoring evaluates the degree to which a participant’s response matches the response of the “subject” of an item: for instance, in a photograph of a facial display of emotion, the correct response is deemed to be that which the subject of the photograph reported feeling when the picture was taken. The second method, expert scoring, evaluates the extent to which a respondent’s answer matches the emotion an “expert”, such as the author of the test, deems present in a given stimulus. For instance, an expert may decide that in a vignette where one person’s parking space is stolen by another, the first person is most likely to experience anger, and therefore that is the correct response. Finally, the consensus scoring criterion assumes a response to be correct to the extent that it agrees with the responses of others taking a test. For instance, if 92% of participants identify the feeling “sad” with the stimulus “blue”, then a response of “sad” earns .92 points. These scoring alternatives were subsequently considered in the development of the MEIS (Mayer et al., 1999). Let us turn to each of these methods in more detail to see if they make sense.

The target method itself is more or less defunct (Mayer et al., 1999; Mayer et al., 2001), largely because targets do not exist for all stimulus items on the MEIS (or MSCET). For instance, it is impossible to ask a geometric design what emotion it feels, as would be necessary

for a target scoring criterion on the Design test of the Identifying and Perceiving Emotions branch. Similarly, in the vignettes which appear throughout the MEIS, it would be impossible to identify what the target actually felt during the vignettes because the targets are fictitious. One could conceivably use the emotion that the vignette author intended to convey, but this would constitute a de facto “expert” criterion (see below).

These glaring difficulties seem to have led to the abandonment of target scoring on practical grounds. But beyond that, there is another objection to this method. It is not hard to conceive of a situation in which the target of a vignette or photograph experienced an emotion so aberrant from what most people would expect that a majority of test takers would “miss” the item, if the target criteria were honestly applied. One might counter that only targets with “normal” emotional responses could be used, but selecting such targets would itself involve some sort of subjective evaluation.

The second method, expert scoring, appears at its outset to hold somewhat more promise. In principle, experts could be sampled for the “best” response to various test items, and the opinions rendered could serve as “correct responses”. MEIS progenitors argue that this, after all, is not unlike how 0, 1, and 2 point answers have been decided on Wechsler series subtests such as Information and Comprehension. The obvious flaw in this comparison was pointed out by Roberts and colleagues (2001). With only a few exceptions, most items on the Wechsler scales are rooted in empirically verifiable fact, whereas MEIS questions are clearly not⁹. In cases where experts had to decide whether an answer on the Wechsler scales deserved zero, one, or two

⁹ Excepting, of course, occasional value-laden items such as the WISC-III Comprehension question, “What is the thing to do if a boy (or girl) smaller than you tries to start a fight with you?” Kaufman and Kaufman (2001) discuss the issue of cultural bias on this item in somewhat more detail. But such questions are probably the exception, rather than the rule, on conventional intelligence tests.

points, the issue was not one of whether something approximated an opinion or majority standard, but the degree to which it approximated an already established fact.

However, the question arises whether an expert might not be able to judge a response on the basis of its “adaptiveness”, an argument harkening back to the Darwinian notion of natural selection (Izard, 2001)¹⁰. This seems a promising alternative at the outset, but its limitations have not been acknowledged by Mayer and colleagues. The main problem is that the degree to which an emotion, perception, or behavior is adaptive will then vary highly across different contexts. Roberts and colleagues (2001) illustrate this with the case of a prisoner, who would most likely score quite low on the MEIS according to expert (as well as target and consensus) criteria. But it is precisely because the prisoner would score low that he or she is well adapted to his or her environment of incarceration, which involves harsh and aggressive survival imperatives. Such a shifting standard is clearly different than the realm of objectively tested intellectual ability, where correct response remain correct across contexts

But perhaps the most salient flaw with expert scoring is that expert opinion invariably reflects the norms and standards of the culture in which experts are embedded (Roberts et al., 2001; 2002; Zeidner et al., 2001). Despite their best efforts at “objectivity”, it would be impossible for an expert in the field of emotions to arrive at a “correct” response to the items on the MEIS or MSCEIT that is not in some way influenced by the expert’s personal history. By definition, the task of designating correct answers requires an implicit assertion of the expert’s personal, social and political values. Thus, answers to questions about emotional experience

¹⁰ James’s pragmatism (perhaps most powerfully articulated in *Varieties of Religious Experience*, 1902) is also of note here. Jamesian pragmatism stipulates, by one interpretation, that the truth value of an assertion is dependent upon the efficacy or “usefulness” of its practical consequences (Durrant, 1927), or (similarly) that the truth value of an assertion is contingent on whether it has adaptive value for that individual (Robinson, 1995). Mayer and colleagues have not, however, recognized this intellectual debt to James because they have not acknowledged many of the ramifications of expert scoring noted here.

must be rooted to a large degree in values rather than scientific fact. Charles S. Peirce immortalized the perils of appeal to authority as a method of knowing long ago (cf. Tomas, 1957), and this point hardly requires further elaboration. In fact, it is more or less conceded by Mayer and colleagues (2001) at a theoretical level, though it did not persuade them to abandon expert scoring (see below).

One final point must be mentioned; it is entailed in the foregoing objections but deserves elucidation. Clearly, there are times when experts may be simply mistaken about questions in their field (Zeidner et al., 2001). Experts are not omniscient, and it would be difficult to conceive of an expert or group of experts in any field whose knowledge was comprehensive enough to authoritatively answer every question. Also, experts may disagree about the canon of established “facts” in a given field, particularly in the social sciences.

Evidently cognizant of these issues, Mayer and colleagues (1999; Mayer & Greher, 1996; Mayer et al., 2001) proposed that “consensus” scoring represents a viable alternative. The degree to which a response is considered correct is proportional to the degree it was provided by the normative sample, and it is rated between .00 (0% of the normative sample) and 1.00 (presuming that there would be something on which the normative sample uniformly agreed).

The first presumption here is that of any normative sample, namely that it is stratified to national demographics. This seems problematic for consensus scoring, given that the dominant culture, which represents a majority of the population by definition, would be given disproportionate power in dictating the correctness of a response. Underrepresented or marginalized groups would be punished for responding according to the norms of their subculture. One might address this by developing different norms for different demographic subsamples, but then one’s EI scores would change radically depending upon which norms were

used in scoring. For an African American lesbian, would one use female norms, African American norms, or GLBT norms? The use of local norms, though inherently sensible, is controversial in other areas of psychometrics and might be eschewed by the Mayer team because it could detract from EI's credibility as an "intelligence".

Regardless of the norms used, the central issue is that consensus scoring method may reflect mere conformity to desirable social standards, rather than EI (Matthews et al., 2002; Roberts et al., 2001; Zeidner et al., 2001). Rather than an innate mental ability with maximal limits, conformity to convention constitutes a behavioral adaptation. While conformity to social norms in the perception, processing, and regulation of emotion may be adaptive, it cannot be said to constitute an intelligence. Consider that one important component of EI is the ability to use emotions to facilitate thinking, a branch specifically entailing creativity. Creativity can be defined in a number of ways, but it often entails a divergence from convention. Thus, if EI is calculated according to agreement with convention, creative individuals, who may be emotionally intelligent by this definition, will be penalized by the consensus scoring criteria (Zeidner et al., 2001).¹¹

Finally, consensus opinion, like expert opinion, may be a wildly inaccurate description of any given individual's experience, or may be factually incorrect. Solomon Asch clearly demonstrated that conformity is often demonstrated with factual incorrectness. With respect to emotional intelligence, the overwhelming majority of individuals may believe in the catharsis hypothesis of coping with anger, but this has not been empirically supported; furthermore, it may lead to disastrous consequences for trait-angry individuals (Zeidner et al., 2001). Yet a person who knew through experience giving vent to anger only impaired their mood further would be

¹¹ Researchers in creativity have generally implemented an "expert" criteria in scoring tests of creativity in which departure from convention is usually explicitly rewarded. Of relevance to the present discussion however, creativity researchers have generally acknowledged that their assessment instruments are somewhat subjective.

considered less emotionally intelligent on the MEIS and MS-CEIT than if they provided a response consistent with consensus opinion.

In short, performance tests of EI have scoring criteria that are riddled with illogical and conceptually problematic features, in contrast to the degree of objectivity found on conventional intelligence tests. Let us turn now to some of the psychometric problems that have been noted thus far on the MEIS.

Psychometric Critique

The shortcomings of the expert and consensus scoring methods might perhaps be overlooked if they generally converged. This does not, however, appear to be the case. Mayer and colleagues (1999) chose only to report convergence between these methods for four randomly selected MEIS subtests (one from each branch), and provided no reason for not reporting convergence across all 12 subtests. The correlations they obtained between expert and consensus scores were .70 for the Stories subtest, .64 for the Feeling Bias subtest, .61 for the Relativity subtest, and .80 for the Managing Feelings of Others subtest. Mayer and colleagues (1999) interpreted this thus: “All *rs* were significant ($p < .00001$). This suggests that the two criteria are closely related” (pg. 280).

The high significance level is fairly meaningless in considering whether these correlations reflect a “close relation” between the expert and consensus methods. Such a significance level is clearly a function of their sample size, which was over 730. The nature of expert-consensus scoring agreement is actually to be determined by the *magnitude* of the correlations. Testing the convergence between alternate scoring methods is rare in psychometrics, but may best be conceived of as part interrater reliability, and part alternate forms reliability. In either case, both kappas or alternate form correlations in the .6s are suspect by

conventional psychometric standards (Anastasi & Urbina, 1997; Cronbach, 1970). Even with the best example given, the Managing Others subtest, one method captures only 65% of the variance in scores of the other method. Is the remaining 35% measurement error, method variance (which would effectively be measurement error in this instance), or irrelevant individual difference variance (again, essentially measurement error)?

In the only other study reporting such data, Roberts and colleagues (2001) found a correlation of .48 between expert and consensus scoring for the same pair of subtests. Across MEIS subtests, Roberts and colleagues uncovered considerably lower agreement between the scoring methods. With the exception of Blends and Progression, where the two methods converged .85 and .96, respectively, correlations ranged from .09 (Designs) to .64 (Synesthesia). Overall branch scores correlated .78 (Understanding of Emotions), .66 (Assimilation), .43 (Management), and .02 (Identification). The composite MEIS scores correlated .48. When a second order general EI factor was extracted from both the consensus (capturing 27% of the variance) and expert scores (capturing 20% of the variance), these two general factors correlated .26.

Such data seriously contravene Mayer, Caruso, & Salovey's (1999) contention that the two scoring methods are "closely related". Roberts and colleagues (2001) conclude that the two scoring methods are so disparate, it is difficult to imagine how psychometric refinement could bring them into adequate agreement. Of further interest, Roberts, Matthews, & Zeidner (2001) found that when the expert criteria was used, men scored higher than women and whites higher than minorities. When the consensus criteria was used, women scored higher than whites (despite the fact that Roberts and colleagues' sample was nearly 80% male), and there were no ethnic differences. The relationship of MEIS branch scores to NEO factors and cognitive abilities

(measured by the Armed Services Vocational Aptitude Battery, or ASVAB) also fluctuated somewhat depending on scoring method. In consensus scored data, Emotional Identification branch scores were negatively correlated with ASVAB scores and positively correlated with Agreeableness and Extraversion. However when the data were expert scored, Emotional Identification branch scores were negatively positively related to ASVAB scores and negatively related to Agreeableness and Extraversion.

In addition to the lack of convergence between the two scoring methods, the reliabilities of the MEIS subtests appear generally low. Mayer and colleagues (1999) report the most favorable internal consistencies (for the consensus method), which range from .49 (Blends) to .94 (Transitions), with the four subtests of the emotional identification subtest being uniformly acceptable (.85 for stories to .90 for designs). The alphas of the subtests on the Understanding and Managing branches were more modest (.49 for Blends to .78 for Relativity, excepting the .94 of the Transitions subtest). Internal consistencies were slightly lower when the expert criteria were applied. Ciarchocci, Chan, and Caputi (2000) reported somewhat lower reliabilities for consensus-scored subtests, ranging from .35 (blends) to .88 (designs), and numbers were generally below the limits of psychometric respectability on the subtests of the Understanding and Managing branches (.35 for blends to .66 for relativity). Roberts and colleagues (2001) also reported much lower subtest internal consistencies, ranging from .38 (Blends) to .85 (Designs), again with the lower level subtests of the Emotional Identification branch being within acceptable limits, and the higher order Understanding Emotions branch and Managing Emotions branch rather questionable (.37 for progressions to .68 for managing self and relativity).

The problem with these poor reliabilities is that they produce a large standard error of measurement (SEM). Cronbach (1970) defines the standard error of measurement as the

departure between a person's observed score and their "universe score", or true score. The SEM of a scale score is calculable from its standard deviation and reliability: $SEM = SD \sqrt{1 - r}$. Thus, an unreliable test is likely to produce a very large SEM, meaning that the EI score observed on the MEIS is likely to deviate substantially from a person's "true EI" score. Using the overall reliability they obtained for the MEIS, Roberts and colleagues (2001) illustrate the phenomenon in this way:

Hence, for an r of .48, SEM is $0.72 SD$, and thus the 95% confidence interval for a true score S would be $S \pm 1.41 SD$ (i.e., $1.96 \times SEM$). For an r of .74, the interval is $S \pm 1.00 SD$. For an IQ test ($M = 100$, $SD = 15$) with an r of .48, the score of a person at the mean would be expected to vary between 79 and 121 on different occasions of testing... (p. 224)

So in addition to the conceptual problems of justifying an "objective" scoring method for a performance measure of EI, and to the poor convergence between scoring methods, there are considerable psychometric problems with the MEIS. These reliability problems effectively prohibit a consideration of the test's validity as well, because while it is possible to have a reliable test that is not valid, it is impossible to have a valid test that is not reliable (e.g., Anastasi & Urbina, 1997).

These rather damning critiques of the MEIS prompted claims from Mayer and colleagues (2001) that the successor of the MEIS, the Mayer Salovey Caruso Emotional Intelligence Test (MSCEIT), suffers fewer problems. They report preliminary data that the convergence between consensus and expert scoring on the MS-CEIT is .98, but provided no other data on the MS-CEIT in either 2001 or 2002, despite actively marketing it upon their web site, which prevents individuals investigating (or even learning about) different scoring methods themselves by forcing them to submit protocols to the authors for scoring.

Mayer and colleagues (2001) have admitted that the expert scoring method might have produced some cultural bias on the MEIS (the experts were Mayer and Salovey themselves). However, they claim that the MSCEIT expert scoring criteria was derived by 21 experts from the International Society of Research on Emotions. Zeidner and colleagues (2001) pointed out that no demographics on these experts are provided, and that a large body of experts may simply reflect consensus as well. Should one expert disagree with the majority opinion, is that expert's expertise to be questioned? The consensus criteria offers no reprieve from cultural bias, because with a stratified normative sample, the majority culture will again dictate the "correctness" of a response.

Zeidner and colleagues also point out that if the MSCEIT is to approximate traditional intelligence tests as its authors intend, the items on scale will have to be of graduated difficulty, with the hardest items relatively difficult if they are to discriminate highly emotionally intelligent individuals, but "Consensus scoring, *sui generis* excludes identification of difficult items on which, say, only 10% of the most able individuals pick the correct answer, and the consensus answer is incorrect". (p. 269).

Perhaps the most salient issue raised by Zeidner and colleagues (2001) is that the MSCEIT, which is intended to have high conceptual overlap with the MEIS (Mayer et al., 2001), must be highly correlated with the MEIS if its developers are not to deviate from established psychometric standards of test revision. However, given the MEIS problems in reliability and the lack of convergence between two conceptually flawed scoring methods, it is hard to imagine how a new version could not be similarly flawed. And if there is a low correlation between the MEIS and MSCEIT, it is unclear if the MSCEIT is measuring EI (Matthews et al, 2002).

In the end, the performance testing paradigm for EI is fraught with problems. It is doubly unfortunate that these critiques have been largely ignored, both by researchers who continue to use the tests in validity studies for EI (e.g., Mayer & Brackett, 2003), and by personnel selection psychologists, to whom the MSCEIT is specifically marketed. Mayer and his camp, who have become widely known as a result of EI, also have a vested financial interest in performance tests. If the tests are to ever reach respectable status, they must do so through independent investigations by objective third parties.

APPENDIX B
DESCRIPTIVE ANALYSES

Other Demographics in the MLA Sample

A variety of general social and life-style information was collected from the MLA sample. Table 1 depicts the means and standard deviations for both current and retrospective (i.e., at age 20) life, marital, and job satisfaction, number of friendships and close friendships, as well as for general leisure habits. Satisfaction ratings were provided on a scale of 1-5, with 1 being very dissatisfied and 5 being very satisfied. Friendship and close friendship estimates were intended as a rough measure of overall relationships and close relationships, respectively, and included family as well.

Of note, the sample reported greater life ($t(240) = 3.27, p = .001$), job ($t(240) = 6.5, p < .001$), and marital ($t(102) = 4.58, p = .001$) satisfaction presently than at age 20. Mid-life adults also reported more friendships ($t(232) = 3.80, p = .001$) and more close friendships ($t(23) = 2.66, p = .008$) currently than in the past. With respect to leisure activities, the sample spent more time reading on their own than with friends and family ($t(133) = 4.3, p < .001$), but spent more time engaged in popular entertainment ($t(229) = -3.80, p < .001$), and non-sport games ($t(126) = -2.2, p = .03$) with family and friends than alone. Mid life adults reported spending about the same amount of time alone as with family or friends in sports related and aesthetic activities.

Some gender differences emerged as well in the MLA sample on these variables. Women reported significantly more life satisfaction at age 20 than men ($t(238) = -2.052, p = .042$), and men reported spending significantly more leisure time alone in sport and exercise ($t(198) = 3.09, p = .003$) and in non-sport games ($t(145) = 2.405, p = .02$), and with family in sport and exercise ($t(161) = 2.58, p = .01$), than did women.

Psychosocial Variables in the MLA Sample

The means and standard deviations of psychosocial variables are shown by gender for the

MLA sample in Table 2. To protect against type I error rates, however, only t-tests significant at the .001 level were considered truly significant (Bonferoni correction = $.05 / 32 = .0016$).

Although it did not quite reach significance at this stringent level, women scored higher than men on the SSRI ($t(240) = -3.14, p = .002$). Women tended to score higher on agreeableness ($t(197) = -3.54, p = .001$), on the RCS intimacy ($t(239) = -4.34, p < .001$), interpersonal sensitivity ($t(241) = -5.14, p < .001$), altruism ($t(241) = -4.58, p < .001$), perspective taking ($t(240) = -3.44, p = .001$) subscales, and on the RCS enhancement factor ($t(237) = -5.30, p < .001$). Trends also existed for women to score higher on the RCS trust subscale ($t(239) = -2.09, p = .04$), on composite RCS scores ($t(237) = -1.834, p = .068$), and on the NEO Conscientiousness factor ($t(194) = -3.03, p = .003$). There was a trend for men to score higher than women on the RCS on dominance ($t(240) = 2.89, p = .004$) and assertiveness ($t(241) = 1.84, p = .07$), to score higher on the UCLA-R ($t(229) = 2.37, p = .019$), and on the SRWNE integrated regulation subscale ($t(195) = 2.058, p = .041$) and Relative Autonomy Index ($t(192) = 1.61, p = .109$).

Thus, these results paint a picture of women at mid-life as more (globally) emotionally intelligent, comfortable with intimacy, interpersonally sensitive and altruistic, able to take others perspectives, and more agreeable, compared to men. There is also some indication that women may be more trusting in close relationships and more conscientious, but that men may be more dominant, assertive, and lonely. The men's trends toward higher scores on the SRWNE integrated regulation scale and Relative Autonomy Index also suggest that men, more so than women, regulate negative emotions voluntarily because they find it rewarding (rather than regulating based on social expectations or guilt).

The pattern of correlations among these variables for the entire MLA sample is represented in Table 3. Of immediate note, SSRI totals showed zero-order correlations with

Synonyms, Matrices, and the everyday math and map reading portions of the STAT. EI was unrelated to these dimensions of practical intelligence. By contrast, the SSRI showed strong correlations, however, with the RCS composite score ($r(240) = .62, p < .001$), and with Initiation ($r(242) = .49, p < .001$) and Enhancement ($r(240) = .54, p < .001$) factor scores, indicating that more emotionally intelligent middle aged adults were more capable and comfortable in intimate and non-intimate relationships. SSRI scores were also strongly associated with UCLA-R Loneliness scores ($r(231) = -.48, p < .001$), and with SSSS scores ($r(238) = .45, p < .001$); more emotionally intelligent individuals were less lonely and felt more socially supported.

In terms of convergence with the Big Five personality traits, SSRI total scores correlated moderately with Neuroticism ($r(200) = -.28, p < .001$), Openness ($r(200) = .25, p < .001$), and Agreeableness ($r(200) = .36, p < .001$), and strongly with Extraversion ($r(200) = .55, p < .001$) and Conscientiousness ($r(200) = .50, p < .001$). This pattern of correlations was somewhat different than in the young adult sample, where only Openness correlated over .5 with EI. EI in the mid life sample appeared to have its strongest associations with Extraversion and Conscientiousness, however.

It was somewhat interesting to note that SSRI scores showed low or zero-order correlations with the SRWNE, the highest being ($r(195) = .26, p < .001$) with the Relative Autonomy index. One would expect emotionally intelligent individuals to regulate emotions due more to internally autonomous motives and strategies, rather than based on rigid, internalized dictates, or social pressures. This appeared somewhat true with respect to the measure of relative autonomy (i.e., the relative proportion of autonomous to compulsively or externally controlled regulation strategies), but here, EI accounted for only perhaps 5% of the variance in negative

emotion regulation. Insignificant zero order correlations were also evident with external and introjected techniques, suggesting that trait EI is relatively unrelated to the extent that individuals regulate negative feelings, through fear of social consequences and through guilt, respectively. One reason for the general lack of association here may be that the emotion regulation items on the SSRI tend to tap positive emotions regulation, such as making a good mood last. It could be that positive and negative emotion regulation are independent processes.

To summarize these results, individuals in the mid life sample who scored higher on trait EI tended to be more adept both at enhancing existing close relationships and navigating other relationships. Not surprisingly, such individuals tended to be less lonely and report higher perceived social support. Higher Trait-EI individuals also tended to be less neurotic, more open to the breadth of their experiences, more agreeable and extroverted, and more conscientious. To a smaller extent, individuals higher in trait EI tended to use a greater proportion of autonomous to controlled regulative strategies for negative emotions—in other ways, they regulated in a more self-motivated and self-responsible way, in comparison to regulation driven more by personal guilt and others' expectations. Finally, Trait EI was not associated with markers of crystallized, fluid, or practical intelligence.

Psychosocial Variables in the YA Sample

The means and standard deviations for psychosocial variables are displayed in Table 4. Again, due to the number of t-tests, differences were considered significant only if they exceeded the .002 (.05 / 23) level. Women scored higher than men on the RCS on intimacy ($t(289) = -3.90$, $p < .001$), altruism ($t(289) = -3.59$, $p < .001$) and interpersonal sensitivity ($t(288) = -4.41$, $p < .001$) subscales, and on the RCS enhancement factor ($t(287) = -3.17$, $p < .001$) and RCS composite score ($t(285) = -3.17$, $p = .002$). Women also scored higher than men on Neuroticism

($t(289) = 4.19, p < .001$). Trends existed for women to score higher than men on the SSRI ($t(286) = -2.31, p = .02$), and on the RCS trust ($t(290) = -2.02, p = .05$) subscale, as well as on Extraversion ($t(287) = -2.63, p = .01$), Agreeableness ($t(283) = -2.47, p = .01$), and Conscientiousness ($t(279) = -1.68, p = .10$). There were also trends for men to score higher on the Marlowe-Crown 10 item ($t(288) = 1.65, p = .10$), on the shyness subscale of the RCS ($t(287) = 1.91, p = .06$), and on the UCLA-R Loneliness Scale ($t(270) = 2.32, p = .02$).

Overall, the results indicated that women were more neurotic, but also more comfortable with intimacy in close relationships, more interpersonally sensitive, and more capable in general of cultivating fulfilling closeness in existing relationships than men. There were also suggestions that women may be more (globally) emotionally intelligent, extraverted, agreeable, and conscientiousness. By contrast, trends indicated that men might be more shy, concerned with social desirability, and lonely than women.

The pattern of correlations among these variables for the entire YA sample is shown in Table 5. Again, the SSRI was not associated with Synonyms or Matrices, but showed strong correlations with the Enhancement ($r(285) = .54, p < .001$) and Initiation ($r(286) = .61, p < .001$) factors of the RCS, as well as with the RCS Composite scores ($r(284) = .68, p < .001$). And again, a strong correlation was evident between the SSRI and UCLA-R Loneliness Scale ($r(270) = -.48, p < .001$). The pattern of correlations between the SSRI and NEO factors was quite similar as well to that observed in the MLA sample, with SSRI moderately to strongly correlated with Neuroticism ($r(287) = -.36, p < .001$), Extraversion ($r(286) = .54, p < .001$), Openness ($r(285) = .19, p < .001$), Agreeableness ($r(281) = .42, p < .01$), and Conscientiousness ($r(278) = .37, p < .01$).

In the YA sample, individuals with greater dispositions toward EI tended to be more

adept at both nurturing close relationships and achieving their goals in less close relationships, and were less lonely. These same individuals were also on average less neurotic, more extroverted, open to experience, agreeable, and conscientiousness. Again, trait EI was unrelated to markers of fluid and crystallized intelligence in the YA sample.

Comparisons between MLA and YA Sample on Psychosocial Variables

To assess general differences between samples, the young adults and mid-life adults were compared on psychosocial variables. The Bonferoni correction placed significance level again at .002 (.05 / 23). The MLA sample scored higher than the YA sample on the SSRI ($t(530) = 3.40$, $p = .001$), and on the Marlowe-Crown 10 item ($t(531) = 3.63$, $p < .001$), as well as on Agreeableness ($t(484) = 4.09$, $p < .001$) and Conscientiousness ($t(477) = 9.42$, $p < .001$). Young adults, however, scored higher on Neuroticism ($t(530) = 3.40$, $p = .001$). Trends existed for mid-life adults to score higher on the RCS instrumentality ($t(533) = 3.01$, $p = .003$) and interpersonal sensitivity ($t(533) = 1.99$, $p = .05$) subscales, as well as on the RCS Initiation factor ($t(529) = 2.12$, $p = .04$) and Composite scores ($t(526) = 1.66$, $p = .10$). There were also trends for young adults to score higher on Openness ($t(485) = -1.80$, $p = .07$), the RCS shyness subscale ($t(530) = -1.93$, $p = .05$), the UCLA-R Loneliness scale ($t(503) = -1.84$, $p = .06$), and the Synonyms subtest of the Gc/Gf Sampler ($t(507) = -1.84$, $p = .07$).

In the present sample, mid-life adults appeared more (globally) emotionally intelligent, agreeable, and conscientious, and were also more concerned with social desirability than their younger counterparts, who were more neurotic than the mid-life group. There were also trends for the mid-life adults to show more instrumental tendencies and sensitivity in their relationships, and to have more general proactive and assertive relationship skills, as well as greater competence with relationships in general. Trends suggested that younger adults might be slightly

more open to experience and possess slightly more crystallized intelligence, but young adults also showed tendencies to be more shy and lonely on average.

Brief Discussion of Cross Sectional Personality Differences

Higher EI, Agreeableness, and Conscientiousness, and lower Neuroticism are in line with recent findings by Srivastava, John, & Gosling (2003), and by Roberts and colleagues (2003). Roberts and his group have deemed the general pattern of decreasing Neuroticism, and increasing Agreeableness and Conscientiousness *maturity*. These trends are also relevant to trait EI because Matthews, Roberts, and Zeidner (2002) argued that EI is characterized by low degrees of Neuroticism, High Agreeableness and Openness, and High Extraversion (to the extent that it is operationalized as positive affectivity).

These trait changes may be the result of adaptation to life, and run contrary to the “hard plaster hypothesis” outlined by Costa & McCrae (1994a,b), suggesting instead a “plasticity” view of personality. By middle age, adults have experienced a greater number of stressful normative life events, such as marriage, securing and advancing through a career, and parenting, as well as stressful non-normative life events, such as financial crises, unexpected illnesses, or death and loss (Danish, Baltes, & Danish, 1980; Danish, Smyer, & Nowak, 1980; Reese & Smyer, 1983). Those who cannot develop sufficient interpersonal and emotion-related coping skills in response to life demands suffer a variety of negative outcomes (e.g., Masten & Coatsworth, 1998). As people’s pursuits and priorities shift from youthful exploration and identity formation to goals Erikson (1950) classically described as intimacy and generativity, they must learn to get along with others, be more consistent and reliable, and take their feelings into account. Similarly, maturation also involves the ability to persist through problems, control anger and anxiety, and maintain interpersonal cohesion. In short, adaptation to life with aging is

reflected in these cross-sectional differences on broad-band personality factors and relational competence. Differences on EI are discussed in more detail in Chapter 4.

APPENDIX C
TABLES AND FIGURES

Table 1

Mid-Life Adult Social and Life-Style Demographics Information

	N	Mean	SD
Current Life Satisfaction	243	3.87	.85
Life Satisfaction at 20	242	3.61	1.02
Current Job Satisfaction	232	3.71	1.08
Job Satisfaction at 20	219	3.04	1.18
Current Marital Satisfaction	220	4.16	1.01
Marital Satisfaction at 20	109	3.51	1.47
Number of Current Friendships ^a	239	28.06	27.31
Friendships at 20 ^b	233	22.81	21.80
Number of Current Close Friendships ^c	239	9.52	9.63
Close Friendships at 20 ^d	234	7.96	6.80
% Leisure Time Reading	230	18.33	21.59
% Leisure Time Popular Media	237	23.44	24.11
% Leisure Time Sport/Exercise	202	11.62	13.26
% Leisure Time Non-Sport Games	149	7.69	13.31
% Leisure Time Aesthetic Pursuits	152	9.47	13.6
% Leisure Time Other	136	21.66	21.43
% Leisure Time, Family/Friends, Reading	135	11.46	16.93
% Leisure Time, Family/Friends, Popular Media	234	28.18	26.33
% Leisure Time, Family/Friends, Sport/Exercise	165	13.19	14.91
% Leisure Time, Family/Friends, Non-Sport Games	147	9.98	14.12
% Leisure Time, Family/Friends, Aesthetic	136	8.96	11.47
% Leisure Time, Family/Friends, Other	149	27.17	25.61

Note: ^a median = 20, mode = 10; ^b median = 15, mode = 10; ^c median = 6, mode = 5; ^d median = 6, mode = 10. Median and mode values provided for means were biased by several respondents who provided estimates as high as 99 for current friendships, friendships at 20, and current close friendships. In leisure time estimates, high standard deviation is due to the wide range (0-100) and a substantial number of participants entering 0.

Table 2

Means and Standard Deviations of Psychosocial Variables by Gender for Mid-Life Sample

	<i>Male Mean</i>	<i>Male SD</i>	<i>Female Mean</i>	<i>Female SD</i>
SSRI Total Score***	119.02	15.40	125.03	12.81
RCS Assertiveness*	13.97	2.96	13.23	3.22
Dominance***	14.99	2.67	13.91	3.07
Instrumentality	15.32	2.70	14.98	2.79
Shyness	10.88	3.31	10.55	3.40
Social Anxiety	10.78	3.40	10.88	3.20
Intimacy***	14.12	2.81	15.75	2.89
Trust***	13.15	2.31	13.84	2.81
Interpersonal Sensitivity***	13.96	2.54	15.67	2.52
Altruism***	14.36	2.25	15.72	2.25
Perspective Taking***	13.70	2.19	14.72	2.31
Initiation Factor	72.71	11.86	70.76	11.98
Enhancement Factor***	69.38	8.89	75.67	9.04
Composite*	142.09	17.98	146.40	17.31
Neo Neuroticism	31.84	5.61	23.87	6.40
Extraversion	40.42	7.74	40.32	7.20
Openness to Experience	37.70	6.23	37.59	6.07
Agreeableness	42.70	6.65	46.00	5.58
Conscientiousness	44.96	6.48	47.87	6.49
Marlowe-Crowne 10 Item	14.72	2.71	15.09	2.90
UCLA-R Loneliness	38.82	35.65	9.96	9.82
Sense of Social Support Scale	44.23	9.61	45.99	9.37
SRWNE External Regulation	27.94	7.26	28.81	8.24
Introjected Regulation	30.42	8.98	31.04	8.97
Identified Regulation	40.13	6.39	40.08	7.62
Integrated Regulation**	26.22	4.94	24.68	5.27
Controlled Index	58.36	15.36	59.73	16.18
Autonomous Index	66.37	9.82	64.76	11.62
Relative Autonomy Index*	8.25	14.39	4.98	12.24
Gc/Gf Synonyms	10.23	5.18	10.30	4.98
Matrices	8.73	3.37	8.16	3.18
STAT Everyday Math/Map Reading	3.89	.17	3.89	.13

Note: * trend toward gender difference, $p \leq .10$; ** trend toward gender difference, $p \leq .05$; *** gender difference significant at $p \leq .01$

Table 3:

Correlations Among Psychosocial Variables for Mid-Life Adults

<i>First half of variables</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1 Job satisfaction																			
2 Marital Satisfaction	.26																		
3 Life Satisfaction	.41	.60																	
4 Age	.01	.02	-.04																
5 Education	.03	.03	.13	.09															
6 SSRI	.10	.11	.16	-.01	-.05														
7 RCS Assertiveness	-.09	-.05	-.01	-.01	.00	.19													
8 RCS Dominance	.04	.04	.11	-.03	.05	.27	.56												
9 RCS Instrumentality	.12	.01	.20	-.11	.07	.42	.43	.57											
10 RCS Shyness	-.14	-.08	-.17	-.03	.04	-.50	-.36	-.45	-.36										
11 RCS Social Anxiety	-.22	-.08	-.23	-.05	.02	-.48	-.42	-.47	-.45	.80									
12 RCS Intimacy	.19	.18	.26	-.05	.01	.49	.09	.13	.24	-.45	-.44								
13 RCS Trust	.23	.20	.31	.00	.04	.27	-.04	.06	.09	-.27	-.32	.53							
14 RCS IP Sensitivity	.15	.12	.18	-.01	-.18	.47	-.05	.03	.20	-.40	-.32	.49	.35						
15 RCS Altruism	.17	.06	.17	-.09	-.09	.39	-.01	.10	.28	-.32	-.28	.45	.30	.67					
16 RCS Perspective Taking	.07	-.01	.03	-.01	-.10	.39	.06	.14	.25	-.30	-.29	.22	.18	.51	.55				
17 RCS Initiation	.12	.05	.18	-.01	.01	.49	.72	.78	.71	-.80	-.83	.36	.18	.23	.25	.27			
18 RCS Enhancement	.23	.15	.26	-.04	-.09	.54	.01	.10	.28	-.48	-.45	.76	.67	.82	.80	.64	.35		
19 RCS Composite	.19	.11	.26	-.03	-.05	.62	.49	.58	.63	-.80	-.80	.65	.47	.60	.60	.52	.86	.78	
20 MC 10	.10	.11	.11	-.03	-.06	.14	.01	.03	.04	-.04	-.10	.13	.17	.30	.20	.21	.04	.26	
21 UCLA-R	-.33	-.26	-.42	.03	-.04	-.48	-.18	-.22	-.31	.45	.46	-.60	-.48	-.46	-.40	-.30	-.43	-.61	
22 SSSS	.26	.17	.39	.04	.09	.54	.11	.20	.29	-.39	-.40	-.56	.50	.42	.37	.27	.36	.58	
23 SRWNE External	-.07	.05	-.05	-.09	.11	-.11	-.38	-.32	-.24	.24	.27	-.17	-.22	-.15	-.08	-.11	-.37	-.20	
24 SRWNE Introjected	-.07	.07	-.05	-.09	.02	-.08	-.38	-.27	-.18	.21	.27	-.18	-.18	-.09	-.04	-.03	-.33	-.15	
25 SRWNE Identified	.02	-.04	-.02	-.06	.09	.10	-.25	-.09	-.04	.09	.15	-.19	-.23	.03	.07	.10	-.16	-.08	
26 SRWNE Integrated	.10	.09	.10	.13	.02	.22	.05	-.07	.17	-.12	-.12	-.06	-.13	.11	.10	.18	.14	.04	
27 SRWNE Control Index	-.07	.06	-.06	-.10	.06	-.10	-.4	-.30	-.22	.24	.28	-.19	-.20	-.13	-.07	-.07	-.37	-.18	
28 SRWNE Autonomy Index	.06	.02	.04	.02	.07	.17	-.14	-.02	.06	.00	.04	-.15	-.21	.07	.09	.15	-.04	-.03	
29 SRWNE Rel. Autonomy	.14	-.05	.11	.13	-.01	.26	.37	.36	.32	-.30	-.31	.10	.07	.20	.16	.21	.42	.19	
30 Synonyms	.11	-.01	.00	.03	-.08	.00	-.03	.07	.02	-.11	-.04	.01	.12	-.01	.03	.10	.06	.07	
31 Matrices	.05	-.12	.00	.14	.07	-.03	-.05	-.01	.08	.05	.07	-.06	.05	-.04	.05	.07	-.03	.02	
32 STAT Math/Map Reading	.03	-.18	.03	.13	.03	-.07	-.12	-.11	-.08	.05	.09	-.03	.03	.06	.10	.10	-.12	.06	

Table 3, Continued

Correlations Among Psychosocial Variables for Mid-Life Adults

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
33 NEO Neuroticism	-.26	-.20	-.38	-.01	-.16	-.28	-.30	-.31	.46	.21	.34	-.21	-.32	-.23	-.20	-.25	-.40	-.31
34 NEO Extraversion	.28	.08	.27	-.08	.01	.55	.35	.46	.44	-.64	-.65	.39	.39	.38	.41	.33	.66	.51
35 NEO Openness	-.01	-.04	.02	.11	.195	.25	.06	.17	.12	-.11	.14	.25	.18	.03	.13	.18	.16	.20
36 NEO Agreeableness	.14	.18	.28	-.04	.10	.36	-.20	-.16	.11	-.12	.16	.41	.49	.57	.55	.51	.01	.67
37 NEO Conscientiousness	.19	.14	.31	-.13	.11	.50	.17	.24	.46	-.27	-.37	.25	.15	.42	.46	.36	.38	.43
<i>Second Half of Variables</i>	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
20 MC 10	-.16																	
21 UCLA-R	-.61	-.16																
22 SSSS	-.55	.18	-.80															
23 SRWNE External	-.35	-.16	.32	-.24														
24 SRWNE Introjected	-.31	-.05	.29	-.22	.78													
25 SRWNE Identified	-.15	.00	.13	.00	.58	.67												
26 SRWNE Integrated	-.11	.02	-.03	.10	.25	.30	.56											
27 SRWNE Control Index	-.35	-.10	.32	-.24	.94	.95	.67	.30										
28 SRWNE Autonomy Index	-.05	.01	.07	.05	.50	.58	.92	.84	.58									
29 SRWNE Rel. Autonomy	.38	.12	-.33	.33	-.71	-.66	-.03	.35	-.73	.15								
30 Synonyms	.07	-.08	-.05	.07	.08	-.08	.02	.09	.08	.06	.15							
31 Matrices	-.01	-.13	-.06	.06	-.09	-.05	.02	.01	-.07	.01	.10	.47						
32 STAT Math/Map Reading	-.04	-.01	-.10	.09	-.07	-.11	-.05	-.08	-.10	-.07	.06	.19	.39					
33 NEO Neuroticism	-.43	-.27	.51	-.43	.42	.32	.13	-.21	.38	-.02	-.47	-.21	-.16	-.07				
34 NEO Extraversion	.71	.11	-.56	.54	-.29	-.26	-.08	.18	-.29	.04	.39	.07	-.06	-.10	-.43			
35 NEO Openness	.21	.05	-.07	.22	-.01	.00	.05	.15	.00	.10	.11	.30	.13	.12	-.10	.10		
36 NEO Agreeableness	.36	.30	-.46	.42	.05	.05	.15	.21	.04	.20	.10	.20	.05	.10	-.41	.27	.13	
37 NEO Conscientiousness	.49	.20	-.43	.37	-.06	-.01	.12	.24	-.04	.20	.21	.11	-.03	.02	-.40	.45	-.03	.48

Note: Correlations of .15 or greater significant at $p < .05$; Correlations .17 or greater significant at $p < .01$. *N*s vary between 187-242.

Table 4

Psychosocial Variable Means and Standard Deviations by Gender for Young Adults

	Male Mean	Male SD	Female Mean	Female SD
SSRI Total Score**	115.42	13.71	119.72	14.14
RCS Assertiveness	13.08	3.03	13.14	2.75
Dominance	13.80	2.58	14.00	2.58
Instrumentality	14.45	2.68	14.45	2.28
Shyness*	11.91	3.34	11.06	3.25
Social Anxiety	11.43	3.04	10.83	3.08
Intimacy***	14.21	3.08	15.79	2.99
Trust**	12.77	2.30	13.43	2.73
Interpersonal Sensitivity***	13.52	2.27	14.91	2.58
Altruism***	14.32	2.30	14.62	2.70
Perspective Taking***	14.23	2.23	14.62	2.70
Initiation Factor	68.00	10.99	69.87	10.84
Enhancement Factor***	69.05	8.59	74.16	10.29
Composite**	137.05	15.78	144.01	17.84
Neo Neuroticism***	32.88	7.05	36.93	7.65
Extraversion**	38.68	7.16	41.22	7.38
Openness to Experience	38.96	6.15	38.61	5.46
Agreeableness**	40.96	5.73	43.00	6.25
Conscientiousness*	40.23	5.65	41.57	6.33
Marlowe-Crowne 10 Item*	14.55	2.36	14.06	1.85
UCLA-R Loneliness**	40.94	10.46	37.60	10.20
Gc/Gf Synonyms	11.06	2.54	10.93	2.42
Matrices	8.55	3.37	8.86	3.08

Note: * trend toward gender difference, $p \leq .10$; ** trend toward gender difference, $p \leq .05$;

*** gender difference significant at $p \leq .01$

Table 5

Correlations Among Psychosocial Variables for Young Adults

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1 SSRI		.35	.37	.44	-.42	-.47	.55	.40	.48	.43	.45	.53	.61	.68	-.36	.54	.19	.42	.37	.08	-.48	.09	.12
2 RCS Assertiveness			.51	.41	-.43	-.45	.26	.08	.02	.21	.07	.73	.17	.55	-.34	.39	.07	-.06	.31	-.13	-.31	.02	-.01
3 RCS Dominance				.42	-.50	-.55	.22	.13	.09	.29	.11	.77	.22	.61	-.37	.49	.03	.01	.37	.02	-.29	.02	-.04
4 RCS Instrumentality					-.31	-.39	.38	.20	.22	.29	.22	.63	.35	.59	-.33	.41	.12	.18	.58	-.02	-.27	.16	.12
5 RCS Shyness						.79	-.33	-.26	-.19	-.35	-.22	-.82	-.36	-.72	.34	-.64	-.04	-.07	-.26	.01	.48	.05	.07
6 RCS Social Anxiety							-.37	-.32	-.21	-.36	-.31	-.86	-.42	-.77	.42	-.66	.04	-.17	-.30	-.01	.51	.05	-.01
7 RCS Intimacy								.55	.47	.49	.39	.41	.78	.70	-.26	.45	.12	.48	.29	-.05	-.57	.08	.24
8 RCS Trust									.40	.42	.33	.26	.72	.57	.30	.36	.06	.48	.21	.11	-.46	.01	.12
9 RCS IP Sensitivity										.62	.55	.19	.79	.57	-.12	.35	.15	.64	.21	.23	-.35	.10	.16
10 RCS Altruism											.51	.39	.78	.69	-.17	.46	.17	.51	.24	.08	-.43	.11	.11
11 RCS Perspective Taking												.25	.72	.57	-.20	.31	.16	.54	.24	.18	-.31	.18	.18
12 RCS Initiation													.40	.85	-.47	.69	.05	.10	.46	-.03	-.50	.02	-.01
13 RCS Enhancement														.82	-.28	.51	.17	.70	.32	.14	-.56	.12	.21
14 RCS Composite															-.46	.72	.13	.46	.47	.06	-.64	.08	.12
15 NEO Neuroticism																-.40	-.04	-.27	.33	-.24	.49	-.04	.08
16 NEO Extraversion																	.01	.32	.45	-.03	-.58	-.04	.08
17 NEO Openness																		.07	-.06	.05	-.05	.20	.18
18 NEO Agreeableness																			.25	.21	-.43	.09	.25
19 NEO Conscientiousness																				.02	-.36	.12	.06
20 MC 10																					.00	.06	-.14
21 UCLA-R																						-.09	-.20
22 Synonyms																							.41
23 Matrices																							

Note: Correlations .12 or greater significant at $p < .05$; Correlations .14 or greater significant at $p < .01$. *N*s vary between 270-292.

Table 6

Differences Between Mid-Life and Young Adult Sample on Psychosocial Variables

	MLA Mean	MLA SD	YA Mean	YA SD
SSRI Total Score***	122.80	14.12	118.62	14.13
RCS Assertiveness	13.52	3.13	13.27	2.82
Dominance	14.35	2.96	13.95	2.58
Instrumentality***	15.13	2.76	14.45	2.39
Shyness	10.72	3.38	11.28	3.29
Social Anxiety	10.86	3.27	10.98	3.08
Intimacy	15.11	2.95	14.55	2.57
Trust	13.60	2.64	13.26	2.64
Interpersonal Sensitivity	15.00	2.66	14.55	2.57
Altruism	14.33	2.34	15.15	2.43
Perspective Taking	14.33	2.31	14.52	2.59
Initiation Factor**	71.50	11.91	69.39	10.89
Enhancement Factor	73.25	9.46	72.84	10.89
Composite	144.74	17.59	142.19	17.58
Neo Neuroticism***	32.40	6.15	35.89	7.70
Extraversion	40.40	6.15	35.89	7.40
Openness to Experience*	37.71	6.21	38.70	5.63
Agreeableness***	44.84	6.35	42.47	6.18
Conscientiousness***	46.85	6.63	41.22	6.18
Marlowe-Crowne 10 Item***	14.97	2.83	14.18	2.00
UCLA-R Loneliness*	36.79	9.97	38.46	10.35
Gc/Gf Synonyms*	10.31	5.04	10.97	2.45
Matrices	8.39	3.28	8.78	3.16

Note: * trend toward gender difference, $p \leq .10$; ** trend toward gender difference, $p \leq .05$;

*** gender difference significant at $p \leq .01$

Table 7

Factor Structure and Item Loadings of the SSRI for Young Adult Sample

<u>Item</u>	<u>Factor 1 (Optimism)^a</u>	<u>Factor 2 (Empathy)^b</u>
1	.36	.23
2	.42	.22
3	.63	.18
4	.30	.41
5	-.18	-.34
6	.30	.16
7	.00	.13
8	.00	.28
9	.28	.35
10	.51	.27
11	.28	.22
12	.35	.26
13	.23	.39
14	.26	.30
15	.18	.26
16	.51	.21
17	.49	.29
18	.22	.68
19	.15	.24
20	.35	.23
21	.28	.17
22	.14	.34
23	.31	.11
24	.39	.30
25	.24	.59
26	.00	.38
27	.12	.28
28	.70	.00
29	.00	.77
30	.34	.56
31	.52	.35
32	.23	.55
33	.35	.42

Note: ^a Eigenvalue = 7.78, 23.58% of common variance; ^b Eigenvalue = 2.32, 6.77 % of common variance

Table 8

Factor Structure and Item Loadings of the SSRI for Mid-Life Sample

Item	Factor 1	Factor 2	Factor 3
1	.30	.23	.00
2	.58	.27	.23
3	.54	.21	.11
4	.44	.46	.20
5	.22	.37	.00
6	.38	.21	.32
7	.27	.21	.62
8	.27	.24	.49
9	.37	.40	.16
10	.62	.37	.24
11	.20	.37	.38
12	.54	.38	.48
13	.26	.38	.19
14	.60	.25	.37
15	.30	.46	.26
16	.41	.44	.23
17	.48	.24	.17
18	.22	.58	.20
19	.40	.43	.21
20	.28	.38	.37
21	.29	.18	.25
22	.40	.34	.26
23	.54	.29	.50
24	.44	.54	.31
25	.24	.65	.30
26	.26	.65	.48
27	.00	.38	.61
28	.45	.00	.00
29	.11	.60	.15
30	.50	.65	.29
31	.42	.34	.66
32	.15	.60	.42
33	.16	.22	.00

Note: ^a Eigenvalue = 8.25, % of common variance = 25%; ^b Eigenvalue = 2.23, % of common variance = 6.76 %; ^c Eigenvalue = 2.08, % of common variance = 6.32 %

Table 9

Items Comprising Different Factors of Competing SSRI Factor Models

Item	1 Factor Model ^a	2 Factor Model ^b	3 Factor Model ^c	4 Factor Model ^d	Hierarchical Model ^e
1	Factor 1	<i>Factor 1</i>	<i>Factor 1</i>	<i>Factor 3</i>	<i>Factor 1</i>
2	Factor 1	Factor 1	Factor 1	Factor 1	Factor 1
3	Factor 1	Factor 1	Factor 1	Factor 1	Factor 1
4	Factor 1	Factor 2, (1)	Factor 2, (1)	Factor 3	Factor 4
5	Factor 1	<i>Factor 2</i>		Factor 2	Factor 2
6	Factor 1		<i>Factor 1, (3)</i>	Factor 3, (4)	<i>Factor 3</i>
7	Factor 1		Factor 3	Factor 4	Factor 3
8	Factor 1		Factor 3	<i>Factor 3</i>	<i>Factor 4</i>
9	Factor 1	<i>Factor 2</i>	Factor 2, (1)	Factor 2	Factor 1
10	Factor 1	Factor 1	Factor 1, (2)	Factor 1	Factor 1
11	Factor 1		<i>Factor 3</i>	Factor 3	Factor 4
12	Factor 1	<i>Factor 1</i>	Factor 1, (3), (2)	Factor 1, (3)	Factor 1
13	Factor 1	<i>Factor 2</i>	<i>Factor 2</i>	Factor 3	<i>Factor 4</i>
14	Factor 1		Factor 1, (3)	Factor 1	Factor 1
15	Factor 1		Factor 2, (1)	Factor 2	Factor 2
16	Factor 1	Factor 1	Factor 2, (1)	Factor 3, (1)	<i>Factor 4</i>
17	Factor 1	Factor 1	Factor 1	Factor 4, (1)	Factor 3
18	Factor 1	Factor 2	Factor 2	Factor 2	Factor 2
19	Factor 1		Factor 2, (1)	Factor 2	Factor 1, (2), (4)
20	Factor 1	<i>Factor 1</i>	<i>Factor 2, (3)</i>	Factor 4, (1)	Factor 3
21	Factor 1			Factor 1	Factor 1
22	Factor 1	<i>Factor 2</i>	Factor 1, (2)	Factor 2, (1)	Factor 1
23	Factor 1	<i>Factor 1</i>	Factor 1, (3)	Factor 1	Factor 1
24	Factor 1	<i>Factor 1</i>	Factor 2, (1), (3)	Factor 3	Factor 4
25	Factor 1	Factor 2	Factor 2	Factor 2	Factor 2
26	Factor 1	<i>Factor 2</i>	Factor 2, (3)	Factor 3	Factor 4
27	Factor 1		Factor 3, (2)	Factor 4	Factor 3
28	Factor 1	Factor 1	Factor 1	Factor 1	Factor 1
29	Factor 1	Factor 2	Factor 2	Factor 2	Factor 2
30	Factor 1	Factor 2, (1)	Factor 2, (1)	Factor 3	Factor 4, (2)
31	Factor 1	Factor 1, (2)	Factor 3, (1), (2)	Factor 1, (3), (4)	<i>Factor 4</i>
32	Factor 1	Factor 2	Factor 2, (3)	Factor 2	Factor 2
33	Factor 1	Factor 2, (1)		<i>Factor 3</i>	Factor 3

Note: ^a Schutte et al., (1998); solution derived from 66 item pool analyzed by principal

components: Factor 1 = General EI. ^b Chapman (2002): Young Adult Sample, MLE factor

analysis with oblique rotation: Factor 1 = Optimism; Factor 2 = Empathy. ^c Chapman (same data, MLE factor analysis with oblique rotation retaining three factors: Factor 1 = Emotion Appraisal and Regulation, Factor 2 = Empathy and Social Skills, Factor 3 = Utilization of Emotion. ^d Petrides and Furnham (2000), MLE factor analysis with oblique rotation: Factor 1 = Optimism/Mood Regulation, Factor 2 = Appraisal of Emotions, Factor 3 = Social Skills, Factor 4 = Utilization of Emotions. ^e Saklofske, Austin, & Mink (2003), Principal Components Analysis with oblique rotation, Factor 1 = Optimism/Mood Regulation, Factor 2 = Appraisal of Emotions; Factor 3 = Social Skills, Factor 4 = Utilization of Emotions. Italics indicate loadings of .3-.39 and numbers in parentheses indicate factors on which item loaded less than .4. Chapman (2002) used a factor loading criteria of .4 or higher to define factors; Petrides and Furnham (2000b) and Saklofske et al. (2003) use .3.

Table 10

Fit Indices for Item Level Models of the SSRI

Factor Model	<i>S-B X²</i>	<i>df</i>	<i>CFI</i>	<i>RCFI</i>	<i>RMSEA</i>	<i>SRMR</i>
1 factor	1147	495	.63	.64	.09	.08
2 factor	1035	494	.69	.70	.08	.08
3 factor	1073	492	.67	.68	.07	.08
4 factor	982	489	.71	.73	.08	.08
Hierarchical	1029	494	.69	.70	.07	.08

Note: Models tested in Young Adult sample, $n = 289$. Models of perfect simple structure implementing all items and retaining independence of residuals.

Table 11

EI Parcel Correlations in Young Adult and Mid-Life Sample

	EffEx	PersOb	PosIm	MdCh	MdPos	HlpOth	LisCom	ImpMg	MdMg	Emp	ApOth1	ApOth2	EmEx	SfAp	ExLiv
EffEx		.48	.51	.21	.42	.28	.37	.38	.45	.25	.25	.20	.35	.35	.20
PersOb	.44		.47	.25	.46	.44	.38	.44	.52	.34	.34	.25	.39	.25	.28
PosIm	.56	.45		.20	.34	.29	.33	.38	.43	.17	.12	.21	.26	.21	.16
MdCh	.14	.36	.19		.24	.22	.17	.09	.24	.27	.28	.16	.22	.16	.41
MdPos	.39	.25	.37	.19		.27	.42	.30	.37	.23	.29	.23	.31	.31	.31
HlpOth	.13	.30	.32	.24	.59		.39	.38	.46	.38	.48	.41	.28	.26	.23
LisCom	.39	.44	.30	.16	.25	.32		.38	.36	.40	.40	.32	.31	.31	.37
ImpMg	.40	.34	.26	.23	.37	.45	.42		.51	.27	.32	.42	.40	.38	.18
MdMg	.50	.48	.45	.31	.30	.44	.42	.50		.28	.34	.32	.44	.47	.23
Emp	.25	.30	.21	.23	.18	.32	.40	.32	.25		.46	.35	.31	.34	.35
ApOth1	.27	.33	.17	.23	.36	.44	.38	.44	.23	.43		.50	.22	.37	.30
ApOth2	.23	.28	.18	.19	.24	.35	.40	.44	.28	.45	.52		.24	.31	.21
EmEx	.26	.27	.21	.21	.20	.40	.35	.34	.40	.34	.29	.32		.46	.36
SfAp	.45	.42	.40	.12	.30	.37	.52	.44	.46	.31	.44	.42	.29		.23
ExLiv	.30	.40	.33	.42	.28	.33	.26	.26	.41	.22	.24	.17	.23	.35	

Note: Correlations above diagonal are Young Adult sample; correlations below the diagonal are Mid Life sample. EffEx = Efficacy Expectations; PersOb = Persistence through Obstacles; PosIm = Positive Imagery Use; MdCh = Mood Change Use; HlpOth = Helping Others; LisCom = Listening and Complimenting; ImpMg = Impression Management; MdMg = Mood Management; Emp = Empathy; ApOth1 = Appraising Others 1; ApOth2 = Appraising Others 2; EmEx = Emotional Expression; SfAp = Self Appraisal; ExLiv = Existential Living.

Table 12

Factor Structure Matrix of EI Parcels in Young Adult Sample

	Factor 1 ^a	Factor 2 ^b	Factor 3 ^c
EffEx	.70	-.05	.042
PersOb	.60	.09	.09
PosIm	.73	-.13	-.02
MdCh	.07	-.01	.59
MdPos	.50	.02	.21
HlpOth	.18	.53	.01
LisCom	.29	.32	.16
ImpMg	.47	.38	-.20
MdMg	.57	.24	-.03
Emp	-.03	.50	.27
ApOth1	-.08	.68	.15
ApOth2	-.02	.69	-.07
EmEx	.40	.14	.17
SfAp	.27	.36	.02
ExLv	.04	.10	.59

Note: ^a Eigenvalue = 5.56; ^b Eigenvalue = 1.39; ^c Eigenvalue = 1.18. EPIC factoring with oblique rotation: factor 1 and 2 correlation = .54; factor 1 and 3 correlation = .36; factor 2 and 3 correlation = .39. EffEx = Efficacy Expectations; PersOb = Persistence through Obstacles; PosIm = Positive Imagery Use; HlpOth = Helping Others; LisCom = Listening and Complimenting; ImpMg = Impression Management; MdMg = Mood Management; Emp = Empathy; ApOth1 = Appraising Others 1; ApOth2 = Appraising Others 2; EmEx = Emotional Expression; SfAp = Self Appraisal; ExLiv = Existential Living.

Table 13

Factor Structure Matrix of EI Parcels in Mid-Life Sample

	Factor 1 ^a	Factor 2 ^b	Factor 3 ^c	Factor 4 ^d
EffEx	.67	.03	.04	.15
PersOb	.45	.13	.30	.17
PosIm	.65	-.12	.07	.14
MdCh	.09	.05	.71	.01
MdPos	.12	.03	.02	.67
HlpOth	.01	.22	.08	.58
LisCom	.38	.51	.03	.10
ImpMg	.17	.42	.01	.24
MdMg	.50	.11	.23	.07
Emp	.02	.63	.11	.06
ApOth1	.10	.60	.02	.25
ApOth2	.05	.71	.03	.06
EmEx	.46	.41	.14	.06
SfAp	.79	.40	.07	.02
ExLv	.22	-.03	.54	.06

Note: ^a Eigenvalue = 5.72; 38.13% of the variance; ^b Eigenvalue = 1.42; 9.47% of the variance

^c Eigenvalue = 1.12; 7.47% of the variance; ^d Eigenvalue = 1.02; 6.8 % of the variance; EPIC

factoring with oblique rotation: factor 1 and 2 correlation = .43; factor 1 and 3 correlation = .38;

factor 2 and 3 correlation = .36 factor 2 and 4 = .43; factor 1 and 4 = .44. EffEx = Efficacy

Expectations; PersOb = Persistence through Obstacles; PosIm = Positive Imagery Use; HlpOth =

Helping Others; LisCom = Listening and Complimenting; ImpMg = Impression Management;

MdMg = Mood Management; Emp = Empathy; ApOth1 = Appraising Others 1; ApOth2 =

Appraising Others 2; EmEx = Emotional Expression; SfAp = Self Appraisal; ExLiv = Existential

Living.

Table 14

Multiple Sample Fit Indices for Nested EI Models

<i>Model</i>	<i>Constraints</i>	X^2	<i>df</i>	<i>CFI</i>	<i>RMSEA</i>	<i>SRMR</i>	ΔX^2	Δdf	<i>p</i>
YA 3 factor hierarchical ^a	λ_1, λ_2	517.766	189	.87	.06	.07			
	λ_1	514.508	186	.87	.06	.07	3.26	3	>.05
	λ_0	502.506	174	.87	.06	.06	12.0	12	>.05
YA 4 factor	λ_1, λ_2	475.681	185	.86	.06	.06			
	λ_1	471.932	182	.86	.06	.06	3.75	3	>.05
	λ_0	460.739	170	.86	.06	.06	11.22	12	>.05
YA 4 factor hierarchical	λ_1, λ_2	490.445	189	.86	.06	.06			
	λ_1	486.450	186	.86	.06	.06	3.95	3	>.05
	λ_0	470.156	174	.86	.06	.06	11.01	12	>.05
ML 4 factor hierarchical ^b	λ_1, λ_2	496.212	189	.88	.06	.08			
	λ_1	492.124	185	.88	.06	.07	4.09	3	>.05
	λ_0	483.264	172	.88	.06	.06	8.86	13	>.05

Note: ^a Best fitting model in young adult sample; ^b Best fitting model in mid life sample. λ_2 = Second order factor loadings constrained to be equal, λ_1 = First order factor loadings constrained to be equal, λ_0 = No constraints. Models tested in young adult sample, $n = 289$, and mid life sample, $n = 245$. ML Robust estimation (and therefore S-B X^2 and RCFI) not available for multisample analysis in EQS 5.7.

Table 15

Factor Structure Matrix of Personality Ability Relationships in Young Adult Sample

	Factor 1 ^a	Factor 2 ^b	Factor 3 ^c	Factor 4 ^d
EI	.50	-.20	.32	.25
RcEnh	.86	-.04	-.14	.05
RcInit	.14	.06	.74	.16
N	-.50	-.34	.04	.28
E	.74	-.03	.12	.07
O	.08	.29	.00	.66
A	-.14	.13	.81	.12
C	.43	.04	.34	.30
Gc	-.07	.65	.04	.04
Gf	.02	.63	.03	.14

Note: ^a Eigenvalue = 3.44; 34.4% of the variance; ^b Eigenvalue = 1.60; 16% of the variance

^c Eigenvalue = 1.27; 12.7% of the variance; ^d Eigenvalue = 1.05; 10.5% of the variance;

EPIC factoring with oblique rotation: factor 1 and 2 correlation = .07; factor 1 and 3 correlation = .43; factor 2 and 3 correlation = .17; factor 2 and 4 = .05; factor 1 and 4 = .03. EI = Emotional Intelligence; RcEnh = Relational Competence Enhancement Factor; RcInit = Relational Competence Initiation Factor; N = Neuroticism; E = Extraversion; O = Openness; A = Agreeableness; C = Conscientiousness; Gc = Crystallized Abilities; Gf = Fluid Ability.

Table 16

Factor Structure Matrix of Personality Ability Relationships in Mid Life Adult Sample

	Factor 1 ^a	Factor 2 ^b	Factor 3 ^c
EI	.59	.03	.30
RcEnh	.80	-.03	-.15
RcInit	.45	-.01	.56
N	-.62	-.11	.04
E	.70	-.11	.14
O	.10	.52	-.15
A	.12	.00	.71
C	.60	.03	.07
Gc	.00	.64	.05
Gf	-.15	.52	.35

Note: ^a Eigenvalue = 3.62; 36.2% of the variance; ^b Eigenvalue = 1.61; 16.1% of the variance; ^c Eigenvalue = 1.15; 11.5% of the variance. EPIC factoring with oblique rotation: factor 1 and 2 correlation = .05; factor 1 and 3 correlation = .30; factor 2 and 3 correlation = .15. EI = Emotional Intelligence; RcEnh = Relational Competence Enhancement Factor; RcInit = Relational Competence Initiation Factor; N = Neuroticism; E = Extraversion; O = Openness to Experience; A = Agreeableness; C = Conscientiousness; Gc = Crystallized Abilities; Gf = Fluid Ability.

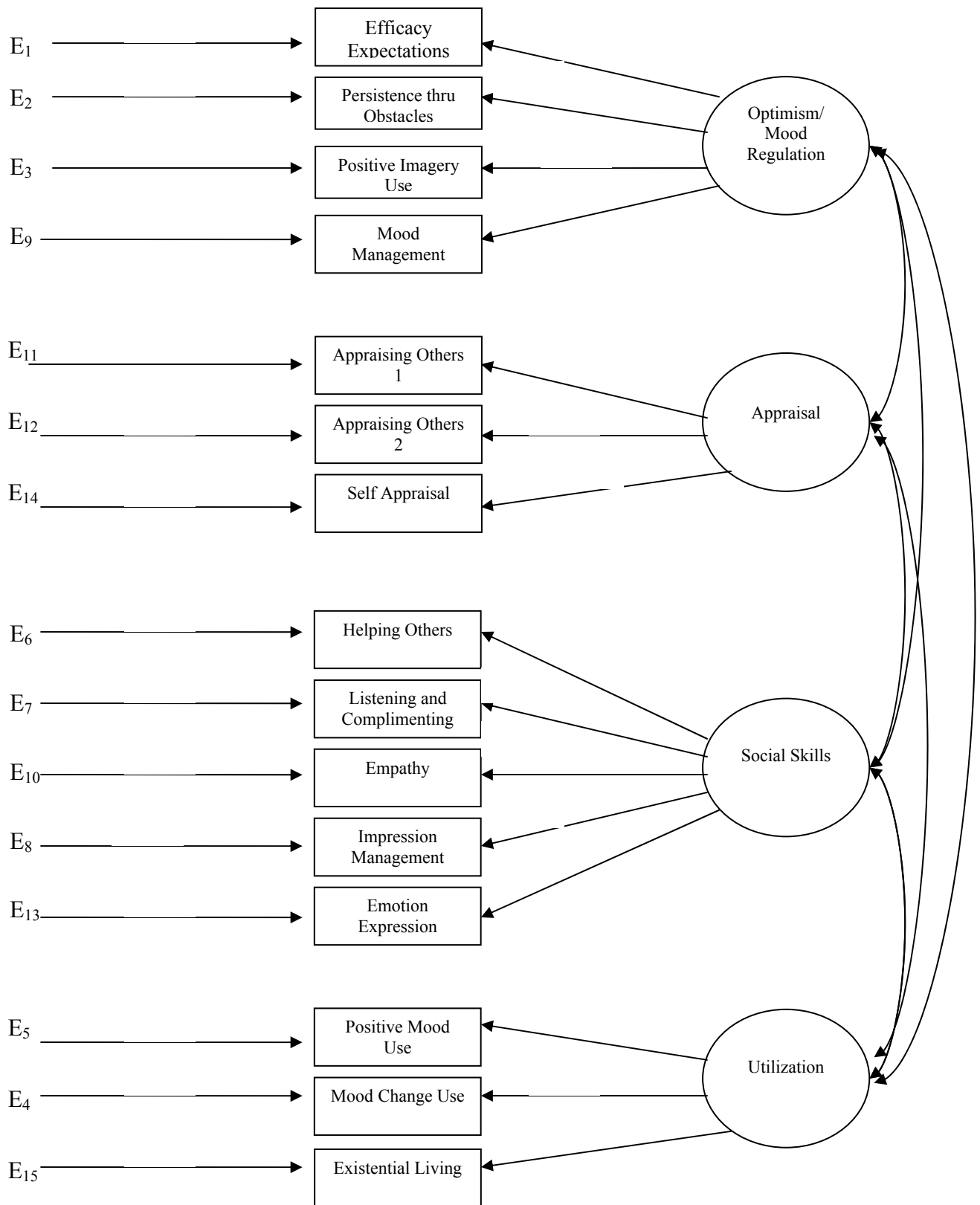


Figure 1. Hypothesized Partially Disaggregated Four Factor EI Model. Error term numbers correspond to item parcel numbers.

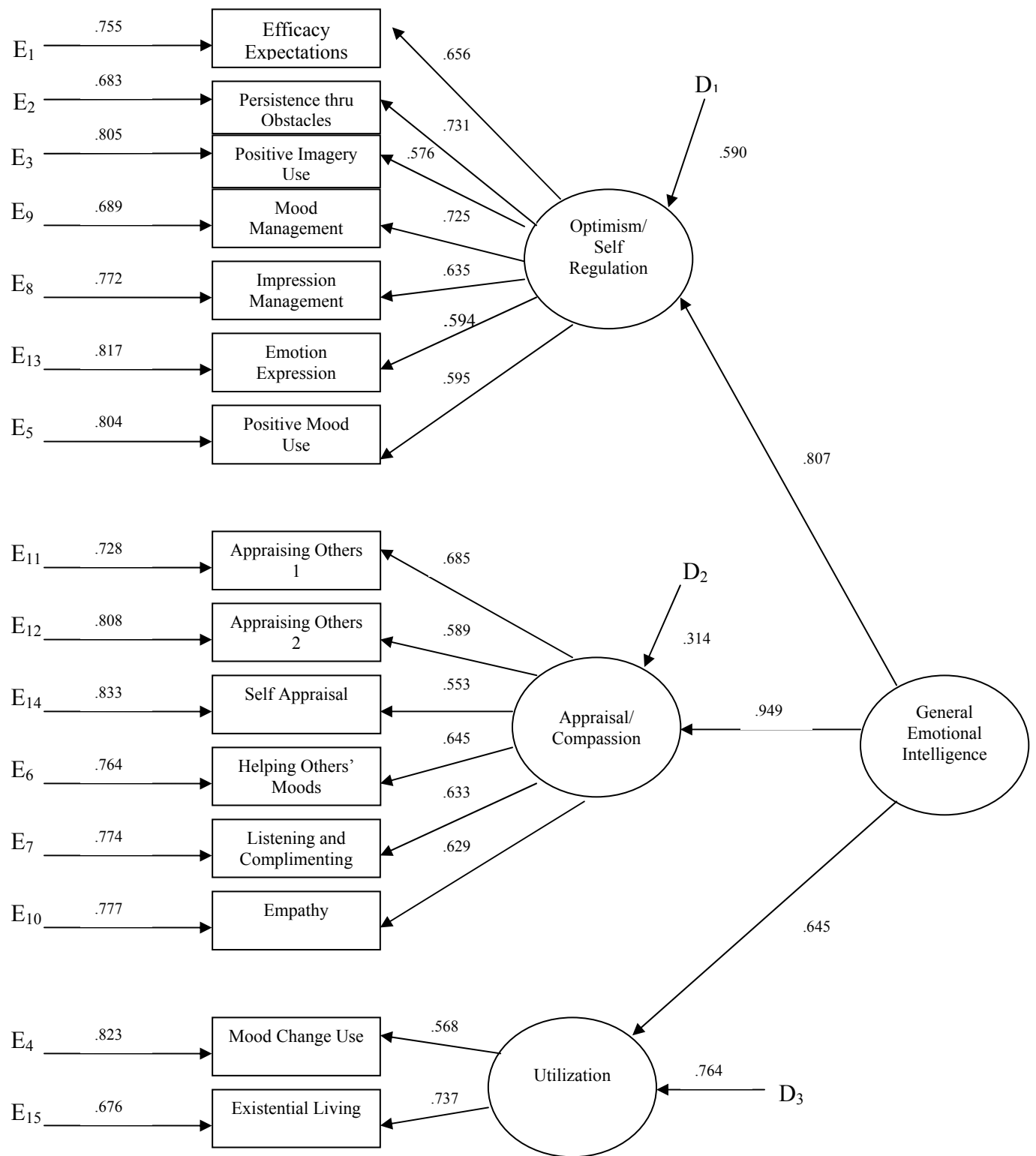


Figure 2. Three Factor Hierarchical Model of Emotional Intelligence in Young Adult Sample. Model fit = ($S-B \chi^2 = 178.92$, $df = 87$, $p < .001$, $CFI = .90$, $RCFI = .90$, $RMSEA = .8$, $SRMR = .06$).

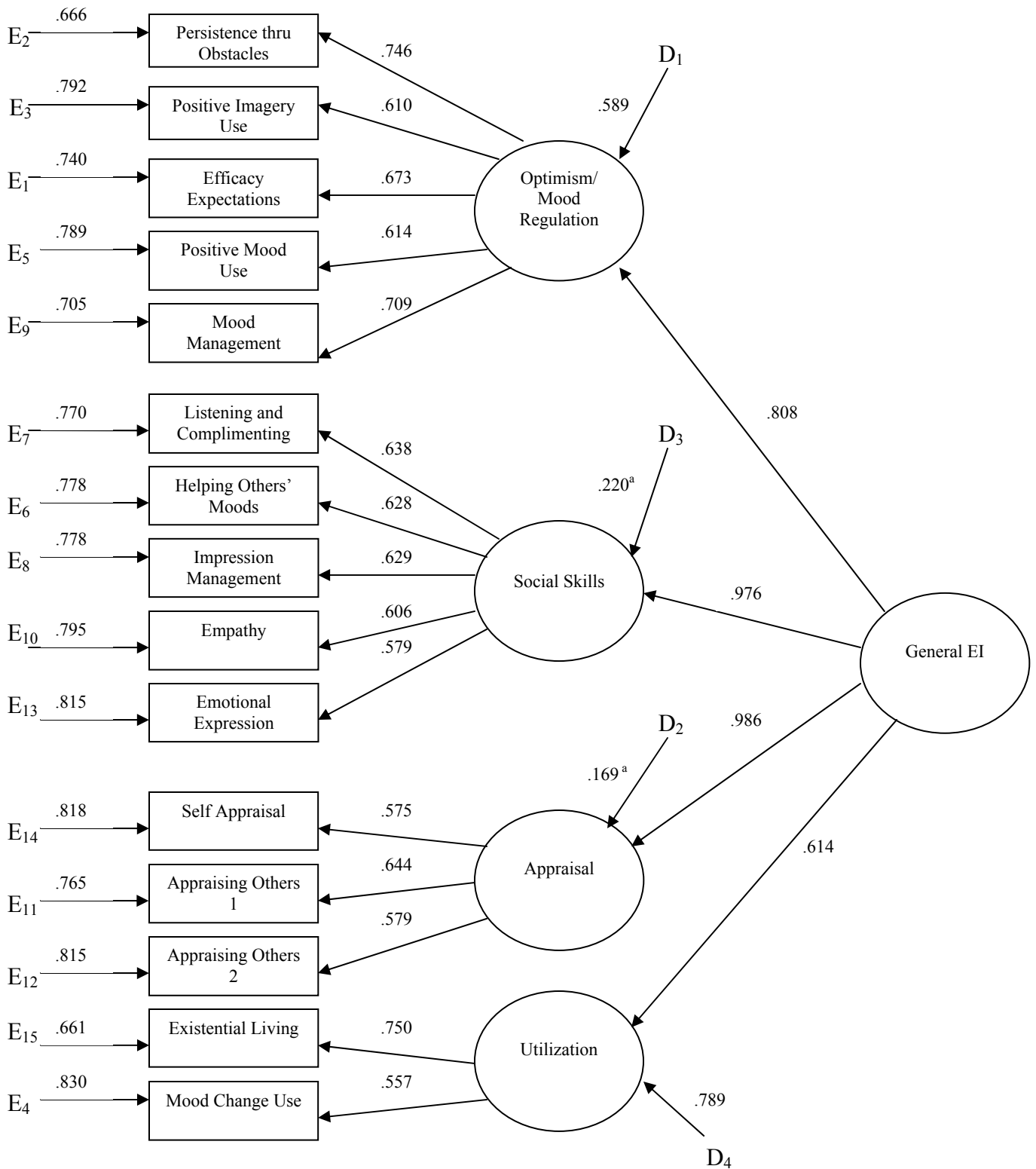


Figure 3. Four Factor Hierarchical EI Model in Young Adult Sample. Model fit = ($S-B X^2 = 182.78$, $df = 86$, $p < .001$, $CFI = .89$, $RCFI = .89$, $RMSEA = .08$, $SRMR = .06$).

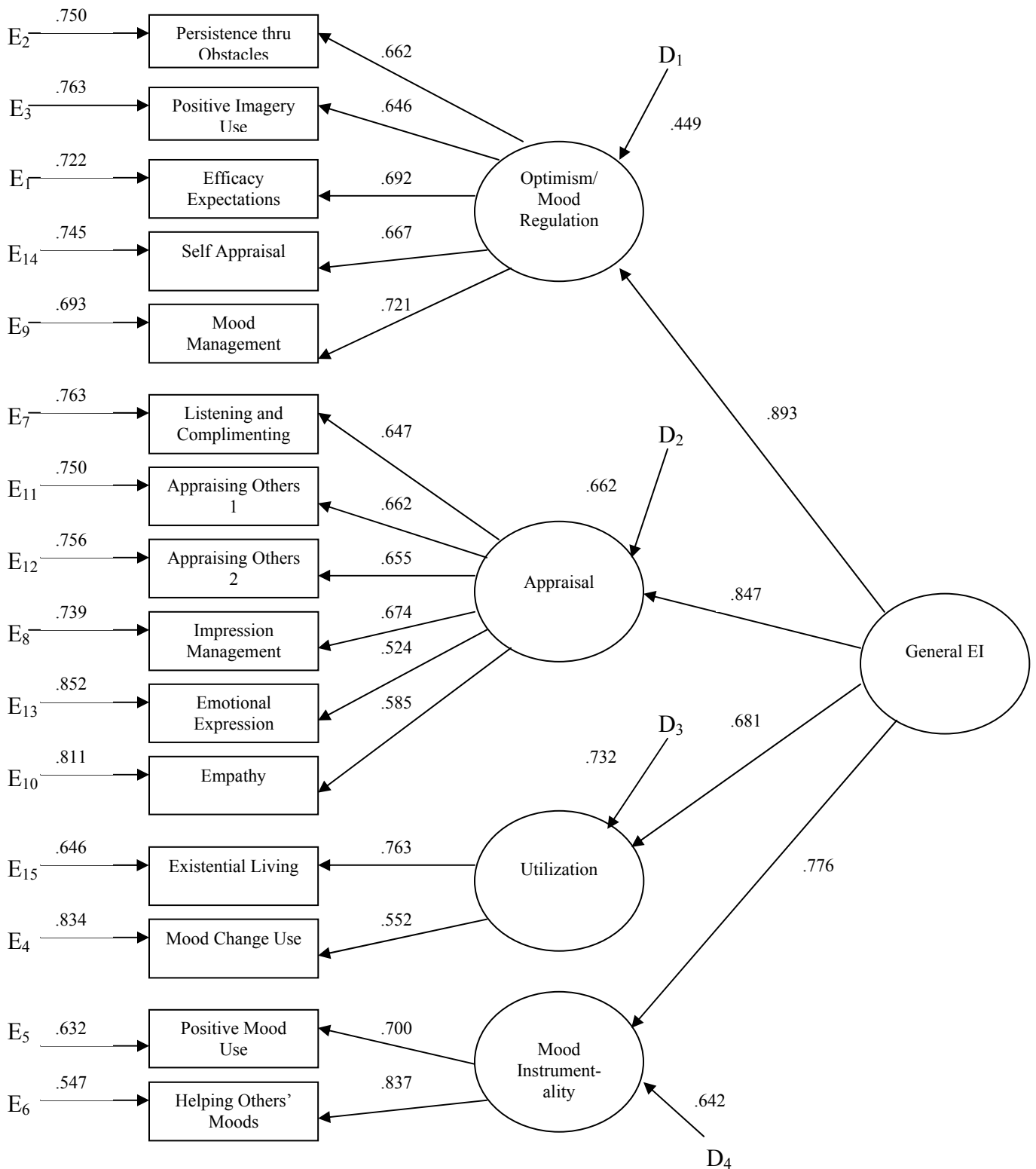


Figure 4. Four Factor Hierarchical EI Model in Mid-Life Sample. ($S-B \chi^2 = 168.27$, $df = 86$, $p < .001$, $CFI = .90$, $RCFI = .90$, $RMSEA = .08$, $SRMR = .06$).

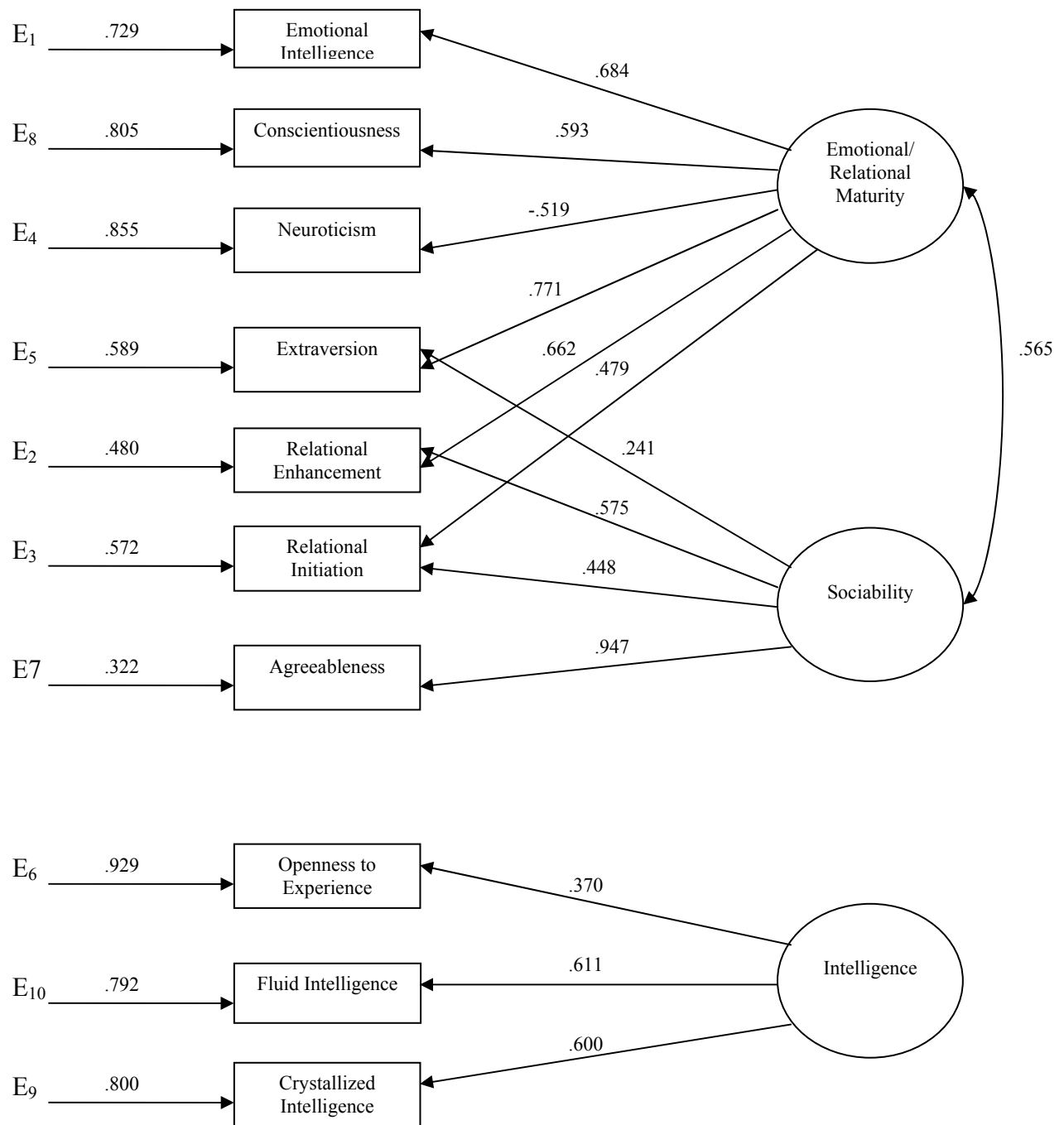


Figure 5. Three Factor Model of Personality-Ability Relationships in Young Adult and Mid-Life Samples. Model fit = ($\chi^2 = 187.960$, $df = 86$, $p < .001$, $CFI = .91$, $RMSEA = .06$, $SRMR = .09$).

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