Development and Psychometric Evaluation of a Short Measure of Personal Intelligence.

A Thesis Submitted to the Committee on Graduate Studies in Partial Fulfillment of the Requirements for the Degree of Master of Science in the Faculty of Arts and Science

Abstract

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The Multidimensional Inventory of Personal Intelligence (MIPI) was designed to measure three related dimensions of the personal intelligence (PI) construct: emotional intelligence (EI), social intelligence (SI), and motivational intelligence (MI). The MIPI has psychometric properties and a theoretical structure that improves on the shortcomings of existing trait EI measures. The aim of the first study was to create and validate a shortened form (MIPI-Short) that maintains the same factorial structure of the original MIPI. The purpose of the second study was to validate the new scale with measures of conceptually similar constructs (e.g., emotional intelligence, Alexithymia) with various measurement methodologies (self-report, observer-report, and performance-based). Results from Study 1 found that the MIPI-Short had good factorial structure in two independent samples, as well as adequate internal reliability, and good incremental validity. The results of Study 2 demonstrated that the MIPI-Short had good construct validity as it generally related as expected with measures of EI and alexithymia. The findings of both studies provide evidence for the validity of the MIPI-Short as a brief measure of Personal Intelligence. Directions for further research are emphasized, as the validation process is on-going for any assessment tool.

Key Words: Personal Intelligence, Socio-Emotional Competencies, Emotional Intelligence, Social Intelligence, Motivational Intelligence

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To my dear friend Lilly, your light will forever shine on.

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Chapter 1

Introduction to Personal Intelligence

Emotional intelligence (EI) is widely recognized as a collection of emotional and social competencies (ESCs) that are known to relate to health, happiness, and overall life satisfaction (Mayer et al., 2008). There are two models of conceptualization within the EI field, both with measurement implications. Ability EI is conceptualized as a skill or a capacity and is measured via maximal performance-based measures (e.g., Mayer, Salovey & Caruso, 2002); Trait EI is conceptualized as a set of emotion-related competencies or traits that can be measured with self- and observer-report measures (e.g., Bar-On, 1997).

Although widely used in research and testing contexts, many of the current Trait EI measures have several crucial limitations. For example, many measures of Trait EI are confounded by state-dependent mood items within their scales and subscales, confounding the measurement of Trait EI with transient mood. Another limitation is that the breadth of emotional competencies measured is relatively narrow in virtually all trait EI models. Most Trait EI measures assess the same 3 overlapping emotional competencies that were originally proposed by Salovey and Mayer in 1990: control of emotions, emotional understanding, and emotional expression. The social competencies included on most trait EI measures are of even more limited scope, focusing almost exclusively on the general construct of 'sociability' (for example the EQ-I, Bar-On, 1997, the EQ-i:2.0, Multi-Health Systems, 2011, and TEIQue, Petrides & Furnham, 2001). This problem is often made worse by blending the emotional and social items together on the same scales and subscales (Crane & Henning, 2022). The blurring of constructs creates issues with the interpretation of scores, particularly when using trait EI measures as part of intervention or skill development programming. Lastly, Trait EI measures at large do not account for

motivational factors. Regardless of how emotionally intelligent a person may be, their ability to accurately interpret emotionally charged situations can be strongly affected by their motivation (Apter, 2018). As noted by Ybarra, Kross and Sanchez-Burks (2014), "when people display low levels of emotional intelligence, the challenge for researchers is to discern whether such failures are a result of poor motivation, lack of ability, or both of these qualities (p. 99).

To address the psychometric and conceptual shortcomings of existing EI measures, Parker (2022) developed the Multidimensional Inventory of Personal Intelligence (MIPI). The MIPI measures the overarching construct of personal intelligence (PI), as well as three subdomains: emotional intelligence (EI), social intelligence (SI), and motivational intelligence (MI). The MIPI is a valid and reliable tool that may be effectively used in comprehensive testing situations (Crane & Parker, 2022), such as career or education counselling, the employment recruitment process, pre- and post-coaching assessments. With over 100 items, however, the MIPI is less suited for situations in which researchers may want to efficiently assess multiple constructs simultaneously. The use of shortened versions of tests have been increasing within the psychological field as a means of minimizing the burden on respondents (Sitarenios, 2022). Therefore, a shortened version of the MIPI has potential value as a research tool, particularly because it assesses a broad set of important constructs (e.g., PI as well as EI, SI and MI).

The purpose of this thesis was to develop and validate a short form for the MIPI (referred to in this document as the MIPI-Short) that maintains the same factorial structure as the original (a general PI dimension, with separate EI, SI and MI sub-dimensions). In Study 1, item selection, factorial validity, reliability, construct validity, and incremental validity were all examined in two large independent samples. In Study 2, the construct validity was further examined in three independent samples of young adults. The relationship between the MIPI-Short and conceptually

related constructs (e.g., trait EI, Alexithymia) with differing measurement methodologies (e.g., self-report, observer-report, and performance-based) was examined. As documented in the next 2 chapters, the data reported in both studies provide evidence for the validity of the MIPI-Short as a brief measure of the PI construct. Since validating a new assessment tool is an ongoing process, the final chapter discusses a number of directions for further research with the MIPI-Short.

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Chapter 2

Development and Initial Validation of a Short Measure of Personal Intelligence

Abstract

The Multidimensional Inventory of Personal Intelligence (MIPI) was designed to measure three related dimensions of personal intelligence (PI): emotional intelligence (EI), social intelligence (SI), and motivational intelligence (MI). The MIPI has psychometric properties and a theoretical structure that improves on the shortcomings of existing trait EI measures. The aim of this study was to create a short form that maintains the same factorial structure of the original MIPI. Two adult samples were used: 1, a derivation sample (N = 846) for item selection and factor structure development; and 2. a second sample (N = 1100) for testing the replicability of the derived factorial structure. Subsets of the samples were then used to assess the new scale's (MIPI-Short) construct and incremental validity with alexithymia and the five-factor model of personality. The 27-item MIPI-Short demonstrated good factorial structure in both samples and its fit was invariant across gender. All dimensions had good internal reliability. Additionally, the MIPI-Short scales accounted for a considerable amount of the variability in alexithymia scores, above and beyond that accounted for by basic personality. Overall, the MIPI-Short provides a multidimensional approach to measuring the three related factors of personal intelligence.

Collectively known as emotional intelligence, emotional and social competencies (ESCs) such as the ability to identify, understand, express, and regulate emotions are increasingly recognized as an important aspect of positive lifespan development (Mayer, Roberts & Barsade, 2008). In the scientific literature, EI is commonly associated with various health and wellbeing outcomes, including sleep, physical activity, diet, and social support (Sarrionandia, & Mikolajczak, 2020). EI has also been found to predict academic success in various environments (MacCann et al., 2020), as well as job performance (Grobelny et al., 2021), exercise and sports performance (Laborde et al., 2016), and romantic relationship satisfaction (Malouff et al., 2014). EI is also relevant in clinical psychology, particularly with its association to successful outcomes in psychotherapy (Parker, 2005). Thus, EI is recognized as an important construct in relation to health, happiness, and overall life satisfaction (Mayer et al., 2008).

The development of multidimensional EI models began with the work of Salovey and Mayer (1990), who emphasized the importance of recognizing emotional and social behaviour as different forms of intelligences. Salovey and Mayer's seminal paper in 1990 was highly influential within the field, however, it also sparked a debate in the area regarding how best to conceptualize and measure the EI construct (Roberts et al., 2007). Very quickly two main schools of thought emerged: those who suggest that EI should be conceptualized as an ability and measured via maximal performance-based measures (e.g., Mayer, Salovey & Caruso, 2002), and those who argue that EI can also be viewed as a set of emotion-related competencies or traits that can be measured via self- and observer-report measures (e.g., Bar-On, 1997). To better capture these differences in the conceptualization and measurement of EI, Petrides and Furnham (2001) proposed a distinction between "ability EI" and "trait EI", with the former performance-based approach labelled ability EI and the latter approach labelled trait EI.

With respect to the measurement of trait EI, a large number of tools have been developed. While most instruments are research forms (e.g., Schutte et al., 1998), a sizeable number have been developed for commercial purposes: the EQ-i (Bar-On, 1997), the EQ-i:2.0 (Multi-Health Systems, 2011), the Emotional and Social Competency Inventory (ESCI; Boyatzis & Goleman, 2007) and the TEIQue (Petrides, 2009). As outlined in the following section, whether these tools are available for purchase or can be accessed from the journal literature as research instruments, existing trait EI measures possess at least four serious flaws (Crane & Henning, 2022; Parker, 2022b): mood contamination of key trait EI scales and subscales, the blurring of the boundaries between emotional and social competencies, a general narrowness in the range of emotional and social competencies being assessed, and a lack of attention to motivational considerations.

Mood Contamination

A considerable problem with most trait EI measures is the way that mood or negative affectivity constructs are utilized (Parker, 2022b). Widely used measures, like the EQ-i (Bar-On, 1997), the EQ-i:2.0 (Multi-Health Systems, 2011), the ESCI (Boyatzis & Goleman, 2007), and the TEIQue (Petrides & Furnham, 2001) include optimism and happiness items as part of various trait EI scales and subscales. By including state-dependent mood items as part of trait EI measures, these test developers have confounded the measurement of the trait EI construct with transient (state) mood. It is worth noting that in the alexithymia literature (a construct with close connections to EI; Bagby et al., 2020), alexithymia researchers typically control for negative mood state when exploring links between alexithymia and outcome measures connected to health and wellness (Lumley, Neely & Burger, 2007)—variables likely to be related with current mood state (Sarrionandia & Mikolajczak, 2020).

Blurring the Boundaries for Emotional and Social Competencies

Additionally, the EI construct historically emerged as a component of Thorndike's broader social intelligence construct (Salovey & Mayer, 1990). Since EI involves the recognition and understanding of other people's emotions, social awareness and functioning are key parts of being emotionally intelligent. Not surprisingly, virtually all trait EI measures include social competency dimensions. While some trait EI measures include social components as distinct dimensions of the EI construct (e.g., ESCI; Boyatzis & Goleman, 2007), most other tools blend emotional and social items together on the same subscales and scales. The original EQ-i (Bar-On, 1997), for example, included social dimensions such as "assertiveness" and "independence" on the same scales as emotional dimensions such as "emotional self-awareness" and "self-actualization". This type of coagulation leads to interpretive problems when trying to predict or account for various outcomes. When emotional and social items are included in the same scale or subscale, we are unable to determine if a moderate score indicates moderate levels of both emotional and social competencies, or the result of a blend of opposing extreme scores.

Narrowness of Emotional and Social Competencies

Another limitation with widely used trait EI measures is that they assess a fairly narrow band of emotional and social competencies (Crane & Henning, 2022). With respect to emotional competencies assessed on the EQ-I, EQ-i:2.0, ESCI, and the TEIQue, once the mood-related scales and sociability scales (or cognitive related dimensions like "decision making") are removed, the set of emotion-related competencies is actually quite limited. Most trait EI assessment tools essentially tap 3 overlapping emotional competencies: control of emotions, emotional understanding, and emotional expression. These are essentially the same set of emotional competencies that were identified by Salovey and Mayer in the 1990 paper that launched the EI subfield in psychology. As noted by Parker (2022b), this is an unfortunate state

of affairs for trait EI measurement, "while the last 30 years has seen an expansion of work on various emotion-related constructs in psychology and many allied fields (e.g., affect regulation, alexithymia, interceptive awareness, mindfulness, etc.), time seems to have stopped at 1990 for many people in the EI subfield" (p. 5).

There is even more narrowness in the social competencies that appear on widely used trait EI measures like the EQ-i, EQ-i:2.0, ESCI, and the TEIQue. This is particularly apparent when one considers the broad range of dimensions that have been connected to the social intelligence construct (Kihlstrom & Cantor, 2011). Kosmitzki and John (1993), for example, identified 7 distinct competencies that have been linked with the social intelligence construct: perspective taking, understanding people, knowing social rules, openness to others, dealing with people, social adaptability, and interpersonal warmth. Even a narrower model proposed by Rahim (2014) offers far more diversity in social competencies than those that appear on widely used trait EI measures: "[the] ability to be aware of relevant social situational contexts; to deal with situational contexts or challenges effectively; to understand others' concerns, feelings and emotional states; and to build and maintain positive relationships and to behave appropriately in social relations" (p. 44). With trait EI measures like the EQi, EQi2.0 and the TEIQue, "sociability" is really the only social competency construct being assessed.

EI and Motivation

As noted by Apter (2018), an important limitation with existing EI measures (both ability and trait), is their overall lack of attention to motivation. A person may be emotionally and socially intelligent, however, their ability to accurately interpret emotionally charged situations is also affected by their motivation (Crane & Henning, 2022). To accurately predict future emotional and social outcomes, an assessment tool must also capture the motivational context.

Evidence of poor emotional and/or social competency may be the result of deficits in these abilities or, alternatively, the result of an individual with appropriate competencies but with a lack of ability to motivation themselves to use these competencies. While a great variety of motivational traits have been proposed (see Dweck & Leggett, 1988; Kanfer & Heggestad, 1997 for some of the taxonomies that have been proposed), a subset would appear to have a critical connection to emotional and social competencies. Perseverance (or the related constructs of grit and persistence), for example, is a motivational trait related to the mental capacity to direct and sustain the pursuit of long-term goals (Duckworth et al., 2007). Since pursuing long-term goals involves responding to ongoing situational factors, it also means overcoming perceived adversity and failures—tasks made more difficult with poor emotional and social competencies.

Moving Beyond Current Models of Trait EI

In an effort to help address some of the conceptual shortcomings of existing trait EI constructs, Parker (2022) proposed a more expanded model of emotional and social competencies: Personal Intelligence (PI). PI is conceptualized as a personality trait consisting of three sets of inter-related non-cognitive competencies: emotional intelligence (EI), social intelligence (SI), and motivational intelligence (MI). Overall, PI involves competencies related to understanding oneself and others, relating to friends, co-workers and family members, and successfully adapting to changing environmental concerns and demands. Along with broadening the range of emotional competencies connected to EI (drawing specifically on dimensions from the alexithymia area missing from most EI measures), the PI model also explicitly differentiates emotional competencies from social competencies.

With respect to SI-related competencies, the PI model explicitly identifies several competencies that are highly interdependent with trait EI. Sociability is an SI dimension

routinely linked with EI and is included. But the PI model also draws on insights from the clinical and personality literature supporting several competencies connected to being comfortable around people, particularly when in social evaluation situations, or where expectations are ambiguous or uncertain (e.g., being with strangers or being in new situations). In addition, the PI model recognizes the need to account for core motivational competencies connected to emotional and social behavior (Apter, 2018). As with SI, there are many potential motivational competencies to consider (e.g., Dweck & Leggett, 1988; Kanfer & Heggestad, 1997). The current PI model includes several motivational competencies that are critical and complementary with emotional and social competencies.

Synthesizing work over almost two decades, Parker (2022a) developed the Multidimensional Inventory of Personal Intelligence (MIPI) to assess the various constructs that are part of the PI model. The dimensions for the MIPI's EI scales were drawn from the literature on emotional intelligence, alexithymia, and other emotional constructs; the EI total scale (26 items) includes four subscales: "attentiveness", "introspectiveness", "emotional understanding", and "emotional communication". The MIPI's SI scales drew on the vast clinical literature on social anxiety, loneliness, and performance anxiety; the SI total scale (24 items) includes three subscales: "performance readiness", "social integration", and "social agency". Meanwhile, the MIPI's MI scales drew on the work of Parker, Apter, and colleagues (Apter et al, 2017; Dave et al., 2019; Duckworth et al., 2007; Kanfer & Heggestad, 1997); the total MI scale (29 items) includes three subscales: "motivational self-efficacy", "perseverance", and "motivational influence". The total EI, SI, and MI scales are also summed to produce a total PI score. The MIPI uses a standard 5-point Likert format in which test-takers rate each question with respect to their own experience. Based on a series of CFAs with various community-based adult samples, the EI items were

found to have excellent fit to the 4-factor model, the SI items had excellent fit to the 3-factor model, and the MI items had excellent fit to the 3-factor model. In a separate 2nd-order CFA, the EI, SI and MI scales were found to have excellent fit to the higher-order PI model (Parker, 2022).

The validity of the MIPI was explored extensively during the scale's development (Parker, 2022a; Crane & Henning, 2022). To examine relationships between the MIPI and trait EI, a sample of undergraduate students completed the MIPI and the EQ-i:Short (Bar-On, 2002). A standard multiple regression was performed to determine the relative contribution of the 10 MIPI subscales to the prediction of total EI on the EQ-i:Short. As expected, the EI, SI and MI subscales were very strong predictors of the total scale for the EQ-i:Short ($R^2 = .69$). To examine the relationship between the MIPI and alexithymia, another group of undergraduate students completed the MIPI and the 20-item Toronto Alexithymia Scale (TAS-20; Bagby et al., 1994). Because there are 4 similarly worded items on both scales, the relevant MIPI subscales and scales were scored with these items removed. A standard multiple regression was performed to determine the relative contribution of the 10 MIPI subscales to the prediction of total alexithymia. Consistent with the results using the EQi:Short, MIPI subscales were very strong predictors of total alexithymia ($R^2 = .81$).

Present Study

Based on these findings, the MIPI appears to be a reliable and valid tool that measures a broad range of emotional, social, and motivational competencies. Nonetheless, at 100+ items the measure may be useful in comprehensive testing situations (Crane & Parker, 2022; e.g., career or education counselling, employment recruitment process, pre- and post-coaching assessments), but less helpful for researchers interested in including EI-related measures as part of a broad set of study variables. As noted by Kruyen et al. (2013), the use of shortened versions of existing

tests appears to be increasing in the psychological literature, presumably so that multiple

constructs can be efficiently assessed while minimizing the burden on research participants. Not

surprisingly, short forms have been developed for a number of widely used trait EI measures

(e.g., EQi:Short, Bar-On, 2002; TEIQue-Short Form, Petrides & Furnham, 2006). The goal of

the present study was therefore to develop a reliable and valid short form of the MIPI: including

separate EI, SI and MI subscales, as well as an overall PI scale.

Methods

Participants and Procedures

Participants were post-secondary students attending a number of institutions in Canada

and the United States. Recruitment of participants was done through use of various forms of

advertisement (e.g., printed posters, social media, flyers, email requests).

Sample 1

The first sample consisted of 846 participants (68.48% females, 29.6% males, and 2.04%

other) from various post-secondary institutions in Canada and the United States. The age of

participants ranged from 17 to 80, with a mean age of 28.67 (SD = 11.90). Sixty-five percent of

participants identified themselves as White, 18% as Asian, 7% as Black, 3% as Hispanic, 1% as

Aboriginal, 5% as Other, and 1% preferred not to identify their race.

All participants completed the MIPI, however a subset of 512 participants (all from the

same post-secondary institution [76.4% females, 22.1% males, 0.8% other]), also completed

measures of alexithymia and the five-factor model of personality.

Sample 2

The second sample consisted of 1100 participants (82.7% females, 15.9% males, and

1.2% other) who were from a university in central Ontario, Canada. The age of participants

ranged from 18 to 53 years old, with a mean age of 20.9 years (SD = 5.19). Sixty-six percent of

participants identified themselves as White, 12% as Asian, 9% as Black, 2% as Hispanic, 2% as Aboriginal, and 9% as Other/chose to not indicate their race.

Measures

Personal Intelligence

The Multidimensional Inventory of Personal Intelligence (MIPI; Parker, 2022) is a self-report measure of PI and relevant components: EI (4 subscales), SI (3 subscales), and MI (3 subscales). For all items on the MIPI participants are asked to identify on a scale of 1-5, the level to which they agreed with each statement (1 = low agreement, 5 = high agreement). Overall, the MIPI meets the generally accepted level of internal consistency for measures that use Likert scales, with Cronbach's alpha levels of .70 and above for all of the scales, for all gender and age groups. The MIPI also demonstrates acceptable test-retest reliability over 4- and 8-months. Validity was heavily assessed throughout the MIPI's development, and was shown to have sufficient construct, incremental, and predictive validity (Parker, 2022).

Alexithymia

The Toronto Alexithymia Scale (TAS-20; Bagby et al., 1994) is a brief self-report measure of alexithymia, and its three sub-components: difficulty identifying feelings, difficulty describing feelings, and externally-oriented thinking. The 20-item measure asks participants to answer 5-point Likert scales that range from 1 (strongly disagree) to 5 (strongly agree). The TAS-20 is highly reliable and valid, with good internal consistency and test-retest reliability, and high levels of convergent and concurrent validity (Bagby et al., 2020).

Personality

A brief measure of the 5-factor model of personality was used (Mini-IPIP; Donnellan et al., 2006). The 20-item Mini-IPIP has separate scales for neuroticism, extraversion,

agreeableness, conscientiousness, and openness. All items are measured on a 5-point Likert scale ranging from 1 (very inaccurate) to 5 (very accurate). The Mini-IPIP demonstrates acceptable reliability as well as various forms of validity, including convergent, criterion-related, and discriminant validity (Donnellan et al., 2006).

Statistical Procedures

All analyses were conducted in JASP version 0.17.3 (JASP Team, 2023). Sample 1 was used as the derivation sample for item selection and factor structure development for the short form, while sample 2 was used to replicate the factorial structure derived using Sample 1.

Item Selection

Exploratory bifactor analysis (Chen et al., 2012) was used to identify a subset of items from the MIPI to be included on the short form. For assessment tools with hierarchal structures (general factors with facets for specific constructs), exploratory bifactor analysis (EBFA) is a useful approach. EBFA models (Reise, 2012; Reise et al., 2013) separate the variance for each item into 3 parts: 1. variance related to the general factor, 2. variance related to the facet, and 3. residual variance. For each subscale (E, S and M), the goal was to identify approximately 9 items that loaded most highly with the general factor. The target of 9 items was selected as it appeared to balance the need for a sufficient number of items for acceptable internal reliability with item content coverage representative of the breadth of the constructs being measured (Sitarenios, 2022).

To identify a subset of EI items from the MIPI, the analyses extracted 5 factors (from the pool of 34 items): a general EI factor and one factor for each of the EI facets (emotional understanding, introspectiveness, attentiveness and emotional communication). All items were allowed to load on the common factor, with a second loading on their specific facet factor.

Cross-loadings of items on the other facet factors were specified to be zero, as well as relationships among factors. The 9 items loading highest on the general factor were retained for the short form (1 to 3 items from each of the 4 EI subscales).

The same method was used to identify subsets of SI items (from a pool of 24 items), and MI items (from a pool of 29 items) from the MIPI. Four factors were extracted for SI: a general SI factor, social integration, performance readiness, and social agency. The 9 items loading highest on the general factor were retained for the short form (3 items from each of the SI subscales). Four factors were extracted for MI: a general MI factor, motivational self-efficacy, motivational influence, and perseverance. The 9 items loading highest on the general factor were retained for the short form (2 to 4 items from each of the MI subscales).

Testing the Factorial Structure

For the purposes of assessing the factorial structure of the 27-items selected for the short form, Diagonally Weighted Least Squares (DWLS) was used as the estimation method for all confirmatory factor analyses. To assess goodness of model fit, we used the following robust indices: The model chi-square test statistic ($\chi 2$), the Comparative Fit Index (CFI), the Tucker–Lewis Index (TLI), the root mean square error of approximation (RMSEA) with a 90% confidence interval (CI), and the standardized root mean square residual (RSMR). The following common cut-off values were considered: CFI and TLI values $\geq .90$, and RMSEA and RSMR values $\leq .08$ were suggestive of acceptable model fit, and CFI and TLI values $\geq .95$, and RMSEA and RSMR values $\leq .05$ were suggestive of good model fit (Marsh, Hau & Wen, 2004).

Reliability and Measurement Invariance across Gender

For the purposes of assessing the reliability and measurement invariance of the new scales for the MIPI short form, both samples were combined to create as large of a sample as

possible (N = 1936). We tested the measurement invariance of the 3-factor structure with respect to gender (males and females) within a multiple-group CFA framework by fitting the same model for the two samples simultaneously and imposing increasingly restrictive cross-group equality constraints on its parameters. We began with a baseline model with no equality constraints (configural invariance), then conducted a test of invariant factor loadings (metric invariance), a test of invariant factor covariances (structural invariance), then a test of invariant intercepts (scalar invariance). Invariance was assumed to hold if these constrained models fit the data well and if there was minimal difference in their fit from that of the baseline model (Chen, 2007; Wang & Wang, 2012). Because of the excessive Type I error rates associated with the chi-square difference test in large samples, we adapted a procedure recommended by Vandenberg and Lance (2000) and evaluated the relative fit of constrained models using change in CFI, RMSEA and RSMR values, with minor differences of ≤ .02 indicating equivalent fit.

Results

Factorial Validity

Confirmatory factor analysis (CFA) was performed with the items selected for the 3 PI subscales (EI, SI, MI) in Sample 1 to determine the factor structure from the derivation sample. The 3-factor model for the MIPI items demonstrated acceptable fit on the selected indices: CFI = .954, TLI = .950, RMSR = .073, and RMSEA = .066, 90% CI = [.063, .070]. The item-to-factor standardized parameter estimates for the sample are displayed in Table 1 (and all were significant, $p < .05$). The parameter estimates among latent variables were .657 ($p < .05$) between EI and SI, .828 ($p < .05$) between EI and MI, and .751 ($p < .05$) between SI and MI.

An identical CFA was performed with Sample 2 to replicate the findings from the derivation sample. The 3-factor model for the MIPI items demonstrated acceptable fit in the replication sample: CFI = .923, TLI = .915, RSMR = .079, and RMSEA = .075, 90% CI = [.072,

.078]. The item-to-factor standardized parameter estimates are displayed in Table 1. All item-to-factor parameter estimates were significant ($p < .05$). The inter-factor parameter estimates were .580 ($p < .05$) between EI and SI, .757 ($p < .05$) between EI and MI, and .704 ($p < .05$) between SI and MI.

Measurement Invariance

For the multiple-group CFAs, the configural invariance model demonstrated adequate fit to the data (CFI = .942, TLI = .936, RSMR = .074, RMSEA = .071 and 90% CI = [.069, .073], indicating that the item composition of the 3-factor factor model was reasonably equivalent for men and women. The metric invariance model was comparably well fitting (CFI = .939, TLI = .935, RSMR = .076, RMSEA = .071 and 90% CI = [.069, .074], indicating that the MIPI-Short items did not function differentially for the two groups (change in RSMR was .02 and in RMSEA was .00). The structural invariance model also fit the data comparably well (CFI = .938, TLI = .937, RSMR = .076, RMSEA = .071 90% CI = [.069, .073], indicating that there were limited group differences in either the nature of the latent dimensions or the degree of overlap among them (change in RSMR was .00 and in RMSEA was also .00).

Reliability and gender differences for the MIPI-Short scales

Table 2. presents the means, standard deviations, Pearson's product moment correlations, Cronbach's alphas and mean inter-item correlations for each of the MIPI short scales (by gender). All Cronbach's alphas met the criteria for acceptable internal reliability (>.70), with most in the good (>.80) to excellent (>.90) range (Cronbach, 1951).

To assess gender differences across the MIPI scales, a series of one-way ANCOVAs were conducted to determine if men and women differed in MIPI scale scores while controlling for age. ANCOVAs were used since men were significantly older than women in the sample

(men M = 26.7 years, SD = 10.91; women M = 23.5 years, SD = 9.04). For the EI scale there was a significant effect of age on EI, $F(1,1877) = 243.38$, $p <.001$, $\eta^2 = .114$, however not for gender after controlling for age. For the SI scale, there was a significant effect of age, $F(1,1877) = 137.10$, $p <.001$, $\eta^2 = .067$, and for gender after controlling for age, $F(1,1877) = 11.57$, $p = <.001$, $\eta^2 = .006$, with men scoring higher than women. For the MI scale, there was a significant effect of age, $F(1,1877) = 165.24$, $p <.001$, $\eta^2 = .079$, and for gender after controlling for age, $F(1,1877) = 18.41$, $p = <.001$, $\eta^2 = .009$, with men scoring higher than women. For the PI scale, there was a significant effect of age, $F(1,1877) = 254.66$, $p <.001$, $\eta^2 = .118$, and for gender after controlling for age, $F(1,1877) = 11.37$, $p = <.001$, $\eta^2 = .005$, with men scoring higher than women.

Preliminary Construct Validity

Table 3 presents the correlations for the MIPI-Short scales (excluding the 4 items that are on both the MIPI short and the TAS-20), TAS-20 scales, and the five mini-IPIP scales, separately by gender. As expected, most of the MIPI scales correlated negatively with the TAS-20 scales and correlated positively with the five mini-IPIP scales. To test the incremental validity of the MIPI-Short scales, a hierarchical regression was conducted with total TAS-20 scores as the dependent variable (run separately by gender). The 5 personality scales were entered in Step 1, and the EI, SE and MI scales were entered at Step 2. The results of these regression analyses are presented in Table 4.

The hierarchical multiple regression for total TAS-20 scores in women was found to be significant at step 1, with neuroticism, agreeableness, conscientiousness, and openness contributing significantly to the regression model, $F(5, 386) = 20.99$, $p < .001$, and accounting for 21% of the variability in total TAS-20 scores. Extraversion did not significantly add to the

model. At step 2, a significant regression equation was found, $F(8, 386) = 47.75$, $p < .001$, and accounted for an additional 28.5% of the variability. When all 8 independent variables were included in step 2, neither social intelligence, extraversion, nor openness were significant predictors. EI and MI explained the most variability in total TAS-20 scores, followed by the three significant personality factors.

The hierarchical multiple regression for total TAS-20 scores in men was found to be significant at step 1, with neuroticism, agreeableness, conscientiousness, and openness contributing significantly to the regression model, $F(5, 107) = 12.56$, $p < .001$, and accounting for 34% of the variability in total TAS-20 scores. Extraversion did not significantly add to the model. At step 2, a significant regression equation was found, $F(8, 104) = 24.65$, $p < .001$, and accounted for an additional 29% of the variability. When all 8 independent variables were included in step 2, only EI and openness were significant predictors of total TAS-20 scores.

Discussion

The main goal of the present study was to create and examine the psychometric properties of a short version of the MIPI. The findings indicate that the 27-item short form has a factor structure consistent with the long form: with separate EI, SI, and MI dimensions that load onto a general PI factor. The factor structure for the short form was also found to be replicable in an independent sample. Measurement invariance of the MIPI-Short demonstrated that the model held well for both men and women, indicating that the MIPI-Short adequately measures its intended constructs across both men and women.

Internal reliability of the measure was assessed with Cronbach's alphas, all of which were above .70, indicating at least adequate internal reliability. For men, mean inter-item correlations among the 3 MIPI scales and total PI were found to range from .28 to .37. Mean inter-item

correlations ranged from .27 to .37 for women, as well as for the total sample. Thus, indicating that the scales are measuring intercorrelated factors.

The men in our sample were older than the women. Since EI is known to increase with age (Pérez-Díaz et al., 2021), we controlled for age while assessing gender differences across the MIPI short scales. Several gender differences were observed, with men scoring higher than women on the SI, MI, and PI scales. However, the effect sizes for these analyses were very small in magnitude, suggesting that these gender differences were quite marginal.

Overall, the MIPI short and alexithymia scales correlated significantly and negatively with each other. Most notably, the SI scale on the MIPI-Short did not significantly correlate with all TAS-20 scales, apart from the difficulty identifying feelings scale in men. Nevertheless, the EI scale strongly correlated (negatively) with all TAS-20 scales for men. This finding was in line with our expectations, since the EI scale for the MIPI was designed to be closely related to the alexithymia construct. This finding also supports that the MIPI-Short effectively separates the emotional competencies from the social competencies, a noted limitation of many EI measures. For women, the SI scale on the MIPI-Short did not significantly correlate with the difficulty describing feelings scale on the TAS-20. All other correlations for women were significant and modest in size, indicating these two measures are measuring related constructs. Although not all scales correlated significantly, the pattern of significance, size, and direction demonstrates a robust relationship between these two conceptually similar constructs.

A main critique of many EI measures is that they are too closely related to personality measures (e.g., Davies et al.,1998). Nevertheless, Trait EI assessment tools are expected to share some degree of variance with higher-order dimensions of basic personality (Bar-On, 2000; Petrides & Furnham, 2001). The MIPI-Short was found to correlate modestly with the Big Five

personality dimensions, consistent with Trait EI's conceptualization of EI (and by extension PI) as belonging to the domain of personality (Bar-On, 2000). However, the strength of associations between the MIPI and the Big Five was relatively modest when compared to the association between the MIPI and alexithymia, with the exception of the relationship between the SI scale and extraversion. This finding is unsurprising given that the SI scale measures the degree to which one feels comfortable with various forms of social interactions within various social contexts, while extraversion measures how outgoing one is. Apart from these two scales, the correlations between the MIPI scales and the Big Five provide important construct validity evidence by supporting the notion that the two models are measuring two distinct constructs, with an appropriate amount of overlap.

The examination of the relationship between the three related constructs of alexithymia, personal intelligence, and the five-factor model of personality lends further construct validity evidence by indicating that personal intelligence (as measure by the MIPI-Short) is able to predict a well-established construct in the ESC field. Scores on the MIPI-Short contributed non-trivial amounts of variance (>10%) to the prediction of alexithymia over and above the variance accounted for by the Big-Five dimensions of personality. Thus, the MIPI-Short demonstrates good incremental validity. The E scale, in particular, accounted for the most variability in the model, indicating that the MIPI adequately encompasses a range of emotional competencies, a major limitation of many widely EI measures.

Strengths, Limitations, and Future Directions

Overall, the MIPI-Short is a brief and useful measure of various ESCs that was derived from a longer scale developed to overcome a number of shortcomings in the Trait EI area: mood contamination, the amalgamation of emotional and social competencies, the narrowness of

measured competencies, and a lack of attention to motivation. Although the psychometric properties of the MIPI-Short were addressed in this paper, the present findings are only preliminary evidence and, as such, they bear various limitations that warrant further exploration. Firstly, participants in this study were primarily young adults, and further examinations should consider the use of a wider age range to determine measurement invariance by age (e.g., transition to adulthood vs. middle age). Secondly, further reliability testing should include test-retest reliability. Although, the original MIPI demonstrated moderate test-retest reliabilities with both 4- and 8-month test-retest correlations. Thirdly, as the MIPI-Short was extracted and validated using samples that had completed the original MIPI, not the MIPI-Short as a stand-alone measure, further validation of the factorial validity, reliability, and construct validity should be re-assessed using samples that completed the short form as a self-standing measure.

Finally, future studies should assess the MIPI-Short's construct validity with other highly related constructs, specifically with EI measures and other conceptually similar constructs (e.g., Trait EI, social anxiety, etc.) and further examine its predictive validity with known correlates of EI measures (e.g., health and wellness, job performance, relationship satisfaction, etc.). One should also consider examining the relationship between the MIPI-Short and measures that deviate from self-report, including observer-report and performance-based assessments of related constructs.

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Table 1. *Item to factor parameter estimates from a confirmatory factor analysis (3-factor model) of the items on the MIPI Short.*

Items	Sample 1 Parameter Estimate	Sample 2 Parameter Estimate
Emotional Intelligence		
1. Trouble finishing tasks.	.687	.629
4. Others believe in touch with feelings.	.344	.338
7. Problems organizing tasks.	.679	.619
10. Difficult to express feelings when writing.	.736	.775
13. Have trouble describing what I feel.	.896	.851
16. Difficult to reveal innermost feelings.	.815	.821
19. Difficult to find the right words.	.948	.861
22. Don't know if I am sad, frightened or angry.	.785	.804
25. Feelings I can't quite identify.	.893	.841
Social Intelligence		
2. Worry might attract the attention of other people.	.711	.765
5. At ease meeting people.	.889	.801
8. Tense mixing in a group.	.992	.979
11. Feel uncomfortable in a line.	.724	.831
14. I feel in tune.	.562	.493
17. Outgoing person.	.696	.728
20. Have a lot in common with the people.	.452	.413
23. Nervous mixing with people.	.985	.842
26. Worry others might see me be sick or ill.	.639	.673
Motivational Intelligence		
3. People ignore what I ask.	.599	.585
6. People do not listen to me.	.614	.621
9. I throw myself into things.	.518	.375
12. Cannot stick to same goal.	.681	.656
15. I never know what I want next.	.769	.710
18. No one pays attention to me in.	.745	.777
21. I am very determined.	.425	.385
24. Never want the same thing for long.	.627	.570
27. I "give it all I've got".	.417	.300

Note. Sample 1 (N = 846); Sample 2 (N = 1100); All estimates significant $p < .05$

Table 2. *Means, standard deviations, Pearson's product moment correlations, Cronbach's alphas, and mean-inter correlations (MIIC) for the MIPI scales, separately by gender.*

Scale	Gender	M	SD	Alpha	MIIC	MIPI-E	MIPI-S	MIPI-M
MIPI-EI	Men	3.38	.83	.84	.37	-		
	Women	3.25	.82	.83	.36	-		
	Total	3.52	.82	.83	.35	-		
MIPI-SI	Men	3.41	.78	.83	.36	.51*	-	
	Women	3.19	.79	.83	.36	.54*	-	
	Total	3.22	.80	.84	.36	.54*	-	
MIPI-MI	Men	3.74	.66	.80	.32	.68*	.60*	-
	Women	3.52	.66	.80	.32	.66*	.61*	-
	Total	3.57	.66	.81	.32	.67*	.61*	-
MIPI-PI	Men	3.51	.65	.91	.28	.86*	.83*	.87*
	Women	3.32	.65	.91	.28	.87*	.84*	.86*
	Total	3.35	65	.91	.28	.87*	.84*	.87*

Note. N_{men} = 422; N_{women} = 1480; N_{total} = 1936; *p < .05; MIPI-EI = emotional intelligence, MIPI-SI = social intelligence, MIPI-MI = motivational intelligence, MIPI-PI = personal intelligence.

Table 3. *Pearson's product moment correlations of MIPI Short, TAS-20 and Mini-IPIP scale, separately by gender.*

Scale	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. MIPI-EI	-	.37*	.59*	.82*	-.52*	-.59*	-.35*	-.63*	.26*	.16*	.26*	.47*	.18*
2. MIPI-SI	.25*	-	.53*	.78*	-.35*	-.36*	-.07	-.34*	.29*	.72*	.23*	.15*	.07
3. MIPI-MI	.47*	.60*	-	.85*	-.47*	-.43*	-.38*	-.55*	.26*	.34*	.31*	.36*	.16*
4. MIPI-PI	.76*	.77*	.84*	-	-.54*	-.57*	-.32*	-.63*	.33*	.50*	.32*	.40*	.16*
5. TAS-20: DIF	-.54*	-.22*	-.42*	-.51*	-	.55*	.25*	.81*	-.39*	-.12*	-.09	-.23*	-.01
6. TAS-20: DDF	-.66*	-.16	-.28*	-.49*	.44*	-	.40*	.83*	-.21*	-.25*	-.26*	-.09	-.12*
7. TAS-20: EOT	-.47*	.07	-.17	-.26*	.26*	.37*	-	.67*	.03	-.04	-.40*	-.05	-.36*
8. TAS-20	-.74*	-.14	-.38*	-.55*	.76*	.79*	.72*	-	-.26	-.18*	-.31*	-.17*	-.19*
9. N	.19*	.51*	.41*	.46*	-.25*	-.11	.04	-.14	-	.12*	-.11*	.18*	.06
10. E	.08	.69*	.40*	.48*	-.07	-.24*	.06	-.11	.34*	-	.27*	.00	.10*
11. A	.44*	.10	.24*	.34*	-.22*	-.38*	-.50*	-.48*	-.07	.22*	-	.03	.19*
12. C	.47*	.25*	.46*	.50*	-.25*	-.27*	-.21*	-.32*	.22*	.12	.26*	-	.01
13. O	.12	-.09	-.02	.01	-.13	-.20*	-.54*	-.38*	-.08	.05	.29*	.02	-

Note. Males (N = 113) below the diagonal; females (N = 395); *p < .05. MIPI-EI = emotional intelligence, MIPI-SI = social intelligence, MIPI-MI = motivational intelligence, MIPI-PI = personal intelligence, TAS-20: DIF = difficulty identifying feelings, TAS-20: DDF = difficulty describing feelings, TAS-20: EOT = externally oriented thinking, N = neuroticism, E = extraversion, A = agreeableness, C = conscientiousness, and O = openness.

Table 4. *Results of hierarchical multiple regressions with MIPI-Short and Mini-IPIP scales predicting total TAS-20 scores.*

Independent Variables	Men		Women	
	B	SPC	B	SPC
Step 1				
N	-.17*	-.16*	-.26*	-.25*
E	.07	.06	.06	-.05
A	-.38*	-.34*	-.30*	-.28*
C	-.19*	-.18*	-.12*	-.11*
O	-.29*	-.28*	-.11*	-.11*
R	.61		.46	
Adjusted R^2	.34		.20	
F (df)	12.56 (5,107)		20.99 (5,389)	
Step 2				
N	-.07	-.06	-.11*	-.10*
E	-.03	-.02	.06	.04
A	-.12	-.09	-.12*	-.10*
C	.06	.05	.18*	.16*
O	-.27*	-.26*	-.04	-.04
MIPI-EI	-.64*	-.49*	-.50*	-.36*
MIPI-SI	.12	.07	-.03	-.02
MIPI-MI	-.13	-.08	-.26*	-.18*
R	.81		.71	
Adjusted R^2	.63		.49	
F (df)	24.65 (8,104)		47.75 (8,386)	

Note. B = standardized betas; SPC = semi-partial correlations; df = degrees of freedom; *p < .05; N = neuroticism, E = extraversion, A = agreeableness, C = conscientiousness, and O = openness, MIPI-EI = emotional intelligence, MIPI-SI = social intelligence, and MIPI-MI = motivational intelligence.

Chapter 3

Validating a Short Measure of Personal Intelligence:

A Multimethod Assessment Approach

Abstract

The purpose of this study was to validate a brief measure of Personal Intelligence (PI): the Multidimensional Inventory of Personal Intelligence (MIPI-Short; Chapter 2). PI is a broad personality trait consisting of separate dimensions of emotional intelligence (EI), social intelligence (SI), and motivational intelligence (MI). Using data from three independent samples, we assessed the construct validity of the MIPI-Short with measures of conceptually similar constructs (e.g., emotional intelligence, alexithymia) using a multimethod assessment approach (i.e., self-report, observer, and performance measures). The first sample, consisting of 257 undergraduate students, examined relationships between the MIPI-Short and widely used measure of Trait emotional intelligence. The second sample, consisting of 241 emerging adults, examined relationships between the MIPI-Short and a performance-based measure of emotional and social competencies. The last sample assessed the relationship between the MIPI-Short and an observer-report measure of alexithymia in a sample of 49 couples. The MIPI-Short was found to account for 42% of the variability in total Trait EI measure. High scorers on the performance-based measure were found to have significantly higher scores on all MIPI-Short scales, and the pattern of relationships between PI and alexithymia matched prior work using only self-report measures for both constructs. Although the findings provide good support for the validity of the MIPI-Short, directions for further research are emphasized.

Over the past several decades, many measures of Emotional intelligence (EI) have been developed to assess core constructs (Stough, Saklofske & Parker, 2009). An important distinction in the area is the differentiation between Ability and Trait EI (Petrides & Furnham, 2001). Ability EI is typically defined as a set of emotion-related cognitive abilities, measured through maximum performance tests (Mayer et al., 1999). Trait EI, on the other hand, is generally defined as a constellation of emotional and social competencies measured through self-report or observer-report measures (Bar-On, 2000). Although both approaches to EI assessment have produced sizeable literatures, research using Trait EI assessment tools continue to dominate the field (Keefer, Parker, & Saklofske, 2018). The dominance of the Trait EI approach is likely the result of several factors. While a broader range of Trait EI measures have been developed in the past several decades compared to ability measures, self-report and observer ratings are inherently easier to administer to respondents compared to performance-based tools. There is also some evidence to suggest that Trait EI may be a more robust correlate than Ability EI when used to predict socioemotional functioning (Martins et al., 2010).

Regardless of the reasons for their broader use, most Trait EI measures have several important limitations (for a broader discussion of these limitations, see Chapter 2; also see Crane & Henning, 2022; Parker, 2022b). Perhaps the most critical problem is the way that mood constructs are utilized. By including state-dependent mood items as part of Trait EI scales and subscales, widely used measures confound the measurement of the Trait EI construct with transient mood. Another limitation is that most Trait EI measures assess a fairly narrow set of emotional and social competencies; they basically assess the same 3 overlapping emotional competencies (control of emotions, emotional understanding, and emotional expression) first identified by Salovey and Mayer in the 1990 paper that initiated the subfield of EI (Parker,

2022b). The range of social competencies included on most Trait EI assessment tools is even more narrow, focusing almost exclusively on the general construct of "sociability" (see for example the EQ-I, Bar-On, 1997, the EQ-i:2.0, Multi-Health Systems, 2011, and TEIQue, Petrides & Furnham, 2001). To make existing Trait EI measures even more problematic, most blend emotional and social items together on the same subscales and scales (Crane & Henning, 2022). Such blurring of constructs on the same scales and subscales creates interpretive problems when trying to account for various outcomes (especially when the goal is to provide intervention or skill development). Lastly, an important limitation with existing Trait EI measures is their lack of attention to motivational factors. As noted by Apter (2018), a person may be emotionally intelligent, however, their ability to accurately interpret emotionally charged situations can be strongly affected by their motivation. As noted by Ybarra, Kross and Sanchez-Burks (2014), "when people display low levels of emotional intelligence, the challenge for researchers is to discern whether such failures are a result of poor motivation, lack of ability, or both of these qualities (p. 99).

As a means of addressing both conceptual and psychometric shortcomings with existing Trait EI measures, Parker (2022a) suggested the field adopt the broader construct of Personal Intelligence (PI): a broad trait consisting of separate dimensions of emotional intelligence (EI), social intelligence (SI), and motivational intelligence (MI). Parker (2022a) also developed the Multidimensional Inventory of Personal Intelligence (MIPI) to measure the PI construct, as well as the constructs for the EI, SI, and MI subdomains. The dimensions selected for the EI scales drew heavily on the alexithymia construct, which has considerable overlap with most EI models (Parker, Taylor & Bagby, 2001). The dimensions selected for the SI scales (and measured independently from EI) move beyond just the sociability construct to include competencies

connected to being comfortable around people, particularly when in social evaluation or ambiguous situations. In addition, the PI model recognizes the need to account for core motivational competencies connected to emotional and social behavior (Apter, 2018). While there are potential motivational competencies that could be considered (e.g., Kanfer & Heggestad, 1997), the dimensions selected for the MI scales include several motivational competencies quite complementary with emotional and social competencies.

The MIPI consists of 100+ items distributed across various scales and subscales. The instrument uses a standard 5-point Likert format in which test-takers rate each question with respect to their own experience. Based on a series of CFAs in various community-based adult samples, the EI, SI and MI items were found to have excellent fit to their multidimensional structures: the EI items have a 4-factor structure (emotional understanding, introspectiveness, attentiveness and emotional communication), while the SI items (social integration, performance readiness, and social agency) and MI items (motivational self-efficacy, motivational influence, and perseverance) have 3-factor structures. In a separate 2nd-order CFA, the EI, SI and MI scales were found to have excellent fit to a higher-order PI factor. The MIPI has good internal and test-retest reliability, and the validity of trait measure was explored extensively during the scale's development with a variety of related constructs and measures (Parker, 2022a; Crane & Henning, 2022).

More recently, a short form was developed for the MIPI (see Chapter 2). As with assessment tools for many constructs in psychology (Sitarenios, 2022), short forms are common in the Trait EI area, (e.g., EQi:Short, Bar-On, 2002; TEIQue-Short Form, Petrides & Furnham, 2006). The MIPI-Short is a 27-item measure with separate EI, SI and MI subscales, as well as an overall PI score. The factor structure for the MIPI-Short was found to be replicable in two

independent samples and the factor structure was found to be invariant across gender. The various scales on the MIPI-Short also demonstrated good internal reliability.

Chapter 2 also presents preliminary evidence for the MIPI's construct validity, by examining its relationship to the conceptually related construct of alexithymia. The pattern of correlations (significance, size, and direction) was consistent with hypothesized relationships between the PI and alexithymia constructs. Consistent with the Trait EI literature (Bar-On, 2000; Petrides & Furnham, 2001), a degree of overlap was to be expected in Chapter 2 between the MIPI-Short and the higher-order dimensions of basic personality. As expected, the MIPI-Short correlated moderately with the Big Five, but only modestly when compared to the association between the MIPI-Short and alexithymia. Furthermore, the MIPI dimensions predicted 29% more variance than the Big Five in the prediction of alexithymia, indicating strong incremental validity.

Overall, the MIPI-Short demonstrates adequate psychometric properties, however, it is essential to extend this work with other relevant constructs using a more diverse measurement The purpose of the present study was to further explore the validity of the MIPI-Short. More specifically, we sought to focus on several related constructs (e.g., emotional intelligence, alexithymia) using a multimethod assessment approach (i.e., self-report, observer, and performance measures).

MIPI-Short and Trait EI

The MIPI was designed to measure a broader range of emotional and social competencies (ESCs) than is typical of Trait EI measures (Parker 2022a) The association between the MIPI-Short and alexithymia has been established in Chapter 2, however, it is also crucial to examine the relationship between the MIPI-Short and existing Trait EI measures. One of the most widely

accepted models of Trait EI was proposed by Bar-On model (Bar-On, 1997), who identified four non-cognitive dimensions for the construct: intrapersonal (self-awareness and understanding of one's own emotions), interpersonal (empathy and responsiveness to other's emotions), adaptability (emotional flexibility in the face of challenge and change), and stress management (resilience and regulation of strong negative emotions). The EQ-i (Bar-On, 1997), one of the first Trait EI measures to be developed, measures constructs from the Bar-On model and has been adapted into a short form (Bar-On, 2002) and a youth version for children and adolescents (Bar-On & Parker, 2000). The MIPI and MIPI-Short were designed to measure a number of similar EI and SI-related competencies that appear on the EQ-i. Thus, one would expect to observe a significant empirical relationship between the MIPI-Short and the EQ-i scales.

MIPI-Short and Situational Judgement Tests (SJTs)

Situational judgement tests (SJTs) assessing emotional and social competencies (ESCs) have been developed as an alternative to self-reports for high stakes settings (e.g., medical school admissions), where the risk for response bias is high (Lievens & Motowidlo, 2015). Typically, SJTs present respondents with a series of situations to which the person must provide a detailed answer on how they would handle the situation(s). An example of a widely used SJT is the Computer-based Assessment for Sampling Personal characteristics (CASPer; Dore et al., 2009), which was developed to be used in conjunction with cognitive-based assessments (e.g., GPA and MCATs) when assessing an applicant's likelihood to succeed in medical school (Buchs & McDaniel, 2021). The CASPer assesses applicants for personal and professional characteristics like empathy, communication and collaboration.

Although studies on the relationship between SJTs and EI and SI-related competencies are sparse, there is expected to be a degree of overlap between CASPer scores and variables on

the MIPI-Short. The CASPer measures competencies that are also measured by EI measures (e.g., empathy, self-awareness, resilience, etc.), therefore, one would expect to see a similar degree of relatedness between the CASPer and trait EI, to that observed when both Ability and trait EI measures have been used. Typically, Trait and Ability measures of EI correlate between r = .20 to .30 (Bracket & Mayer, 2003; Brannick et al., 2009; Petrides, 2011). Therefore, it is expected that a similar pattern of relatedness would be observed with the CASPer and Trait EI. On the other hand, SJTs like the CASPer are often used to identify potential elite performers (e.g., individuals likely to complete a difficult post-secondary program like a medical degree). Therefore, it is not unusual for SJTs to be used as a screening tool for high-stakes applications (e.g., only applications with CASPer scores above a target threshold are considered for admittance; Buchs & McDaniel, 2021). Since the core constructs measured by the MIPI-Short have been found to strongly predict success in a variety of educational and workplace contexts (MacCann et al., 2020), it is expected that the MIPI-Short would predict extreme scoring groups on the CASPer.

MIPI-Short and Observer Measures

One of the main critiques of the Trait EI area is the dominant use of self-report methodologies (Mayer, Roberts & Barsade, 2008). Along with obvious concerns about social desirability when completing Trait ET measures (MacDonald, 2008), there is also the concern that individuals with low Trait EI may have trouble accurately evaluating their ability to identify or describe emotions and feelings. Not surprisingly, researchers within the related area of alexithymia favour a multi-modal approach to measurement as a means of accommodating potential bias. For example, Bagby and colleagues (2021) created an observer-rated version of

the Toronto Alexithymia Scale (TAS-20; Bagby et al., 1994), the Toronto Alexithymia Scale –
Informant Form (TAS-20-IF).

The magnitude of associations between self- and informant-reports typically ranges from
$r = .20$ to .30 (Clark & Watson, 2019), with fluctuations dependant on the type of construct being
measured and the relationship between the observer and the individual. For example, self-
informant correlations are typically lower for low visibility traits, such as alexithymia, when
compared to high visibility traits, such as extraversion. Conversely, self-informant correlations
are typically stronger when the relationship between individuals is more intimate, for example a
married couple would have higher correlations than a friend or co-worker (Connelly & Ones,
2010). Given the associations found in Chapter 2 between alexithymia and the MIPI-Short, we
expect to observe a similar pattern of relatedness between the MIPI-Short and observer-rated
alexithymia scores.

Methods

Participants and Procedures

Sample 1

Sample 1 was comprised of 257 undergraduate students attending a small university in
central Ontario (32 men, 225 women) who completed the MIPI and the EQ-i:Short (Bar-On,
2002). Participants ranged in age from 17 to 53 years old ($M = 21.55$, $SD = 6.00$). Seventy-three
percent of participants identified themselves as White, 7% identified as Black, 7% Asian, 2%
Hispanic, 1% Aboriginal, and 11% did not disclose their race. Data was collected online using
the SONA system, a research portal that connects researchers with participants and allows the
latter to choose a study to engage in. Students who completed the study received an incentive
(bonus marks in their psychology courses).

Sample 2

Sample 2 was comprised of 241 emerging adults (51 men, 186 women, 3 other, and 4 unidentified) who had completed the CASPer (Dore et al., 2009) as part of their medical school applications. The age of participants ranged from 18 years old to 29 years old (M = 23.38, SD = 3.13). Sixty-three percent of participants were White, 18% Asian, 5% Hispanic, 4% Black, 1% Aboriginal, 6% other, and 2% preferred not to say. After completing the CASPer, as part of a routine process for applying to medical school, their participants received an online invitation to volunteer for the present study. After completing an online consent form (agreeing to have their CASPer scores matched with variables from the present study), participants completed several demographic questions and the MIPI on Qualtrics.

Sample 3

Sample 3 consisted of students from the same institution as Sample 1, or their friends and family members. The sample consisted of 49 couples, of which 46 were heterosexual and 3 were same-sex. Participants ranged in age from 18 to 80 years old (M = 31.75, SD = 16.64). Participants completed the MIPI and the TAS-20-I (Bagby et al., 2021). The length of the relationships ranged from 1 year to 50 years, with a mean relationship length of 9.62 years (SD = 12.89). Seventy-seven percent of participants identified themselves as White, 10% identified themselves as Asian, 5% identified as Black, 3% identified as Hispanic, 3% preferred not to say, 1% identified as other, and 1% as Aboriginal. All data was collected online via Qualtrics.

Measures

Personal Intelligence

The Multidimensional Inventory of Personal Intelligence (MIPI; Parker, 2022) is a self-report measure of personal intelligence and three subdomains: emotional intelligence, social intelligence, and motivational intelligence. For all of the statements on the MIPI, participants

were asked to identify on a scale of 1-5, the level to which they agreed with each statement (1 = low agreement, 5 = high agreement). In a recent study (see Chapter 2), 27 items from the original MIPI were used to create the MIPI-Short. The 3-factor model for the MIPI-Short items was found to have acceptable fit in multiple samples, as well as good internal reliability. Preliminary construct validity was also presented in Chapter 2, with the MIPI-Short scales accounting for a considerable amount of the variability in alexithymia scores, above and beyond that accounted for by basic personality variables.

Emotional Intelligence

The Emotional Quotient Inventory – Short Form (EQ-i:Short; Bar-On, 2002) is a 51-item tool that measures four dimensions of EI (interpersonal, intrapersonal, stress management, and adaptability), as well as a global EI score. Items are measured with a 5-point Likert scale, ranging from 1 (very seldom true of me) to 5 (very often true of me). The EQ-i:Short has been shown to have good psychometric properties, including moderate to high internal consistency among men and women (Parker et al., 2011), and good factorial validity, construct validity, and convergent and discriminant validity (BarOn, 2002).

CASPer

The Computer-based Assessment for Sampling Personal Characteristics (CASPer; Dore et al., 2009) is an online, open-response situational judgement test. The test is widely used as an educational admission screening tool, particularly for medical school programs. The CASPer presents 14 scenarios to participants to which they must respond with either a video response or typed response. The test takes approximately 90-110 minutes, and each response is graded by trained raters. The CASPer scenarios target a range of personal and professional qualities, including communication, motivation, empathy, problem solving, resilience, self-awareness,

collaboration, equity, professionalism, and ethics. Scores on the CASPer are converted into Z-scores to determine how well a participant does in relation to other test-takers. The CASPer has been shown to be reliable (Dore et al., 2009) and able to predict future success in medical school (Dore et al., 2017). To create high-performing and lower-performing groups on the CASPer, a tercile split was conducted for CASPER scores for Sample 3 (N = 241). Those that were in the lower third (N = 80) were coded as "non-elite performers" and those in the upper third (N = 81) were coded as "elite performers".

Observer-Rated Alexithymia

The TAS-20 (Bagby et al., 1994) was adapted to create the Toronto Alexithymia Scale-Informant Form (TAS-20-I; Bagby et al., 2021), a 20-item version that corroborates a participant's self-reported Alexithymia levels through use of an observer. The TAS-20-I has been shown to have good reliability and validity, with a similar factor structure (Bagby et al., 2021). The scale measures total Alexithymia, as well as the same 3 subscales as the original. All items are modified from the original TAS-20 and are measured on a 5-point Likert scale, ranging from strongly disagree (1) to strongly agree (5).

Statistical Procedure

All analyses were conducted in JASP (JASP Team, 2023) and mean-item scores were used for the EQ-i:Short, MIPI, and TAS-20-I.

Results

Relationship between the EQi:Short and the MIPI-Short

Table 1 presents means, standard deviations and Person's product moment correlations for the MIPI-Short and EQ-i:Short. All correlations among the scales were positive and significant. The strongest correlations observed were between the MIPI-Short scales and total PI.

Correlations among MIPI-Short and EQi:Short subscales ranged in size from .19 to .53. Total EI correlated moderately with all three MIPI-Short scales, and total PI correlated moderately with all four EI:Short scales. The strongest correlation observed between the two measures was PI and total EI (r = .67).

A standard multiple regression was performed to determine the relative contribution of the MIPI-Short scales to the prediction of global EI on the EQ-i:Short. The multiple regression was found to be significant with all three MIPI-Short scales contributing significantly to the model, $F(3, 253) = 62.72$, $p < .001$ and accounting for 42% of the variability in global EI on the EQ-i:Short.

Relationship between the MIPI-Short and the CASPer

All correlations among the MIPI-Short scales and CASPer scores were positive and significant. The strongest correlation was between total PI and CASPer scores (r = .27), followed by the MI (r = .26), EI (r = .24), and SI (r = .18) scales.

Table 2 presents means and standard deviations for the MIPI-Short dimensions across performance group ("non-elite" versus "elite" performers). A performance group by MIPI dimension (EI, SI versus MI) repeated measures ANOVA was calculated using mean-item MIPI-Short scores as the dependent variables. A Greenhouse-Geisser correction was employed as the Mauchly's test for sphericity was significant ($p < .05$). A significant main effect was found for MIPI-Short dimension, $F(1.86, 296.14) = 50.07$, $p < .001$, $\eta2 = .085$, and for performance group $F(1, 159) = 11.48$, $p <.001$, $\eta2 = .043$. Elite performers had significantly higher scores for the EI, SI and MI subscales. No significant interaction effect was found.

Relationships with the MIPI-Short and TAS-20-I

Table 3 presents means, standard deviations, and bivariate correlations between scores on the MIPI-Short and the TAS-20-I. All correlations were significant (except for the externally-oriented thinking scale on the TAS-20): for the difficulty identifying feelings subscale, correlations ranged from -.28 (for SI) to -.37 (for PI), for the difficulty describing feelings subscale correlations ranged from -.39 (for MI) to -.50 (for PI), and for the total alexithymia scale correlations ranged from -.39 (for SI) to -.50 (for EI). For the externally oriented thinking subscale only the correlation with the EI scale was significant.

Discussion

The main goal of the present study was to further examine the validity of the MIPI-Short by assessing relationships with several related constructs using a multimodal measurement approach. Prior research with the MIPI-Short (see Chapter 2) explored validity using only self-report measures. Since this type of assessment format is susceptible to the effects of response styles such as of social desirability (SDR) and acquiescent responding (Paulhus, 1991), it was important to investigate the MIPI-Short's validity using performance-related and observer measures. Since the MIPI-Short, and the PI construct, was developed as an expansion of the EI construct (Crane & Henning, 2022; Parker, 2022a), it was also important to examine the relationship between the new measure and established Trait EI assessment tools.

As expected, the MIPI-Short and EQ-i:Short scales correlated significantly and positively with one another. The strongest correlation was between the total EI score on the EQ-i:Short and total PI ($r = .67$), indicating that the two assessment tools are measuring strongly related constructs. Not surprising, when the MIPI-Short subscales were used in a regression with the total EI scale, they accounted for 42% of the variability in this EQi:Short variable.

The MIPI-Short and the CASPer were also found to correlate as expected. All MIPI variables were found to correlate within the expected range (r = .20 to .30), except SI, which correlated slightly lower r = .18. The constructs measured by the MIPI-Short have been found to strongly predict academic and professional success in a variety of contexts (MacCann et al., 2020). Therefore, we also expected the MIPI-Short variables to predict extreme scoring groups on the CASPer, as the tool was designed to identify individuals with strong (or elite) personal and professional competencies (e.g., individuals likely to graduate from medical school; Buchs & McDaniel, 2021). In line with the intended use of the SJT to identify top performers on a variety of emotional and social competencies, the elite scoring group had significantly higher scores on all MIPI-Short variables.

The magnitude of the associations between the MIPI-Short and TAS-20-I were as expected, ranging from -.28 to -.50. The lack of relationships between the externally orienting thinking subscale and MIPI variables is consistent with findings from Chapter 2, where this alexithymia variable did not correlate very highly with any of the MIPI variables (in men and women).

Limitations and Future Directions

The purpose of this study was to further validate the short form for the MIP developed in Chapter 2. The present study has successfully demonstrated elements of construct validity among measures with various methodologies. That being said, the psychometric evaluation of the MIPI-Short done in this chapter was not exhaustive, as validation is a continuous and long-term process (Strauss & Smith, 2009). The most apparent limitation of this work is that it relied primarily on student or young adult samples (with limited ethnic diversity), which limits the generalizability (Leentjens & Levenson, 2013). Future work should evaluate the validity of the

MIPI-Short in populations of more diversity with respect to age, ethnicity, and socioeconomic status (i.e., non-student populations). Given some of the gender differences reported in Chapter 2, this work should use large enough samples-sizes to report findings separately by gender. Moreover, future studies should further this work by assessing the predictive validity of the MIPI-Short with outcome variables that are well-established within the Trait EI area, such as health and wellness (Sarrionandia, & Mikolajczak, 2020), academic success (MacCann et al., 2020), and vocational or work outcomes (Grobelny, Radke & Paniotova-Maczka, 2021).

In conclusion, our results demonstrate that the MIPI-Short is a valid tool that may be easier for researchers bound by time constraints to administer compared to its longer counterpart, the MIPI (Parker 2022a). Although replication and further validation studies are needed, the MIPI-Short is a comprehensive tool that reliably measures PI and its three subdomains (EI, SI and MI).

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Table 1. *Means, standard deviations, and Pearson's product correlations for MIPI-Short and*

EQ-i:Short scales and subscales.

Scale	M	SD	1.	2.	3.	4.	5.	6.	7.	8.
1. MIPI-EI	3.13	.41	-							
2. MIPI-SI	3.27	.71	.28*	-						
3. MIPI-MI	3.47	.54	.43*	.47*	-					
4. MIPI-PI	3.29	.43	.65*	.83*	.81*	-				
5. EQi-INTER	4.15	.64	.19*	.28*	.39*	.38*	-			
6. EQi-INTRA	3.44	.72	.31*	.53*	.47*	.58*	.23*	-		
7. EQi-ADAPT	3.63	.66	.33*	.19*	.28*	.33*	.38*	.21*	-	
8. EQi-STRESS	3.54	.78	.46*	.40*	.49*	.57*	.36*	.41*	.36*	-
9. EQi-TEQ	11.95	1.50	.39*	.51*	.58*	.67*	.67*	.66*	.65*	.62*

Note. N = 257; mean-item scores for MIPI-Short and EQi:Short. MIPI-EI = emotional intelligence, MIPI-SI = social intelligence, MIPI-M = motivational intelligence, MIPI-PI = personal intelligence, EQi-INTER = interpersonal, EQi-INTRA = intrapersonal, EQi-ADAPT = adaptability, EQi-STRESS = stress management, EQi-TEQ = total emotional intelligence.

Table 2. *Means and Standard deviations by CASPER performance group.*

Variable	Non-Elite Performers	Elite Performers
MIPI-EI	3.38	3.76
MIPI-SI	3.21	3.50
MIPI-MI	3.75	4.07
MIPI-PI	3.45	3.77

Note. MIPI-EI = emotional intelligence, MIPI-SI = social intelligence, MIPI-M = motivational intelligence, MIPI-PI = personal intelligence.

Table 3. *Means, standard deviations, and bivariate correlations between MIPI and TAS-20-I scales.*

Scale	M	SD	TAS-20-I DIF	TAS-20-I DDF	TAS-20-I EOT	TAS-20-I Total
MIPI-EI	3.20	.79	-.33*	-.43*	-.38*	-.48*
MIPI-SI	3.27	.75	-.28*	-.42*	-.01	-.31*
MIPI-MI	3.43	.53	-.31*	-.39*	-.17	-.37*
MIPI-PI	3.30	.57	-.37*	-.50*	-.23	-.47*
M	-	-	2.50	3.08	2.67	2.72
SD	-	-	.85	.85	.57	.58

Note. MIPI-EI = emotional intelligence, MIPI-SI = social intelligence, MIPI-M = motivational intelligence, MIPI-PI = personal intelligence, and TAS-20-I DIF = difficulty identifying feelings, TAS-20-I DDF = difficulty describing feelings, TAS-20-I EOT = externally oriented thinking, TAS-20-I total = total observer-rated Alexithymia.

Chapter 4

Future Directions for Validating the MIPI-Short

The purpose of this thesis was to develop and validate a short measure of Personal Intelligence (PI), a construct that encompasses a broad range of emotional and social competencies (ESCs; Parker, 2022). Most existing Trait EI measures have several important limitations, including mood contamination, blurring the boundaries for emotional and social competencies (which are both conceptualized as quite narrow constructs), and a general disregard of motivational competencies (for a full review of these limitations see Chapter 2; Crane & Henning, 2022; Parker 2022). To address both the conceptual and psychometric shortcomings with existing Trait EI measures, Parker (2022) proposed that the field adopt the more robust and higher-level personal intelligence construct. PI not only captures a wide range of emotional competencies, but also captures the motivational and social components necessary for efficient emotional functioning. Thus, the PI construct consists of separate dimensions of emotional intelligence (EI), social intelligence (SI), and motivational intelligence (MI).

To measure PI and its three subdomains (EI, SI, and MI), Parker (2022) developed the Multidimensional Inventory of Personal Intelligence (MIPI), a 100+ item self-report measure. The MIPI may be particularly useful in comprehensive testing situations (Crane & Parker, 2022; e.g., career or education counselling), but less helpful for researchers interested in including EI-related measures as part of a broad set of study variables. The MIPI-Short was created for this purpose—a pithy research tool that could assess PI and its three subdomains of EI, SI and MI.

The first study included item selection and preliminary reliability and validity findings for the MIPI-Short, while the second study further examined the construct validity of the MIPI-Short with related measures that used different measurement methodologies (e.g., performance

and observer ratings). Study 1 found that the MIPI-Short maintained the same factorial structure of the original MIPI in both a derivation sample and a replication sample. The factor structure was also found to be invariant across gender. Study 1 also provided evidence of appropriate internal reliability, construct validity, and incremental validity. Indeed, the MIPI-Short scales were found to account for a considerable amount of the variability in alexithymia scores, above and beyond that accounted for by basic personality (thus supporting incremental validity).

Study 2 further validated the MIPI-Short with self-report measures, observer-report measures, and performance-based measures of conceptually similar constructs. The MIPI-Short was found to account for 42% of the variability in a self-report measure of trait EI and correlated as expected with an observer-report measure of Alexithymia. Additionally, higher scores on the MIPI-Short were found to have significantly higher scores on a performance-based measure of socio-emotional functioning. The findings of both studies provide support for the empirical use of the MIPI-Short as a brief, yet robust, measure of PI and related subdomains (EI, SI and MI)

While there are strengths in the data that has been report in this thesis, there are also a number of limitations that need to be highlighted. Perhaps most notable is the fact that all of the participants used in the thesis completed the MIPI long form (Parker 2022). As noted by Kruyen and associates (2013), answers to items on short forms may have been influenced by answers on the long form, therefore the superior strategy for exploring the psychometric properties of a shortened form is using independent samples that complete only the short form. To address this issue, we took care to ensure that the MIPI-Short was designed with several considerations in mind. More specifically, we followed several recommendations suggested by Kruyen, Emons, and Sijtsma (2013) for researchers interested in creating shortened forms from longer scale. First, they caution researchers against using just minimum reliability requirements (for example,

Cronbach's alpha > .70); they suggest that test developers aim high with their psychometric goals. We followed this suggestion with respect to internal reliability, as all scales on the MIPI-Short have alpha's above .80 (PI total score had alpha's above .90 for men, women and the total sample). Alphas of these levels are considered very strong (Kline, 2000; Nunnally & Bernstein, 1994).

Kruyen and associates (2013) also note as one of their recommendations that the validity of a shortened form should not just be inferred from the validity findings used with the longer form. While scales from a long form may relate to other constructs in a hypothesized manner, the same pattern of results can be assumed to generalize to scales or subscales on a short form. Not only did we evaluate the construct validity of the MIPI-Short with measures of conceptually related constructs used in the development of the long form (Parker, 2022), we also explored these relationships using different measurement methods, including observer-report and performance-based measures. Thus, the construct validity of the MIPI-Short has been extensively explored.

As noted by Kruyen and associates (2013), test developers of short forms need to evaluate various types of validity, not just construct validity. Future work needs to examine the predictive validity of the MIPI-Short with known outcome variables for Trait EI, such as academic achievement (MacCann et al., 2020), wellness (Sarrionandia & Mikolajczak, 2020), and workplace success (Grobelny et al., 2021). Perhaps the most important future work for the MIPI-Short is the need to test the replicability of the factor structure for scale items using a sample of participants who only complete the short form. While the structure was found to replicate in an independent sample from the one used to develop the short form (see Chapter 2),

the factor structure still needs to be replicated in a sample of participants completing only the 27 items from the short form.

Finally, Kruyen and associates (2013) recommend that test designers and researchers consider the pay-off between gained practical efficiency and losses in statistical accuracy. The original MIPI encapsulates the three PI subdomains (EI, SI, and MI), as well as a variety of subscales. With the development of a short form, it was not feasible to maintain the various subscales, as there would be too few items to appropriately capture the nuance of the subscales. Therefore, researchers statistically or theoretically interested in the subscales of the various PI subdimensions (EI, SI and MI) should consider using the longer MIPI (Parker, 2022)— something a researcher interested in just a broad measure of PI and the key subcomponents may be less interested in. Both the long and short forms for the MIPI have demonstrated acceptable reliability and validity, thus the researcher interested in PI should decide what their needs are prior to choosing which version to use.

Future studies on the MIPI-Short should also examine other forms of test reliability (e.g., test-retest reliability), as we only considered internal reliability. Additionally, future studies should also consider the use of a wider age range to determine measurement invariance by age (e.g., transition to adulthood vs. middle age). Undoubtedly, more studies are needed to replicate our findings and further the validation of the MIPI-Short, however the current findings demonstrate preliminary evidence for various components of validity and reliability.

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