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Assessing Actions and Feelings Related to Multidimensional Well-Being: Validation of the I COPPE Actions and Feelings Scales

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UNIVERSITY OF MIAMI

ASSESSING ACTIONS AND FEELINGS RELATED TO MULTIDIMENSIONAL
WELL-BEING: VALIDATION OF THE I COPPE ACTIONS AND FEELINGS
SCALES

By

Carolyn L. Rubenstein

A DISSERTATION

Submitted to the Faculty
of the University of Miami
in partial fulfillment of the requirements for
the degree of Doctor of Philosophy

Coral Gables, Florida

August 2017

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ASSESSING ACTIONS AND FEELINGS RELATED TO
MULTIDIMENSIONAL WELL-BEING: VALIDATION OF
THE I COPPE ACTIONS AND FEELINGS SCALES

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Assessing Actions and Feelings Related to

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Actions and Feelings Scales

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The purpose of this study was to validate two new scales on actions and feelings for well-being in key areas of life. The I COPPE Actions Scale and the I COPPE Feelings Scale measure Interpersonal, Community, Occupational, Physical, Psychological, and Economic (I COPPE) well-being. A total of 478 University of Miami employees provided online responses to the I COPPE Actions and Feelings Scales. Confirmatory factor analysis was used to examine the a priori hypothesized correlated six-factor structure for responses to the I COPPE Actions and Feelings Scales. Multiple group confirmatory factor analysis was used to evaluate measurement invariance across gender for the I COPPE Actions and Feelings Scales. There was strong empirical evidence to support the hypothesized factor structure of the I COPPE Actions Scale. While there was inadequate empirical evidence to support the hypothesized factor structure of the I COPPE Feelings Scale, a slightly modified model achieved acceptable fit. Partial strict invariance with equal factor variances and covariances was met across gender for the I COPPE Actions Scale; however, measurement invariance did not hold across gender for the I COPPE Feelings Scale. The ability of these scales to measure multidimensional well-being through actions and feelings in two separate but conceptually related measures is a potential contribution to the growing body of literature on well-being.

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CHAPTER 1: INTRODUCTION

The term “well-being” refers to a positive state of affairs in six interacting domains of life: interpersonal, community, occupational, physical, psychological, and economic. Together these six domains form the acronym I COPPE. The purpose of this study is to validate two new scales of actions and feelings related to well-being in key areas of life, assessing measurement invariance across different demographic groups. Research supports a distinction between overall well-being (OVWB) and domain-specific well-being (DSWB). Whereas the former refers to global assessments of satisfaction with life, the latter pertains to satisfaction with specific life areas such as health, relationships, financial security, employment, and sense of community (Diener, Scollon, & Lucas, 2009; International Wellbeing Group, 2006; Rath & Harter, 2010). For the purpose of clarity, I will use the term overall well-being (OVWB) to refer to subjective well-being, overall quality of life, and overall life satisfaction.

I COPPE Domains of Well-Being

Personal well-being is a complex and dynamic concept, encompassing subjective elements such as self-determination, perceptions of life satisfaction, sense of control, mastery over the environment, and positive emotions, along with objective elements such as socioeconomic status (SES), social standing based on education, income, and occupation (APA, 2006), and educational attainment (Eid & Larsen, 2008; Fredrickson, 2009; Lyubomirsky, 2008; Marmot, 2004; Rath & Harter 2010; Seligman, 2011).

For individuals to thrive, their skills must support well-being in each of the six I COPPE domains of well-being. Research on personal (Diener, Wirtz, Tov, Kim-Prieto, Choi, Oishi, & Biswas-Diener, 2009; Eid & Larsen, 2008; Keyes, 2007; Lyubomirsky, 2008; Marmot, 2004; Powers & Faden, 2006; Rath & Harter, 2010; Seligman, 2011),

interpersonal (Cacioppo, Reis, & Zautra, 2011; Cohen, 2004; Gottman, Gottman, & Atkins, 2011), organizational (Bolman & Deal, 2003; Sisodia, Wolfe, & Sheth, 2007), and community well-being (Commission on Social Determinants of Health, 2008; Graham, 2009; Inglehart, Foa, Peterson, & Welzel, 2008; Wilkinson & Pickett, 2009) supports the assertion that the I COPPE domains are vital for persons and systems to flourish. Research also suggests that overall well-being is linked to satisfaction in each of the six I COPPE domains (Prilleltensky et al., 2015; Argyle, 2001; Cohen, 1999; Gonzalez, Coenders, Saez & Casas, 2010; Erdogan, Bauer, Truxillo, & Mansfield, 2012), such that “[d]eficiencies in any one component of the well-being ecology may alter the level of satisfaction in other parts” (Prilleltensky, 2012, p. 2).

While the six I COPPE domains are defined individually, they should be thought of as constructs that have a synergistic relationship with one another as well as with overall well-being. Additionally, satisfaction within each domain exists along a continuum, reflecting that these are not fixed constructs.

Interpersonal well-being (INWB) reflects satisfaction with the quality of one’s relationships with important people, such as family, friends, and colleagues. People are interpersonally well when they communicate effectively and cooperate with others, and when they feel supported and connected to friends, relatives, and peers (Ryff & Singer, 2000). Handling conflict well, fostering positive relationships, and experiencing intimacy with loved ones are signs of INWB. Previous research has found that INWB has strong positive correlations with longevity, resilience, physical health, mental health, overall well-being, and life satisfaction (Buettner, 2008, 2010; Cacioppo, Reis, & Zautra, 2011;

Cohen, 2004; Prilleltensky & Prilleltensky, 2006; Prilleltensky et al., 2015; Rath & Harter, 2010).

Community well-being (COWB), on the other hand, reflects satisfaction with one's community. A healthy community is one where people feel safe, supported, and engaged (Ziersch, Baum, MacDougall, & Putland, 2005). COWB depends on two important factors: the efforts of individuals to build trusting relationships and the presence of structures that encourage community building. COWB is strengthened when neighbors are friendly, supportive, and willing to lend a helping hand. Being helpful and supportive can take different forms: providing information, helping with tasks, or simply listening and showing we care. Moreover, celebrating others' strengths and contributions is just as important as extending help in times of need (Gable, Gonzaga, & Strachman, 2006). Volunteering time and services to help community members who live in different neighborhoods is another way to foster COWB. COWB has been shown to positively correlate with mental health, community participation, and sense of belonging on one hand, and negatively correlate with depression on the other (Peterson, Speer, & McMillan, 2008).

Occupational well-being (OCWB) reflects one's satisfaction with his or her job, vocation, or avocation, as determined by individuals themselves. OCWB is strengthened when an individual worker feels connected to others, uses his or her strengths, and experiences personal and professional growth. Good employers understand the relationship between work satisfaction and business outcomes (Harter, Schmidt, & Hayes, 2002). For example, an employee with an outgoing personality will likely enjoy a position that entails a lot of interaction, whereas a more introverted employee with strong

technical skills would likely thrive in a position more suited to her personality. With a supportive employer and a pleasant social environment, workers can make meaningful contributions and experience a high degree of job satisfaction (e.g., Lent & Brown, 2006). A healthy workplace is characterized by a culture of mutual support, flexible work arrangements, and involvement in decision-making. Employees in such healthy workplaces report high levels of engagement, satisfaction, and happiness. They are less likely to be absent from work due to illness and are more likely to remain at their place of work for longer periods of time (e.g., Grawitch, Gottschalk, & Munz, 2006). OCWB contributes to worker health and to work outcomes simultaneously (Jacob, Bond, Galinsky & Hill, 2008).

Physical well-being (PHWB), meanwhile, reflects satisfaction with one's overall health and wellness. An individual is physically well when he or she has energy to engage in daily activities and experiences low levels of pain and discomfort. Multiple factors contribute to physical well-being, and many of them are within an individual's control (e.g., Penedo & Dahn, 2005). For example, eating a healthy diet, exercising on a regular basis, and managing daily stressors all go a long way in promoting PHWB. PHWB increases when a person eats healthy foods and avoids junk food. Making healthy lifestyle choices, such as exercising and maintaining a healthy weight, also contribute to PHWB (Penedo & Dahn, 2005). Research suggests that PHWB is correlated with OVWB (Chmiel et al., 2012; Gonzalez et al., 2010; International Wellbeing Group, 2006; Rath & Harter, 2010).

Psychological well-being (PSWB) reflects satisfaction with one's emotional life. PSWB involves a person experiencing positive emotions, relatively few negative

emotions, feeling satisfied with his or her life, and having a feeling of thriving. Positive thoughts and emotions lead to healthy choices, positive interpersonal interactions, and high levels of happiness and PSWB (Fredrickson, 2013; Kok et al., 2013). The ability to manage not only stress but also negative thoughts and emotions is critical to PSWB. Minor hassles and stressors in life are inevitable. But how individuals perceive and respond to stressors is very important. When a person feels down he or she has a tendency to perceive the situation in an excessively negative light. This, in turn, will affect his or her actions and mood. Learning to challenge negative thinking can lead to improved mood and healthier behaviors (e.g., Cowden Hindash & Amir, 2012; Goli, Asghari, & Moradi, 2014). In addition, engaging in healthy behaviors can lead to better mood and more optimistic thinking (Hogan, Mata, & Carstensen, 2013; Reed & Ones, 2006). Multiple strategies exist for combating negative thinking patterns that threaten to bring individuals down. Equally important, a person can act to increase the level of positive emotion in his or her life. For example, focusing on the things he or she is grateful for and being kind to others are two proven strategies for increasing PSWB (Fredrickson, 2009; Sheldon & Lyubomirsky, 2006). Moreover, PSWB has been associated with greater physical well-being (Keyes, 2005) and less mental illness (Keyes, 2007).

Finally, *economic well-being* (ECWB) reflects satisfaction with one's financial situation. ECWB refers to an individual's actual and perceived financial stability—how secure an individual feels in his or her financial present and future. An individual who puts a percentage of his or her monthly paycheck into a retirement account enhances ECWB by saving for the future. At the same time, spending money on experiences that a

person can share with others contributes more to happiness than buying material objects for him or herself (Dunn, Aknin, & Norton, 2008). Studies show that people who donate money to charities or purchase gifts for others experience greater happiness than people who spend their money on personal bills, expenses, or gifts for themselves (Dunn, Aknin, & Norton, 2008). In general, favorable economic conditions have been associated with better mental and physical health (Commission on Social Determinants of Health, 2008; Donohoe, 2013; Levy & Sidel, 2006; Marmot, 2004; Prilleltensky, 2012; Sen, 2009) and overall life satisfaction (Diener, Kahneman, Tov, & Arora, 2010). A closely associated factor, unemployment, has been shown to have ongoing negative consequences for overall well-being (Clark, 2010; Rath & Harter, 2010). In general, ECWB has been recognized as an important facet of well-being (Chmiel et al., 2012).

Promoting Well-Being

The value of well-being derives from its intrinsic and extrinsic merits. Well-being is no doubt valuable on its own accord, but it is also desirable because of its positive association with mental health, physical health, and meaningful relationships (Andrews & Withey, 1976; Buettner, 2008, 2010; Campbell, Converse, & Rodgers, 1976; Nieboer, Lindenberg, Boomsma, & Van Bruggen, 2005; Pavot & Diener, 2008; Seligman, 2011). People who report high levels of well-being experience fewer physical and mental health problems, fewer days of missed work, better relationships, longer lives, greater work productivity, and lower risk of suicide (Keyes, 2005, 2007; Keyes, Dhingra, & Simoes, 2010; Keyes et al., 2012; Keyes & Grzywacz, 2005; Keyes & Simoes, 2012).

Research also suggests that well-being contributes to enhanced resilience in the face of adversity (e.g., Keyes et al., 2010; Ryff, 2014). Keyes and colleagues (2010) report that “[g]ains in mental health decreased the odds, and losses of mental health

increased the odds, of the incidence of mental illness” (p. 2369). They underscore the protective mechanism of well-being for reducing mental illness. Their findings also support well-being as dynamic or changing for individuals—half of those who were characterized as having high levels of well-being had not been characterized as such ten years earlier using the same criteria.

Since the advent of the two-factor model of mental health, clinicians and researchers have begun to show special interest in well-being as a viable route to complete mental health. The two-factor model posits that complete mental health derives from *both* the reduction of mental illness *and* the enhancement of well-being (Keyes, 2005, 2007). Hitherto, much effort has been invested in the former, but relatively little in the latter. Keyes (2007) and Seligman (2011) have persuasively argued for a balance between the two paradigms. Notably, only a small proportion of the population (16.6%) is estimated to possess what can be described as “complete mental health” (Keyes, 2005). Complete mental health requires that we focus more attention on understanding and promoting well-being.

Measuring Well-Being

Perceptions

Given the importance of well-being in complete mental health, numerous scales have been developed within different disciplines in an effort to better assess the construct of well-being (e.g., Diener et al., 1985; International Wellbeing Group, 2006; Nieboer et al., 2005). The varied focus of the existing scales has led to the creation of disparate models of well-being. In an effort to integrate different measures of well-being, Prilleltensky and colleagues (2015) developed and validated the I COPPE Scale to assess well-being as a multidimensional construct.

The I COPPE Scale measures perceptions of well-being for the six specific I COPPE domains and overall well-being. *Perceptions* of well-being refer to an individual's evaluation of his or her satisfaction in key areas of life. Prilleltensky et al. (2015) found that the seven domains of well-being (I COPPE and overall) are all strongly interrelated. In a later study, differences between demographic groups were found across multiple I COPPE domains with small to large effect sizes—indicating that demographic variables have an important but non-large effect on well-being (Rubenstein et al., 2016).

Actions and Feelings

Given that well-being is a multidimensional construct, an accurate and thorough assessment of well-being should include measures of different components of the I COPPE domains. Therefore, in addition to measuring perceptions of well-being using the I COPPE Scale, the present study aims to expand the measurement of well-being to include both actions and feelings related to well-being in key areas of life through the validation of the I COPPE Actions Scale and the I COPPE Feelings Scale. The decision to develop these new surveys is based on lack of satisfactory tools, particularly the realization that most relevant instruments are either outdated, or they neglect to distinguish perceptions, actions, and feelings.

For example, the Health-Promoting Lifestyle Profile II (HPLP II; Walker & Hill-Polerecky, 1996) measures health-promoting behaviors related to the domains of spiritual growth, interpersonal relations, nutrition, physical activity, health responsibility, and stress management. The 52-item self-report measure asks individuals to indicate the frequency with which they engage in a behavior on a 4-point scale ranging from never to routinely. However, many of the items use outdated recommendations or guidelines to measure behavior (e.g., recommended physical activity per week, dietary guidelines).

Although outdated, the HPLP II is still one of the only measures available to assess actions related to well-being in key areas of life. Relatedly, researchers have expressed the importance of clearly distinguishing between different approaches for measuring well-being in key areas of life. Specifically, Diener, Kahneman, Arora, Harter, and Tov (2009) suggested that measures of well-being be "... ordered along a dimension varying from evaluative judgments of life at one end to experienced affect at the other" (p. 233). For example, many measures of well-being, including the I COPPE Scale, utilize the Cantril Self-Anchoring Scale (Cantril, 1965) to assess an individual's *perception* of his or her well-being. The Cantril Scale measures well-being according to evaluative judgments of life so does not provide a measure of experienced affect or other dimensions related to well-being in key areas of life (Diener et al., 2009). Consistent with the current study's aim, which is to examine different components of well-being in key areas of life, Diener and colleagues (2009) recommended that "well-being must be parsed into judgmental versus affective components....In future research, judgments of life and affect ought to be distinguished in all research on well-being, even though in some instances they will produce similar conclusions" (p. 244).

Based on existing tools and the desire to obtain a more accurate assessment of the I COPPE domains of well-being, the current study utilizes the I COPPE Actions Scale and the I COPPE Feelings Scale. The I COPPE Actions Scale measures *actions* related to well-being by measuring the frequency with which an individual engages in activities that promote satisfaction within the I COPPE domains. The I COPPE Feelings Scale measures *feelings* related to well-being by measuring the frequency with which an individual experiences emotions that promote satisfaction within the I COPPE domains.

Fun For Wellness Intervention

The I COPPE Actions Scale and the I COPPE Feelings Scale were developed for use in the Fun For Wellness (FFW) intervention to allow for a more precise understanding of the impact of the intervention on well-being over time. The FFW intervention is based on seven scientific principles of change. These seven drivers of change are: **B**ehaviors, **E**motions, **T**houghts, **I**nteractions, **C**ontext, **A**wareness, and **N**ext Steps. Together, the drivers form the acronym BET I CAN. Participants in FFW learn 14 skills supporting the seven drivers of change that promote well-being in the I COPPE domains (see Appendix A for an overview of the 14 BET I CAN skills). These skills are taught in an effort to increase self-efficacy, which reflects an individual's belief in his or her capacity to execute the behaviors needed to attain specific results (Bandura, 1977).

Method

Data for the current study came from a randomized controlled trial (RCT) evaluating the effectiveness, feasibility, and acceptability of FFW designed to promote well-being in the I COPPE domains of well-being through self-efficacy and specific skills (see Appendix A for description of the RCT). The present study used data collected at baseline (T1) prior to randomization, although the participants were asked to complete surveys twice more to evaluate any possible intervention effort. 478 University of Miami employees consented to participate in the study and completed the baseline measures prior to randomization. The study was conducted entirely online.

Hypotheses

The hypotheses were developed based on the a priori measurement model that emerged previously for the I COPPE Scale, a scale of perceptions of well-being

(Prilleltensky et al., 2015). This a priori measurement model suggested correlations among the subscales.

H1: The a priori hypothesized measurement model for the I COPPE Actions Scale will emerge.

H2: The a priori hypothesized measurement model for the I COPPE Feelings Scale will emerge.

These hypotheses were tested using confirmatory factor analysis (CFA). CFA is a widely used methodology that can empirically evaluate the a priori hypothesized relationships between observed variables and theoretical latent constructs (Brown, 2006). For both the I COPPE Actions Scale and the I COPPE Feelings Scale, the CFA models tested the hypothesized correlated six-factor structure (see Figure 1.1).

H3: The measurement properties of the I COPPE Actions Scale will be equivalent across demographic groups.

H4: The measurement properties of the I COPPE Feelings Scale will be equivalent across demographic groups.

These measurement invariance (MI) hypotheses were tested using multiple group confirmatory factor analysis. The multiple group CFAs empirically evaluated whether the measurement properties of the I COPPE Actions Scale and the I COPPE Feelings Scale were equivalent across groups.

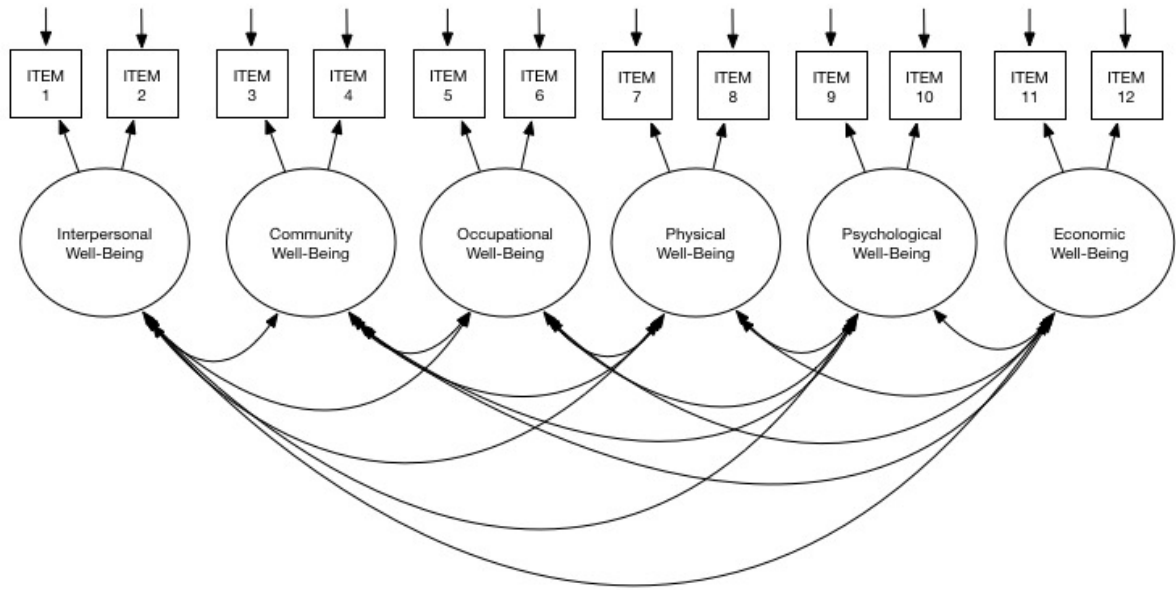


Figure 1.1. A priori measurement theory for responses to the I COPPE Actions Scale and the I COPPE Feelings Scale.

CHAPTER 2: LITERATURE REVIEW

I COPPE Domains of Well-Being

Overall well-being and each of the six I COPPE domains of well-being are reviewed in detail below. For each domain-specific review, I outline the findings from two previous studies dealing with I COPPE perceptions conducted by our research team: Prilleltensky et al. (2015) and Rubenstein et al. (2016). Using data from these studies, I summarize the correlations for each domain with the other domains and describe how each domain behaves demographically.

Overall well-being (OVWB) refers to subjective well-being, overall quality of life, and overall life satisfaction. OVWB is linked to six domains of well-being: Interpersonal, Community, Occupational, Physical, Psychological, and Economic well-being (I COPPE). The domains are interconnected, influencing one another in a synergistic relationship (Cohen, 1999; Gonzalez et al., 2010).

OVWB has been positively correlated across many studies with specific facets of well-being (Chmiel et al., 2012; Cohen, 1999; Nieboer et al., 2005). Specifically, OVWB is significantly correlated with the six I COPPE domains of well-being (interpersonal, community, occupational, physical, psychological, economic), but most strongly associated with physical and economic well-being (Prilleltensky et al., 2015).

OVWB also differs significantly among various demographic variables. Age, marital status, ethnicity, education, employment status, occupation, income, and housing tenure made a difference in levels of OVWB, whereas there are no significant differences by gender for OVWB. Emerging adults tended to show higher OVWB than young adults and adults ($d = 0.31-0.37$). Married people reported higher OVWB than divorced or separated and single people ($d = 0.31-0.36$). In terms of ethnicity, Hispanic/Latino

individuals reported higher OVWB than White/Caucasian individuals ($d = 0.29$). People with a bachelor's degree or higher showed higher OVWB than people with some college or vocational education ($d = 0.17$). Employed (full-time and part-time) and retired people tended to report higher OVWB than unemployed people. Professionals and people working in management tended to show higher OVWB than people working in service and manual labor ($d = 0.27 - 0.30$). People who earned more tended to have higher OVWB than people who earned less ($d = 0.33-0.65$), with the greatest effect size for the difference in OVWB between those who earned \$75k and higher and those who earned less than \$20k. For housing tenure, owners reported higher OVWB than renters ($d = 0.13$). Each of these demographic variables explained between 0.5 and 5.3% of the total variance of OVWB, with housing tenure explaining the least variance and income explaining the most variance (Rubenstein et al., 2016).

Interpersonal well-being (INWB) reflects satisfaction with the quality of one's relationships with important people, such as family, friends, and colleagues. Feeling supported and connected to others contributes to INWB (Ryff & Singer, 2000). In addition, communicating effectively, cooperating with others, and experiencing positive relationships are all signs of INWB.

Previous research suggests that INWB has strong positive correlations with longevity, resilience, physical health, mental health, overall well-being, and life satisfaction (Buettner, 2008, 2010; Cacioppo, Reis, & Zautra, 2011; Cohen, 2004; Prilleltensky & Prilleltensky, 2006; Prilleltensky et al., 2015; Rath & Harter, 2010). Prilleltensky and colleagues (2015) found that INWB was significantly correlated with five specific domains of well-being (community, occupational, psychological, physical,

and economic) and overall well-being, with its strongest associations with psychological and overall well-being.

In addition to positive correlations with other domains of well-being, INWB differs significantly for various demographic variables. Age, marital status, occupation, income, and housing tenure made a difference in levels of INWB, whereas there were no significant differences for gender, ethnicity, education, and employment status on INWB. Adults and the elderly tended to have higher INWB than young adults ($d = 0.27-0.54$). Married people reported significantly higher INWB than divorced or separated ($d = 0.41$) and single people ($d = 0.46$). Professionals and people working in management showed significantly higher INWB than people working in service ($d = 0.29$). In general, people who earned more tended to show significantly higher INWB than people who earned less. The effect sizes ranged from small to medium ($d = 0.32-0.47$). For housing tenure, homeowners showed significantly higher IWB than renters ($d = 0.21$). Each of these demographic variables explained between 1.4 and 4.4% of the total variance of INWB, with occupation explaining the least variance and marital status explaining the most variance (Rubenstein et al., 2016).

Community well-being (COWB) reflects satisfaction with one's community. Ziersch and colleagues (2005) suggest a healthy community is one in which people feel safe, supported, and engaged. Both the efforts of individuals to build trusting relationships and the presence of structures that encourage community building are critical for COWB. Individuals foster COWB through helping (e.g., helping with tasks, providing information), celebrating others' strengths and contributions, and volunteering

time and services to help community members in different neighborhoods (Block, 2009; Marmot, 2015; Putnam, 2001, 2015).

COWB has shown a correlation with mental health, community participation, and sense of belonging, and it negatively correlates with depression (Peterson, Speer, & McMillan, 2008). COWB has been found to be significantly correlated with five specific domains of well-being (interpersonal, occupational, psychological, physical, economic) and overall well-being; it is most strongly associated with economic and overall well-being (Prilleltensky et al., 2015).

COWB also functions significantly differently for multiple demographic variables. Age, marital status, ethnicity, employment status, occupation, income, and housing tenure made a difference in levels of COWB, whereas there are no significant differences for gender and education. The elderly tended to have higher COWB than young adults, adults, and older adults, with small to medium effect sizes ($d = 0.39-0.63$), the largest effect size found as the difference between elderly and young adults. Married people had higher COWB than those who were single ($d = 0.27$) and those living with a partner ($d = 0.36$). For ethnicity, Hispanic/Latino people showed significantly higher COWB than White/Caucasian people ($d = 0.27$). Unemployed people tended to show significantly lower COWB than full-time workers ($d = 0.30$) and retired people ($d = 0.40$). Professionals and people working in management showed significantly higher COWB than people who worked in service ($d = 0.31$). In general, people who earned more tended to show significantly higher COWB than people who earned less ($d = 0.32-0.43$). The effect sizes ranged from small to medium. For housing tenure, homeowners tended to show significantly higher COWB than renters ($d = 0.25$). Each of these demographic

variables explained between 1.6 and 3.4% of the total variance of COWB, with marital status explaining the least variance and income explaining the most variance (Rubenstein et al., 2016).

Occupational well-being (OCWB) reflects satisfaction with one's job, vocation, or avocation as determined by the individuals themselves. Feeling connected to others at work, being able to utilize one's strengths, and experiencing growth help to enhance OCWB. Effective employers optimize the positive relationship between work satisfaction and business outcomes (Harter, Schmidt, & Hayes, 2002). When in a positive and supportive environment, individuals are able to make meaningful contributions and experience a high degree of job satisfaction (e.g., Lent & Brown, 2006). Employees in healthy workplaces (i.e., culture of mutual support, flexible work arrangements, and involvement in decision making) tend to have fewer absences due to illness and are more likely to maintain their employment (Achor, 2010; Schwartz, 2015).

Good working conditions enhance well-being, while poor working conditions and unemployment exert great detriment on one's overall well-being (Clark, 2010; Harter & Arora, 2010). Work is also an explicit and important facet of well-being (Chmiel et al., 2012). OCWB in turn also contributes to the health of workers and to their work outcomes (Jacob, Bond, Galinsky & Hill, 2008). OCWB has been found to be significantly correlated with the five specific domains of well-being (interpersonal, community, psychological, physical, economic) and overall well-being; it is most strongly associated with psychological and overall well-being (Prilleltensky et al., 2015).

OCWB also differs significantly for various demographic variables. Age, marital status, ethnicity, employment status, occupation, income, and housing tenure made a

difference in levels OCWB, whereas there were no significant differences for gender and education. Elderly adults tended to have higher OCWB than adults and older adults ($d = 0.35-0.36$). Married people showed higher OCWB than those who were divorced or separated and single ($d = 0.32-0.38$). In terms of ethnicity, Hispanic/Latino individuals had higher OCWB than those who identified themselves as White/Caucasian ($d = 0.25$). Unemployed people reported significantly lower OCWB than employed people (part-time and full-time workers; $d = 0.48-0.58$). Furthermore, professionals and people working in management had higher OCWB than people who worked in service and manual labor ($d = 0.28$). People who earned more tended to have higher OCWB than people who earned less ($d = 0.33-0.72$), with the greatest effect size for the difference in OCWB for those earned \$75k and higher versus those who earned less than \$20k. With regard to housing tenure, homeowners tended to have higher OCWB than renters ($d = 0.23$). Each of these demographic variables explained between 1.2 and 6.5% of the total variance of OCWB, with age explaining the least variance and income explaining the most variance (Rubenstein et al., 2016).

Physical well-being (PHWB) reflects satisfaction with one's overall health and wellness. Experiencing sufficient energy to engage in daily activities and low levels of pain and discomfort are positive signs of PHWB. PHWB is influenced by multiple factors, and many of these factors exist within an individual's control (e.g., Penedo & Dahn, 2005). For example, exercising regularly and maintaining a healthy diet promote PHWB.

Previous research indicates that physical well-being correlates strongly with overall well-being (Chmiel et al., 2012; Gonzalez et al., 2010; International Wellbeing Group, 2006; Rath & Harter, 2010). PHWB has been found to be significantly correlated

with five specific domains of well-being (interpersonal, community, occupational, psychological, economic) and overall well-being; it is most strongly associated with psychological and overall well-being (Prilleltensky et al., 2015).

PHWB also differs significantly for various demographic variables. Age, marital status, ethnicity, education, employment status, occupation, and income made a difference in levels of PHWB, whereas there were no significant differences for gender and housing tenure. Emerging adults tended to report higher PHWB than adults and older adults ($d = 0.38-0.40$). Married and single people tended to show significantly higher PHWB than divorced or separated people ($d = 0.30-0.31$). For ethnicity, Hispanic/Latino individuals tended to have higher PHWB than those who identified as White/Caucasian ($d=0.33$). People with a bachelor's degree or higher tended to show significantly higher PHWB than people with some college or a vocational education ($d=0.37$). Employed people (full-time and part-time) showed significantly higher well-being on PHWB than unemployed people ($d=0.42-0.43$). Professionals and people working in management showed significantly higher PHWB than people who worked in manual labor ($d = 0.31$). Furthermore, people who earned \$75k and above tended to have significantly higher PHWB than those who earned under \$20k and \$30-50k ($d=0.44-0.47$). Each of these demographic variables explained between 0.7 and 2.9% of the total variance of PHWB, with education explaining the least variance and income explaining the most variance (Rubenstein et al., 2016).

Psychological well-being (PSWB) reflects satisfaction with one's emotional life. Experiencing positive emotions, feeling satisfied with one's life, and having a feeling of thriving are all signs of PSWB. While negative thoughts and emotions are inevitable, the

way individuals perceive and respond to stressors has a great effect on their PSWB. For example, challenging negative thoughts can lead to improved mood and healthy behaviors (Cowden Hindash & Amir, 2011; Goli, Asghari, & Moradi, 2014). Relatedly, engaging in healthy behaviors (e.g., focusing on gratitude, being kind to others) can lead to more optimistic thinking (Fredrickson, 2009; Hogan, Mata, & Carstensen, 2013; Reed & Ones, 2006; Sheldon & Lyubomirsky, 2006).

PSWB is associated with higher physical well-being (Keyes, 2005) and lower mental illness (Keyes, 2007). PSWB was significantly correlated with five specific domains of well-being (interpersonal, community, occupational, physical, economic) and overall well-being, with its strongest associations with physical and overall well-being (Prilleltensky et al., 2015).

PSWB also differs significantly for various demographic variables. Age, marital status, ethnicity, education, employment status, income, and housing tenure made a difference in levels of PSWB, whereas there are no significant differences for gender and occupation. The elderly tend to have higher PSWB than young adults, adults, and older adults ($d = 0.35-0.43$). Married people tended to show significantly higher PSWB than single people ($d = 0.21$). With regard to education, people with a bachelor's degree or higher tend to show higher PSWB than people with some college or vocational education ($d = 0.17$). Employed (full-time and part-time) and retired people tend to report higher PSWB than unemployed people ($d = 0.29-0.37$). Furthermore, people who make less than \$20k tend to show significantly lower PSWB than people who make \$30-50k, \$50-75k, and \$75k and higher ($d = 0.32-0.47$), with the greatest effect size for the difference between those who made less than \$20k and more than \$75k. In terms of housing tenure,

owners had significantly higher PSWB than renters ($d = 0.14$). Each of these demographic variables explained between 0.5 and 2.6% of the total variance of PSWB, with education explaining the least variance and income explaining the most variance (Rubenstein et al., 2016).

Economic well-being (ECWB) reflects satisfaction with one's financial situation. ECWB has to do with an individual's sense of financial security in the present as well as in the future. Research suggests that spending money on shared experiences or on others (e.g., donations, gifts for others) enhances happiness more so than spending money on oneself (Dunn, Aknin, & Norton, 2008).

In general, financial security and positive economic conditions have been associated with greater psychological, physical, and overall well-being (Commission on Social Determinants of Health, 2008; Diener, Kahneman, Tov, & Arora, 2010; Donohoe, 2013; Levy & Sidel, 2006; Marmot, 2004; Prilleltensky, 2012; Sen, 2009). Relatedly, negative financial situations (e.g., unemployment) have been shown to have persistent negative consequences for overall well-being (Clark, 2010; Rath & Harter, 2010). ECWB, recognized as an important facet of well-being (Chmiel et al., 2012), has been found to be significantly correlated with five specific domains of well-being (interpersonal, community, occupational, physical, psychological) and overall well-being, most strongly associated with psychological and overall well-being (Prilleltensky et al., 2015).

ECWB also differs significantly according to various demographic variables. Age, marital status, ethnicity, education, employment status, occupation, income, and housing tenure made a difference in levels of ECWB, whereas there are no significant differences by gender. Elderly adults tend to report higher ECWB than adults ($d = 0.32$). Married

people report higher ECWB than those who are divorced, separated, single, or living with a partner ($d = 0.32 - 0.35$). In terms of ethnicity, Hispanic/Latino people tend to have higher ECWB than White/Caucasian people ($d = 0.33$). People with a bachelor's degree or higher tend to show higher ECWB than those with a high school education or less ($d = 0.27$). In addition, employed (full-time and part-time) and retired people show higher ECWB than unemployed people ($d = 0.35-0.49$), with the greatest effect size for the difference between full-time workers and unemployed people.

The type of employment also makes a difference; professionals and people working in management tend to have higher ECWB than service workers ($d = 0.35$). People who earn more tend to have higher ECWB than people who earn less ($d = 0.33-0.81$), with the greatest effect size for the difference in ECWB for those who earn \$75k and higher versus those who earn less than \$20k. With regard to housing tenure, owners report higher ECWB than renters ($d = 0.27$). Each of these demographic variables explain between 1 and 8.1% of the total variance of ECWB, with age explaining the least variance and income explaining the most variance (Rubenstein et al., 2016).

Overall, the I COPPE domains of well-being and overall well-being are all strongly interrelated. In addition, demographic group differences in domain-specific well-being were found across multiple domains with small to large effect sizes, indicating that the demographic variables had an important but non-large effect. While there were no gender differences, compared with those in the same demographic variable, higher income earners, married, elderly, Hispanic, educated, white-collar professionals, and homeowners reported the highest levels of well-being. The unemployed reported the lowest level of well-being on all but one of the domains—the interpersonal domain.

Finally, income explained the most variance for all domains except for interpersonal well-being in which the most variance was explained by marital status.

Measuring Well-Being

Perceptions, Actions, and Feelings

In an effort to better understand and promote complete mental health, researchers in different disciplines have constructed numerous scales assessing the construct of well-being (e.g., Diener et al., 1985; International Wellbeing Group, 2006; Nieboer et al., 2005). The proliferation of well-being scales and the varied foci of these scales have led to disparate models of well-being. Prilleltensky and colleagues (2015) developed and validated the I COPPE Scale to assess well-being as a multidimensional construct—establishing an integrated model of well-being.

The I COPPE Scale measures perceptions of well-being across six specific I COPPE domains and overall well-being. *Perceptions* of well-being refer to an individual's evaluation of his or her satisfaction in key areas of life. Given that well-being is a multidimensional construct, an accurate and thorough assessment of well-being should include measures of different components of the I COPPE domains. Therefore, the present study aims to validate the I COPPE Actions Scale and the I COPPE Feelings Scale to expand the measurement of well-being to include actions and feelings related to well-being in key areas of life.

The decision to develop these new surveys is based on lack of satisfactory tools, particularly the realization that most relevant instruments are narrowly focused (e.g., focused on perceptions alone, focused on one specific domain of well-being), fail to distinguish among perceptions, actions, and feelings, or are somewhat outdated. As such, existing measures do not allow for a comprehensive and contemporary assessment of

change (i.e., change in perceptions, actions, and feelings, individually) within the I COPPE domains (see Table 2.1 for a review of measures used to assess well-being).

For example, the Health-Promoting Lifestyle Profile II (HPLP II; Walker & Hill-Polerecky, 1996) measures health-promoting behaviors related to the domains of spiritual growth, interpersonal relations, nutrition, physical activity, health responsibility, and stress management. The 52-item self-report measure asks individuals to indicate the frequency with which they engage in a behavior on a 4-point scale ranging from never to routinely. However, many of the items use outdated recommendations (e.g., recommended physical activity per week, dietary guidelines).

Although outdated, the HPLP II is still one of the only measures available to assess actions related to well-being in key areas of life. While the HPLP II focuses on the assessment of actions related to domains of well-being, the Mental Health Continuum-Short Form (MHC-SF; Keyes et al., 2008) focuses on feelings related to emotional, psychological, and social well-being. The 14-item measure asks individuals to rate the frequency of feelings experienced in the past month on a 6-point scale ranging from never to every day. Whereas the HPLP II measures actions and the MHC-SF measures feelings, the Satisfaction with Life Scale (SWLS; Diener et al., 1985) measures perceptions of overall well-being. The 5-item measure assesses cognitive judgments of satisfaction with one's life.

In contrast to the SWLS, HPLP II, and the MHC-SF, which are narrowly focused on the measure of perceptions, actions, or feelings related to well-being, respectively, the Individual-Level Well-Being Assessment and Scoring Method (IWBS; Evers et al., 2012) assesses perceptions, actions, and feelings for the six domains of well-being. While the

IWBS uses multiple components to measure well-being, these components are combined to create overall domain scores, conflating the unique information from the different assessment components.

In addition to a review of well-being scales, researchers have underscored the need to clearly distinguish between different approaches used to measure well-being. Specifically, Diener and colleagues (2009) recommended that measures of well-being be “... ordered along a dimension varying from evaluative judgments of life at one end to experienced affect at the other” (p. 233). For example, the Cantril Scale (Cantril, 1965) used in many well-being measures, including the I COPPE Scale, measures the construct of well-being through an individual’s evaluative judgments of life (i.e., perceptions). As such, measures based solely on the Cantril Scale do not provide a measure of experienced affect or other dimensions of well-being in key areas of life, such as actions (Diener et al., 2009).

Table 2.1

Review of Measures Used to Assess Well-Being

Measure	Construct assessed	Description	Perceptions	Actions	Feelings
Abridged Job in General Scale (AJIG; Russell et al., 2004)	Job satisfaction	<ul style="list-style-type: none"> List of 8 phrases and adjectives that describe different aspects of a job in an overall sense Participants respond yes, no, or unsure for each of the descriptions 	X		X
Authentic Happiness Inventory (AHI; Seligman et al., 2005)	Overall happiness	<ul style="list-style-type: none"> 24 items with five different statements per item [e.g., most of the time I am bored (1) to most of the time I am fascinated by what I am doing (5)] Focused on how one experiences positive emotions, engagement, and a sense of meaning in life 	X		X
Brief Sense of Community Scale (BSCS; Peterson et al., 2008)	Sense of community	<ul style="list-style-type: none"> 8 positively worded items which all reference respondent's neighborhood Answers are given on a 5-point scale ranging from 1 (strongly agree) to 5 (strongly disagree) 	X		
Flourishing Scale (FS; Diener et al., 2009)	Psychological well-being	<ul style="list-style-type: none"> 8 positively formulated items which measure perceived success in areas such as relationships, self-esteem, purpose, and optimism Participants rate the items on a 7-point scale from 1 (strongly disagree) to 7 (strongly agree) 	X		
Fordyce Emotions Questionnaire (Fordyce, 1988)	Current happiness or emotional well-being	<ul style="list-style-type: none"> Very brief measure of current happiness Participants are asked: <i>In general, how happy or unhappy do you usually feel?</i> Asked to respond from 0 (extremely unhappy) to 10 (extremely happy) 			X

Table 2.1 *continued*

Measure	Construct assessed	Description	Perceptions	Actions	Feelings
Health-Promoting Lifestyle Profile II (HPLP II; Walker & Hill-Polerecky, 1996)	Overall health-promoting lifestyle and health-promoting behaviors related to various domains (spiritual growth, interpersonal relations, nutrition, physical activity, health responsibility, and stress management)	<ul style="list-style-type: none"> • Participants also asked the percent of time they feel happy, unhappy, and neutral (total should be 100%) • 52 items focused on different health-promoting behaviors • Participants indicate the frequency with which they engage in a behavior on a 4-point scale ranging from 1 (never) to 4 (routinely) 		X	
InCharge Financial Distress/Financial Well-Being Scale (IFDFW; Prawitz et al., 2006)	Perceived financial wellness	<ul style="list-style-type: none"> • 8 items, with four items representing a sense of one's present state of financial well-being and the other four items characterizing one's reaction to his or her present state of financial well-being • Respondents indicate personal levels of economic-based distress across various situation based financial prompts on a 10-point continuum 	X		
Individual-Level Well-Being Assessment and Scoring Method (IWBS; Evers et al., 2012)	Six well-being domains (emotional health, physical health, work environment, healthy behaviors,	<ul style="list-style-type: none"> • Adapted from the population-based Gallup-Healthways Well-Being Index • Many of the domains are measured via people's perceptions, actions, and/or feelings and then these responses are combined into individual domain scores 	X	X	X

Table 2.1 *continued*

Measure	Construct assessed	Description	Perceptions	Actions	Feelings
Meaning in Life Questionnaire (Steger et al., 2006)	basic access, and life evaluation) Presence of meaning and search for meaning	<ul style="list-style-type: none"> Assesses 2 dimensions of meaning in life using 10 items rated on a 7-point scale ranging from 1 (Absolutely Untrue) to 7 (Absolutely true) Presence of Meaning subscale measures how full respondents feel their lives are of meaning Search for Meaning subscale measures how engaged and motivated respondents are in efforts to find meaning or deepening their understanding of meaning in their lives 	X		
Mental Health Continuum-Short Form (MHC-SF; Keyes et al., 2008)	Overall well-being and domain-specific well-being (emotional, psychological, social)	<ul style="list-style-type: none"> 14 items measuring various feelings of well-being Respondents asked to rate frequency of each feeling in the past month on a 6-point scale, ranging from 0 (never) to 5 (every day) 			X
Personal Well-Being Index (PWI; International Wellbeing Group, 2006)	Overall and domain-specific well-being (standard of living, health, achieving in life, relationships, safety, community connectedness, future security, spirituality/religion)	<ul style="list-style-type: none"> 8 items, with 1 item per domain Respondents indicate satisfaction level for each item, ranging from 0 (no satisfaction at all) to 10 (completely satisfied) 	X		

Table 2.1 *continued*

Measure	Construct assessed	Description	Perceptions	Actions	Feelings
Positive and Negative Affect Schedule (PANAS; Watson et al., 1988)	Positive affect and negative affect	<ul style="list-style-type: none"> • 10 positive adjectives and 10 negative adjectives • Respondents are asked to rate the adjectives according to the extent to which each describes the way they have felt during a specified time, from 1 (very slightly or not at all) to 5 (extremely) 			X
Satisfaction with Life Scale (SWLS; Diener et al., 1985)	Life satisfaction	<ul style="list-style-type: none"> • 5-item instrument designed to measure global cognitive judgments of satisfaction with one's life • Respondents indicate agreement with each item, ranging from 1 (strongly disagree) to 7 (strongly agree) 	X		
Social Connectedness Scale-Revised (SCS-R; Lee et al., 2001)	Social connectedness	<ul style="list-style-type: none"> • 20-item scale derived from the original SCS scale, with 10 positively and 10 negatively worded items • Each item is rated on a 6-point scale, ranging from 1 (strongly disagree) to 6 (strongly agree) • Positively worded items capture experiencing a sense of closeness with others and maintaining and seeking connections (e.g., I am able to connect with other people, I feel comfortable in the presence of strangers) • Negatively worded items capture experience of distance and isolation from others (e.g., I see myself as a loner, I feel like an outsider) 	X		X

Table 2.1 *continued*

Measure	Construct assessed	Description	Perceptions	Actions	Feelings
Social Production Function Instrument for the Level of Well-being (SPF-IL; Nieboer et al., 2005)	Various dimensions of well-being (social, physical, and overall)	<ul style="list-style-type: none"> • 58-item measure that assesses different dimensions of well-being (social, physical, and overall) • Specific item responses vary throughout the measure but are all on a Likert Scale 	X	X	X
Social Well-Being Scale (Keyes, 1998)	Social well-being	<ul style="list-style-type: none"> • 15-item measure, with 3 items per dimension • 5 dimensions of social well-being assessed: social coherence, actualization, integration, contribution, and acceptance • Item responses range from 1 (strongly disagree) to 7 (strongly agree) 	X		
World Health Organization Well-Being Index (WHO-5; World Health Organization, 1998)	Current mental well-being	<ul style="list-style-type: none"> • 5 items rated on a 6-point scale, ranging from 0 (at no time) to 5 (all of the time) [timeframe: over the last two weeks] • Subjective quality of life based on positive mood (good spirits, relaxation), vitality (being active and waking up fresh and rested), and general interest (being interested in things) 	X	X	X

Development of the I COPPE Actions and Feelings Scales

Based on the existing tools and the desire to obtain a more accurate assessment of the I COPPE domains of well-being, the current study utilizes the I COPPE Actions Scale and the I COPPE Feelings Scale. The I COPPE Actions Scale measures *actions* related to well-being by assessing the frequency with which an individual engages in activities that promote satisfaction within the I COPPE domains. The I COPPE Feelings Scale measures *feelings* related to well-being by assessing the frequency with which an individual experiences emotions that promote satisfaction within the I COPPE domains.

In addition to the overarching aim of the present study, which is to validate the factor structure of the I COPPE Actions Scale and the I COPPE Feelings Scale, the present study aims to assess measurement invariance of these scales. Establishing measurement invariance is a necessary condition in order to compare scores across groups and infer that differences in observed scores reflect differences in the latent variable (Millsap, 2011). Myers and colleagues (2012) emphasized that, “providing evidence for measurement invariance across groups for which a new instrument is intended is an important facet of validity evidence (AERA, APA, NCME, 1999)” (p. 744).

Within the well-being literature, very little research has evaluated measurement invariance for different demographic groups (Ong & van Dulmen, 2006). The limited research that does exist has focused on the assessment of measurement invariance across countries. For example, Dimitrova and colleagues (2015) provided evidence for the measurement invariance of the Satisfaction with Life Scale (SWLS; Diener et al., 1985) across three cultural groups from Argentina, Mexico, and Nicaragua. Similarly, Linley and colleagues (2009) provided evidence for the measurement invariance of subjective and psychological well-being based on the Satisfaction with Life Scale (SWLS; Diener et

al., 1985), Positive and Negative Affect Scales (PANAS; Watson et al., 1988), and Scales of Psychological Well-Being (Ryff & Keyes, 1995) in the United Kingdom, the United States, and China. In addition, Linley and colleagues (2009) demonstrated measurement invariance of subjective and psychological well-being among participants from the United Kingdom by gender (male, female), age (18-30, 30+), and ethnicity (White, Black, Indian).

A review of existing well-being research reveals that very few studies provide evidence of measurement invariance (e.g., country, age, gender, ethnicity), with no known evidence suggesting nonequivalence by group. While little empirical support has suggested measurement invariance or non-invariance of well-being, in the *Oxford Handbook of Methods in Positive Psychology*, Ong, Horn, and Walsh (2006) presented the necessity to establish evidence for measurement invariance in the well-being literature.

Implicit in the comparison of groups and individuals is the assumption of equivalence of measurement. This assumption, however, is rarely tested directly in well-being research. . . . Measurement invariance is fundamentally important for evaluating intraindividual evidence. For in each case, before any construct validation results can be sensibly interpreted, there must be assurances that the scales measure the same attributes in the same way in different groups and circumstances. If scales do not measure (a) the same factors in the same way in different groupings of people or (b) in the same people measured in different places and times, there is no logical basis for interpreting the results of analyses of differences between means or variances or correlations or patterns of relationships (cf. Horn & McArdle, 1992; Meredith & Horn, 2001). (pp. 13-14)

Given the current well-being literature and lack of evidence for measurement invariance by demographic groups, it is unclear whether the I COPPE Actions and Feelings Scales would be comparable across subgroups.

Fun For Wellness

BET I CAN Skills

Fun For Wellness (FFW) is an interactive program where participants learn skills and techniques to improve their health and well-being. They participate in activities and learn skills specifically designed to improve well-being in the I COPPE domains. The FFW intervention is based on seven scientific principles of change. These seven drivers of change are: **B**ehaviors, **E**motions, **T**houghts, **I**nteractions, **C**ontext, **A**wareness, and **N**ext Steps. Together, the drivers form the acronym BET I CAN. Participants in FFW learn 14 skills supporting the seven drivers of change that promote well-being in the I COPPE domains. The skills for each of the BET I CAN drivers of change are outlined below (See Appendix A for an overview of the BET I CAN drivers and the skills in FFW).

Behaviors. Participants learn how to *set a goal* and *create positive habits*. Goal-setting is beneficial in planning positive actions and increasing well-being (Coote & MacLeod, 2012). Setting goals also serves to enhance one's motivation and adherence (Morisano, Hirsch, Peterson, Pihl, & Shore, 2010). To create positive habits, one must understand the triggers that initiate the behavior and the rewards that maintain it. By taking charge of cues and rewards, one may decrease negative habits while creating new positive habits (e.g., Rothman et al., 2015).

Emotions. Participants learn how to *cope with negative emotions* and *collect positive emotions*. In order to cope with negative emotions, we must be aware of emotions and how they affect us. Through meditation and mindfulness, one can better tolerate negative emotions and avoid escalating their affective intensity (Kemeny et al., 2012; Robins et al., 2012). The experience of focusing on one's negative emotions in an

active manner (i.e., not ruminating) is also beneficial (Yu-Hsin Liao, Wei, Russell, & Abraham, 2012). Positive emotions promote well-being. Focusing on the good things for which one is grateful helps to increase positive emotions (Emmons & McCullough, 2003; Ouweneel et al., 2014).

Thoughts. Participants learn how to *challenge assumptions* and *write a new story*. By recognizing negative automatic thoughts, one can challenge them. Challenging assumptions and negative thoughts helps to weaken the link between the negative emotion and the negative thought. For example, reappraising a situation that provokes anxiety helps to moderate the subjective feeling of anxiety associated with that situation more so than merely accepting or suppressing the anxiety (Hofmann, Heering, Sawyer, & Asnaani, 2009). Writing a new story empowers individuals to disengage from an unhelpful story about the self and to develop a more optimistic and fulfilling narrative. One's mindset has a powerful effect on performance (e.g., Good et al., 2003; Schroder, Moran, Brent Donnellan, & Moser, 2014).

Interactions. Participants learn how to *connect* and *communicate*. Connection and support are important protective factors (e.g., Bond et al., 2003). Healthy relationship skills, which are critical to connection and interpersonal well-being, can be taught (e.g., Bradley & Gottman, 2012). Effective and empathic communication helps to cultivate fulfilling relationships. Active listening is an integral element of interpersonal communication (Bodie et al., 2015; Weger, Bell, & Robinson, 2014). Assertiveness (e.g., confronting criticism, expressing dissatisfaction) is another important component of interpersonal communication (Lin et al., 2004).

Context. Participants learn how to *read cues* and *change cues*. Signals in our environment play an important role in the behaviors we engage in. Adapting one's behavior to cues in the environment can be instrumental in reaching a particular goal (e.g., Martins & Vallen, 2014). Changing cues enhances one's ability to modify problematic behavior and promote healthy behavior (e.g., Lai & Good, 2005; Papies & Hamstra, 2010).

Awareness. Participants learn how to *know yourself* and *know the issue*. Knowing oneself can help clarify one's values and make it easier to commit to actions that align with those values. Mindfulness can serve as a powerful tool in the quest for creating greater clarity and meaning in one's life. Research supports the relationship between mindfulness and positive emotional states (Warren, Brown, & Ryan, 2003). Knowledge empowers individuals to take responsibility for assessing choices and making decisions. Research supports the role of knowledge in promoting well-being (e.g., Husson et al., 2011; Manios, Moschonis, Katsaroli, Grammatikaki, & Tanagra, 2007; Morokuma et al., 2013).

Next steps. Participants learn how to *make a plan* and *make it stick*. Making a plan provides a general direction for setting goals and aligning one's actions with goals (e.g., Darker, French, Eves, & Sniehotta, 2010; Lange et al., 2013; Wiedemann et al., 2011). Once new skills are learned, one must practice them in order to maintain positive habits and cope with setbacks (e.g., Evers, Klusmann, Schwarzer, & Heuser, 2012; Kiernan et al., 2013).

Self-Efficacy

FFW targets two specific areas in which self-efficacy occurs: (a) self-efficacy in I COPPE and (b) self-efficacy in BET I CAN. By mastering BET I CAN skills, individuals

should experience an increase in I COPPE domain-specific self-efficacy. Self-efficacy reflects “people’s beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives” (Bandura, 1994, p. 71). Similar to the construct of well-being, self-efficacy can be conceptualized as a general construct or as domain-specific (e.g., social self-efficacy; Lent, 2004).

People who are high in self-efficacy have been found to experience higher well-being than people who are low in self-efficacy (e.g., Luszczynska & Gutierrez-Dona, 2005; Strobel, Tumasjan, & Sporrle, 2011). Conversely, low self-efficacy has been associated with depression (Bandura, 1997). In conceptualizing well-being, both Ryan and Deci (2000) and Ryff and Singer (2002) highlight the importance of competence or environmental mastery beliefs. Relatedly, Bandura (1986, 1997) “posits that self-efficacy beliefs play important roles in the self-regulation of affective states (e.g., efficacy beliefs influence the construal of life events as benign or upsetting, the actions taken to affect environmental obstacles, and the cognitive and emotional strategies used to cope with adverse events)” (Lent, 2004, p. 494). Research using self-efficacy measures has found that “feeling competent and confident with respect to valued goals is associated with enhanced well-being” (Ryan & Deci, 2001, p. 156).

Bandura’s social cognitive theory (1986, 1997) highlights the bidirectional relationship between self-efficacy and social variables. For example, “social self-efficacy facilitates involvement in social activities generally and pursuit of social support, in particular. Social support, in turn, serves as a valuable source of self-efficacy, providing encouragement as well as coping role models when one is confronted with challenging life conditions” (Lent, 2004, p. 496). Low social self-

efficacy may limit an individual's social support and serve to reinforce or exacerbate low well-being.

Unlike some indices of well-being, self-efficacy is relatively amenable and susceptible to change (Lent, 2004). As such, it presents an important mechanism of change for intervention research. Specific self-efficacy beliefs play a significant role in mediating the effects of interventions, for example on substance use and sexual risk behavior (e.g., Kadden & Litt, 2011; O'Leary, 1992), and multiple health risk behaviors (e.g., Brown, Seragianian, Tremblay, & Annis, 2002; Danaher, Smolkowski, Seeley, & Severson, 2008; Gilchrist & Schinke, 1983; Jardin & Carpenter, 2012; Schmiede et al., 2009; Strecher et al., 1986).

Well-Being Outcomes in FFW

In an effort to strengthen the evidence of the impact of the BET I CAN skills on well-being outcomes, our research team developed two additional measures to assess actions and feelings. The I COPPE Actions Scale and the I COPPE Feelings Scale were developed for use in the FFW intervention to allow for a more precise understanding of the effect of the intervention on well-being over time. Together, the I COPPE Scale, the I COPPE Actions Scale, and the I COPPE Feelings Scale, provide a comprehensive assessment of well-being outcomes based on three unique components: perceptions, actions, and feelings.

Summary

In summary, FFW is an interactive online intervention focused on improving well-being in each of the six I COPPE domains and overall well-being. In addition to an extensive review of domain-specific well-being, this chapter summarizes the strong correlations that have been found for each I COPPE domain with the other domains as

well as how each domain behaves demographically. Of note, demographic group differences in domain-specific well-being have been found across multiple domains with small to large effect sizes, indicating that the demographic variables have an important but non-large effect on well-being.

FFW teaches 14 empirically-based skills designed to improve well-being by increasing I COPPE domain-specific self-efficacy. The measurement of well-being was discussed in detail earlier in the chapter. In addition, the chapter includes a discussion of the decision to develop two additional measures of actions and feelings related to well-being in an effort to provide stronger evidence of the effect of the BET I CAN skills on well-being outcomes. The overarching goal of this research is to validate two new scales of actions and feelings related to well-being in key areas of life.

CHAPTER 3: METHODOLOGY

Study Aims

The aims of this study were as follows: (a) to examine the factor structure of responses to the I COPPE Actions Scale, (b) to examine the factor structure of responses to the I COPPE Feelings Scale, (c) to evaluate whether measurement properties of the I COPPE Actions Scale were equivalent across gender, and (d) to evaluate whether measurement properties of the I COPPE Feelings Scale were equivalent across gender.

The following four research questions were examined: (a) Does the a priori hypothesized measurement theory for the I COPPE Actions Scale emerge? (see Figure 1.1), (b) Does the a priori hypothesized measurement theory for the I COPPE Feelings Scale emerge? (see Figure 1.1), (c) Is there support for measurement invariance across gender for the I COPPE Actions Scale? (d) Is there support for measurement invariance across gender for the I COPPE Feelings Scale?

Participants

Participants were 478 (364 women, 114 men) English-speaking adults (see Table 3.1 for participant demographics). The participants were part of a larger study evaluating the effectiveness, feasibility, and acceptability of an intervention designed to promote well-being in the I COPPE domains of well-being through self-efficacy and specific skills (see Appendix A for description of the larger study). These voluntary online respondents ranged from 22 to 72 years of age ($M = 41.67$, $SD = 11.51$) and legally consented to participate by electronically signing the study consent form approved by our academic institution's Internal Review Board (IRB). After consenting to participate in the study and completing the baseline measures, participants received an Amazon electronic gift card credit of \$10.

Table 3.1

Participant Demographics

<i>Variable</i>	<i>n</i>	<i>(%)</i>
Gender		
Females	364	(76.2)
Males	114	(23.8)
Age		
18-25 years (emerging adults)	22	(4.6)
26-34 years (young adults)	136	(28.5)
35-54 (mid-life)	235	(49.2)
55-64 (old)	72	(15.1)
65 years or older (elderly)	12	(2.5)
Missing	1	(0.2)
Ethnicity		
Hispanic	217	(45.6)
White/Caucasian	175	(36.8)
African American	39	(8.2)
Asian	27	(5.7)
Native American	1	(0.2)
Other	17	(3.6)
Education level completed		
High school	11	(2.3)
Vocational/technical school (2-year)	7	(1.5)
Some college	82	(17.2)
College graduate (4-year)	148	(31.0)
Master's degree	134	(28.0)
Doctoral degree	56	(11.7)
Professional degree (MD, JD)	38	(7.9)
Other	2	(0.4)
Current marital status		
Divorced or separated	60	(12.6)
Married	229	(48.0)
Living with Partner	37	(7.8)
Single	145	(30.4)
Widowed	6	(1.3)
Employment status		
Full-time	463	(96.9)
Part-time	15	(3.1)
Occupation		
In-office support	133	(28.1)
Management office/project staff	128	(27.0)
Administration	115	(24.3)
Faculty	94	(19.8)
Facilities, maintenance	4	(0.8)
Current household income		
Under \$20,000	3	(0.6)

Table 3.1 *continued*

<i>Variable</i>	<i>n</i>	(%)
\$20,000-29,999	20	(4.2)
\$30,000-39,999	51	(10.7)
\$40,000-49,999	47	(9.9)
\$50,000-74,999	100	(21.0)
\$75,000-99,999	73	(15.3)
\$100,000-150,000	72	(15.1)
Over \$150,000	68	(14.3)
Rather not say	42	(8.8)

Procedure

The current study analyzes participant data from a larger intervention-based study designed to promote well-being (see Appendix A for description of the intervention).

The study was conducted online, with all potential respondents recruited through email.

E-mail invitations were sent to University of Miami employee e-mail addresses.

Respondents were directed to the online consent form if they were (a) at least 18 years of age and (b) a current employee of the University of Miami. Measures were administered at baseline (T1), 30 days-post baseline (T2), and 60 days-post baseline (T3). The current study only analyzes measures completed at baseline (T1), prior to randomization, because the focus of the study is on measurement validation rather than intervention effectiveness.

Measures

Demographic Questionnaire

A nine-item questionnaire was developed for the study to collect demographic information (gender, income, marital status, age, ethnicity, education level, employment type, and occupation). See Table 3.1 for participant demographics. This measure was administered once at baseline for all consented participants.

I COPPE Actions Scale

The I COPPE Actions Scale is a self-report measure created for this study (see Appendix B for full measure). The measure consists of 12 items which tap behavioral outcomes in the six I COPPE constructs. Each construct is comprised of two items measuring the frequency of engagement in behaviors aligned with the six constructs. Each item is rated on a scale of 0-4 where the lowest value means “very rarely or never” and the highest value means “very often or always”. The six constructs and their respective definitions follow:

- a) **INTERPERSONAL**: Engaging in activities that promote satisfaction in important relationships in life
- b) **COMMUNITY**: Engaging in activities that promote satisfaction as well as involvement and sense of belonging in one’s community
- c) **OCCUPATIONAL**: Engaging in activities that promote satisfaction with main occupation such as work, volunteering, or caring after relatives
- d) **PHYSICAL**: Engaging in activities that promote physical health and well-being
- e) **PSYCHOLOGICAL**: Engaging in activities that promote emotional and psychological well-being
- f) **ECONOMIC**: Engaging in activities that promote economic well-being

I COPPE Feelings Scale

The I COPPE Feelings Scale is a self-report measure created for this study (see Appendix B for full measure). The measure consists of 12-items which tap feelings within the six I COPPE constructs. Each construct is measured by two items assessing the frequency of experiencing feelings across situations within the six constructs. Each item

is rated on a scale of 0-4 where the lowest value means “very rarely or never” and the highest value means “very often or always”. The six constructs and their respective definitions follow:

- a) **INTERPERSONAL**: Experiencing positive emotions and situations related to important relationships in life
- b) **COMMUNITY**: Experiencing positive emotions and situations related to satisfaction as well as involvement and sense of belonging in one’s community
- c) **OCCUPATIONAL**: Experiencing positive emotions and situations related to satisfaction with main occupation such as work, volunteering, or caring after relatives
- d) **PHYSICAL**: Experiencing positive emotions and situations related to your physical health and well-being
- e) **PSYCHOLOGICAL**: Experiencing positive feelings and situations related to emotional and psychological well-being
- f) **ECONOMIC**: Experiencing positive emotions and situations related to economic well-being

Statistical Analyses

Research Questions 1 and 2

The first two research questions were investigated using confirmatory factor analysis (CFA) in *Mplus 7.4* (Muthén & Muthén, 2012). For both the I COPPE Actions Scale and the I COPPE Feelings Scale, the CFA models tested the hypothesized correlated six-factor structure (six factors included Interpersonal, Community, Occupational, Physical, Psychological, and Economic Well-Being). The models were

estimated with robust maximum likelihood (MLR), which adjusts the model chi-square test statistic and standard errors to account for non-normality (Yuan & Bentler, 2000). Model fit was assessed using a number of different indexes including the chi-square test statistic, CFI, TLI, and RMSEA.

Research Questions 3 and 4

The third and fourth research questions tested for measurement invariance (MI) across gender for the I COPPE Actions Scale and the I COPPE Feelings Scales. This was accomplished by conducting a series of hierarchical nested model comparisons using model constraints and likelihood ratio tests (LRTs) within the multiple group CFA framework in *Mplus 7.4* (Muthén & Muthén, 2012). These tests empirically evaluated whether or not the measurement properties of these two I COPPE scales were equivalent for different groups (e.g., males and females).

CHAPTER 4: RESULTS

Analytic Strategy

The research questions were investigated using confirmatory factor analysis (CFA) in Mplus 7.4 (Muthén & Muthén, 2012). For both the I COPPE Actions Scale and the I COPPE Feelings Scale, the CFA models tested the hypothesized correlated six-factor structure (Interpersonal, Community, Occupational, Physical, Psychological, and Economic Well-Being). The models were estimated with robust maximum likelihood (MLR), which adjusts the model chi-square test statistic and standard errors to account for non-normality (Yuan and Bentler, 2000). Since MLR was used for model estimation, the CFAs included all available information (e.g., no listwise/pairwise deletion). Model fit was assessed using a number of different indices including the chi-square test statistic, CFI, TLI, RMSEA, and SRMR. Cutoff values suggested by Hu and Bentler (1999) were used as criteria of adequate model fit: $CFI \geq .95$, $TLI \geq .95$, $RMSEA \leq .06$, $SRMR \leq .08$. For CFA model identification, one item's factor loading was fixed at 1 for each latent factor, the means of the latent factors were fixed at 0, and the variances of the latent factors were freely estimated.

Research Question 1: Does the Hypothesized Factor Structure for the I COPPE Actions Scale Hold?

Response and Item Analysis

Examination of the observed I COPPE Actions Scale items showed that there was very little missing data (only 2 missing item responses). Table 4.1 presents the correlations, means, and standard deviations for the observed I COPPE Action Scale items. As expected, the correlations between item pairs within hypothesized subscales

were moderate-to-large (r 's ranged from .33 to .74). Item correlations across different hypothesized subscales were smaller (r 's ranged from .04 to .42).

Factor Structure

Results from the hypothesized correlated six-factor CFA model (Interpersonal, Community, Occupational, Physical, Psychological, and Economic Well-Being), demonstrated adequate model fit, $\chi^2(39) = 82.98, p < .001$, RMSEA = .05 [90% CI = .04, .07], $p = .42$, TLI = .94, CFI = .96, SRMR = .04. Table 4.2 shows the unstandardized factor loadings and standard errors. All of the estimated factor loadings were statistically significant ($p < .001$). The corresponding standardized estimates (factor loadings, interfactor correlations, residual variances) are presented in Figure 4.1. All of the standardized factor loadings were also statistically significant ($p < .001$) and ranged from .41 to .88, with most of the factor loadings (i.e., 7 of 12) above .70. These large factor loadings suggested that each of the observed items was strongly related to its hypothesized latent factor.

Table 4.3 provides the unstandardized factor variances, covariances, and standardized correlations. All of these estimates were statistically significant ($p < .05$). The interfactor correlations ranged from .16 to .76, with most of the correlations (i.e., 11 of 15) falling in the moderate range between .20 and .50. The unstandardized item intercepts, unstandardized item residual variances, and R^2 values are presented in Table 4.4. All of the R^2 values were statistically significant ($p \leq .001$) and ranged from .17 to .78, with most of the R^2 values (i.e., 10 of 12) at or above .40. The moderate-to-large, statistically significant R^2 values showed that the latent factors explained substantial amount of the variability in the observed item responses. A reasonable answer to research

question 1 was that there was strong empirical support for the hypothesized correlated six-factor structure of the I COPPE Actions Scale.

Research Question 2: Does the Hypothesized Factor Structure for the I COPPE Feelings Scale Hold?

Response and Item Analysis

Examination of the observed I COPPE Feelings Scale items showed that there was very little missing data (only 1 missing item response). Table 4.5 presents the correlations, means, and standard deviations for the observed I COPPE Feelings Scale items. As expected, the correlations between item pairs within hypothesized subscales were small-to-moderate (r 's ranged from .23 to .69). Item correlations across different hypothesized subscales were smaller (r 's ranged from .03 to .47).

Factor Structure

Results from the hypothesized correlated six-factor CFA model (Interpersonal, Community, Occupational, Physical, Psychological, and Economic Well-Being), demonstrated poor model fit, $\chi^2(39) = 107.75, p < .001$, RMSEA = .06 [90% CI = .05, .08], $p = .05$, TLI = .89, CFI = .94, SRMR = .04. Although this model did not fit the data well, results are explored for thoroughness. The next two sections explore potential specific sources of model misfit and an alternative CFA measurement model.

Table 4.6 shows the unstandardized factor loadings and standard errors. All of the estimated factor loadings were statistically significant ($p < .001$). The corresponding standardized estimates (factor loadings, interfactor correlations, residual variances) are presented in Figure 4.2.

Table 4.1

Correlations, Means, and Standard Deviations for Items on the I COPPE Actions Scale

Item	1	2	3	4	5	6	7	8	9	10	11	12
1. Engage in positive interactions with people close to you	1	--	--	--	--	--	--	--	--	--	--	--
2. Make attempts to repair relationships following conflict	.33***	1	--	--	--	--	--	--	--	--	--	--
3. Volunteer in the community	.23***	.13**	1	--	--	--	--	--	--	--	--	--
4. Participate in community events	.24***	.08	.74***	1	--	--	--	--	--	--	--	--
5. Persevere with work-related tasks	.19***	.20***	.11*	.09*	1	--	--	--	--	--	--	--
6. Focus intently at work	.10*	.18***	.12*	.12**	.52***	1	--	--	--	--	--	--
7. Engage in moderate physical activity for about 30 min 5x wk	.13**	.09	.16***	.20***	.08	.04	1	--	--	--	--	--
8. Eat mostly a plant-based diet such as fruits, vegetables, nuts and seeds	.13**	.13**	.24***	.25***	.15**	.16***	.37***	1	--	--	--	--
9. Engage in activities that you find meaningful	.42***	.14**	.29***	.32***	.21***	.13**	.44***	.28***	1	--	--	--
10. Take concrete steps to experience peace of mind	.36***	.24***	.22***	.20***	.09	.10*	.35***	.29***	.54***	1	--	--
11. Save money	.21***	.14**	.13**	.23***	.09*	.08	.19***	.22***	.24***	.26***	1	--
12. Take steps to improve your financial situation	.27***	.16***	.15**	.16***	.11*	.14**	.18***	.18***	.28***	.35***	.60***	1
<i>M</i>	3.22	2.88	1.47	1.61	3.45	3.40	2.43	2.15	2.70	2.46	2.29	2.58
<i>SD</i>	.75	.93	1.14	1.05	.66	.68	1.29	1.22	.85	1.00	1.19	.95

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

Table 4.2

Unstandardized Factor Loadings and Standard Errors for the Six-Factor I COPPE Actions Scale CFA Model

Item	Factors					
	INWB Est(SE)	COWB Est(SE)	OCWB Est(SE)	PHWB Est(SE)	PSWB Est(SE)	ECWB Est(SE)
1. Engage in positive interactions with people close to you	1.00	-	-	-	-	-
2. Make attempts to repair relationships following conflict	.64(.14)	-	-	-	-	-
3. Volunteer in the community	-	1.00	-	-	-	-
4. Participate in community events	-	.97(.10)	-	-	-	-
5. Persevere with work-related tasks	-	-	1.00	-	-	-
6. Focus intently at work	-	-	.78(.22)	-	-	-
7. Engage in moderate physical activity for about 30min 5x wk	-	-	-	1.00	-	-
8. Eat mostly a plant-based diet such as fruits, vegetables, nuts and seeds	-	-	-	.74(.12)	-	-
9. Engage in activities that you find meaningful	-	-	-	-	1.00	-
10. Take concrete steps to experience peace of mind	-	-	-	-	1.05 (.10)	-
11. Save money	-	-	-	-	-	1.00
12. Take steps to improve your financial situation	-	-	-	-	-	.91(.13)

Note. Model Fit: $\chi^2(39) = 82.98$, RMSEA = .05, CFI = .96, TLI = .94, SRMR = .04. Est = estimate; INWB = interpersonal well-being; COWB = community well-being; OCWB = occupational well-being; PHWB = physical well-being; PSWB = psychological well-being; ECWB = economic well-being. Est and SE are the unstandardized estimates and standard errors. Factor loadings fixed at 1.00 for model identification. All estimated factor loadings were statistically significant, $p < .001$.

Table 4.3

Factor Variances, Covariances, and Correlations for the Six-Factor I COPPE Actions Scale CFA Model

Factor	1	2	3	4	5	6
1. Interpersonal Well-Being (INWB)	.36	.19	.10	.14	.26	.21
2. Community Well-Being (COWB)	.34	.91	.08	.32	.26	.20
3. Occupational Well-Being (OCWB)	.30	.16	.30	.10	.09	.08
4. Physical Well-Being (PHWB)	.27	.38	.21	.78	.44	.28
5. Psychological Well-Being (PSWB)	.66	.42	.26	.76	.44	.28
6. Economic Well-Being (ECWB)	.40	.24	.18	.37	.49	.74

Note. Model Fit: $\chi^2(39)=82.98$, RMSEA=.05, CFI=.96, TLI=.94. Factor variances (bolded) are shown on the diagonal, covariances are shown above the main diagonal, and correlations are shown below the main diagonal. All estimates were statistically significant, $p < .05$.

Table 4.4

Unstandardized Item Intercepts, Unstandardized Item Residual Variances, and R-Square Values for the Six-Factor I COPPE Actions Scale CFA Model

Item	Intercept Est (SE)	Residual variance Est (SE)	R ² Est (SE)
1. Engage in positive interactions with people close to you	3.22 (.04) **	.21 (.07) *	.63(.13) **
2. Make attempts to repair relationships following conflict	2.88 (.05) **	.72 (.06) **	.17(.05) **
3. Volunteer in the community	1.47 (.06) **	.40 (.10) **	.70(.08) **
4. Participate in community events	1.61 (.05) **	.24 (.09) *	.78(.08) **
5. Persevere with work-related tasks	3.45 (.03) **	.14 (.09)	.68(.19) **
6. Focus intently at work	3.40 (.03) **	.27 (.06) **	.40(.12) **
7. Engage in moderate physical activity for about 30min 5x wk	2.43 (.06) **	.88 (.15) **	.47(.09) **
8. Eat mostly a plant-based diet such as fruits, vegetables, nuts and seeds	2.15 (.06) **	1.04 (.10) **	.29(.06) **
9. Engage in activities that you find meaningful	2.70 (.04) **	.29 (.04) **	.60(.06) **
10. Take concrete steps to experience peace of mind	2.46 (.05) **	.51 (.05) **	.48(.05) **
11. Save money	2.29 (.06) **	.68 (.12) **	.52(.08) **
12. Take steps to improve your financial situation	2.58 (.05) **	.28 (.08) **	.68(.09) **

Note. Model Fit: $\chi^2(39)=82.98$, RMSEA=.05, CFI=.96, TLI=.94.

* $p < .01$. ** $p < .001$.

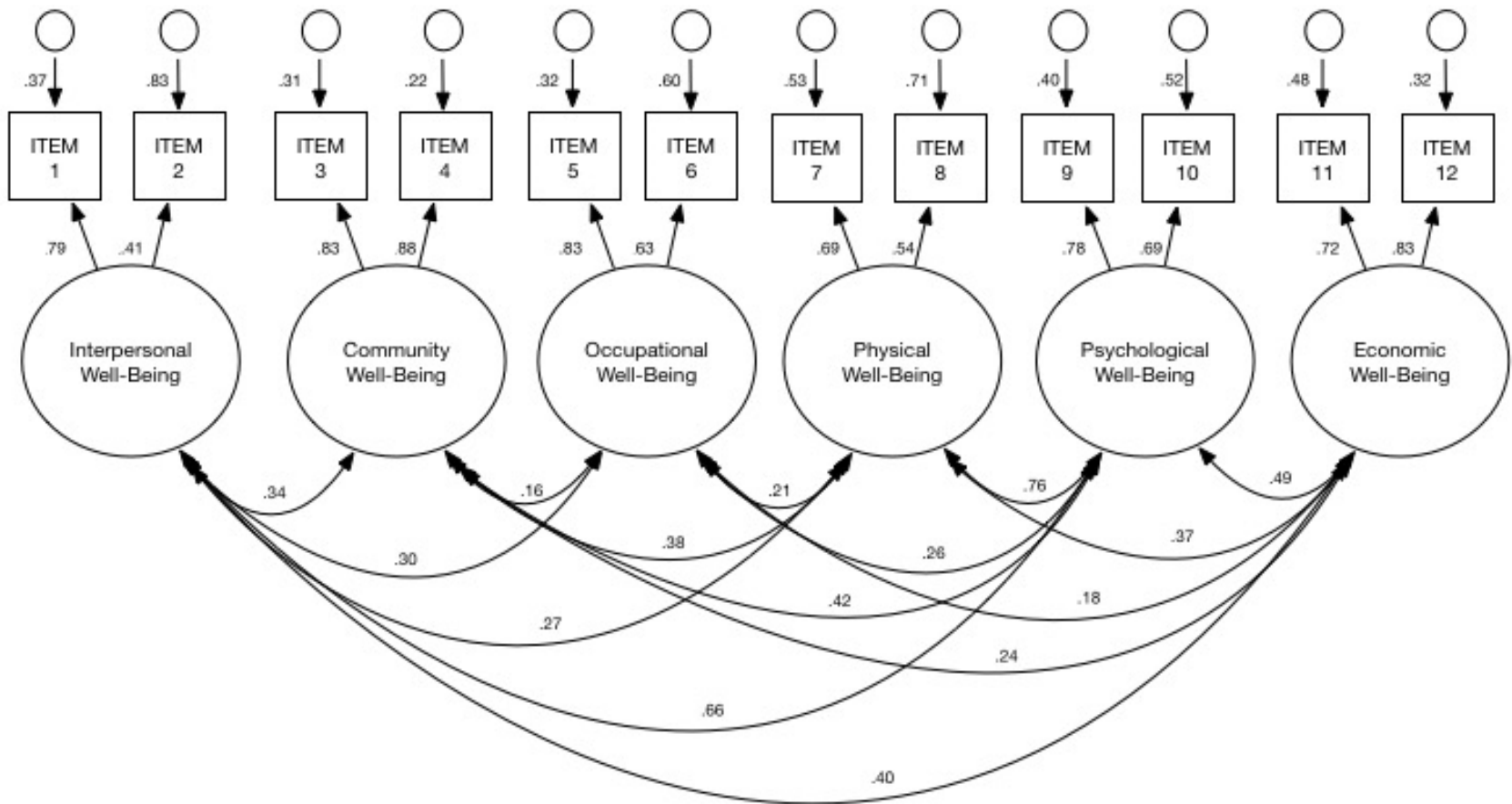


Figure 4.1. Standardized estimates for the six-factor I COPPE Actions Scale CFA model. All item factor loadings are significant at $p < .001$. All interfactor correlations are significant at $p < .05$. All residual variances are significant at $p < .01$ except for item 5 which is nonsignificant.

All of the standardized factor loadings were also statistically significant ($p < .001$) and ranged from .30 to .86, with most of the factor loadings (i.e., 8 of 12) above .65.

Table 4.7 provides the unstandardized factor variances, covariances, and standardized correlations. All of these estimates were statistically significant ($p < .05$). The interfactor correlations ranged from .21 to .71, with most of the correlations (i.e., 9 of 15) above .40.

The unstandardized item intercepts, unstandardized item residual variances, and R^2 values are presented in Table 4.8. All of the R^2 values were statistically significant ($p < .05$) and ranged from .09 to .74, with most of the R^2 values (i.e., 7 of 12) above .45. Of note, item 8 (“*that you are overweight*”) had the lowest factor loading (.30) and the lowest R^2 value (.09).

Potential sources of model misspecification. Modification indices were examined as a guide in search for model misspecification. The modification indices suggested making two specification changes to the original hypothesized CFA model. First, they suggested allowing a cross-loading for item 1 “*a strong emotional connection to others*” (designed to measure Interpersonal Well-Being) on to Psychological Well-Being. This modification makes substantive sense because item 1 includes the term “emotional,” a term strongly associated with the domain of Psychological Well-Being. Also, item 9 (“*overwhelmed by negative emotion*”), the only other item on the scale that includes the term “emotion,” is intended to measure Psychological Well-Being. Second, the modification indices supported correlated residuals for item 8 “*that you are overweight*” and item 9 “*overwhelmed by negative emotion.*” Correlated measurement errors may indicate a method effect (e.g., variance due to similarities in wording, positive or negative wording, method of measurement) (Podsakoff, MacKenzie, Lee, & Podsakoff,

2003). Item 8 and item 9 share similarities in wording (e.g., *overweight*, *overwhelmed*). These items are also both negatively worded (the other items are positively worded) and as a result were recoded to reflect this difference. Thus, allowing these residuals to correlate makes substantive sense.

Alternative measurement model. Because the hypothesized factor model yielded an inadequate model fit, an alternative CFA model based on the sources of misfit outlined above was specified. Establishing well-fit models is a prerequisite to testing for equivalence of parameters across groups (Byrne, Shavelson, & Muthén, 1989). When the original CFA model was modified to allow the residual correlation between item 8 and item 9 as well as the cross-loading of item 1 on Psychological Well-Being, the model fit significantly improved compared to baseline (Satorra-Bentler $\chi^2(2) = 38.86, p < .001$). Further, the model fit of the modified model showed acceptable values across the range of fit indices, $\chi^2(37) = 72.63, p < .001$, RMSEA = .05 [90% CI = .03, .06], $p = .58$, TLI = .94, CFI = .97, SRMR = .04.

Table 4.9 shows the unstandardized factor loadings and standard errors for the modified model (Model 2). All of the estimated factor loadings were statistically significant ($p < .01$). The corresponding standardized estimates (factor loadings, interfactor correlations, residual variances) are presented in Figure 4.3. All of the standardized factor loadings were also statistically significant ($p < .001$) and ranged from .28 to .89, with most of the factor loadings (i.e., 7 of 13) falling in the .77 to .89 range. These large factor loadings suggested that most of the observed items were strongly related to its hypothesized latent factor.

Table 4.10 provides the unstandardized factor variances, covariances, and standardized correlations. All of these estimates were statistically significant ($p < .05$), except for the covariance between Economic Well-Being and Interpersonal Well-Being which was not statistically significant. The interfactor correlations ranged from .15 to .65, with most (i.e., 10 of 15) falling in the moderate range from .20 to .45. The unstandardized item intercepts, unstandardized item residual variances, and R^2 values are presented in Table 4.11. All of the R^2 values were statistically significant ($p < .05$) and ranged from .08 to .79. The majority of the R^2 values (i.e. 7 of 12) were moderate-to-large (.60 to .79) suggesting that the latent factors explained a substantial amount of the variability in the observed item responses. A reasonable answer to research question 2 was that the empirical evaluation of the original hypothesized correlated six-factor structure of the I COPPE Feelings Scale did not show strong support. However, follow-up exploratory analyses suggested that a slightly modified six-factor model with a single cross-loading item and a residual correlation between two items fit the data well.

Measurement Invariance Analytic Strategy

For both the I COPPE Actions Scale and the I COPPE Feelings Scale, measurement invariance across gender was investigated using multiple group confirmatory factor analysis (MGCFA) in *Mplus 7.4* (Muthén & Muthén, 2012). All models were estimated using maximum likelihood estimation with robust standard errors and chi-square test statistics (MLR). In order to formally test measurement invariance, a series of nested models were fitted and compared using Satorra-Bentler Chi-Square Difference tests, which are likelihood ratio tests that account for the MLR scaling factor.

Table 4.5

Correlations, Means, and Standard Deviations for Items on the I COPPE Feelings Scale

Item	1	2	3	4	5	6	7	8	9	10	11	12
1. A strong emotional connection to sig. others	1	--	--	--	--	--	--	--	--	--	--	--
2. You are helpful to others	.37***	1	--	--	--	--	--	--	--	--	--	--
3. A sense of belonging in your community	.30***	.32***	1	--	--	--	--	--	--	--	--	--
4. You are making a contribution to your community	.26***	.37***	.69***	1	--	--	--	--	--	--	--	--
5. In control of your work tasks	.13**	.26***	.09	.12*	1	--	--	--	--	--	--	--
6. Competent at work	.18***	.37***	.17***	.17***	.44***	1	--	--	--	--	--	--
7. Energetic	.28***	.31***	.35***	.29***	.22***	.25***	1	--	--	--	--	--
8. That you are overweight	.05	-.03	.06	.13**	.03	.05	.23***	1	--	--	--	--
9. Overwhelmed by negative emotion	.29***	.17***	.25***	.23***	.12**	.15**	.32***	.26***	1	--	--	--
10. Happy	.39***	.28***	.34***	.25***	.19***	.21***	.47***	.19***	.54***	1	--	--
11. Financially secure	.17***	.08	.19***	.24***	.05	.10*	.22***	.19***	.23***	.33***	1	--
12. Competent in managing your money	.15**	.15**	.16***	.16***	.07	.21***	.20***	.24***	.24***	.25***	.54***	1
<i>M</i>	3.18	3.38	2.29	2.06	3.03	3.49	2.76	1.92	2.43	2.87	2.16	2.54
<i>SD</i>	.85	.65	1.00	1.09	.86	.67	.86	1.50	.95	.74	1.08	1.01

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

Table 4.6

Unstandardized Factor Loadings and Standard Errors for the Six-Factor I COPPE Feelings Scale CFA Model 1

Item	Factors					
	INWB Est(SE)	COWB Est(SE)	OCWB Est(SE)	PHWB Est(SE)	PSWB Est(SE)	ECWB Est(SE)
1. A strong emotional connection to sig. others	1.00	-	-	-	-	-
2. You are helpful to others	.91(.14)	-	-	-	-	-
3. A sense of belonging in your community	-	1.00	-	-	-	-
4. You are making a contribution to your community	-	1.04(.10)	-	-	-	-
5. In control of your work tasks	-	-	1.00	-	-	-
6. Competent at work	-	-	1.04(.18)	-	-	-
7. Energetic	-	-	-	1.00	-	-
8. That you are overweight	-	-	-	.68(.21)	-	-
9. Overwhelmed by negative emotion	-	-	-	-	1.00	-
10. Happy	-	-	-	-	1.07(.11)	-
11. Financially secure	-	-	-	-	-	1.00
12. Competent in managing your money	-	-	-	-	-	.79(.16)

Note. Model Fit: $\chi^2(39) = 107.75$, RMSEA = .06, CFI = .94, TLI = .89, SRMR = .04. Est = estimate; INWB = interpersonal well-being; COWB = community well-being; OCWB = occupational well-being; PHWB = physical well-being; PSWB = psychological well-being; ECWB = economic well-being. Est and SE are the unstandardized estimates and standard errors. Factor loadings fixed at 1.00 for model identification. All estimated factor loadings were statistically significant, $p < .001$.

Table 4.7

Factor Variances, Covariances, and Correlations for the Six-Factor I COPPE Feelings Scale CFA Model 1

Factor	1	2	3	4	5	6
1. Interpersonal Well-Being (INWB)	.23	.25	.14	.18	.17	.11
2. Community Well-Being (COWB)	.61	.72	.11	.28	.22	.22
3. Occupational Well-Being (OCWB)	.60	.25	.24	.14	.10	.09
4. Physical Well-Being (PHWB)	.58	.50	.43	.43	.28	.23
5. Psychological Well-Being (PSWB)	.60	.43	.33	.71	.35	.24
6. Economic Well-Being (ECWB)	.27	.30	.21	.40	.47	.75

Note. Model Fit: $\chi^2(39) = 107.75$, RMSEA = .06, CFI = .94, TLI = .89, SRMR = .04. Factor variances (bolded) are shown on the diagonal, covariances are shown above the main diagonal, and correlations are shown below the main diagonal. All estimates were statistically significant, $p < .05$.

Table 4.8

Unstandardized Item Intercepts, Unstandardized Item Residual Variances, and R-Square Values for the Six-Factor I COPPE Feelings Scale CFA Model 1

Item	Intercept Est (SE)	Residual variance Est (SE)	R ² Est (SE)
1. A strong emotional connection to sig. others	3.18 (.04) **	.49 (.05) **	.32 (.06) **
2. You are helpful to others	3.38 (.03) **	.24 (.03) **	.44 (.08) **
3. A sense of belonging in your community	2.29 (.05) **	.28 (.07) **	.72 (.07) **
4. You are making a contribution to your community	2.06 (.05) **	.40 (.08) **	.66 (.07) **
5. In control of your work tasks	3.03 (.04) **	.49 (.06) **	.33 (.07) **
6. Competent at work	3.49 (.03) **	.18 (.05) **	.59 (.10) **
7. Energetic	2.76 (.04) **	.30 (.12) *	.59 (.16) **
8. That you are overweight	1.92 (.07) **	2.06 (.11) **	.09 (.04) *
9. Overwhelmed by negative emotion	2.43 (.05) **	.55 (.06) **	.39 (.06) **
10. Happy	2.87 (.04) **	.14 (.04) **	.74 (.07) **
11. Financially secure	2.16 (.05) **	.41 (.15) *	.65 (.13) **
12. Competent in managing your money	2.54 (.05) **	.55 (.11) **	.46 (.11) **

Note. Model Fit: $\chi^2(39) = 107.75$, RMSEA = .06, CFI = .94, TLI = .89, SRMR = .04.

* $p < .05$. ** $p < .001$.

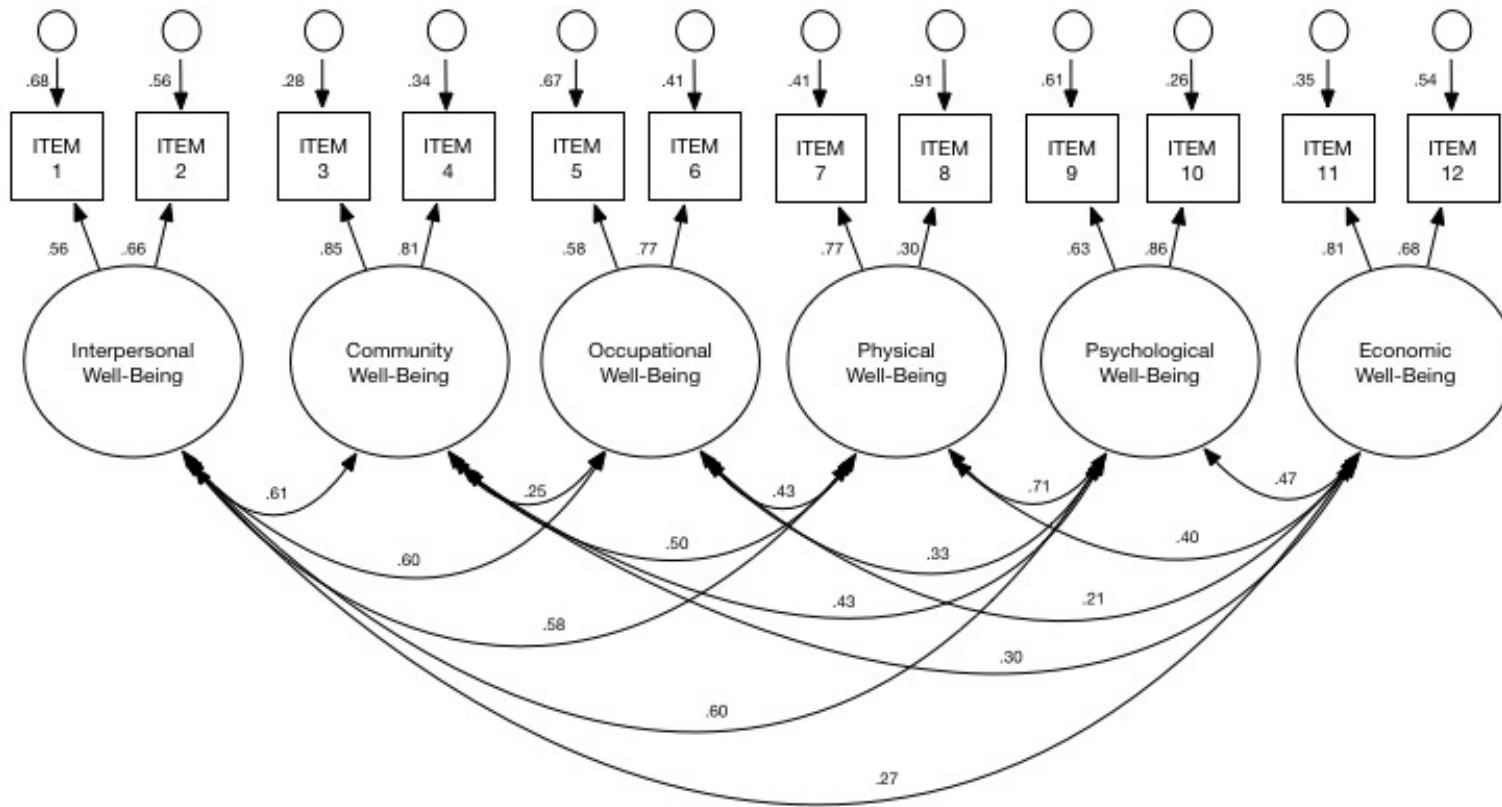


Figure 4.2. Standardized estimates for the Six-Factor I COPPE Feelings Scale CFA Model 1 (no modifications). All item factor loadings are significant at $p < .001$. All interfactor correlations are significant at $p < .05$. All residual variances are significant at $p \leq .01$.

Table 4.9

Unstandardized Factor Loadings and Standard Errors for the Six-Factor I COPPE Feelings Scale CFA Model 2

Item	Factors					
	INWB Est(SE)	COWB Est(SE)	OCWB Est(SE)	PHWB Est(SE)	PSWB Est(SE)	ECWB Est(SE)
1. A strong emotional connection to sig. others	1.00	-	-	-	0.51 (0.10)	-
2. You are helpful to others	2.34(.83)	-	-	-	-	-
3. A sense of belonging in your community	-	1.00	-	-	-	-
4. You are making a contribution to your community	-	1.05(.11)	-	-	-	-
5. In control of your work tasks	-	-	1.00	-	-	-
6. Competent at work	-	-	1.05(.17)	-	-	-
7. Energetic	-	-	-	1.00	-	-
8. That you are overweight	-	-	-	.59(.19)	-	-
9. Overwhelmed by negative emotion	-	-	-	-	1.00	-
10. Happy	-	-	-	-	1.08(.11)	-
11. Financially secure	-	-	-	-	-	1.00
12. Competent in managing your money	-	-	-	-	-	.76(.17)

Note. Model Fit: $\chi^2(37) = 72.625$, RMSEA = .05, CFI = .97, TLI = .94, SRMR = .04. Est = estimate; INWB = interpersonal well-being; COWB = community well-being; OCWB = occupational well-being; PHWB = physical well-being; PSWB = psychological well-being; ECWB = economic well-being. Est and SE are the unstandardized estimates and standard errors. Factor loadings fixed at 1.00 for model identification. All estimated factor loadings were statistically significant, $p < .01$.

Table 4.10

Factor Variances, Covariances, and Correlations for the Six-Factor I COPPE Feelings Scale CFA Model 2

Factor	1	2	3	4	5	6
1. Interpersonal Well-Being (INWB)	.06	.10	.06	.07	.05	.03
2. Community Well-Being (COWB)	.47	.71	.11	.28	.22	.22
3. Occupational Well-Being (OCWB)	.52	.25	.24	.14	.10	.09
4. Physical Well-Being (PHWB)	.39	.46	.40	.51	.27	.22
5. Psychological Well-Being (PSWB)	.36	.44	.33	.65	.35	.24
6. Economic Well-Being (ECWB)	.15	.30	.20	.36	.46	.78

Note. Model Fit: $\chi^2(37) = 72.625$, RMSEA = .05, CFI = .97, TLI = .94, SRMR = .04. Factor variances (bolded) are shown on the diagonal, covariances are shown above the main diagonal, and correlations are shown below the main diagonal. All estimates were statistically significant, $p \leq .05$, except for the covariance between ECWB and INWB which was nonsignificant.

Table 4.11

Unstandardized Item Intercepts, Unstandardized Item Residual Variances, and R-Square Values for the Six-Factor I COPPE Feelings Scale CFA Model 2

Item	Intercept Est (SE)	Residual variance Est (SE)	R ² Est (SE)
1. A strong emotional connection to sig. others	3.18 (.04) **	.51 (.05) **	.29 (.05) **
2. You are helpful to others	3.38 (.03) **	.09 (.09)	.79 (.21) **
3. A sense of belonging in your community	2.29 (.05) **	.29 (.07) **	.71 (.07) **
4. You are making a contribution to your community	2.06 (.05) **	.39 (.09) **	.67 (.08) **
5. In control of your work tasks	3.03 (.04) **	.49 (.06) **	.33 (.07) **
6. Competent at work	3.49 (.03) **	.18 (.05) **	.60 (.10) **
7. Energetic	2.76 (.04) **	.23 (.15)	.69 (.20) **
8. That you are overweight	1.92 (.07) **	2.08 (.11) **	.08 (.04) *
9. Overwhelmed by negative emotion	2.43 (.05) **	.56 (.06) **	.39 (.06) **
10. Happy	2.87 (.04) **	.14 (.03) **	.74 (.06) **
11. Financially secure	2.16 (.05) **	.38 (.16) *	.67 (.14) **
12. Competent in managing your money	2.54 (.05) **	.57 (.11) **	.44 (.11) **

Note. Model Fit: $\chi^2(37) = 72.625$, RMSEA = .05, CFI = .97, TLI = .94, SRMR = .04.

* $p < .05$. ** $p < .001$.

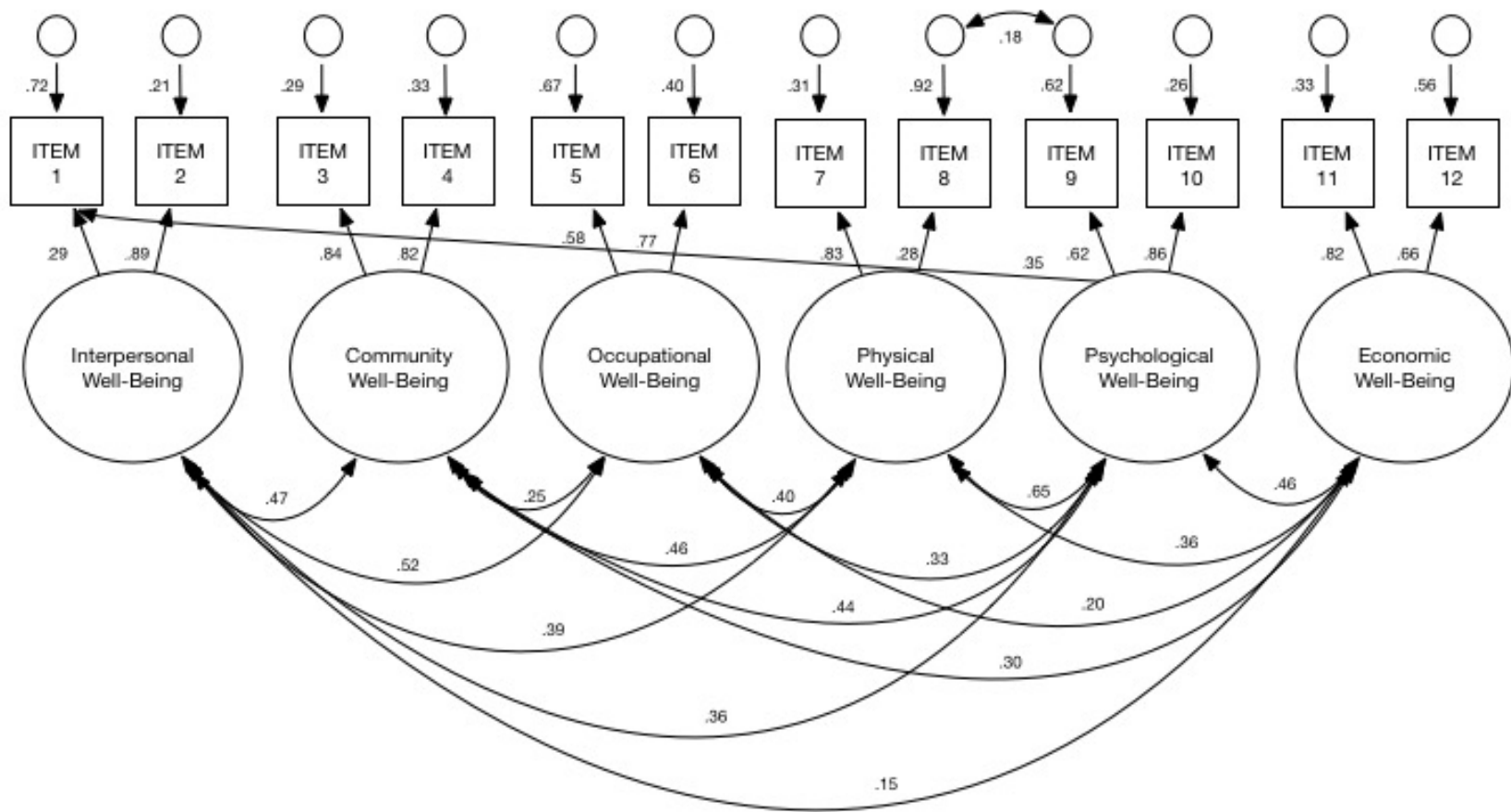


Figure 4.3. Standardized estimates for the Six-Factor I COPPE Feelings Scale CFA Model 2 (with modifications: added residual correlation for item8 and item9; allowed item1 to load onto interpersonal well-being and psychological well-being). All item factor loadings are significant at $p < .001$. All interfactor correlations are significant at $p < .05$. All residual variances are significant at $p < .05$, except for item2 and item 7 which are nonsignificant.

Measurement invariance was tested by first fitting the least constrained MGCFA model (i.e., all parameters differed across males and females) and subsequently fitting models with sequentially more restrictive parameter constraints to evaluate different types of measurement invariance (e.g., metric, strong, strict).

Research Question 3: Is There Support for Measurement Invariance Across Males and Females for the I COPPE Actions Scale?

Descriptive Statistics

The male and female participants' means, standard deviations, skewness and kurtosis for the 12 items of the I COPPE Actions Scale are displayed in Table 4.12. The means ranged from 1.39 to 3.45 for males and from 1.50 to 3.45 for females. The values of univariate skewness and kurtosis ranged from -1.18 to .32 for males and from -1.03 to .95 for females, which indicates that none of the items have a major normality problem.

Measurement Invariance

The full set of model comparison results are displayed in Table 4.13. Prior to fitting the baseline model, configural invariance was assessed by fitting separate CFAs for males and females. Both the male and female CFA models fit the data well (males: $\chi^2(39) = 49.54$, $p = .12$, CFI = .97, TLI = .95, RMSEA = .05 [90% CI = .00, .09], $p = .44$, SRMR = .05; females: $\chi^2(39) = 61.51$, $p < .05$, CFI = .97, TLI = .96, RMSEA = .04 [90% CI = .02, .06], $p = .74$, SRMR = .03). Further, visual examination of the parameter estimates across the models suggested similar factor patterns. Because these results were consistent with configural invariance, a baseline model (Model 1) was assessed with all parameters set free. As shown in Table 4.13, the baseline model fit the data, supporting a similar factor structure holds across males and females, $\chi^2(78) = 111.22$, CFI = .97, TLI = .95, RMSEA = .05 [90% CI = .02, .06], $p = .67$, SRMR = .04. This baseline model

served as the first step for empirically evaluating measurement invariance by means of nested model comparison.

Second, metric invariance (Model 2) was assessed by constraining the factor loadings to be equal across males and females. Model 2 was nested within Model 1. The fit of Model 2 was acceptable, $\chi^2(84) = 118.70$, $p < .01$, CFI = .97, TLI = .96, RMSEA = .04 [90% CI = .02, .06], $p = .70$, SRMR = .04, and did not significantly differ from that of the baseline configural model (Satorra-Bentler $\chi^2(6) = 7.55$, $p = .27$). This result indicates that metric invariance was met (i.e., relationship between latent factors and items are similar for males and females).

Third, strong invariance (Model 3) was assessed by constraining the intercepts to be equal across groups. Model 3 was then nested within Model 2. The fit of Model 3 was not acceptable, $\chi^2(90) = 171.10$, $p < .001$, CFI = .93, TLI = .90, RMSEA = .07 [90% CI = .05, .08], $p = .05$, SRMR = .06, and the Sattora-Benter Chi-Square Difference showed that the less parsimonious Model 2 fit the data significantly better compared to the more restrictive strong invariance Model 3 (Satorra-Bentler $\chi^2(6) = 68.22$, $p < .001$). This result indicates that strong invariance did not hold (i.e., all item intercepts were not equal across groups). Since strong invariance was not met, partial strong invariance was evaluated in Model 4. Inspection of the modification indices suggested that the problem may lie with the intercepts for item 8 (“*eat mostly a plant-based diet such as fruits, vegetables, nuts, and seeds*”) and item 10 (“*take concrete steps to experience peace of mind*”). For item 8, this difference indicated that given the same level of physical well-being, males endorsed less often eating a mostly plant-based diet than the females. For item 10, this difference indicates that given the same level of psychological well-being, males endorsed less often

taking concrete steps to experience peace of mind than the females.

Furthermore, Model 4 imposed invariant intercepts for all items except for these two items. This partial strong invariance Model 4 was then compared with metric invariant Model 2. The fit of Model 4 was acceptable, $\chi^2(88) = 125.49$, $p < .01$, CFI = .97, TLI = .95, RMSEA = .05 [90% CI = .03, .06], $p = .68$, SRMR = .04, and did not significantly differ from that of Model 2 (Satorra-Bentler $\chi^2(4) = 7.02$, $p = .14$). This result indicates that partial strong invariance was met such that only two item intercepts (“*eat mostly a plant-based diet such as fruits, vegetables, nuts, and seeds*” and “*take concrete steps to experience peace of mind*”) significantly differed across groups. Specifically, given the same level on the latent physical and psychological well-being factors, males and females significantly differed in their expected score on these two items (“*eat mostly a plant-based diet such as fruits, vegetables, nuts, and seeds*” and “*take concrete steps to experience peace of mind*”). Another way to conceptualize these intercept differences is that males need to have higher levels of physical and psychological well-being in order to have the same expected score on these two observed items compared to females.

After establishing partial strong invariance in Model 4, partial strict invariance was assessed (Model 5) by constraining the residual variances to be equal across groups. Model 5 was nested within Model 4. The fit of Model 5 was acceptable, $\chi^2(100) = 144.56$, $p < .01$, CFI = .96, TLI = .95, RMSEA = .05 [90% CI = .03, .06], $p = .66$, SRMR = .06, and did not significantly differ from that of Model 4 (Satorra-Bentler $\chi^2(12) = 10.22$, $p = .08$). This result indicates that partial strict invariance was met (i.e., the residual variances did not significantly differ between the groups).

Having established partial strict invariance related to the measurement model, the invariance of the factor means, variances, and covariances was assessed. Partial strict invariance with equal factor means was assessed (Model 6) by constraining the factor means to be equal across groups. Model 6 was then compared to Model 5. The fit of Model 6 was not acceptable, $\chi^2(106) = 184.07, p < .001$, CFI = .94, TLI = .92, RMSEA = .06 [90% CI = .04, .07], $p = .16$, SRMR = .08, and the Satorra-Bentler Chi-Square Difference test favored the less parsimonious Model 5 where the factor means differed across gender (Satorra-Bentler $\chi^2(6) = 35.85, p < .001$). This result indicates that males and females significantly differed with regards to their average level on the latent factors. Lastly, partial strict invariance with equal factor variances/covariances was assessed (Model 7) by constraining the factor variances and covariances to be equal across groups. Model 7 was then compared to Model 5. The fit of Model 7 was acceptable, $\chi^2(121) = 170.77, p < .01$, CFI = .96, TLI = .96, RMSEA = .04 [90% CI = .03, .06], $p = .74$, SRMR = .08, and did not significantly differ from that of Model 5 (Satorra-Bentler $\chi^2(21) = 26.44, p = .19$). This result (see Table 4.14 and Table 4.15) indicates that partial strict invariance with equal factor variances and covariances was met. As such, while males and females significantly differed on the factor means, the variances and covariances for the factors did not significantly differ across the groups. A reasonable answer to research question 3 was that due to unequal item intercepts measurement invariance did not fully hold across males and females for the I COPPE Actions Scale.

Table 4.12

Univariate Descriptive Statistics for the Items on the I COPPE Actions Scale

Item	Males (<i>n</i> = 100)				Females (<i>n</i> = 329)			
	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	<i>M</i>	<i>SD</i>	Skewness	Kurtosis
1. Engage in positive interactions with people close to you	3.17	.65	-.19	-.66	3.24	.78	-.91	.95
2. Make attempts to repair relationships following conflict	2.79	.91	-.30	-.71	2.91	.93	-.68	.39
3. Volunteer in the community	1.39	1.20	.32	-.95	1.50	1.13	.37	-.49
4. Participate in community events	1.62	1.09	.04	-.62	1.61	1.04	.19	-.44
5. Persevere with work-related tasks	3.45	.66	-.79	-.43	3.45	.67	-.95	.28
6. Focus intently at work	3.29	.73	-.51	-.96	3.43	.66	-.93	.62
7. Engage in moderate physical activity for about 30min 5x wk	2.98	1.16	-.90	-.12	2.26	1.28	-.14	-1.03
8. Eat mostly a plant-based diet such as fruits, vegetables, nuts and seeds	1.93	1.24	.01	-.79	2.21	1.20	-.20	-.77
9. Engage in activities that you find meaningful	2.97	.75	.05	-1.18	2.61	.87	-.21	-.06
10. Take concrete steps to experience peace of mind	2.49	1.05	-.30	.04	2.45	1.00	-.22	-.36
11. Save money	2.48	1.19	-.38	-.75	2.23	1.19	-.17	-.78
12. Take steps to improve your financial situation	2.70	1.00	-.23	-.74	2.54	.93	-.37	-.08

Table 4.13

Summary of Fit Statistics for Testing Measurement Invariance for the I COPPE Actions Scale

Model	χ^2	CFI	TLI	RMSEA	SRMR	Models compared	Satorra-Bentler χ^2 difference	Conclusion
Model 1: Baseline	$\chi^2(78)=111.22$ $p = .008$	.97	.95	.05	.04	-	-	Factor structure similar across groups.
Model 2: Metric Invariance (Invariant Loadings)	$\chi^2(84)= 118.70$ $p = .008$	.97	.96	.04	.04	2 vs. 1	$\chi^2(6)=7.55$ $p = .27$	Metric invariance met. Relationship between latent factors and items are not significantly different by gender.
Model 3: Strong Invariance (Invariant Loadings & Intercepts)	$\chi^2(90)=171.10$ $p < .001$	.93	.90	.07	.06	3 vs. 2	$\chi^2(6)=68.22$ $p < .001$	Strong invariance not met. Holding levels on latent factors constant, the expected scores on the observed items significantly differed by gender.
Model 4: Partial Strong Invariance (Invariant Loadings & Intercepts except Items 8 and 10)	$\chi^2(88)=125.49$ $p = .005$	.97	.95	.05	.04	4 vs. 2	$\chi^2(4)=7.02$ $p = .14$	Partial strong invariance met. Given the same level on the latent PHWB and PSWB factors, males and females only significantly differed in their expected score on items 8 and 10 (males < females).
Model 5: Partial Strict Invariance (Invariant Loadings, Intercepts except Item 8 and 10, & Residuals)	$\chi^2(100)=144.56$ $p = .002$	.96	.95	.05	.06	5 vs. 4	$\chi^2(12)=19.22$ $p = .08$	Partial strict invariance met. The residual errors did not significantly differ between groups.

Table 4.13 *continued*

Model	χ^2	CFI	TLI	RMSEA	SRMR	Models compared	Satorra-Bentler χ^2 difference	Conclusion
Model 6: Partial Strict Invariance and Equal Factor Means (Invariant Loadings, Intercepts except Item 8 and 10, Residuals, & Factor Means)	$\chi^2(106)$ =184.07 $p < .001$	.94	.92	.06	.08	6 vs. 5	$\chi^2(6)$ =35.85 $p < .001$	Equal factor means not met. Males and females had significantly different means on the latent factors.
Model 7: Partial Strict Invariance and Equal Factor Co/Variiances (Invariant Loadings, Intercepts except Item 8 and 10, Residuals, Variances and Covariances)	$\chi^2(121)$ =170.7 7 $p < .001$	.96	.96	.04	.08	7 vs. 5	$\chi^2(21)$ =26.4 4 $p = .19$	Equal Factor Co/Variiances met. The factor variances and covariances for the factors did not significantly differ by gender.

Note. CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.

Table 4.14

Unstandardized Factor Loadings, Standard Errors, Item Intercepts, and Residual Variances for the Six-Factor I COPPE Actions Scale for Model 7

Item	Factor loadings						Item intercepts		
	INWB Est(SE)	COWB Est(SE)	OCWB Est(SE)	PHWB Est(SE)	PSWB Est(SE)	ECWB Est(SE)	Male Est(SE)	Female Est(SE)	Residual variances Est(SE)
1. Engage in positive interactions with people close to you	1.00	-	-	-	-	-	3.16(.07)***	3.16(.07)***	.22(.07)**
2. Make attempts to repair relationships following conflict	.65(.14)** *	-	-	-	-	-	2.84(.06)***	2.84(.06)***	.71(.06)***
3. Volunteer in the community	-	1.00	-	-	-	-	1.44(.12)***	1.44(.12)***	.38(.10)***
4. Participate in community events	-	.96(.10)** *	-	-	-	-	1.58(.11)***	1.58(.11)***	.26(.09)**
5. Persevere with work-related tasks	-	-	1.00	-	-	-	3.41(.08)***	3.41(.08)***	.17(.10)
6. Focus intently at work	-	-	.88(.32)**	-	-	-	3.36(.08)***	3.36(.08)***	.25(.08)**
7. Engage in moderate physical activity for about 30min 5x wk	-	-	-	1.00	-	-	2.98(.12)***	2.98(.12)***	.82(.13)***

Table 4.14 *continued*

Item	Factor loadings						Item intercepts		
	INWB Est(SE)	COWB Est(SE)	OCWB Est(SE)	PHWB Est(SE)	PSWB Est(SE)	ECWB Est(SE)	Male Est(SE)	Female Est(SE)	Residual variances Est(SE)
8. Eat mostly a plant-based diet such as fruits, vegetables, nuts and seeds	-	-	-	.83(.13)** *	-	-	1.93(.12)***	2.81(.16)***	.95(.10)***
9. Engage in activities that you find meaningful	-	-	-	-	1.00	-	2.97(.07)***	2.97(.07)***	.28(.04)***
10. Take concrete steps to experience peace of mind	-	-	-	-	1.07(.10)* **	-	2.49(.10)***	2.83(.10)***	.51(.05)***
11. Save money	-	-	-	-	-	1.00	2.45(.11)***	2.45(.11)***	.67(.11)***
12. Take steps to improve your financial situation	-	-	-	-	-	.90(.13)** *	2.72(.09)***	2.72(.09)***	.29(.08)***

Note. Model Fit: $\chi^2(121)=170.77$, RMSEA = .04, CFI = .96, TLI = .96, SRMR = .08. Est = estimate; INWB = interpersonal well-being; COWB = community well-being; OCWB = occupational well-being; PHWB = physical well-being; PSWB = psychological well-being; ECWB = economic well-being. Est and SE are the unstandardized estimates and standard errors. Factor loadings fixed at 1.00 for model identification – these serve as marker, or, reference items.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4.15

Factor Variances, Covariances, Correlations, Means, and Standard Errors for the Six-Factor I COPPE Actions Scale for Model 7

	1	2	3	4	5	6
1. Interpersonal Well-Being (INWB)	.35	.20	.09	.14	.26	.21
2. Community Well-Being (COWB)	.35	.92	.09	.31	.27	.20
3. Occupational Well-Being (OCWB)	.31	.17	.27	.10	.09	.09
4. Physical Well-Being (PHWB)	.29	.38	.23	.74	.41	.26
5. Psychological Well-Being (PSWB)	.68	.43	.27	.73	.43	.27
6. Economic Well-Being (ECWB)	.41	.25	.20	.36	.48	.74
<i>M (SE)</i>						
Males	0	0	0	0	0	0
Females	.08(.08)	.04(.13)	.06(.09)	-.72(.14)	-.36(.09)	-.20(.12)

Note. Model Fit: $\chi^2(121)=170.77$, RMSEA = .04, CFI = .96, TLI = .96, SRMR = .08. Factor variances (bolded) are shown on the diagonal, covariances are shown above the main diagonal, and correlations are shown below the main diagonal. All variance/covariance estimates were statistically significant, $p < .05$.

Research Question 4: Is There Support for Measurement Invariance Across Males and Females for the I COPPE Feelings Scale?

Descriptive Statistics

The male and female participants' means, standard deviations, skewness and kurtosis for the 12 items of the I COPPE Feelings Scale are displayed in Table 4.16. The means ranged from 2.05 to 3.55 for males and from 1.78 to 3.47 for females. The values of univariate skewness and kurtosis ranged from -1.25 to .16 for males and from -1.39 to 1.72 for females, which indicates that none of the items have a major normality problem.

Measurement Invariance

The first step tested for configural invariance, which examined the equivalence of the factor structure for the two groups without parameter constraints. The model fit for females was acceptable, $\chi^2(37) = 69.52$, $p = .001$, CFI = .96, TLI = .93, RMSEA = .05 [90% CI = .03, .07], $p = .42$, SRMR = .04; however, the model fit for males was not acceptable, $\chi^2(38) = 70.86$, $p = .001$, CFI = .91, TLI = .84, RMSEA = .09 [90% CI = .06, .13], $p = .02$, SRMR = .07 (see Appendix C for the CFA models for the males and females). Inspection of the standardized factor loadings (see Table 4.17) suggests that the pattern of loadings may not hold for males due to several smaller and non-significant loadings. Specifically, item 1 (“*a strong emotional connection to significant others*”), which cross-loads on both interpersonal well-being and psychological well-being has small, non-significant loadings on both factors.

Overall, there were three primary differences between the male and female models for the I COPPE Feelings Scale. First, the indices of model fit suggested an acceptable fit for females, but an unacceptable fit for males. Second, the males and females had different loadings for item 1. Specifically, for males, item 1 had non-

significant loadings on interpersonal well-being and psychological well-being; however, for females, item 1 had significant loadings on both of the factors. Finally, in order for the model to converge to a proper solution, it was necessary to constrain the residual variance for item 7 (“*energetic*”) to 0 for the males but not for the females. Given these differences, there was not sufficient supporting evidence that the same conceptual representation of the latent variables holds across males and females for the I COPPE Feelings Scale. In addition, research suggests that “configural invariance must be established in order for subsequent tests to be meaningful” (Vandenberg & Lance, 2000, p. 12). Therefore, subsequent tests of measurement invariance were not conducted. A reasonable answer to research question 4 was that measurement invariance did not hold across males and females for the I COPPE Feeling Scale.

Table 4.16

Univariate Descriptive Statistics for the Items on the I COPPE Feelings Scale

Item	Males (<i>n</i> = 100)				Females (<i>n</i> = 329)			
	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	<i>M</i>	<i>SD</i>	Skewness	Kurtosis
1. A strong emotional connection to sig. others	3.21	.82	-.75	-.18	3.18	.86	-.85	.34
2. You are helpful to others	3.28	.68	-.42	-.81	3.41	.64	-.69	-.20
3. A sense of belonging in your community	2.13	1.01	.03	-.32	2.34	1.00	-.25	-.10
4. You are making a contribution to your community	2.05	1.14	-.18	-.73	2.06	1.07	.05	-.52
5. In control of your work tasks	2.93	.91	-.67	.16	3.05	.84	-.58	-.14
6. Competent at work	3.55	.64	-1.13	.16	3.47	.68	-1.20	1.72
7. Energetic	2.80	.85	-.10	-.79	2.74	.86	-.15	-.41
8. That you are overweight	2.38	1.41	-.28	-1.25	1.78	1.51	.19	-1.39
9. Overwhelmed by negative emotion	2.50	.96	-.25	-.31	2.40	.95	-.29	-.16
10. Happy	2.83	.75	-.29	-.12	2.86	.77	-.37	.99
11. Financially secure	2.18	1.05	-.21	-.54	2.15	1.08	-.29	-.46
12. Competent in managing your money	2.63	.98	-.44	.03	2.51	1.02	-.33	-.47

Note. Items 8 and 9 have been reverse coded. Higher scores indicate more often experiencing emotions that promote satisfaction.

Table 4.17

Standardized Factor Loadings for Males and Females for the I COPPE Feelings Scale

Item	INWB Est(SE)		COWB Est(SE)		OCWB Est(SE)		PHWB Est(SE)		PSWB Est(SE)		ECWB Est(SE)	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
1. A strong emotional connection to sig. others	.31(.25)	.33(.08)	-	-	-	-	-	-	.17(.26)	.39(.06)	-	-
2. You are helpful to others	.78(.22)	.90(.12)	-	-	-	-	-	-	-	-	-	-
3. A sense of belonging in your community	-	-	.78(.09)	.88(.05)	-	-	-	-	-	-	-	-
4. You are making a contribution to your community	-	-	.99(.08)	.76(.06)	-	-	-	-	-	-	-	-
5. In control of your work tasks	-	-	-	-	.72(.11)	.53(.07)	-	-	-	-	-	-
6. Competent at work	-	-	-	-	.72(.13)	.82(.08)	-	-	-	-	-	-
7. Energetic	-	-	-	-	-	-	1.00 ^a	.70(.11)	-	-	-	-
8. That you are overweight	-	-	-	-	-	-	.29(.10)	.31(.08)	-	-	-	-
9. Overwhelmed by negative emotion	-	-	-	-	-	-	-	-	.59(.08)	.63(.05)	-	-
10. Happy	-	-	-	-	-	-	-	-	.92(.07)	.85(.04)	-	-
11. Financially secure	-	-	-	-	-	-	-	-	-	-	.76(.21)	.84(.12)
12. Competent in managing your money	-	-	-	-	-	-	-	-	-	-	.68(.24)	.66(.11)

Note. For the females, all factor loadings were statistically significant at $p < .001$. For the males, all factor loadings were statistically significant at $p < .01$ except for three loadings (item 1 on INWB, item 1 on PSWB, item 7 on PHWB) which were non-significant.

^a Residual variance fixed to 0 for item 7 in model for males in order for model to converge.

CHAPTER 5: DISCUSSION

Well-being, a multi-dimensional construct consisting of six interacting domains (I COPPE: interpersonal, community, occupational, physical, psychological, economic), has valuable intrinsic and extrinsic merits. It maintains the attention of researchers in part due to its association with many positive outcomes, such as mental health (Keyes, 2007; Keyes, Dhingra, & Simoes, 2010; Seligman, 2011), physical health (Andrews & Withey, 1976; Campbell, Converse, & Rodgers, 1976; Keyes, 2005; Keyes & Simoes, 2012), meaningful relationships (Myers, 2003), work productivity (Keyes & Grzywacz, 2005), longevity (Buettner, 2008, 2010), and lower risk of suicide (Keyes et al., 2012). Well-being is also a viable route to complete mental health, which the two-factor model posits requires *both* the reduction of mental illness and the enhancement of well-being (Keyes, 2005, 2007). Research has largely focused on the reduction of mental illness with much less emphasis on the enhancement of well-being (Keyes, 2007; Seligman, 2011). This study contributes to the research literature focused on the enhancement of well-being.

While numerous scales have been developed across disciplines to assess the construct of well-being, this varied focus led to the creation of disparate models of well-being. In an effort to integrate different measures of well-being, Prilleltensky and colleagues (2015) developed and validated the I COPPE Scale to measure *perceptions* (i.e., an individual's evaluation of his or her satisfaction) of well-being as a multidimensional construct (i.e., six specific I COPPE domains and overall well-being).

Most existing scales for measuring well-being are either outdated, narrowly focused (e.g., focused on perceptions alone, focused on one specific domain of well-being), or mix perceptions, actions, and feelings (see Table 2.1 for a review of measures used to assess well-being). The present study aimed to expand the measurement of well-

being to include both actions and feelings related to well-being through the validation of the I COPPE Actions Scale and the I COPPE Feelings Scale. The I COPPE Actions Scale measures *actions* related to well-being by measuring the frequency with which an individual engages in activities that promote satisfaction within the I COPPE domains. The I COPPE Feelings Scale measures *feelings* related to well-being by measuring the frequency with which an individual experiences emotions that promote satisfaction within the I COPPE domains. Data for the current study came from a randomized controlled trial (RCT) evaluating the effectiveness, feasibility, and acceptability of Fun For Wellness, an intervention designed to promote well-being in the I COPPE domains of well-being through self-efficacy and specific skills.

The confirmatory factor analysis for the I COPPE Actions Scale supported the hypothesized six-factor model; however, the results of the confirmatory factor analysis for the I COPPE Feelings Scale did not adequately support the proposed six-factor model. When the original six-factor model for the I COPPE Feelings Scale was modified to allow a residual correlation as well as a cross-loading, the model fit the data significantly better and demonstrated good overall model fit across multiple fit indices. The results of the measurement invariance tests for the I COPPE Actions Scale suggested that partial strict invariance with equal factor variances and covariances was met for males and females; however, the results for the I COPPE Feelings Scale did not support measurement equivalence across males and females. In this chapter, the results for each measure are discussed separately and implications from the findings for future research are considered.

I COPPE Actions Scale

Factor Structure

The current study found that the hypothesized six-factor model of the I COPPE Actions Scale obtained adequate model fit. The majority of the standardized factor loadings (i.e., seven of the 12 items) were greater than .70. The remainder of the standardized factor loadings showed fair to good values above .40. The predominantly large factor loadings suggested that each of the observed items was strongly related to its hypothesized latent factor. The majority of the R^2 values were between .40 and .78, which indicated that the latent factors explained a substantial amount of variability in the observed item responses.

While the majority of the parameter estimates for the hypothesized model suggested strong psychometric properties, item 2 (“*make attempts to repair relationships following conflict*”), designed to measure interpersonal well-being, had both the lowest standardized factor loading (.41) and the lowest R^2 value (.17). This item is the only repair focused item on the scale as well as the only item to include a negative valence word (i.e., *conflict*). These differences in item content and wording may have impacted the item’s psychometric properties. Of note, some research has indicated that negatively worded items can lower a scale’s validity (e.g., Roszkowski & Soven, 2010).

Since well-being is a multidimensional construct, interfactor correlations were expected. The majority of the interfactor correlations were in the moderate range (.20 to .50), while two of the correlations were somewhat higher (PHWB and PSWB: .76; INWB and PSWB: .66). These higher correlations (PHWB and PSWB; INWB and PSWB) are consistent with prior research examining the relationship between these domains (e.g., Cacioppo, Reis, & Zautra, 2011; Cohen, 2004; Keyes, 2005; Prilleltensky

et al., 2015). While significantly correlated, the factor correlations are not so high as to suggest the concepts are not measuring distinct constructs (i.e., discriminant validity; Brown, 2015).

Measurement Invariance

Multiple group confirmatory factor analysis provided evidence that measurement invariance did not fully hold across males and females for the I COPPE Actions Scale. While all factor loadings and residual variances were largely comparable for males and females, the I COPPE Actions Scale did not achieve strong invariance due to intercept differences for two items (item 8 “*eat mostly a plant-based diet such as fruits, vegetables, nuts, and seeds*” and item 10 “*take concrete steps to experience peace of mind*”) between the groups. For item 8, this difference indicates that given the same level of physical well-being, males endorsed less often eating a mostly plant-based diet than the females. For item 10, this difference indicates that given the same level of psychological well-being, males endorsed less often taking concrete steps to experience peace of mind than the females. While it is possible to account for these intercept differences using more complicated scoring approaches, more common scoring approaches (e.g., sum scores) will not incorporate these measurement differences (van de Shoot, Schmidt, de Beuckelaer, Lek, & Zondervan-Zwinjenburg, 2015).

Given research supporting the compensation of psychological deficits (Dixon & Backman, 1995), it is possible to speculate that women may compensate for lower levels of physical and psychological well-being through specific actions (e.g., eating a mostly plant-based diet, taking concrete steps to experience peace of mind). Relatedly, it has been found that women are more likely to report eating a plant-based diet relative to men

(e.g., Beardsworth, Bryman, Keil, Goode, Haslam, & Lancashire, 2002; Fraser, Welch, Luben, Bingham, & Day, 2000).

Although in the strictest sense measurement invariance was not met, the impact of partial or scalar invariance in practice is unknown. There were only two intercepts that significantly differed across gender and these items are only related to two (PHWB and PSWB) of the six domains. Given this, applied researchers should pay close attention to gender comparisons on the PHWB and PSWB domains when using this scale.

I COPPE Feelings Scale

Factor Structure

While the hypothesized six-factor model of the I COPPE Feelings Scale was not supported by the current study's findings, follow-up exploratory analyses suggested that a slightly modified six-factor model fit the data adequately. The modified measurement model allowed one item (item 1 "*a strong emotional connection to others*") to load on both interpersonal and psychological well-being, and a residual correlation between one pair of items (item 8 "*that you are overweight*" and item 9 "*overwhelmed by negative emotion*") was included.

Item 1 "*a strong emotional connection to others*", which cross loads on interpersonal and psychological well-being, was originally designed to measure interpersonal well-being. It includes "emotional" in its question wording, which is a term strongly associated with the domain of psychological well-being. In addition, interpersonal well-being and psychological well-being had a significant strong interfactor correlation (.66) on the I COPPE Actions Scale, which suggests that even when item wording is more distinct there is still an inherent relationship between the two factors. This relationship may suggest an intuitive correlation in respondents' minds about

psychological and interpersonal issues. Due to the conceptual congruency between item 1 and psychological well-being, the original hypothesized model was respecified to allow item 1 to cross-load on both interpersonal and psychological well-being.

In general, “correlated errors imply that factors in addition to the latent variables influence the association between two observed variables” (Fleishman, 2003, p. III84). Correlated residuals for item 8 “*that you are overweight*” and item 9 “*overwhelmed by negative emotion*” may suggest a method effect (e.g., variance due to similarities in wording, positive or negative wording, method of measurement; Podsakoff et al., 2003). A method effect is a possibility given similarities in wording (e.g., *overweight*, *overwhelmed*) and the fact that both items are negatively worded whereas the other items are positively worded. These two items were the only reverse-scored items. In addition, the items occur adjacent to each other in the questionnaire which could have also contributed to the correlation.

As expected, the majority of the interfactor correlations for the I COPPE Feelings Scale were in the moderate range (.15 to .52), while only one correlation was somewhat higher (PHWB and PSWB: .65). Of note, physical and psychological well-being also had the highest interfactor correlation on the I COPPE Actions Scale indicating that these two factors are strongly related across measures of actions and feelings.

While the majority of the parameter estimates for the modified model suggested strong psychometric properties, two of the scale’s items had potentially poor psychometric properties. Specifically, item 1 (“*a strong emotional connection to others*”), which cross-loaded on both interpersonal well-being and psychological well-being, had low standardized factor loadings (.29 and .35) and a relatively low R^2 value (.29). This

item was intended to measure interpersonal well-being (i.e., experiencing emotions that promote satisfaction in important relationships in life). In addition, item 8 (“*that you are overweight*”) had poor psychometric properties, with both the lowest standardized factor loading (.28) and the lowest R^2 value (.08). These properties suggest that item 8 was not strongly related to physical well-being and that physical well-being did not explain a substantial amount of the variability in the item 8 responses. In the modified model, item 8’s residual was also allowed to correlate with item 9 which may have been necessary due to a method effect from similarities in wording.

Measurement Invariance

Results for the I COPPE Feelings Scale indicated differences between the male and female models. Specifically, when configural invariance was evaluated (i.e., the same theoretical model holds for both males and females), the model fit was acceptable for the female CFA but not for the male CFA. Further, results suggested specific measurement differences across these baseline male and female models (e.g., male model had non-significant factor loadings for item 1 on INWB/PSWB). Without establishing the pattern invariance, there is not sufficient evidence that the same conceptual representation of the latent variables holds across males and females. Thus, there is no basis for continuing to test measurement invariance by comparing more restrictive models. This is consistent with prior research stating that the measurement properties of some scales function in group-specific ways (Byrne, 2008).

Future Directions

The psychometric evaluation of the I COPPE Actions Scale supported the proposed six-factor model and suggested partial measurement invariance across gender. While two intercepts significantly differed across males and females for items related to

PHWB and PSWB, the impact of these differences in practice is unknown and may not meaningfully impact gender comparisons on well-being. Given this, the I COPPE Actions Scale should be used with caution across genders (particularly when considering gender comparisons on the PHWB and PSWB domains). Future research should explore the broader implications of these measurement differences for applied researchers more closely in order to determine if the intercept differences contribute to any meaningful bias in the measurement of well-being actions across gender.

Relative to the I COPPE Actions Scale, the I COPPE Feelings Scale had less psychometric support. While the hypothesized factor structure had poor fit, a modified model achieved adequate fit. However, when this modified model was further examined, the same theoretical model did not hold across males and females. These results suggest that future research using the existing I COPPE Feelings Scale should not assume measurement invariance across gender (i.e., scores may not have similar meanings for males and females).

While the current study focused on examining the factor structure of responses to the I COPPE Actions and Feelings Scales, it would be beneficial for future research to evaluate the convergent and discriminant validity of the factors. Convergent validity establishes that theoretically-related constructs are correlated; whereas, discriminant validity establishes that distinct constructs are unrelated. Convergent and discriminant validity are established by collecting supplemental data from established comparison instruments designed to measure theoretically related and unrelated constructs. In addition, future studies could evaluate the test-retest reliability of the scales to verify the consistency of the measures.

In addition to exploring the relationship between factors on the I COPPE Actions and Feelings Scales with factors on established comparison instruments, future research could also examine the relationship between factors on the I COPPE Actions Scale, the I COPPE Feelings Scale, and the I COPPE Scale. For example, it would be expected that individuals who have greater levels of INWB on the I COPPE Scale would also have greater levels of INWB on the I COPPE Actions and Feelings Scales than those with lower levels of INWB on the I COPPE Scale.

It may also be beneficial to consider modifying scale content. Since both scales consist of only two items per factor, the lowest recommended number of items per factor (Brown, 2006; Kline, 2011), none of the items with weak psychometric properties could be eliminated. As such, modifications of item content may improve the scales' psychometric properties. Based on an evaluation of the current study's findings, specific items for modification as well as some suggestions for modification are outlined below.

For the I COPPE Actions Scale, based on their psychometric properties (e.g., R^2 and factor loadings), the two weakest items were item 2 ("*make attempts to repair relationships following conflict*") and item 8 ("*eat mostly a plant-based diet such as fruits, vegetables, nuts, and seeds*"). Item 2 could be modified to "take steps to improve your relationships" which would more closely align with the wording and structure of the other items on the scale (e.g., item 12 "*take steps to improve your financial situation*"). In addition to weaker psychometric properties compared to the other scale items, item 8 had intercept differences for males versus females which indicates that given the same level of PHWB, males endorsed less often eating a mostly plant-based diet than females. Item 8 could be modified to further explore if the current wording of the item represents a

true gender difference or if it represents a method effect. For example, item 8 could be reworded to “eat a diet that includes a variety of fruits, vegetables, nuts, and seeds.”

For the I COPPE Feelings Scale, the two weakest items were item 1 “*a strong emotional connection to significant others*” and item 8 “*that you are overweight.*” Item 1 cross-loads on interpersonal and psychological well-being, two strongly correlated factors on both scales. In an effort to explore the necessity of cross-loading, item 1 could be modified to “a strong connection to significant others,” which would eliminate the use of “emotional” in its wording—a word that is strongly related to the domain of psychological well-being. Item 8 had weak psychometric properties (e.g., lowest R^2 and factor loading) as well as a correlated residual with item 9 (designed to measure psychological well-being). Item 8 could be reworded to “satisfied with your weight” which would more closely align with the structure and wording of the other items on the scale.

Finally, it may also be appropriate to explore alternative statistical measurement techniques. Since the purpose of this current study was to evaluate a predefined six-factor model developed from prior research and substantive expertise, the confirmatory nature of CFA provided a strong analytical framework for explicitly testing the a priori theoretical model. While CFA was used as the primary statistical method for the current study, there are other related statistical methods worth noting such as exploratory structural equation modeling (ESEM) and bifactor models.

Used in the initial validation of the I COPPE Scale (Prilleltensky et al., 2015), ESEM is a new methodology that integrates the best features from both exploratory factor analysis (EFA) and CFA. An advantage of ESEM is that it may result in better fit

and less correlated factors than the corresponding CFA solutions (Marsh, Morin, Parker, & Kaur, 2014). Moreover, based on the results of the current study, item cross-loadings may be expected between different factors which would indicate that the application of ESEM may be appropriate. Therefore, it may be useful to examine if ESEM results in substantially better model fit or smaller factor correlations for the I COPPE Actions and Feelings Scales.

A bifactor model is an alternative framework for considering the multidimensional nature of well-being (Reise, Bonifay, Haviland, 2013). In a bifactor model, individual scale items load on a general factor as well as on a subscale factor, which allows for the interpretation of a general well-being factor in addition to the six domain-specific well-being factors. Demonstrating the feasibility of a bifactor model, Myers et al. (2016) used an exploratory bifactor model to provide initial validity evidence for the use of the I COPPE Scale (based on perceptions) in a Hispanic sample.

Implications

The findings of the current study, and the use of the I COPPE Actions and Feelings Scales, have implications for clinical practice and the broader community context. For clinicians and applied researchers, exploring the relationship between actions, feelings, and perceptions will provide a more comprehensive lens of an individual's well-being. For example, by targeting domain-specific well-being actions, individuals may also experience improvement in domain-specific well-being feelings and perceptions. It may also be possible to examine individuals with high levels of perceived well-being with depressed scores in some domains of actions and/or feelings, to see if high scores in other domain-specific actions and/or feelings act in a compensatory fashion. The ability of individuals to compensate can be a promising area for future interventions.

Similarly, it may also be appropriate to explore if some people struggle with certain aspects of multidimensional well-being more so than others or to understand which components of well-being are most strongly related to particular outcome variables (e.g., depression). Identifying the relationship between domain-specific well-being (actions/feelings) and particular outcomes like depressive symptomology may help to create more targeted interventions.

In addition, the I COPPE Actions Scale may become a tool to educate people about the essential actions of well-being. Just as individuals learn to brush their teeth and to eat fruits and vegetables, it is just as critical to learn how to be mentally healthy by learning specific actions to take. As such, by outlining the top four actions in each I COPPE domain, the I COPPE Actions Scale can become not just a measurement tool but also an educational tool.

Overall, the present study introduces two new scales for measuring well-being. These scales are the first to measure domain-specific well-being through actions and feelings. The ability of these scales to assess I COPPE actions and feelings in separate instruments is a potential contribution to the growing research on well-being. If well-being can be measured through perceptions, actions, and feelings using three separate but conceptually related multidimensional measures, then this may enhance the ability of researchers and clinicians to further understand and promote well-being.

Limitations

There are two primary limitations for this initial validation of the I COPPE Actions and Feelings Scales. The first limitation is the relatively narrow population from which the sample was drawn. This study was conducted with university employees so all participants were employed and most of the participants held graduate degrees. A more

diverse sample that includes individuals who are both employed and unemployed and represent a wider range of educational attainment may provide different results. For example, based on prior findings, employed individuals tend to have greater well-being than unemployed individuals (e.g., McKee-Ryan, Song, Wanberg, & Kinicki, 2005; Rubenstein et al., 2016). Relatedly, individuals with greater educational attainment also tend to have greater well-being than those with lower levels of education (e.g., Keyes, Shmotkin, & Ryff, 2002; Rentfrow, Mellander, & Florida, 2009; Rubenstein et al., 2016). Future research that draws one or more samples from one or more broader populations would more fully evaluate generalizability of the study's findings.

The second limitation is the number of items designed to measure each factor. In general, Kline (2011) recommends "the absolute minimum for CFA models with two or more factors is two indicators per factor, which is required for identification. However, CFA models with factors that have only two indicators are more prone to problems in the analysis, especially in small samples" (p. 114). Since none of the items could be eliminated from the scale, the more problematic items with weak psychometric properties likely contributed to misfit in model-data fit.

Conclusion

In synthesis, the current study examined the validity of two new scales: the I COPPE Actions and Feelings Scales. The main contribution to the well-being literature is in expanding the measurement of domain-specific well-being to include actions and feelings related to well-being. The findings supported the hypothesized six-factor model for the I COPPE Actions Scale. However, the hypothesized six-factor model for the I COPPE Feelings Scale was not supported and had to be modified in order to achieve adequate model fit. In the strictest sense, measurement invariance did not hold for the I

COPPE Actions or Feelings scales. However, the degree of measurement non-invariance was worse for the I COPPE Feelings Scale compared to the I COPPE Actions Scale. The I COPPE Feelings Scale did not achieve configural invariance (basic structure was not the same across males and females), which is the first step in testing measurement invariance. The I COPPE Actions Scale showed partial scalar invariance (intercept differences on two items) but it is unknown how much this degree of measurement non-invariance will meaningfully impact gender comparisons in applied research. Future researchers should investigate this and consider potential modifications to item content and wording that may improve the psychometric proprieties of these two scales.

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APPENDIX A

FUN FOR WELLNESS INTERVENTION

Fun For Wellness BET I CAN Skills: Key Ingredients of the Intervention

Drivers of Change	Skills	
BEHAVIORS	Set a goal	Create positive habits
EMOTIONS	Cope with negative Emotions	Collect positive emotions
THOUGHTS	Challenge Assumptions	Write a new story
INTERACTIONS	Connect	Communicate
CONTEXT	Read the cues	Change the cues
AWARENESS	Know yourself	Know the issue
NEXT STEPS	Make a plan	Make it stick

Fun For Wellness Intervention: Randomized Controlled Trial

The Fun For Wellness (FFW) intervention was a prospective, double-blind, two parallel groups, longitudinal randomized controlled trial (RCT). Well-being measures were administered at baseline (T1), 30 days-post baseline (T2) and 60 days-post baseline (T3). The participants were randomized into two groups: an intervention group and a placebo control group. Participants in both groups were given 30-day access to the online activities.

Intervention condition. Through the online program named Fun For Wellness (FFW), participants (a) watched original vignettes performed by professional actors, (b) watched and/or read mini-lectures narrated by a coach teaching 14 empirically-based skills, (c) engaged in self-reflection exercises, and (d) played team-produced interactive games related to the vignettes and the skills.

Placebo control condition. Through a website that was credible and structurally equivalent to the intervention, participants were able to: (a) read text and watch narrated videos introducing websites and games from reputable well-being and health promotion websites, (b) access the links, and (c) access the games.

Fun For Wellness Challenge Type Descriptions

1. **Read text and watch narrated video clips.** Psycho-educational wellness content pertaining to the skill is provided in text format. A short video (approx. 30-90 seconds) of a person narrating the same text is embedded in the same screen.
2. **Video scenes.** A mini-drama consisting of a series of 34 independently viewable scenes (approx. 90 seconds each) is distributed throughout the program. These videos depict a network of characters (played by actors) engaging in real-life enactments of common experiences of BET I CAN drivers across I COPPE domains.
3. **Games.** Interactive video games, produced by the team, are embedded throughout various modules. The games contain well-being content specific to the targeted skill in each module. Game content is interwoven with recognizable vocabulary and character storylines from the mini-drama videos.
4. **Written self-reflection exercises.** Text prompts and open-ended questions related to the skill of focus are provided in strategically placed module sections. Participants are encouraged to provide free responses to prompts about the content they have: (a) read about, (b) listened to in the narrated videos, or (c) seen acted out in the mini-scenes drama videos. These self-reflective exercises provide participants with the conceptual and physical space to plan, develop, revise, and document their goals for self-directed change. Participants are able to go back and read their responses throughout their FFW experience and make changes as they wish.
5. **Chat room and community forum social interactions.**
 - a. **Chat room.** Live chat room functions are available to intervention participants to send and receive real-time communications to other intervention group participants. Only participants who are online at the exact same time with each other have the opportunity to communicate with each other. Identification of participants is only made using a participants' screen name created by each participant during the initial study registration. Chat room log interactions are not permanently posted for participants to view at later times. Each chat log interaction only remains visible to participants for as long as a participant is present in the chat room. Chat logs are not systematically monitored by the research team.
 - b. **Community forum.** Community forum capabilities are available for participants to begin conversations based on specific topics. These threads are posted to the forum boards and remain visible to all intervention participants who click on a particular topic thread. Community forum logs are not systematically monitored by the research team.

Modules and Corresponding Challenges

Challenge	Read Text & Watch Narrated Video	Watch Video Scene	Play Game	Write Self-Reflection
BEHAVIORS: Set a Goal				
Choose a goal	•			•
Watch Florence struggle with her goal		•		
Commit to your goal	•			•
Think about the long term				•
Help Karl set a goal	•	•		
Learn about SMART sub-goals	•			
Set a SMART sub-goal	•			•
Play video game			Getting It Done!	
BEHAVIORS: Create Positive Habits				
Learn about the power of rewards	•	•		
Reward baby steps	•			
Design your reward system				•
Watch Florence reviewing her food journal	•	•		
Play video game			HabEats of the Mind	
Become a good detective	•			•
Learn from Erin	•	•		
Learn about alternatives	•	•		
Play video game			Nutrition Wars	
EMOTIONS: Cope with Negative Emotions				
Understand negative emotions	•			
Watch Larry and Erin arguing		•		

Play detective!	•			•
Detect and deflect!				•
Watch Jim lose his cool		•		
Learn about emotional awareness	•			
Watch Erin trying to study		•		
Play video game			Stress Less	
Stay on track				•
EMOTIONS: Collect Positive Emotions				
Watch David and Alicia's anniversary dinner		•		
Help David and Alicia collect positive emotions	•			•
Learn about positive emotions	•			
Count your blessings				•
You at your best				•
Watch too busy to coach		•		
Commit acts of kindness				•
Watch Jim coaching softball!		•		
Play video game			Emotional Seesaw	
Feel the future				•
THOUGHTS: Challenge Assumptions				
Explore the relationship between thoughts, feelings, and behaviors	•			
Watch Erin at the bulletin board		•		
Discover the self-defeating loop	•			•
Understand faulty thinking	•			
Watch Jan and Jim at the office		•		
Watch Larry about to join the party		•		

Detect faulty thinking	•			•
Play video game			Rethink That!	
Talk back to negative self-talk!				•
Unplug from thoughts that short circuit your goal				•
THOUGHTS: Write a New Story				
Watch Larry write a new story		•		
Read about the new ending to Larry's story	•			
Help Larry find sparkling moments	•			•
Find your own sparkling moments				•
Re-watch Erin at the student career center		•		
Help Erin write a different ending	•			•
Explore the benefits of a growth mindset	•			
Play video game			Fix a Fixed Mindset	
Adopt a growth mindset				•
Recover from setbacks				•
INTERACTIONS: Connect				
Read about the importance of connection	•			
Guess the formula to a happy marriage				•
Watch Larry preparing dinner		•		
Search for hints of happiness	•			•
Watch Larry's bid for connection with Erin	•	•		
Watch Larry and Erin at the party	•	•		
Learn about gifts of the heart, the head, and the hand	•			
Play video game			Better Together	
Write about gifts you have given and received				•

Learn to support when things go well	•			
Play video game			Upbeat or Downbeat	
Let others help you				•
INTERACTIONS: Communicate				
Communicate with L.O.V.E.	•			
Re-watch the conflict between Erin and Larry		•		
Do a L.O.V.E analysis	•			•
Listen well	•			•
Observe well	•			
Watch Jan asking for Jim's help	•	•		
Verbalize well	•			
Watch Karl's struggle with assertive communication		•		
Play video game			Choose to Assert	
Assert yourself				•
Search for signs of empathy	•	•		
Put yourself in Erin's shoes	•	•		
Empathize well	•			
Ask for what you need				•
CONTEXT: Read the Cues				
Learn about cues	•			
Watch Florence's struggle with food		•		
Help Florence read the cues	•			•
Watch Erin trying to study		•		
Help Erin read the cues	•			•
Watch David and Alicia at the restaurant		•		

Help David read the cues	•			•
Read the cues in your environment				•
Take control of your response to cues	•			
Play video game			Self Control	
CONTEXT: Change the Cues				
Read about changing the cues	•			
Play video game			NewTriton	
Change the cues that lead you astray	•			•
Watch David and Karl planning lunch	•	•		
Watch David and Karl at the restaurant		•		
Attend to cues and rewards	•			•
See how the story ends	•	•		
Watch Erin resisting distractions	•	•		
Help Erin do even better	•			•
Create your own environment	•			•
AWARENESS: Know Yourself				
Watch Karl and Jim at the office		•		
Look for signs of stress				•
Learn about our response to threat	•			
Watch Erin and Jason on campus	•	•		
Reflect on how you deal with stress	•			•
Watch Karl's epiphany	•	•		
Explore your values and priorities	•			•
Think about the end of life	•			•
Build a thriving community				•

Watch Jim self-reflect	•	•		
Consider the benefits of mindfulness	•			
Focus on your breath	•			
Play video game			Mindful Living	
Link goal and meaning				•
AWARENESS: Know the Issue				
Become informed	•			
See how David ignores information!	•	•		
Discover your own biases	•			•
Master the basics of I COPPE	•			
Play video game			Stop Before You Shop	
Play video game			True or False	
Play video game			Well Words	
Play video game			Match the Task	
Select a BET I CAN strategy to match your goal				•
NEXT STEPS: Make a Plan				
Imagine your best possible self	•			•
Turn your aspirations into goals				•
Watch Karl clean up his act	•	•		
Make it gradual	•			•
Help Florence make it gradual	•	•		
Reinforce yourself	•			•
Make it easy	•			•
Explore alternatives	•			•
Help David explore alternatives	•	•		

Seek support	•			•
Educate yourself	•			•
Play video game			GREASE the Plan	
NEXT STEPS: Make it Stick				
Consider the long haul	•			•
Keep recording and rewarding	•			
Watch Florence struggling with temptation	•	•		
Fortify yourself				•
Surf the urge	•			
Help Florence stay on track	•	•		
Practice saying no	•			•
Plan ahead	•			•
Don't let a slip be your downfall	•			
Consider your next step	•	•		
Play video game			Skill Drill	

Placebo Control Links

Health	
Choose My Plate (US Department of Agriculture)	http://www.choosemyplate.gov/
Healthy Sleep (Harvard Medical School)	http://healthysleep.med.harvard.edu/healthy/matters
Physical Activity (CDC)	http://www.cdc.gov/physicalactivity/
Physical Activity Guidelines for Americans (Office of Disease Prevention and Health Promotion)	http://www.health.gov/paguidelines/guidelines/
Fruit & Vegetable Nutrition (Fruits & Veggies—More Matters)	http://www.fruitsandveggiesmorematters.org/fruit-veggie-nutrition
Facts & Statistics (President’s Council on Fitness, Sports, and Nutrition)	http://www.fitness.gov/resource-center/facts-and-statistics/
Games (Health)	
Nutrition activities- American Heart Association	http://www.heart.org/HEARTORG/GettingHealthy/NutritionCenter/HealthyEating/Nutrition-Quizzes_UCM_308044_Article.jsp Note to user: “Once you land on this page you can click on multiple nutrition quizzes offered on the web page.”
Physical fitness	http://www.online-games-zone.com/pages/fun/fitness-challenge.php

Happiness	
Authentic Happiness (U Penn)	https://www.authentichappiness.sas.upenn.edu/learn
The Happiness Formula (BBC News)	http://news.bbc.co.uk/2/hi/programmes/happiness_formula/default.stm
Mindset (Center for Confidence and Well-Being)	http://www.centreforconfidence.co.uk/flourishing-lives.php?pid=454
Mindfulness exercises: How to get started (Mayo Clinic)	http://www.mayoclinic.org/healthy-living/consumer-health/in-depth/mindfulness-exercises/art-20046356
The Science of Mindfulness (Dr. Daniel Siegel)	http://www.mindful.org/the-science/medicine/the-science-of-mindfulness
Based on Gretchen Rubi’s book on knowing yourself	www.happiness-project.com
emotional life	www.pbs.org/thisemotionallife/topic/happiness
Games (Happiness)	

Maslow's Hierarchy of Needs	http://planeta42.com/psychology/maslow/index.html
Self-esteem: McGill University	http://selfesteemgames.mcgill.ca/games/index.htm http://selfesteemgames.mcgill.ca/games/chigame.htm http://selfesteemgames.mcgill.ca/games/sematrix.htm http://selfesteemgames.mcgill.ca/games/wam.htm

Relationships	
Social Support (Mayo Clinic)	http://www.mayoclinic.org/healthy-living/stress-management/in-depth/social-support/art-20044445?pg=1
Center for Nonviolent Communication	http://www.cnvc.org/
Creative Response to Conflict (Non-Profit)	http://crc-global.org/resources/workshop-handouts/
Center on Social and Emotional Foundations for Early Learning (Vanderbilt)	http://csefel.vanderbilt.edu/resources/family.html
Healthy Relationships (LoveIsRespect.org)	http://www.loveisrespect.org/dating-basics/healthy-relationships
Games (Relationships)	
Relationships-Conflict Resolution	http://www.creducation.org/cre/crday/snakesalive/ http://www.creducation.org/cre/crday/snakesandladders/
Emotional Intelligence	http://www.creducation.org/cre/crday/emotions/

Work	
Leadership & Work (Omega Institute)	http://www.eomega.org/learning-paths/leadership-work
Well-being at Work (New Economics Foundation)	http://www.neweconomics.org/publications/entry/well-being-at-work
What motivates us at work? 7 fascinating studies that give insights (TED)	http://blog.ted.com/2013/04/10/what-motivates-us-at-work-7-fascinating-studies-that-give-insights/
Being Happy at Work Matters (Harvard Business Review)	https://hbr.org/2014/11/being-happy-at-work-matters
Productivity	http://www.pickthebrain.com/blog/category/productivity/
Games (Work)	
Brain Training AARP	http://www.aarp.org/health/brain-health/brain_games/

Stress	
Mayo Clinic-stress management	http://www.mayoclinic.org/healthy-living/stress-management/basics/stress-basics/hlv-20049495

American Psychological Association- stress	http://www.apa.org/topics/stress/index.aspx
WebMD-relaxation techniques	http://www.webmd.com/balance/guide/blissing-out-10-relaxation-techniques-reduce-stress-spot
WebMD-Debt-stress connection	http://www.webmd.com/balance/features/the-debt-stress-connection
Cognitive behavioral therapy	www.lltff.com
Centers for Disease Control-violence prevention-coping with stress	http://www.cdc.gov/violenceprevention/pub/coping_with_stress_tips.html
Omega Institute-exercise your joy	http://www.eomega.org/learning-paths/body-mind-spirit-personal-growth-health-healing-wellness/exercise-your-joy?content=FEAT&source=OM.health
American Psychological Association-stress and exercise	http://www.apa.org/helpcenter/exercise-stress.aspx
Games (Stress)	
Stress management	Drifting Afternoon- http://www.ferryhalim.com/orisinal/g3/drift.htm High Delivery- http://www.ferryhalim.com/orisinal/g3/high.htm

APPENDIX B

I COPPE ACTIONS AND FEELINGS SCALES

I COPPE Actions Scale

		<i>(select the most appropriate category for each item)</i>				
<i>How often do you-</i>		Very rarely or never	Rarely	Sometimes	Often	Very often or always
1.	engage in positive interactions with people close to you	0	1	2	3	4
2.	make attempts to repair relationships following conflict	0	1	2	3	4
3.	volunteer in the community	0	1	2	3	4
4.	participate in community events	0	1	2	3	4
5.	persevere with work-related tasks	0	1	2	3	4
6.	focus intently at work	0	1	2	3	4
7.	engage in moderate physical activity such as brisk walking for about 30 minutes at least five times a week	0	1	2	3	4
8.	eat mostly a plant-based diet such as fruits, vegetables, nuts and seeds	0	1	2	3	4
9.	engage in activities that you find meaningful	0	1	2	3	4
10.	take concrete steps to experience peace of mind	0	1	2	3	4
11.	save money	0	1	2	3	4
12.	take steps to improve your financial situation	0	1	2	3	4

I COPPE Feelings Scale

		<i>(select the most appropriate category for each item)</i>				
<i>How often do you feel-</i>		Very rarely or never	Rarely	Sometimes	Often	Very often or always
1.	a strong emotional connection to significant others	0	1	2	3	4
2.	you are helpful to others	0	1	2	3	4
3.	a sense of belonging in your community	0	1	2	3	4
4.	you are making a contribution to your community	0	1	2	3	4
5.	in control of your work tasks	0	1	2	3	4
6.	competent at work	0	1	2	3	4
7.	energetic	0	1	2	3	4
8.	that you are overweight	0	1	2	3	4
9.	overwhelmed by negative emotion	0	1	2	3	4
10.	happy	0	1	2	3	4
11.	financially secure	0	1	2	3	4
12.	competent in managing your money	0	1	2	3	4

Table C.1

Unstandardized Item Intercepts and Residual Variances for the Six-Factor I COPPE Feelings Scale for Males and Females

Item	Item intercepts		Residual variances	
	Male Est(SE)	Female Est(SE)	Male Est(SE)	Female Est(SE)
1. A strong emotional connection to sig. others	3.21(.08)***	3.18(.05) ***	.54(.08)***	.49(.06)***
2. You are helpful to others	3.28(.07)***	3.41(.04) ***	.18(.16)	.08(.09)
3. A sense of belonging in your community	2.13(.10) ***	2.34(.06) ***	.39(.13)**	.23(.09)*
4. You are making a contribution to your community	2.05(.11) ***	2.06(.06) ***	.03(.21)	.49(.10)***
5. In control of your work tasks	2.93(.09) ***	3.06(.05) ***	.40(.14)**	.51(.06)***
6. Competent at work	3.55(.06) ***	3.47(.04) ***	.20(.07)**	.15(.06)**
7. Energetic	2.80(.09) ***	2.75(.05) ***	0	.38(.11)***
8. That you are overweight	2.38(.14) ***	1.78(.08) ***	1.79(.17)***	2.05(.14)***
9. Overwhelmed by negative emotion	2.50(.10) ***	2.40(.05) ***	.60(.11)***	.54(.07)***
10. Happy	2.83(.08) ***	2.88(.04) ***	.08(.07)	.15(.04)***
11. Financially secure	2.18(.10) ***	2.15(.06) ***	.46(.35)	.35(.24)
12. Competent in managing your money	2.63(.10) ***	2.51(.06) ***	.51(.31)	.59(.15)***

Note. Est and SE are the unstandardized estimates and standard errors.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table C.2

Factor Variances, Covariances, and Correlations for the Six-Factor I COPPE Feelings Scale for Males

	1	2	3	4	5	6
1. Interpersonal Well-Being (INWB)	.07	.16	.07	.13	.09	.05
2. Community Well-Being (COWB)	.79**	.62**	.08	.23*	.16*	.18
3. Occupational Well-Being (OCWB)	.42**	.16	.43**	.29***	.13*	.21*
4. Physical Well-Being (PHWB)	.60***	.34**	.52***	.72***	.31***	.22*
5. Psychological Well-Being (PSWB)	.64**	.37***	.35*	.66***	.31***	.18*
6. Economic Well-Being (ECWB)	.26	.29*	.40**	.33**	.41***	.62

Note. Factor variances (bolded) are shown on the diagonal, covariances are shown above the main diagonal, and correlations are shown below the main diagonal.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table C.3

Factor Variances, Covariances, and Correlations for the Six-Factor I COPPE Feelings Scale for Females

	1	2	3	4	5	6
1. Interpersonal Well-Being (INWB)	.08*	.09**	.07**	.06*	.05*	.03
2. Community Well-Being (COWB)	.36***	.76***	.10***	.30***	.24***	.24***
3. Occupational Well-Being (OCWB)	.56***	.27***	.19***	.10**	.08**	.06
4. Physical Well-Being (PHWB)	.38***	.57***	.38***	.36**	.26***	.23***
5. Psychological Well-Being (PSWB)	.28***	.46***	.29***	.71***	.36***	.26***
6. Economic Well-Being (ECWB)	.11	.31***	.14	.43**	.48***	.82***

Note. Factor variances (bolded) are shown on the diagonal, covariances are shown above the main diagonal, and correlations are shown below the main diagonal.

* $p < .05$. ** $p < .01$. *** $p < .001$.