

Validity Evidence for a Model and Measure of Life Balance

A DISSERTATION
SUBMITTED TO THE FACULTY OF THE GRADUATE SCHOOL
OF THE UNIVERSITY OF MINNESOTA

BY
Kathleen Matuska

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

Co-Advisor, Dr Ruth Thomas

Co-Advisor, Dr Susan Walker

June, 2010

Dedication

To Tom, for your unending support and humor that kept me going

Abstract

This study examined the construct validity of a model and measure of life balance conceptualized as both congruence among desired and actual time spent in activities, and equivalence in the degree of discrepancy between desired and actual time spent across activities that meet health, relationship, challenge/interest and identity needs. The life balance inventory (LBI) was used as the measure for life balance and was pre-tested for construct validity. Structural equation modeling was used to test the hypothesized relationships between life balance (LBI), perceived stress (DASS21 stress subscale), personal well-being (PWI-A), and need satisfaction (BPNS) in the hypothesized life balance model (LBM). Four hundred and fifty eight participants representing mixed demographic groups participated in the study by completing the 4 instruments. SEM results indicated that congruence, moderated by equivalence predicted lower stress, higher personal well-being and higher need satisfaction, but equivalence alone did not. Working, having children at home, and being non-white negatively moderated congruence and larger family size positively moderated congruence. This study provides initial construct validity evidence for the hypothesized model and measure of life balance.

Table of Contents

List of Tables	v
List of Figures	vi
List of Appendixes	vii
Chapter 1: Introduction	1
The Life Balance Model	4
Research Plan	16
The Life Balance Inventory	20
Chapter 2: Review of Literature	35
Chapter 3: Methods	66
Measures used	66
Participant Recruitment	70
Procedures	72
Data Analysis	73
Chapter 4: Findings	80
Participants	80
Research Question 1: LBI Validity Evidence	82
Research Question 2: Congruence and SEM	90
Research Question 3: Equivalence and SEM	93
Research Question 4: Combined Model and SEM	97
Research Question 5: Differences Among Demographic Groups	101
Research Question 6: Demographics Added and SEM	112
Research Question 7: Demographics and Congruence	113
Research Question 8: Demographics and Equivalence	114
Chapter 5: Discussion	118
LBI Validity	118
Life Balance Model (LBM) Validity	120
Implications	131

Limitations and Future Research	135
Conclusion	137
References	138

List of Tables

Table 1: Demographics of Participants in Test-retest Reliability Pilot Study	24
Table 2: Demographics of Participants in LBI Pilot Study	27
Table 3: Comparison of Need-based Theories or Models	40
Table 4: Demographic Summary	81
Table 5: Health Subscale: Standardized Factor Loadings and p Values	86
Table 6: Relationship Subscale: Standardized Factor Loading and p Values	87
Table 7: Identity Subscale: Standardized Factor Loading and p Values	87
Table 8: Challenge/interest Subcategory: Standardized Factor Loading and p Values	88
Table 9: Congruence Model Fit Indices	91
Table 10: Equivalence Model Fit Indices	94
Table 11: Combined Model Fit Indices	97
Table 12: Model Chi Square Comparisons	98
Table 13: Mean and Standard Deviation for LBI Raw Scores and Euclidian Distance Scores for Each Demographic Group	102
Table 14: Comparison of Demographic Groups' Mean Congruence Scores	104
Table 15: Comparison of Demographic Groups' Mean Perceived Stress Scores	105
Table 16: Comparison of Demographic Groups' Mean Personal Well-being Scores	107
Table 17: Comparison of Demographic Groups Income Levels and Education Levels on Mean Relatedness BPNS Scores	109
Table 18: Comparison of Demographic Groups Income Levels and Education Levels on Mean Competence BPNS Scores	109
Table 19: Comparison of Demographic Groups Income Levels and Education Levels on Mean Autonomy BPNS Scores	110
Table 20: Combined Model with Demographics-Added Model Fit Indices	113
Table 21: Combined Model and Demographic-added Model Comparisons	114

List of Figures

Figure 1. Life Balance Model	7
Figure 2. Hypothesized Relationships to be Tested in the Proposed Research	19
Figure 3. Construct Map Indicating Location of People and Items Scores 2 and 3	85
Figure 4. Structural Model with Standardized Path Coefficients (Congruence Model)	92
Figure 5. Structural Model with Standardized Path Coefficients (Equivalence Model)	96
Figure 6. Structural Model with Standardized Path Coefficients Combined Model)	100
Figure 7. Combined Model with Demographic-Added Standardized Path Coefficients	115

List of Appendixes

Appendix A: Lifestyle Balance Inventory and DASS21	158
Appendix B: PWI-I and BPNS Scales	162
Appendix C: Rasch Analysis Output	165
Appendix D: Mean and Standard Deviation for Demographic Groups for LBI Raw Score, DASS21, Need Satisfaction (Autonomy, Relatedness, and Competence) and PWI	168
Appendix E: Pearson Correlations Among Variables	171
Appendix F: Model Fit Indices and Path Coefficients of the Congruence Model with Demographics-added.	172
Appendix G: Consent Form	174
Appendix H: Journal of Occupational Science Copyright Permission	176

Chapter 1

Introduction

The construct of interest in this study is *life balance*, a term frequently heard in everyday conversations or seen in the popular press related to healthy lifestyles. Although the life balance construct seems to be accepted in everyday parlance, it remains the focus of scholarly investigation. This research will explore whether empirical evidence can be found for a model and measure of life balance as they relate to stress, need satisfaction and well-being.

Stress is a reality of modern society. Modern family lives are often perceived as rushed and stressed, where keeping up with the demands of home and work exceed people's ability to cope with them. Evidence of this perception is widespread within developed countries as seen in increased reports of stressful lives (Bachmann, 2000; Robinson, & Godbey, 1997; Statistics Canada, 1998; 2005). Nearly half of U.S. workers report that their jobs interfere some or a lot with their personal lives, and nearly three quarters of working mothers and fathers report feeling that they do not have enough time to spend with their children (Bond, Galinsky, Swanberg, & Prottas, 2002, Beck & Arnold, 2009).

Family stress has been a concern for researchers and practitioners for decades and according to family stress theory (Hill, 1949), if the stress is severe enough, and for a long enough period of time, it could lead to physical, emotional or relational crisis within families. The cumulative research is increasingly more compelling that the consequences

of prolonged everyday stress has a cumulative impact on physical and mental health (Kiecolt-Glaser, McGuire, Robles & Glaser, 2002; McEwen & Lasley, 2002; Seeman, et al., 2002). There is a need to understand how individuals and families can best cope with such stressors and create satisfying and healthy lives.

Popular Press Notions of Life Balance

The popular press has been promoting life balance as one of the answers to stressful lives. Although not quantified or defined, the general idea of life balance relates to wanting enough time devoted to work, self care, leisure, and rest, and to the stress that results without that perceived balance. A web search conducted while writing this manuscript using the term *lifestyle balance* produced 22 million hits; a search for the term *life balance* produced roughly four-fold more. Clearly the phrase has become commonly accepted and people seem to accept the idea that living a balanced life is desirable and possible. A brief scan of the titles from the first 20 websites that appeared in the iGoogle™ search showed that information and services are available that are intended to help people gain life balance, well-being, and more satisfying lives. Some of the messages delivered on these web sites assert that people can create optimal lives if they make the “right” choices about what they do in everyday living, that many people are not making the “right” choices and are therefore stressed, unhappy or unhealthy, and that they could make improvements with the “right” information or service.

There seems to be an assumed (and prescriptive) understanding of what constitutes life balance and what influences it, such as stress, exercise, nutrition, relationships, adequate sleep, a positive attitude, or workplace satisfaction. Similar to a food pyramid, life balance is sometimes depicted in the popular press as a prescribed

amount of daily activities and attitudes that are seen as necessary for everyone. It is also generally assumed that life balance is a good thing to strive for, and if successful, a balanced life will result in better health, less stress, and an overall better life. The popular press is full of examples and helpful hints to help people achieve life balance.

Do people ever actually achieve a balanced life? Does a balanced life mean a *better* life? And if that's possible, what does a balanced life look like? These questions led to efforts to understand and articulate the phenomenon, which resulted in a proposed theoretical model of life balance (Matuska & Christiansen, 2008) and development of an instrument to measure it. Given the growing need for successful adaptation to stressful lives in modern times, studying life balance may be timely and useful for understanding important components in life considered necessary for reducing the consequences of chronic stress and for enhancing health and well-being. Research is only beginning to explore this idea, however, and there is no common understanding about what a balanced life really is and whether or not it contributes to health and well-being.

Given the important relationships between stress, lifestyles and well-being, understanding the recurring patterns of life activities that reduce stress and promote health is of potential value. Although it is widely accepted that certain activities are more beneficial to health and quality of life than others (Christiansen & Matuska, 2006; Sternberg, 1997), little theoretical or empirical work has been done to identify optimal lifestyle patterns. What constitutes a balanced life? How is it related to other aspects of well being?

For the purposes of this research, the term *life balance* is used as a conceptualization of a type of life that is optimal for health and well-being. Recently, a

model of life balance was proposed by Matuska and Christiansen (2008) based on a comprehensive review of the literature (Christiansen & Matuska, 2006), but there is no evidence to support its validity. One way to provide validity evidence for a theoretical model is to create and test a measure built from the dimensions of the model, and see if predicted associations among known constructs within the model can be empirically verified. Thus, if construct validity evidence is found for a measure of life balance that was created from a theoretical model of life balance, then both the measure and the model have empirical support. Exploration of the validity of a measure of life balance that has been developed is a major focus of this study. The following section describes the theoretical underpinnings of the measure of life balance, the Life Balance Model (LBM).

The Life Balance Model

The theoretical model of life balance (LBM) that underlies this research was proposed by Matuska & Christiansen (2008). This life balance model builds on interdisciplinary research about the physiological and psychological attributes considered important for well-being, and conceptualizes life balance based on how the configurations of everyday activities meet essential human needs (Christiansen & Matuska, 2006). A more thorough discussion of that research appears in Chapter 2, Review of the Literature. Here, the theoretical model and instrument used to test the model's validity, the primary foci of this study, are described.

The everyday activities that people engage in, such as grooming, bathing, cooking and eating, driving, working, child rearing, and leisure comprise activity configurations. The model proposes that activity configurations should enable people to: (1) meet basic

instrumental needs necessary for sustained biological health and physical safety; (2) have rewarding and self-affirming relationships with others (3) feel engaged, challenged, and competent; (4) create meaning and a positive personal identity (Matuska & Christiansen, 2008, p. 11). The model proposes that to the extent people are able to engage in configurations of activities that address all of these need dimensions, they will perceive their lives as more satisfying, less stressful, and more meaningful, or *balanced*. Finally, Matuska & Christiansen (2008) proposed a fifth need-based dimension, “to organize their time and energy in ways that enable them to meet important personal goals and renewal” (p. 11), but in the LBM described here, this dimension has been conceptualized as a skill rather than a need.

The definition of life balance in this model is “*a satisfying pattern of daily activity that is healthful, meaningful, and sustainable to an individual within the context of his or her current life circumstances*” (Matuska & Christiansen, 2008, p.11). The term *satisfying* in this definition means *congruence* between the amount of time one actually spends participating in activities and the amount of time one would like to spend participating in activities. *Healthful* means the activity configurations contribute to both physiological and mental health, *meaningful* means that the activities participated in are valued and important, and *sustainable* means the activity configurations can be maintained over the long term.

Figure 1 displays the theoretical life balance model (LBM) with the expected relationships between activity configurations, the environment, and associated life outcomes such as, life balance or imbalance, personal well-being, need satisfaction, and other physical or mental health outcomes. The two large ovals in the center represent the

activity configurations people engage in. It is expected that activity configurations will vary across people because individuals have different personalities, values and interests. It is also expected that activity configurations will vary for individuals across situations and time because people have different roles and role requirements in different situations.

The focus on *activity configurations* (ovals A and B) as the means for meeting important needs differentiates life balance from other positive state constructs such as happiness and satisfaction with life. Definitions of those constructs (happiness and life satisfaction) typically focus more on global, subjective appraisals of well-being. The LBM proposes that life balance is best understood by knowing how people live their lives, and that life balance can be conceptualized through actual configurations of activities that people engage in on a daily, weekly, monthly, and yearly basis. In other words, what people actually do (activity configurations) is a representation of their lives and that certain configurations are considered balanced or imbalanced depending on whether their needs are met.

Although the need-based dimensions of the LBM need empirical validation, another fundamental question is yet to be answered as well. What constitutes a *balance* among these need dimensions? And is a *balance* among the need dimensions important for positive physical and mental health outcomes? If people report satisfaction with their activity configurations, it might not represent life balance, but simply a level of life satisfaction.

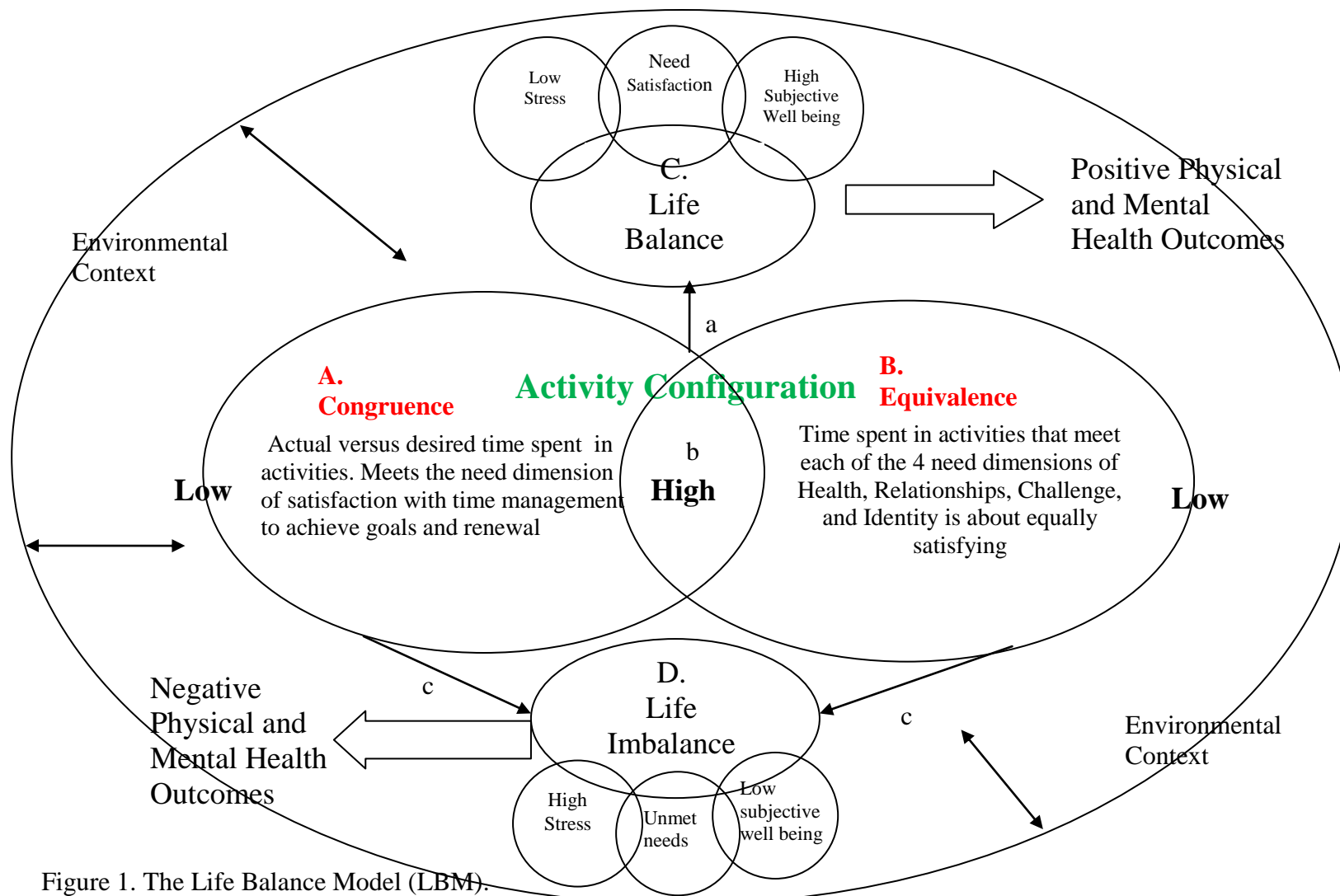


Figure 1. The Life Balance Model (LBM).

To address the *balance* part of the LBM, two components are considered: activity configuration *congruence*, and activity configuration *equivalence*. Activity configurations are represented in Figure 1 by two separate ovals, activity configurations that are congruent (oval A) and activity configurations that are equivalent (oval B). Each of these will be described in detail next.

Oval A represents *congruence* of activity configurations which means that one's *actual* activity configuration in everyday life matches one's *desired* activity configuration in everyday life. The LBM proposes that one component of a balanced life is high activity configuration congruence. In other words, if people report the amount of time spent in most activities is *about right; not too much or too little*, then they would have high congruence. Conversely, if people report spending too little or too much time in most activities relative to what they desire, then they would have low congruence. This represents the fifth dimension proposed in the Matuska and Christiansen (2008) life balance model, "to organize their time and energy in ways that enable them to meet important personal goals and renewal" (p. 11). In the LBM, this dimension reflects a skill needed to manage time and energy in ways that create optimal satisfaction with activity engagement in everyday life and is reflected by a person's reported *congruence* in activity configurations.

Time and energy are viewed as key dimensions in the proposed LBM because they are central to lay understandings of life balance, play a pervasive role in the orchestration of social activity, influence how and when activities are undertaken and experienced, and perhaps most importantly, contribute in significant ways to the creation of meaning. Organizing time and energy is viewed in two distinct ways in the LBM; one

view refers to the more immediate perception of time as in the allocation of time in day to day activities (activity configuration congruence and equivalence), while the other view recognizes that life choices and values change with the passage of time and context (not visible in Figure 1, but part of the theoretical foundation about changes over the lifespan).

Partitioning a prescribed amount of time to various activities is not what is proposed in the LBM. Rather, it is the contextual influence of time relative to meeting needs (health, positive relationships, challenge, and meaning) that is proposed to contribute to lower stress and life satisfaction. In other words, in balanced lives, need-based activities are engaged in *through* time in a manner that, at the end of the day, week, month, or year, people feel satisfied that their needs have been met and that their important goals have been achieved.

Congruence is conceptualized as only one part of activity configurations in the LBM because it does not take into consideration the holistic nature of lives and health. It is conceivable that an individual might regularly spend a large amount of time in one activity with very little time in other activities. For example, 0 hours *desired*, and 0 hours *actual*, in a given activity shows congruence, or 15 hours *desired* and 15 hours *actual* in a given activity also shows congruence. Thus, for example, a person who works 15 hours a day (as desired) and spends no time in relationships (as desired) would be considered balanced. Similarly, a person who spends 8 hours a day working (as desired) and 8 hours a day viewing pornographic web sites (as desired) would also have congruence and be considered balanced. The LBM addresses the potential limitations of considering only congruence by proposing another component to life balance, activity configuration equivalence.

Oval B represents *equivalence* of activity configurations. The LBM proposes that the second component of a balanced life includes activity configurations that allow people to meet the four need dimensions identified in the LBM: “(1) meet basic instrumental needs necessary for sustained biological health and physical safety; (2) have rewarding and self-affirming relationships with others (3) feel engaged, challenged, and competent; (4) create meaning and a positive personal identity” (Matuska & Christiansen, 2008, p. 11). High equivalence means that there is an approximate equal apportion of satisfaction with time use (congruence) across various activities that meet the need-based dimensions in the LBM. Low equivalence means that people do not perceive equal levels of satisfaction with time use across various activities that meet the need dimensions of the LBM.

An important distinction of the LBM is that it does not prescribe certain activities, or amount of time spent in certain activities, as important for life balance. Rather, it suggests that the activities engaged in meet the needs of physiological health, satisfactory relationships, positive identity, and challenge or interest. For example, it is possible that during 15 hours of work, an individual feels the work is very meaningful, feels challenged, and has rewarding social interactions and friendships. The individual in this case may report congruence (satisfaction with desired versus actual time in work and with time spent in activities relevant to several need dimensions) and also display a certain amount of equivalence (meeting 3 of the four need-based dimensions of the LBM). The activity configuration of this hypothetical individual would seem more balanced if viewed through need satisfaction than if judged by time use (i.e. hours at work) alone.

The LBM depicts an overlap between equivalence and congruence because both are proposed as necessary for a balanced life (Matuska & Christiansen, 2008). Figure 1 suggests that both high congruence and high equivalence lead to a *balanced* life (line a), and low congruence or low equivalence (or both) lead to an *imbalanced* life (lines c). The relationship in the LBM of congruence and equivalence to a *balanced* life (line a in Figure 1) will be directly tested in this research, but their relationship to an *imbalanced* life will not be directly tested.

Life balance, represented by oval C in Figure 1, is expected to relate to lower stress, higher need satisfaction and higher personal well-being. Life balance is expected to share some common attributes with these three constructs, but it is also expected to have its own unique dimensions. The relationships among life balance, stress, need satisfaction, and personal well-being are expected to be moderate. If the relationship between life balance and any of these constructs is too strong (for example if personal well-being shares 80% of the variance with life balance), then it is possible that life balance and personal well-being are the same thing.

This research will test the relationships between life balance, stress, need satisfaction, and personal well-being. Life balance is expected to be positively related to need satisfaction and personal well-being, and stress is expected to be inversely related to life balance. As stress increases, it is proposed that people will report less balance in their lives. Similarly, if people engage in activity configurations that do not meet the need-based dimensions of the LBM, it is presumed that they will also report higher stress. Figure 1 shows stress as a circle that intersects with life balance (and imbalance) and need satisfaction and that is related (through need satisfaction) to personal well being.

Figure 1 indicates that an expected consequence of life balance is positive physical and mental health. A discussion of this expected relationship will follow, but this relationship will also not be directly tested in this research.

Life imbalance is represented by oval D. Low congruence and/or low equivalence in activity configurations are expected to relate to life imbalance and to reports of high stress, low need satisfaction and low personal well-being. Life imbalance is characterized by configurations of daily activities that are perceived to be unsatisfactory (incongruent) to the individual and which: 1) increase the risk for physical and mental health problems, 2) limit or compromise participation in valued relationships, 3) are incongruent with establishing or maintaining a satisfactory identity, 4) are felt to be mundane, uninteresting or unchallenging, or 5) are not sufficiently organized or comprehensible to enable self renewal or goal achievement (Matuska, 2009; Matuska & Christiansen, 2009). Life imbalance is also expected to relate to poor health outcomes as depicted in Figure 1. This assumption will not be directly tested in the current research.

Finally, the entire figure is surrounded by a large oval representing the supports and barriers of the *environmental context*. The environmental context includes: the physical context, (such as where one lives and works); the social context, (such as social roles and responsibilities); the cultural context, (such as values and traditions); the political and economic contexts, (such as availability of resources); and the temporal context, (such as age or life stage). The interaction between the person and the environment is dynamic; where one's presence and actions influence the environment and alternatively, the physical and social characteristics of the environment influence the emotions and actions of the individual (Shaw, 2003; Wells, 2002). This person-

environment interaction is shown in Figure 1 by the arrows representing a two-way relationship between the activity configuration and the surrounding environment.

However, in some contexts, the interaction is one way only. For example, where one's gender, race, or age may influence activity configurations, but are not malleable to change based on one's actions.

The LBM suggests that choosing activity patterns that are optimal for one's overall perception of a balanced life is not entirely within one's personal control. The forces of the environment may make it difficult to engage in the kinds of activities desired. It is conceivable, for example, that resource limitations can influence the extent to which a person can meet needs and participate in valued activities, thus constraining the opportunity to attain a balanced life.

LBM critique

The LBM was proposed based on a comprehensive review of the literature that provided a context for identifying specific life characteristics and activity configurations relating to positive health and well-being outcomes (Christiansen & Matuska, 2006). There is research to support the idea that meeting important needs is linked to positive physical and mental health outcomes, but there is no evidence to date that the need dimensions proposed in the model are those essential for a balanced life. Furthermore, there is no evidence that a *balance* in the degree to which these needs are met is essential. It is possible that people could do very little to meet one or two of the proposed needs dimensions outlined in the model, yet perceive their lives to be satisfactory and/or have little stress.

It was also suggested that the LBM reflects four need dimensions that are universal to humans and influenced by their environments. In other words, people need to engage in culturally relevant activities that meet those need dimensions for optimal satisfaction with life, need satisfaction, and lower stress. And when they are unable to do so, because of environmental constraints (poverty, oppression, illness, etc.), they will not experience life balance, and may perceive poorer satisfaction with life, higher stress, and lower need satisfaction than those who are able to engage in a pattern of activities that meet the four need dimensions. However, Whiteford (2009) observed that life balance is shaped and understood in a Eurocentric discursive tradition and in connection with the labour market issues associated with Western Capitalism. She questioned whether the pursuit of life balance is a universal, cross cultural value and whether life balance is attainable or even relevant in the face of significant forces that mitigate against it. For the older women members of Grandmothers Against Poverty and Aids (GAPA) she interviewed in South Africa, it seemed that they had more important, extra-personal concerns, and life balance was irrelevant. Thus, she concluded that life balance may be a luxury and relevant only to those with adequate fiscal, material and educational resources. Additionally, the need-based dimensions of the LBM may overly reflect a western perspective, where people in other cultures may not identify the same needs as important or may identify an entirely different set of needs.

If activity identification or value is culture-specific, then one potential strength of the LBM is that the model allows for very different ways to meet the four need dimensions and is not prescriptive in its approach. For example, people from different cultures may engage in very different types of activities, yet meet their needs for

meaning, or satisfactory relationships. This assertion remains untested, however and will not be tested in this research.

LBM Summary

The LBM is a theoretical model that conceptualizes life balance and imbalance through their relationships to activity configurations, health and well-being outcomes, and the influence of the environment. Activity configurations are the focus of the LBM where high levels of congruence or equivalence in activity configurations are proposed to lead to a balanced life with resultant lower stress, higher personal well-being and need satisfaction, resulting in positive health and well-being outcomes. Conversely, low levels of congruence or equivalence in activity configurations are proposed to lead to an imbalanced life resulting in higher stress and lower personal well-being and need satisfaction, resulting in negative health and well-being outcomes. Finally, the environment is expected to have an influence on all the dimensions in the model.

These proposed relationships have not been tested, however, and are the focus of this research. The *life balance* dimension of the LBM will be tested in this research by examining the relationship between activity configuration congruence and equivalence to the other dimensions in the model, including some aspects of the environment. The proposed relationship between life balance and positive health will not be tested in this research. Furthermore, the *life imbalance* dimension of the LBM will also not be directly tested.

Research Plan

This research will focus on the *life balance* dimension of the LBM by examining the relationships between activity configuration congruence and equivalence, and stress, personal well-being and need satisfaction. An instrument was developed to measure activity configuration congruence and equivalence, the Life Balance Inventory (LBI). However, because the instrument requires additional validity testing, a second focus of this research will be to examine the LBI for construct validity. If the construct validity of the LBI is supported, then the validity of the underlying theoretical model from which it was built will also be supported.

Research Questions and Hypotheses

This research is a non-experimental, cross sectional design looking for relationships among variables at a given point in time. Figure 2 shows the hypothesized relationships between activity pattern congruence and equivalence, and between the constructs of stress, personal well-being, need satisfaction, and some aspects of the environment that will be tested in this research.

The overarching research purpose is to examine the construct validity of the Life Balance Inventory (LBI) and the underlying theoretical model, the Life Balance Model (LBM).

The specific research questions are:

1. Is there content and construct validity evidence for the Life Balance Inventory (LBI) and its subscales?

2. Does overall congruence (match between actual and desired time spent in valued activity categories) relate to lower perceived stress, higher personal well-being, and higher need satisfaction? (b, c, d in Figure 2)

Null hypothesis: There is no relationship between congruence and perceived stress, personal well-being, or need satisfaction, or the relationships are in the opposite direction.

3. Does equivalence relate to lower perceived stress, higher personal well-being, and higher need satisfaction? (e, f, g in Figure 2)

Null hypothesis: Equivalence shows no relationship to perceived stress, personal well-being, or need satisfaction or the relationships are in the opposite direction.

4. Is congruence related to equivalence? (a in Figure 2)

Null hypothesis: congruence is unrelated to equivalence.

5. Are there differences in congruence or equivalence based on gender, age, race, education, marital status, income level, employment status, number of children or number of children living at home? (h in Figure 2)

Null hypothesis: There are no differences in congruence or equivalence based on gender, age, race, education, marital status, income level, employment status, number of children or number of children living at home.

6. Are there differences in the relationships between congruence and perceived stress, personal well-being, and need satisfaction based on gender, age, race, education, marital status, income level, employment status, number of children or number of children living at home? (Figure 2 does not depict these relationships)

Null hypothesis: There are no differences in the relationships between congruence and perceived stress, personal well-being, and need satisfaction based on gender, age, race, education, marital status, income level, employment status, number of children living at home.

7. Are there differences in the relationships between equivalence and perceived stress, personal well-being, and need satisfaction based on gender, age, race, education, marital status, income level, employment status, number of children or number of children living at home? (Figure 2 does not depict these relationships)

Null hypothesis: There are no differences in the relationships between equivalence and perceived stress, personal well-being, and need satisfaction based on gender, age, race, education, marital status, income level, employment status, number of children or number of children living at home.

8. Are there differences in the relationship between congruence and equivalence based on gender, age, race, education, marital status, income level, employment status, number of children or number of children living at home? (Figure 2 does not depict these relationships)

Null hypothesis: There is no difference in the relationship between congruence and equivalence based on gender, age, race, education, marital status, income level, employment status, number of children or number of children living at home.

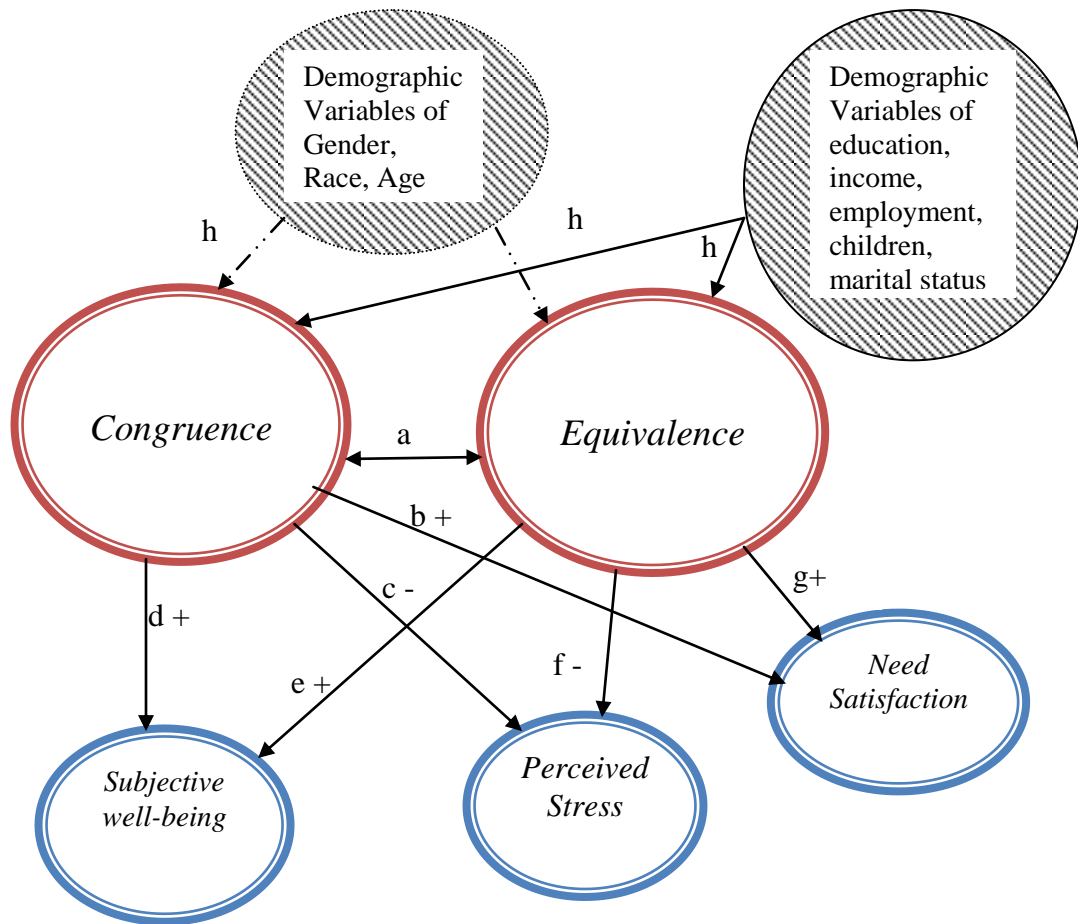


Figure 2. Hypothesized relationships to be tested in the proposed research.

Note: + = expected positive relationship, - = expected negative relationship. Filled circles represent the environmental context dimension of the LBM. Dashed lines indicate theoretically one-way relationships, all others reflect a two-way relationship. Because Figure 2 depicts only the relationships that are being tested, relationships that are theoretically two-way interactions, but for which only one-way is being tested, are not depicted. Connecting lines between environmental contexts and lines a,b,c,d,e, f, and g will be tested but are not shown.

The Life Balance Inventory

If life balance is a valid and unique construct, worthy of study, with potential implications for individuals, family and societal well-being, then there needs to be a measure of the life balance construct that can be used for research. Without such an instrument, the life balance construct will continue to be weakly defined, poorly understood, and without empirical support. This section will describe the development and pilot testing of the Life Balance Inventory (LBI), the measure for the construct of life balance used in this research.

The LBI is this researcher's attempt to measure the construct of life balance. The LBI is built on the conceptual life balance model (LBM) framework and was developed to measure congruence and equivalence as central constructs that comprise life balance. The LBI is intended to assess perceived congruence between how people want to spend their time in various activity categories and how they actually spend their time in those categories. It is meant to be used for both research and as a personal assessment of life balance that can inform individuals (and/or their counselors) about the balances and imbalances in their lives that may need to be addressed. The LBI was developed to include activity categories that represent common ways of meeting the need-based dimensions reflected in the equivalence component of the LBM.

Description of the Life Balance Inventory

The LBI is a 53 item questionnaire that measures how individuals meet their needs through daily activity configurations. The items are believed to represent common categories of activity that people in Western cultures engage in that meet the need-based

dimensions outlined in the model of life balance. The LBI contains four subscales, each containing items intended to reflect one of the LBM dimensions. For example, items such as *relaxing* and *getting regular exercise* are in the health subscale and are intended to reflect activities that meet the need-based LBM dimension of maintaining health. Items such as *doing things with friends* and *having an intimate sexual relationship* are in the relationships subscale and intended to reflect activities that meet the need-based dimension of having satisfactory relationships. Items such as *taking care of your appearance*, and *participating in religious events* are in the identity subscale and intended to reflect activities that meet the need-based dimension of creating a satisfactory identity. Finally, items such as *working for pay*, *making music* and *gardening* are in the challenge/interest subscale and intended to reflect activities that meet the need-based dimension of being challenged and having interests. (See appendix A for the LBI measure.)

On a dichotomous scale of yes/no, respondents record whether or not they do each activity or *want* to do the activity. For each of the items that they do, or *want* to do, they rate their perceived satisfaction with the amount of time they spent doing that activity in the past month compared to the amount of time they wanted to do the activity as: always less than I want, sometimes less than I want, about right for me, sometimes more than I want, and, always more than I want. This scoring method individualizes the results to reflect the unique activity configuration of each individual by ignoring activities the person does not do or does not want to do.

The satisfaction ratings for each item reflect the fifth dimension of the life balance model related of *organizing time and energy to meet goals*. The center score, “about right for me” represents perceived balance (congruence) in that activity, and is scored the highest (3). Ratings of either “too little” or “too much” on any item represent *imbalance*, and are scored (2) if rated “sometimes” and (1) if rated “always.” Scoring of the LBI generates a total average score across all items respondents do or want to do (sum of ratings divided by number of items rated) and reflects the congruence component of the LBM. The four subscales are scored by taking an average satisfaction score across all items respondents do or want to do within the subscale items (sum of ratings divided by number of items rated in the subscale).

Development of the LBI

The LBI has been through several iterations since its earliest version created in 2001. The following discussion will describe the development of the LBI used and tested in this research.

Item Development. The first method used to develop the activity categories for the Life Balance Inventory (LBI) was to create a list of activity categories that represented common ways of meeting the wide range of basic human needs discussed in connection with the LBM. Activity categories include several different activities. For example “getting regular exercise” is considered an activity category because it can be expressed through various activities; swimming, walking, tennis, etc. “Doing things with friends” is another example of a category where the actual activities engaged in with friends can vary greatly (hanging out, going for walks, sharing a meal, etc). The items were meant to

be broad, to encompass the various ways people engage in the activity categories. Six scholars in occupational science were solicited in 2002 to collapse or expand the list by eliminating redundancies and adding activity categories that were missing. These experts were asked to respond to whether the activity categories were described with generally accepted meanings and if the categories reflected most activities and contexts of modern life.

The resultant initial version of the LBI had 30 broad categories of activities thought to relate to basic need fulfillment. Instructions asked respondents to rate the *importance* of each activity category on a 5 point rating scale (not important to extremely important), and their level of *satisfaction* with that aspect of their life for each activity category on another 5 point rating scale (not satisfied to extremely satisfied).

Pilot Test I. The first pilot test of the LBI focused on test-retest reliability. The LBI was administered to a convenience sample of adults between the ages of 18-65 years who were friends, family or acquaintances of the researchers, and graduate students who were gathering data for their theses (Kleist, 2002). After initial approval from the Institutional Review Board, 150 participants were given a consent form, two copies of the LBI, a demographic form, a questionnaire about the LBI, and two stamped envelopes. They were instructed to complete and return the forms and the first copy of the LBI and complete and return the second copy of the LBI two weeks later.

One hundred and eight sets were returned (91 with complete data) out of 150 distributed among 18-65 year olds. The mean age was 39.7 years. Ninety-four percent were Caucasian, and 58 percent were female (demographics in Table 1).

Pearson correlation coefficients of .60 or above were attained for 26 of the 30 LBI *importance* items respondents completed initially and two weeks later ($p \leq .000$).

Correlation coefficients for the *satisfaction* ratings at the two points in time were .60 or above for 16 of the 30 items ($p \leq .000$).

Table 1

Demographics of Participants in Test-retest Reliability Pilot Study (N=91)

		18-40 year old (n=33)		41-65 year old (n=58)	
		n	%	n	%
Gender					
	Male	11	33	22	42
	Female	22	67	31	58
Marital Status					
	Single	21	64	13	24
	Married	10	30	35	66
	Divorced/widowed	2	6	5	10
Race					
	Caucasian	30	91	51	96
	African American	0	0	2	4
	Asian	3	9	0	0
Highest Education Level					
	High School	8	24	12	23
	Bachelor's Degree	14	42	20	38
	Graduate Degree	11	34	7	14
Employment Status					
	Full Time	12	36	34	64
	Part Time	8	24	15	28
	Other (Retired, Homemaker)	13	40	4	8

Item Analysis. Item analysis was completed on all 30 items to determine if the items had enough variation in responses to represent unique aspects of people's varied lives. The analysis consisted of tallying each respondent's ratings of *importance* and *satisfaction* for each item to determine the range of responses. Both the importance and satisfaction ratings for each of the 30 items had a response range of 4 or 5 points, indicating each item was eliciting an acceptable range of responses (not everyone rated it the same way).

Finally, respondents completed a questionnaire that asked open ended questions about whether the LBI mentioned all the activity categories that were important and meaningful to them, and if not, to indicate the activity categories that were missed. The questionnaire also asked respondents to indicate how they felt about completing the LBI and whether or not they found it useful. Most respondents reported that it was easy to answer, thought provoking, and covered most aspects of their lives. Some respondents reported confusion about how to rate a satisfaction level for an activity category that they also rated as not important. Most respondents reported some new insight as a result of taking the LBI, such as being pleased that they were relatively balanced or satisfied, or recognizing some areas that needed to be changed for greater life satisfaction.

As a result of the feedback from the respondents, five new items representing additional activity categories were created and one was deleted. The five new activity categories were: eating nutritiously, getting adequate sleep, caring for pets, personal hygiene, and managing money. The item that was deleted was having a balance of daily activities as it seemed redundant. Some items were also reworded for clarity.

Pilot Test II

The revised 34-item LBI was further refined for clarity and comprehensiveness. These revisions were: 1) adding 20 items that increased the activity specificity, 2) revising the scaling, and 3) clarifying instructions as recommended by participants after 3 think-aloud tests (where participants say what they are thinking as they fill out the measure). The additional 20 items added specificity to many of the items. For example “Participating in outdoor sports” was revised to include “participating in organized sports” and “doing outdoor activities (hunting, fishing)” and “communing with nature.”

Another notable revision was made in the way the LBI was rated and scored. Instead of rating every activity category item for “importance” and then for “satisfaction” as the phase I LBI had asked respondents to do, the revised LBI asked respondents to only rate activity categories they “do or want to do.” This eliminated the confusion about rating levels of satisfaction with activities that were not important to the respondents. For activities respondents “do or want to do” the scaling became: always less than I want, sometimes less than I want, about right for me, sometimes more than I want, and always more than I want. This revised rating scale was intended to more precisely elicit respondents’ perceptions of balance and to be applicable to both too much and too little time, both of which are balance perceptions.

After human subjects ethics review, the pilot test of the revised LBI was conducted in February, 2008 with 282 primarily white (96%) females (90%) ranging in age from 19 years to 90 years (mean =42.8 years). Although primarily white and female, the participants were quite diverse in age, level of education, marital status, number of

children living with them, employment status, and type of community where they lived. See Table 2 for demographic information about the sample.

The data in pilot test II were subjected to Rasch analysis using the Winsteps program (version 3.62.1; Linacre, 2006). Rasch analysis was used to obtain valuable information about the LBI at the item level and about its rating scale structure that is not available using classical test development processes. In the Rasch analysis, the ordinal data were transformed to interval data through a series of logarithmic calculations. The 53 responses on the revised LBI and the people taking the LBI were placed on the same hierarchical scale according to their relative ability or trait of *balance*. The items that most respondents reported “about right for me” (or balance) were placed lowest on a *balance* continuum and the items rarely rated “about right for me” even for the most balanced individuals (highest overall scores) were placed highest on the *balance* continuum. The analysis showed that the items were capturing a range of balance traits and that the items fit intuitively with the model of life balance (Matuska & Christiansen, 2008). For most common everyday activity categories, people felt the time used for these activities was “about right for me.”

Table 2

Demographics of Participants in LBI Pilot Study (N=282)

	n	%
Gender		
Male	28	10.0
Female	254	90.0
Race		
American Indian or Alaskan	1	0.1
Asian	3	1.1
African American	4	1.4

	Native Hawaiian	1	0.1
	Hispanic or Latino	2	0.1
	White	271	96.0
Marital Status			
	Single	106	38.0
	Married	142	51.0
	Divorced	32	11.0
	Separated	2	0.1
Number of Children			
	No Children	99	35.0
	One child	38	14.0
	Two Children	74	26.0
	Three Children	34	12.0
	Four Children	20	7.0
	Five Children or more	17	6.0
Number of Children Living with Them			
	No Children	171	61.0
	One child	48	17.0
	Two Children	45	16.0
	Three Children	14	5.0
	Four Children or More	4	1.0
Highest Education Level			
	Less than High School	2	1.0
	High School	82	29.0
	Associate Degree	75	26.0
	Bachelor's Degree	77	27.0
	Master's Degree	33	12.0
	Doctoral Degree	13	5.0
Where They Live			
	Major City	88	31.0
	Suburbs	148	53.0
	Small City	21	7.0
	Small Town	12	4.0
	Rural	13	5.0
Employment			
	Full Time	164	58.0
	Part Time	36	13.0
	Temporary Leave	1	0.1
	Unemployed and Looking	6	2.0
	Retired	43	15.0
	In School	29	10.0
	Keeping House	3	1.0

It took a high level of overall balance, however, to also be satisfied with dance, travel, exercise, art composition, music (the items listed high on the item map). This indicated that the people with the highest balance scores, also felt that they spent time in those activities as they wanted (“about right for me”), and people with low overall balance scores were less likely to be satisfied with the time spent in those activities. Finally, the items that discriminated best between high and low overall balance were: doing things with friends, participating in groups (clubs, etc), participating in organized sports, doing outdoor activities (hunting, fishing), communing with nature, and doing crafts/hobbies.

Phase II pilot data indicated that all the items on the LBI as a whole fit the expectations of the Rasch model, meaning that each item contributed positively to the total score (Thorndike, 2006). The internal consistency was good ($r = .89$) meaning 89 % of observed score variance is the true score variance and 11% is measurement error variance. Since Rasch analysis results in scores that are at the interval level, inferential testing of the LBI was now possible.

LBI Critique. Construct validity of the LBI is a major focus of the present study. The LBI is intended to provide information about two components of life balance. First, it is intended to measure *congruence* between desired and actual time spent across a broad configuration of activities. This is reported as the total average satisfaction score. The expectation is that closer congruence between desired and actual time spent in activities will be related to greater need satisfaction, higher personal well-being, and lower perceived stress (Sheldon, 2009; Sheldon et al., 2008). Second, the LBI is intended to

provide information about activity configuration *equivalence*, the perceived satisfaction across the need-based dimensions of the LBM, 1) health, 2) relationships, 3) identity, and 4) challenge/interest. The expectation is that when there is a similar perceived average satisfaction across the four LBI subscales, there will be an associated greater need satisfaction, higher personal well-being, and lower perceived stress.

Phases I and II of the LBI development established its content validity, including item development from a theoretical foundation (built from literature), expert opinion, and Rasch analysis. Think alouds also contributed to clarifying instructions to LBI respondents. Development of the activity category items was based on the LBM which is based on the extant research literature to date, and also on expert opinion.

There are several limitations of the LBI that resulted from the Phase II pilot-test. First, because the content was developed through feedback from several United States groups, the activity categories chosen for the LBI reflect western culture and may not be appropriate for other cultures. The item analysis and the test-retest reliability investigations were based on data collected from white Midwest United States women. Although the demographics within the pilot test sample were diverse in terms of education level, income, home location, age, and marital status, it is unknown if the LBI is appropriate for men, people living in other areas of the country, or people in other racial or ethnic groups. Thus, it cannot be claimed that the LBI is an appropriate measure of life balance for adult persons universally until its use with other groups and other cultures provides evidence supporting this assumption.

Finally, the process of LBI subscale identification to represent the four need-based dimensions of the model raises questions of validity. Although the subscales were created using logical construction with feedback from experts in occupational science and psychology, they are not based on factor analysis. They may overly represent a western view of what people do to meet physiological, relationship, identity, and challenge/interest needs based on the opinions of educated and privileged people. In creating these subscales, the author recognized the potential for overlap among activity items (activities may meet needs in more than one category), but used the general principle that activities with creative or engaging qualities were in the *challenge/interest* subscale, and activities related to rituals, routines, or traditions were in the *identity* subscale. The abbreviated LBI items chosen for each subscale are listed below.

Health Subscale Items:

- Taking care of personal hygiene and bathing
- Getting adequate sleep
- Relaxing
- Getting regular exercise
- Eating nutritiously
- Managing your health needs

Relationship Subscale Items:

- Taking care of children or family members
- Doing things with spouse or significant others
- Doing things with family members
- Doing things with friends
- Having an intimate sexual relationship
- Participating in groups (clubs, classes etc)
- Meeting new people
- Taking care of pets
- Mentoring (teaching) others
- Socializing at work

Identity Subscale Items:

- Taking care of appearance
- Demonstrating competence at work
- Participating in religious events
- Participating in traditions/holidays
- Participating in education
- Participating in professional events
- Volunteering in community
- Participating in organized sports
- Cooking
- Doing housework
- Shopping
- Going to plays
- Meditating
- Journaling
- Composing (music, poetry)

Challenge/interest Subscale Items:

- Managing money
- Working for pay
- Outdoor activities
- Gardening
- Communing with nature
- Planning events
- Decorating spaces
- Going to restaurants/bars
- Making crafts
- Making music
- Making art
- Repairing
- Sewing
- Reading
- Using computers
- Dancing
- Playing games of skill
- Watching TV
- Traveling
- Storytelling

Activities of Daily Living Items (used in total score only)

- Driving

- Taking the bus

Pilot testing of the LBI showed some support for face and content validity of the LBI total score, but the LBI subscales have not been tested. A needed next step is to test construct validity of the LBI and its subscales in order to verify the assumed relationship between LBI scores (total and subscale) and need satisfaction, stress, and personal well-being, and to know if the LBI is measuring life balance in ways proposed in the LBM.

Summary

This chapter described both the Life Balance Model (LBM) and the Life Balance Inventory (LBI). The LBM is a theoretical model showing expected relationships between life balance or imbalance, activity configurations, health and well-being, and the environment. Life balance is conceptualized as having activity configurations that are congruent with desired activity configurations, and having approximately equal levels of satisfaction across activities that meet health, relationship, identity, and challenge/interest needs. Although the LBM was created from a comprehensive review of the literature, it has not been tested for validity. To test the LBM, an appropriate instrument was needed that measured the key constructs of the model. The LBI was created to measure both congruence and equivalence in activity configurations, the two key constructs in the LBM proposed to lead to life balance. As described in this chapter, the LBI was pilot tested for content validity, but additional testing is needed to support its construct validity. There needs to be evidence that the relationships proposed in the LBM occur with expected strength, and in the directions predicted. Testing the relationships between activity configuration congruence and equivalence (using the LBI), and stress, personal

well-being, need satisfaction, and the environment (depicted in the LBM) is a necessary next step for validity of both the model and measure, and is the focus of this research.

Chapter 2

Review of the Literature

This chapter synthesizes relevant literature on life balance, presenting historical and contemporary contexts followed by interdisciplinary research regarding each of the components of the life balance model (LBM). Finally, various interdisciplinary conceptualizations of life balance are compared and contrasted with the LBM.

Historical Context for Balanced Living¹

The idea that living balanced lives will lead to health and well-being has persisted for centuries. Aristotle (1908) described human flourishing in the context of life activities that were virtuous and balanced to the interests, goals, values and capabilities of the individual. Hippocrates, and later Galen, each maintained that emotions influenced physical health, and these ideas persisted well into the middle ages (Sternberg, 1997). Teachings from belief systems ranging from Chinese medicine to Native American healing hold that maintaining health requires a balance among thoughts, actions and feelings, and that the physical and social environments in which people live provide them with both opportunities and challenges for meeting needs and maintaining well-being (Alter, 1999).

Pierce (2003) observed that in Western cultures, an understanding of life balance is deeply rooted in the history of society such as the changes emanating from the

¹ This section has previously been published in: Christiansen, C., & Matuska, K. (2006). Lifestyle balance: a review of concepts and research. *Journal of Occupational Science*, 13(1), 50. See Appendix H for Copyright permission.

protestant reformation, industrialization, and Victorian ideals. These periods changed daily patterns of living through introducing modern forms of paid work and other changes, and adaptation was necessary, such as creating new emphasis on leisure and dealing with health problems associated with sedentary lives. A common theme across the ages has been that well-being and happiness can be promoted by patterns of activities that reflect a satisfactory relationship with self, others and the environment. Unfortunately, in modern living, the social, economic, political and cultural environments are not wholly supportive of people creating balanced lives.

Modern Context for Balanced Living

The Global Burden of Disease Study projected that the majority of the conditions that will consume worldwide health resources by the year 2020, can be directly or indirectly related to Western lifestyles (World Health Organization, 2008). Some of these conditions, such as cardiovascular disease, chronic obstructive pulmonary disease, and motor vehicle crashes are directly related to unhealthy or unsafe lifestyle habits. Others, such as unipolar major depression, substance abuse, and self-inflicted injury (suicide), can be traced to life circumstances that are not perceived by the individuals affected to be enjoyable, meaningful, or worthy of engagement. These have been aptly termed *diseases of meaning* (Jobst, 2006). The alarming incidence of meaning-related conditions creates a compelling need for a reappraisal of the personal and environmental factors that create social conditions which exceed the coping resources of individuals and families and make life seem unbearable.

Evidence of perceived life imbalance is widespread within developed countries as seen in increased reports of stressful lives. For example, in the United States during 1994 and 1995, over half of surveyed respondents reported experiencing "a lot" or "moderate" stress during the previous year (Bachmann, 2000; Robinson, & Godbey, 1997). A study by the Conference Board of Canada that found the number of Canadians who reported moderate and high levels of stress as a result of perceived work-family imbalance increased from 26.7% in 1989 to 46.2% in 1999 (Bachmann, 2000). One of the most significant social transformations of the past few decades has been the increase in the total time spent at the workplace by couples, essentially driven by the substantial rise in the labor market participation of women (Marshall, 2009). The combined paid work hours of couples increased from an average of 58 per week in 1976 to 65 in 2008. The number of dual-earner couples rose from 1.9 million (43% of couples) to 4.2 million (68% of couples) (Marshall, 2009). Although there is some evidence that parents are spending more time with their children (Bianchi, 2000) there is also evidence of increased pressure and stress in families trying to juggle work-life demands (Bond, Thompson, Galinsky, & Prottas, 2002; Beck & Arnold, 2009).

The link between lifestyles, stress, and health has become increasingly clear with genesis in early research showing the need to re-establish homeostasis after disruptive life changes (Cannon, 1939), and the bodily reaction to stressful life demands (Selye, 1946). In the past quarter century, perhaps because of the growing recognition that psychosocial factors play a major role in the most prevalent and costly health conditions of our time, there has been a renewed interest in lifestyle factors and their influence on our health, particularly as these factors relate to the body's stress responses (Baum, Garofalo, &

Yali, 1999; McEwen, 2000; Seeman, Singer, Ryff, Love, & Levy-Storms, 2002).²

Research relating cumulative stress to mental and physical health is extensive (Kemeny, 2003; Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002). Thus, the idea of creating a balanced life that enables people to manage the demands of everyday life more successfully and therefore promote health, prevent illness, and improve perceived well being has potential value.

The need-based dimensions identified in the LBM are based on theories of motivation and well-being and provide some understanding about life choices. Maslow's theory (1943, 1970) recognizes the interrelatedness of needs, drives, perceptions, and the environment, and how these influence motivation. Maslow asserted that both *being* needs (cognitive, aesthetic and self-actualization) and *deficiency needs* (drives, safety and security, affiliation, and esteem) motivate everyday activity choices and drive the behavior that makes up our lives.³

Research on positive psychological functioning has shown that basic psychological needs associated with living a meaningful life must be satisfied if optimal functioning and well-being are to be achieved (Ryff, 1995). Ryff and Singer (1996) found similarities among many mental health, clinical, and life-span developmental theories of well-being and integrated these ideas into a theoretical model of positive psychological well-being. Their theory of psychological well-being contains six theory-guided

² This paragraph was previously published in: Christiansen, C., & Matuska, K. (2006). Lifestyle balance: A review of concepts and research. *Journal of Occupational Science*, 13(1), 51. See Appendix H for copyright permission.

³ This, and parts of the following three paragraphs were previously published in: Matuska, K., & Christiansen, C. (2008). A proposed model of lifestyle balance. *Journal of Occupational Science*, 15(1), 11. See Appendix H for copyright permission.

dimensions that have been supported by empirical findings in numerous publications that have been reported (Ryff, 1989, 1995, Ryff & Singer, 1998). The six dimensions considered core to well-being are: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth.

In their Self Determination Theory (SDT), Deci and Ryan (2000) assert that humans have innate needs that specify necessary conditions for psychological growth, well-being, and integrity. They identify competence, autonomy and relatedness as the fundamental psychological needs that must be satisfied for self-organization and relations with society. Deci and Ryan propose that satisfaction of these needs is associated with effective functioning and that negative consequences will result from their neglect. According to Self Determination Theory, then, well-being requires competence and flexibility to interact effectively with a changing environment; relatedness to connect meaningfully with others and integrate into society; and autonomy for self-regulation of actions and to be true to one's identity.

Considered together, Maslow's need hierarchy, Ryff's Psychological Well-being Theory, and Deci & Ryans Self-Determination Theory propose need categories that are similar to each of the need-based dimensions proposed in the LBM (See Table 3). The need-based theories mentioned above form the empirical foundation underlying the LBM's focus on how key needs are met or are not met through activity choices. Because life is complex, it is likely that a person's activity choices at any one instant will be motivated by a multitude of factors with changing influences. Moreover, people often make choices that, in hindsight, are contrary to their best interests. A brief discussion of the literature support for each need-based dimension follows.

Table 3: Comparison of Need-based Theories or Models*

Life Balance Model ¹	Hierarchy of Needs ²	Psychological Well-being ³	Self Determination Theory ⁴
Meet basic instrumental needs necessary for sustained biological health, security and physical safety	Safety/Security	These appear to be treated as “givens” determined more by physiological drives and instincts than conscious thought. Therefore they are so obvious and ubiquitous that the theorists accept them as deficiency needs and move on	
Have rewarding and self-affirming relationships with others	Affiliation	Positive Relations with others	Relatedness
Feel engaged, challenged, and competent	Aesthetics Cognition	Personal growth	Competence
Create meaning and a positive personal identity	Self actualization	Self acceptance Purpose in life Autonomy	Autonomy
Organize their time and energy in ways that enable them to meet important personal goals and renewal (considered a skill)	Esteem	Environmental Mastery	

¹Matuska & Christiansen (2008); ²Maslow (1943;1970); ³Ryff (1989;1996;1998), ⁴Deci & Ryan (2000).

* From “A proposed model of lifestyle balance.” By K. Matuska and C. Christiansen, 2008, *Journal of Occupational Science*, 15(1), p.12.

The Need-based Dimensions of the LBM

*Meet basic instrumental needs necessary for sustained biological health and physical safety*⁴ Cumulative research is convincing of the beneficial effects on health of good nutrition, exercise, safety practices (seat belt use, safety equipment use), adequate sleep, and avoiding addictive substances. Although health and safety are clearly identified as important needs by Maslow (1943) they are not typically highlighted in positive psychology literature because of their general acceptance as health-promoting. The LBM brings these basic needs to the forefront, asserting that one important part of a balanced life would be sustainable activity patterns that maintain physiological health and safety. An assumption underlying the LBM is that without good health, the likelihood of sustaining activities to meet other critical needs is diminished. Table 3 shows that the LBM and Maslow's Hierarchy of Needs Theory address physiological needs directly, but physiological needs are ignored in the Self Determination theory and Psychological Well-being Theory.

One of the key influences to physiological health is managing stress. This ability has direct relevance to the LBM because stress is related to life choices. Research has established that chronic stress can have serious health consequences (McEwen & Lasley, 2002), whether resulting from situations where people are feeling constantly pressed for time, or because people live in environments that do not enable them to pursue a satisfying pattern of activities that supports human flourishing.

⁴ This section in part was previously published in: Matuska, K., & Christiansen, C. (2008). A proposed model of lifestyle balance. *Journal of Occupational Science*, 15(1), 11. See Appendix H for copyright permission.

The negative physical effects of chronic stress on health can be measured as allostatic load, or the cumulative effect of ten physiologic responses to stress: systolic and diastolic blood pressure, waist-hip ratio, serum HDL, cholesterol, glycosylated hemoglobin, serum DHEA-S, cortisol, norepinephrine, and epinephrine levels (McEwen & Lasley, 2002). When allostatic load is elevated over a long period, the physiological responses are harmful to the body, and can contribute to cardiovascular disease and immune response suppression (McEwen & Lasley, 2002). Stress has also been associated with depression, disrupted sleep patterns, memory problems, obesity, and various other health conditions (Sapolsky, 2004).

Given the significant impact of stress on health and well-being, a balanced life would be one where stress is managed in a way that minimizes its long term negative effects. Considerable research has shown that there are certain life choices that buffer against stress and improve overall health. For example, regular exercise has been associated with decreased stress response (Skully, Kremer, Meade, Graham, & Dudgeon, 1998), improved sleep (Youngstedt, O'Connor, & Dishman, 1997), and decreased depression (Craft & Landers, 1998). Good nutrition and eating habits have also been associated with lower stress effects and better overall health (Baum & Posluszny, 1999). Reams of evidence support the idea that healthy life choices have long term beneficial effects on overall health and well-being. Therefore, this factor is considered one of the key need-based dimensions in the model of a balanced life.

Have rewarding and self-affirming relationships with others. ⁵ Relationship needs are clearly addressed in the LBM, Maslow's Hierarchy of Needs Theory (affiliation) Self Determination Theory (relatedness), and the Psychological Well-being Theory (positive

relations with others) as displayed in Table 3. Having rewarding and self-affirming relationships with others is also well supported in the literature. For example, socially supportive environments have been associated with psychological well-being (Thompson & Heller, 1990), quality of life (Achat, et al, 1998), higher cognitive performance (Seeman, Lusignolo, Albert, & Berckman, 2001), and healthy aging (Gurung, Taylor, & Seeman, 2003). Socially supportive family environments have long term effects in children by reducing their risk for mental health disorders, chronic diseases, and early mortality (Repetti, Taylor, & Seeman, 2002). Even when people live in stressful situations such as in low socioeconomic conditions, social support seems to lower stress associated with living in impoverished environments (Taylor & Seemen, 1999).

The link of positive relationships to overall health status has growing evidence with strong associations found between social support and specific physiological functions, including the cardiovascular, immune and endocrine systems (Uchino, Cacioppo, & Kiecolt-Glaser, 1996). Social support also appears to be a buffer to stress because it has been linked to lower levels of allostatic load (Kiecolt-Glaser, McGuire, al., 2004). The positive physiological benefits of social support have also been shown to reduce worker sickness and absenteeism. In research on middle aged employees, workers with satisfactory social support reported significantly less sickness and less absenteeism than workers who did not have satisfactory social support (Melchoir, Niedhammer, Berkman, & Goldberg, 2003). Additionally, studies show that even when people become

⁵ This section was previously published in: Matuska, K., & Christiansen, C. (2008). A proposed model of lifestyle balance. *Journal of Occupational Science*, 15(1), 13. See Appendix H for copyright permission.

ill, better recovery from the illness and less onset of disability in activities of daily living is fostered by social support (Mendes de Leon, et al, 1999).

One component of healthy relationships that requires more research involves understanding the balance between care for self and care for others. Healthy relationships involve both giving and receiving support, but little is known about a healthy balance between the two. Care giving can be deeply meaningful, but in excess it can be depleting as well. The Western focus on individualism is also contrasted by the Eastern values of collectivism, and these cultural differences can influence one's perception of optimal balance. In other words the meaning of activities or the needs met by doing activities may look different with people from different world views. Caring for elders for example, may have a more positive meaning, and meet needs of establishing a positive identity, or fostering a rewarding relationship for people with a collectivist worldview; whereas, care-giving may feel more like a burden for people with an individualist worldview (Whiteford, 2009). The LBM does not prescribe activity patterns necessary for healthy relationships, but proposes that the meaning and satisfaction with chosen activity patterns in context influences perceived balance.

Feel engaged, challenged, and competent. The LBM proposes that an important component of a balanced life includes opportunities to feel competent and engaged through activities that are interesting and challenging. The idea of challenge, engagement, and competence as representing important needs is also evident in Maslow's Hierarchy of Needs Theory (aesthetics/cognition), Self Determination Theory (competence), and the Psychological Well-being Theory (personal growth) as displayed in Table 3. Engagement in activities is fundamental to life because it is through the active transactions with

people, places and things in an environment that people develop a sense of competence and self-efficacy. This contributes to identity and creates meaning in lives (Christiansen, 1999). When people are successful in their actions to meet their needs and fulfill their roles, they develop mastery, which increases their sense of competence and self-efficacy. This leads to a willingness to try other novel or challenging things (Bandura, 1977, 2000, 2001). Since life is continually changing, people need to have the ability to respond to these challenges in new ways that allow them to continue to grow as individuals.

⁶Competency and efficacy are not only important for continued adaptation to the demands of living; they also have been linked to well-being and quality of life (Deci & Ryan, 2000). A sense of control over one's personal environment relates to competency and efficacy and is fundamental to life and drives behavior. For example, the ability to make decisions and control many of the events in life has been linked to improved alertness, participation in daily activities, and well-being in nursing home residents (Langer & Rodin, 1976). In a study of personal project dimensions on 120 adults, Christiansen, Backman, Little, & Nguyen (1999) found that efficacy and stress were the factors explaining the most variation in well-being. Efficacy emerged as a central factor in explaining progress and outcome, and was significantly related to the dimension of project meaning. Britt and Bliese (2003) also found that being personally self-engaged in activities was related to well-being of soldiers in stressful situations through its effect as a stress-buffer.

⁶This, and parts of the following paragraph were previously published in: Matuska, K., & Christiansen, C. (2008). A proposed model of lifestyle balance. *Journal of Occupational Science*, 15(1), 13. See Appendix H for copyright permission.

The idea of an optimal person-environment match for a sense of well-being was researched extensively by Csikszentmihalyi (1990, 1997). He described a phenomenon termed “flow” that occurs when people have a sense of control over what they’re doing, where they feel competent and efficacious in their ability to do the activity, where they know the goal of the activity and receive feedback from their efforts, and where time is suspended because they are deeply involved in the activity for its own sake. This optimal state is achieved when there is a balance between high skill and high challenge resulting in enjoyment, interest and motivation. In contrast, activities that provide low challenge and require low or medium skills result in apathy or boredom (Persson, Eklund, & Isacson, 1999). The physical and psychological consequences of engagement and participation in activities can range from emotional rewards (such as pleasure and satisfaction) to increased knowledge and wisdom and a sense of life meaning and are important for a balanced life.

*Create meaning and a positive personal identity.*⁷ Frankl (1984) and Antonovsky (1979,1987, 2003) are among prominent scientists who have asserted the importance of creating meaning (or life purpose) in human flourishing, suggesting that it may be the life characteristic that is most important for resilience under stressful conditions. Meaning and identity are also considered important needs in Maslow’s Hierarchy of Needs Theory (self actualization), Self Determination Theory (autonomy), and the Psychological Well-being Theory (self acceptance, purpose in life, autonomy) as displayed in Table 3.

⁷ This, and the following three paragraphs in part were previously published in: Matuska, K., & Christiansen, C. (2008). A proposed model of lifestyle balance. *Journal of Occupational Science*, 15(1), 13-14. See Appendix H for copyright permission.

The meaning dimension of activities includes all of the subjective, emotional appraisals of the events in our life, the significance attributed to them in relation to our goals, and the underlying values, beliefs, and personal identity that are created and supported by them. Research in the social and behavioral sciences demonstrates wide agreement on the importance of meaning to human flourishing (Christiansen, 1999; Deci & Ryan, 2000; Klinger, 1977, 1998; Little, 1988, 1998; Ryff, 1989; Taylor & Seeman, 1999; Zika & Chamberlain, 1992). In pursuing meaningful lives and creating a positive identity, people engage in an array of activities, some of which are related to understanding of their situations at the moment and others pertaining to evaluating purpose in their lives over the longer course. These activities range from regular meditation and contemplation during walks in the forest for example, to more formal rituals and fellowship embodied in the activities and worship of organized religion, for example. These spiritual activities, and their meanings, need to be fully considered in studies of lifestyle and health.

A physically healthy lifestyle but with little meaning, may be insufficient for a balanced life (Ryff, 1989; Reker, Peacock, & Wong, 1987; Wong, 2000). Maslow (1970) distinguished between people who are *merely healthy* and those who are *transcenders*. The transcenders are those who live more at the level of being, who have more peak experiences and are motivated to a greater good beyond them. Similarly, Victor Frankl (1984) believed that “Man’s search for meaning is the primary motivation in his life” (p. 121). Frankl considered finding meaning as fundamental to our existence and that we accomplish it by creating or doing, experiencing people or things, and by the attitude we take towards suffering. This ability to find meaningfulness in our everyday events, even

in deplorable circumstances makes the difference between a life worth living and despair. Other theorists support the belief that a prolonged existence without meaning, values or ideals creates boredom and apathy, lack of personal fulfillment, personal distress, and illness (Frankl, 1984; Maslow, 1970; Yalom, 1980).

The inadequacy of defining health as the merely the absence of symptoms is clear when one considers why two individuals given similar illnesses have remarkably different life outcomes or why individuals considered physically robust can be at the brink of despair. Certainly, some of these differences are related to how different actions are experienced and interpreted. Persson, Erlandsson, Eklund, & Iwarsson (2001) described value dimensions of activities and related these to how people assign meaning to what they do. Based on their research, they concluded that personal meaning is based on the perceived value underlying action and that individuals, within the context of their lives and situations, interpret meanings uniquely.

Yet, although they are highly individual, such meanings must also have coherence. Aaron Antonovsky (1979) proposed a salutogenic model of health that emphasized factors that keep people healthy. His clinical work revealed that a basic attitude of experiencing the world as manageable, meaningful and comprehensible seemed to contribute to a sense of coherence that was central to maintaining health. According to Antonovsky, this attitude reduced states of tension and was related to increased health promoting behaviors (Antonovsky, 1987).

Other researchers have found that living a meaningful existence or having a purpose in life is associated with well-being. Studies of personal projects have shown that having projects with personal meaning in and relating to one's identity are associated

with greater well-being (Christiansen, 1999; Little, 1998; Little & Chambers, 2003). Of particular interest in these studies is the finding that people make time for those goal-related activities that are viewed as important by themselves and others. In summary, there is abundant empirical evidence supporting the importance of having lives that engender the creation of meaning and a positive identity.

Organize time and energy in ways that enable them to meet important personal goals and renewal. In order to meet needs, the LBM suggests that people must manage the multiple demands on their time sufficiently to accomplish their goals and create opportunities for energy renewal. Table 3 compares this need-based dimension to Maslow's *esteem* need such as confidence and achievement, and the Psychological Well-being *environmental mastery* need to function optimally in the environment for well-being.

Lay understandings of life balance universally involve the perceived time-stress associated with social pressures to fit more activities within a timeframe that cannot be expanded. In contemporary Western society, there is a growing perception that the routine demands of living exceed the time available for them, and that there is insufficient time to rest or participate in discretionary pursuits or to accomplish work-related tasks at desired performance levels (Robinson & Godfrey, 1997). Time is seen as a commodity that must be rationed (Peloquin, 1990) and results in stress when there is a perceived press for time or multiple demands on time.

Time management can also be viewed as *activity* management because it represents a planned and purposeful choice of which activities will be engaged in over time. As the LBM suggests, a balanced life would be one where there is satisfaction in

the congruency between desired and actual use of time. One approach to finding congruency is using time management strategies that organize attention and energy for satisfactory completion of daily activities. This was demonstrated in several studies of college students who typically have multiple demands on their time. Compared to college students who had poor time management, students who used effective time management strategies demonstrated less stress (Misra & McKean, 2000), and had better academic performance (Britton & Tesser, 1991). Employees who used effective time management strategies reported greater work and life satisfaction, reported less role overload, and had fewer job-induced and somatic tensions (Macan, Shahani, Dipboye, & Phillips 1990).

Well-being and life satisfaction are compromised when time is perceived as inadequate to meet goals and fulfill roles. Satisfaction with how time is spent was one of the moderate predictors of life satisfaction in adults with spinal cord injuries (Pentland, Harvey, & Walker, 1998) and older adults (Seleen, 1982). People are also more satisfied and report a higher sense of well-being when they feel they are achieving the goals of their long or short term projects (Christiansen, Backman, Little, & Nguyen, 1999). Conversely, having too much time available with subsequent boredom and inactivity has been related to lower levels of mental health and life satisfaction. (Jonsson, Borell, & Sadlo, 2000; Zuzanek 1998).⁸

Time can also be viewed from a more biological perspective when considering the

⁸This, and the following two paragraphs were previously published in: Matuska, K., & Christiansen, C. (2008). A proposed model of lifestyle balance. *Journal of Occupational Science*, 15(1), 14. See Appendix H for copyright permission.

control exerted by nature such as circadian rhythms that impose an internal structure and rhythm on activity. People spend one-third of their lives sleeping, and regular activity routines (acting as internal clocks) are necessary to help entrain people to their natural environments. Disentrainment interrupts customary activity routines and can have deleterious health consequences (Monk, et al., 1997; Monk, Flaherty, Frank, Hoskinson & Kupfer, 1990; Szuba, Yager, Guze, Allen, & Baxter, 1992). Research shows that biological rhythms and social activities have a reciprocal relationship, and when loss of synchrony occurs, sleep and mood disturbances result (Brown, et al., 1996; Monk, Reynolds, Buysse, DeGrazia, & Kupfer, 2003).

There is also a temporal influence on the selection and subjective experience of activities. The nature and timing of chosen activity pursuits, while influenced by social expectations, seems also to be a function of stage of life. Early stage theories of development posited that as individuals move through stages of life chronologically, they are motivated by different primary tasks or issues (Erikson, 1982; Havighurst, 1972). As people age, they tend to pursue goals that are more meaningful and with more emphasis on the present in recognition that time remaining is diminishing (Carstensen, 1998) and they choose personal projects that are more congruent with their values and identity (Christiansen, 2000; Little, 1998; McGregor & Little, 1998). In anticipating the future in the context of their lives and personal stories, people are motivated to pursue activities that shape positive identities and address unmet needs and potentials (Christiansen, 1999; Markus, 1986; McAdams, 1992, 1993, 1999). Thus time creates a contextual backdrop that influences the selection of activities and their meanings both prospectively and retrospectively.

The need-based dimensions of the LBM were supported in a qualitative study of women with multiple sclerosis (MS) who participated in focus groups (Matuska & Erickson, 2008). The women with MS lived independently in the community, yet had ongoing struggles to manage their disease and create balanced lives. They did not experience life balance because of the obstacles created by their disease, but could identify things about their own lives that indicated lack of balance. The themes that emerged were the desire to be physically healthy with minimal stress, the importance of meaningful relationships, their need for a personal identity unrelated to multiple sclerosis, the importance of rewarding and stimulating activities (as many were lost), and the challenge of managing their energy to achieve daily goals because of fatigue associated with MS (Matuska & Erickson, 2008).

Activity Configuration Congruence

One of the earliest studies that supported the concept of congruence in activities was by Seelen (1982), who found that for older adults, perceived congruence between desired and actual time use among ten categories of activities was related to life satisfaction. Arguably, the congruence between actual and desired time use could be construed as *balance* but the authors did not describe it as such. Wilcock, Hall, & Hambley, (1997) also found that ideal balance was represented by Australian respondents as approximately equal involvement in physical, mental, social and rest activities, and a significant relationship was found between the closeness of current activity patterns to those perceived by the respondents to be ideal and his or her reported health. The congruent idea was also supported by Håkansson, Dahlin-Ivanoff, Sonn, (2006) who found that women with stress-related disorders reported a sense of balance (that they felt

was synonymous with well-being) when they had a harmonious repertoire of daily activities that were meaningful and created a positive self image, and when they used strategies to manage and control everyday life.

The research reported above explored what people actually do versus what they desire to do, and their self-reported levels of satisfaction in certain areas. This may be confounded by psychological traits such as neuroticism or other affective states and may be difficult to differentiate from personal well being, life satisfaction, or other positive states. In other words, self-reported satisfaction with daily activities may not actually reflect life *balance* it may just reflect a personality trait of the person reporting. If perceived life balance yields personal well being, happiness, or other positive psychological states, then there is the question of whether or not researchers can differentiate life balance from these constructs. For example, if we expect that people who report having balanced lives will also report more life satisfaction or happiness (or any other positive state), then, is life balance and life satisfaction or happiness so related that they cannot be differentiated? Are they essentially the same thing?

Activity Configuration Equivalence

In multiple studies with samples from United States, India, and Australia, Sheldon, Cummins & Khamble (2008) found that life balance was a unique construct and the discrepancy among desired and actual time use in daily activities related to need satisfaction and personal well being in significant and predictable ways. They also found that relatively equal apportionment of time across ten activity categories: sleeping, school/or paid work, household chores, community activities, recreation, commuting, relationships, health and self-care, spirituality or religious activities, predicted need

satisfaction and personal well being, but less robustly than the discrepancy of time use predicted lack of need satisfaction and lower personal well-being. The *relative* equal apportionment is critical here. It does not make intuitive sense that the same amount of time should be spent in each of the 10 activities. Commuting, for example seems suspect. In a given day most people would consistently show differences in time use in the 10 activities and perhaps this measure might only be useful when *extreme* time use differences are noted in any one or two of the activities, i.e. large number of hours at work, small number of hours sleeping. Sheldon, et al.'s (2008) method of conceptualizing life balance through time use was supported by their findings that balanced time use predicts personal well-being and need satisfaction and they concluded that life balance may be a unique construct, worthy of further study.

The research on time use above, that studied desired versus actual time allocation among activities, and equal apportionment of time across activities related to health, comes close to the LBM except they do not address the outcome of stress and limit their activities to 10 categories. The LBM is not limited to 10 major activity categories, suggesting that any activity that meets the need dimensions should be included. As an example, such activities as art, music, or writing might be extremely important to some people even if engaged in only rarely in a given time period.

The combined research on activity patterns suggests that certain configurations of activities or attitudes about activities relate to need satisfaction or personal well-being. None of them have tested that relationship to life balance directly, although some have shown how activity configurations relate to other positive outcomes such as well-being

(Cummins, 2009). The present research will test the relationship between activity configurations, life balance, and stress, personal well-being, and need satisfaction.

Life Balance: Alternative Perspectives

The LBM associates activity configurations described above with either a balanced life or imbalanced life. High equivalence and high congruence of activity configurations is expected to relate to life balance and conversely, low equivalence or low congruence of activity configurations is expected to relate to life imbalance. Other researchers have theorized life balance in very different ways. The following discussion will summarize the two broad categories of research addressing life balance: studies that examined characteristics of daily activities (role balance, experiential balance, occupational integrity, time use), and studies that examined the outcomes of life choices (happiness, need satisfaction). Perspectives in these studies will be compared and contrasted with those in the LBM.

First, there is the question of whether or not life balance is a legitimate concept, worthy of research. Philosophically, Birchenbach and Glass (2009) questioned whether balanced living is necessarily desirable. They challenged popular press ideas of life *imbalance* suggesting that it may not be a problem for some people and that researchers should not discount variations of lifestyles by turning them into problems, particularly medical problems (i.e. too much work creates health problems). They warn of dangers in prescribing a one size fits all lifestyle and question whether medical or professional judgements should be made in this area. Their argument points to the importance of considering the *outcome* of life for each unique individual (such as contentment,

happiness, accomplishment, etc.) rather than the specific repertoire of activities people engage in on a daily basis.

It seems that Birchenbach and Glass (2009) assumed in their critique that models of life balance would be prescriptive, similar to the food pyramid in dietetics. In other words a balanced life would be the same for all; certain ideal proportions of rest, work, and play. This type of life prescription would indeed, be inappropriate according to the LBM. The LBM addresses how regular activity patterns meet essential needs, It does not prescribe specific activities to be chosen to meet those needs. To illustrate, an individual may choose to spend a disproportionate amount of time in work activities that by some standards, would be considered excessive. But if the individual meets his/her needs in the five dimensions of the model through work and the other areas of life, then the greater proportion of time spent in work does not necessarily represent an imbalanced life.

Life balance viewed as role balance. Sociologists often view lifestyles through role fulfillment which has some similarities to the activity configuration concept in the LBM. Research about roles has consistently found that participation in valued roles is related to life satisfaction and measures of well-being (Verbrugge, 1983). Too much conflict among multiple roles can be associated with stress (Goode, 1960), yet having more social roles typically has beneficial consequences, since it may enable the individual to have access to more social support and reduce a person's vulnerability to stress (Linville, 1987). Marks and MacDermid (1996) showed that finding a way to balance multiple demands on one's time and role responsibilities correlated with peoples' perception of ease and satisfaction for adequately meeting daily role demands. They found that positive role balance was reflected in a person's "tendency to become fully

engaged in the performance of every role in one's total role system, to approach every typical role and role partner with an attitude of attentiveness and care" (1996, p. 421).

People who maintained more balance across their entire role systems had lower reported stress, lower rates of depression, and higher self-esteem and overall well-being than people who did not have balance among their roles (Marks & MacDermid, 1996).

Although research on roles has provided insight into some factors that contribute to or alleviate the consequences of life stress, studies have generally failed to provide information about the patterns or types of specific activities and practices that typify the roles of the most (or least) successful study participants. Research on roles does not help us understand daily lives because engagement in activities could fulfill more than one role, i.e. cooking dinner with children could fulfill the role of parent or the role of homemaker. Conversely, activities chosen to fulfill roles will vary significantly among individuals. For example, one mother may feel that cooking nutritious meals for regular family dinners is important whereas another mother may find that less important and emphasize taking her children to activities (that often interfere with regular meals). Thus, for one mother (but not another), cooking is important, and if the pressures of life make it so that she cannot cook as much as she would like to, she may report feeling *imbalanced*. The LBM emphasizes daily activity patterns rather than specific roles because engagement in activities could fulfill more than one role.

Life balance viewed as experiential balance. From an occupational science perspective, Persson and Jonsson (2009) propose a model of *experiential* balance whereby they believe a balanced mix of *types* of everyday experiences is important for health and well-being. They define 3 key experience dimensions in daily activities:

“highly or moderately challenging experiences that are matched with high skills (challenging, intense, but rewarding), highly challenging experiences that are not matched with high skills (somewhat stressful, stretches one’s ability level), and low to moderately challenging experiences (not challenging, routine, little effort required). They theorize that all three experience types and their relationships are important for achieving balance in life, meaning that none of them is intrinsically positive or negative (Persson & Jonsson, 2009, p 137).” The three experience types have different relationships to each other and are needed within the total context of everyday experience. If any of these three experiences is too dominating, an imbalance arises that in the long-term might risk developing into a destructive process; one that would lead to occupational deprivation and/or overload, with negative consequences on health and well-being. In other words, too much challenge will result in the stress of anxiety, and too little challenge results in the stress of boredom.

The experiential model of life balance adequately addresses the experiential aspects of everyday living but may fall short of a full model for a balanced life because it does not address the other dimensions of living such as how these experiences may be balanced among relational, spiritual, or physiological aspects of life. Is it possible for someone to have these three activity experiences but still experience loneliness, for example? Or be unhealthy, such as having limited exercise or an addiction to cigarettes or alcohol? It is conceivable that an individual could have the experiential mix described above in a work setting or at home, yet not have other needs met in his/her life as a whole. The LBM similarly highlights the importance of a mix of challenging activities

and the need for renewal, as this is one of the need-based dimensions in the model (oval B), but the experiential model does not address other aspects related to life balance.

Life balance viewed as occupational integrity. Pentland and McColl (2009) offer an alternative perspective on life balance, one they believe is missing from the current discourse. They propose that the extent to which people perceive their life to be in balance derives from the extent to which they are living congruent with their personal values and strengths or have *occupational integrity*. Thus, they believe “the metaphor of *balance* focuses on an idealistic and dualistic (either in balance or out of balance) outcome and obscures the fundamental characteristics and nature of this sought-after state. Living in occupational integrity involves choosing everyday activities that matter the most and the extent to which we can design occupational lives consistent with our values will influence the degree to which we feel a sense of balance and well-being” (2009). To do this requires reconciling and prioritizing what we choose to do on the basis of personal values (awareness and deciding what matters most), and assertiveness (i.e. being able to say “no”) and living with the consequences of making choices that may let others down or incur disapproval from the environment. The failure to make activity choices from a stance of personal values over time will negatively affect our well being (Pentland & McColl).

Like the Persson and Jonsson (2009) model discussed previously, the model of occupational integrity by Pentland and McColl (2009) describes living in congruence with values as the single most important aspect of balanced living, but it falls short of addressing the full complement of life choices. For example, it is conceivable that a

person might value hard work and believe that providing financial support to his/her family is the single most important thing to do, but this value may not match family members' values, creating stress. Additionally, this model does not address the physiological needs that are affected by life choices. Living with integrity aligns with one of the 5 dimensions in the LBM, *meaning and the development of a satisfactory personal identity* but does not explain a balanced life along other dimensions.

Research that considers life *outcomes* would be a potential way of addressing the differences in everyday activities across cultures. For example, if people (in any culture) were given opportunities to create lives that were satisfactory to them, would they have better overall life outcomes than people who cannot create satisfactory lives? This line of inquiry would help determine the universality of life balance without imposing culturally laden values on the types of activities that necessarily make up peoples' lives.

Life balance viewed as happiness. From a sociological perspective, Veenhoven (2009) agreed that researching life outcomes has theoretical and empirical value. He described three potential ways to assess life balance and asserted that depending on which approach is chosen, the results will be quite different. For example, should *balance* be a subjective sense of how balanced people think they are? Should it be based on a preconceived idea of what balance should be (so much time in certain activities)? Or is balance a life-style-mix that yields the most happiness? He asserted that balance reflects best in satisfaction with life-as-a-whole, that is, in happiness. A life full of short lived pleasures is not necessarily a balanced life and neither is a life with incidental peak experiences. Likewise, satisfaction in particular domains of life does not denote balanced living, such as having high job-satisfaction if it is costing low satisfaction with family life

(Veenhoven). With this perspective of life balance, research would focus on subjective appraisals of lives and compare and contrast lifestyles that bring the most and least levels of happiness.

This approach is consistent with the LBM whereby life balance is conceived by the subjective outcome of the configuration of everyday activities as a whole. The difference is in the outcome of interest. In the LBM, need satisfaction is the outcome of interest, rather than happiness. One could argue that need satisfaction and happiness are highly related to each other, or that they at least share some variance related to a balanced life. Sorting out these confounding variables to a balanced life will be important for future research.

Life balance viewed as need satisfaction. Another way to conceptualize life balance from a psychological perspective is to focus on whether or not daily activities are deemed satisfactory for meeting needs considered essential for health and well-being. In four studies using multiple designs, Sheldon & Niemiec (2006) found that a balance of satisfaction in relatedness, autonomy, and competence, the three need areas in Self Determination Theory (Deci & Ryan, 2000) had unique additive effects on psychological well-being (equivalence). In other words, people who experienced balanced need satisfaction (similar scores across need areas) reported higher well-being than those with greater variability in need satisfaction, even when the sum of total scores was equal. Later, Sheldon (2009) found that people with non-discrepant (or congruent) time use had significantly higher need satisfaction than those who had imbalanced (incongruent) time use. This higher level of need satisfaction was in turn, associated with personal well-being. In other words, their research suggested that balanced (equivalent and congruent)

lives helped people meet their psychological needs and positively impacted their personal well-being. This research along with the balanced time research by Sheldon et al. (2008) mentioned above was highly influential in the development of the LBI.

Stress

The importance of stress to overall health and well-being outcomes was described in the earlier section discussing the physiological need based dimension of the LBM. The evidence reported clearly linked stress to poor health outcomes.

The importance of rewarding relationships is one of the need-based dimensions of the LBM. If important family relationships are strained, it may influence life balance. There is a large body of literature about family stress, much of it built from family stress theory (Hill, 1949; 1971; 2003) where it is believed that if the stress is severe enough, and for a long enough period of time, it could lead to physical, emotional or relational crisis within families. In such a crisis, then, the need dimension of rewarding relationships may not be met. Different theorists have explanations for how families cope with stress, one of the most prominent being the double ABCX model of family stress (McCubbin & Patterson, 1983), where adequate family resources and supports, and family perceptions and self-efficacy are seen as buffers to stress. According to the LBM, family stress will likely be an influence on life balance, and an individual or family's ability to create balance lives may be an influence on perceived stress (or a stress buffer). This research will explore the relationship between stress and life balance as perceived by individuals, an untested association. Additional research will be needed to explore relationships between family stress and life balance.

Subjective Well-being

Subjective well-being (SWB) is a field of psychology that attempts to understand people's evaluations of their lives. Subjective well-being (SWB) refers to how people evaluate their lives, and includes variables such as life satisfaction and marital satisfaction, lack of depression and anxiety, and positive moods and emotions (Diener, Suh, & Oishi, 1997). People's goals, cognitive styles, and activities are also likely influences of SWB (Diener, et al., 1997). External circumstances are often less important to SWB but extreme situational differences such as that between life in the wealthiest and poorest nations do appear to affect SWB. Additionally, values are related to positive SWB in that people who are involved in goal-directed activities that they believe are important are more likely to experience feelings of well-being (Diener, et al., 1997). The idea that goals, activities, and values influence SWB suggests that people who report life balance may also report high SWB. Subjective well-being is expected to have a positive relationship with life balance. If people report activity configuration congruence and activity configuration equivalence, the LBM suggests that they will have an overall positive appraisal of their lives, or subjective well-being.

Need Satisfaction

The LBM proposes that meeting the four need-based dimensions is important for a balanced life. These need-based dimensions were explained in detail in Chapter one. Validation of the LBM will require the need-based dimensions to be compared with expected outcomes in related areas. According to the LBM, equivalence and congruence in activity configurations would mean that the need-based dimensions are met. One way to test this assumption is to compare LBM equivalence and congruence with a measure of need satisfaction to see if they are related as would be expected.

The Environment

Each of the primary motivational theorists (Maslow, 1943; 1970; Ryff, 1989; 1996; 1998; Deci & Ryan, 2000) whose work has influenced the development of the LBM has recognized that an individual's choices, actions and success in goal attainment represent the product of their personality, experience, and the opportunities provided them within a given situational or environmental context. Ideal situations provide just right levels of stimulation, challenge and support, to elicit feelings of competence, comfort, support, growth and need fulfillment (Csikszentmihalyi, 1997; Deci & Ryan, 2000). Depending on their circumstances, however, people may be unable to participate regularly in the types of activities that address needs considered essential for a balanced life. Terms such as occupational deprivation, alienation, and disruption have been used to describe situations when people are unable to engage in daily activities that foster health, well-being and quality of life because of environmental constraints (Christiansen & Townsend, 2004; Whiteford, 2001, 2004). A convincing example of how social class privilege influenced role balance was found in research where financial strain was a robust predictor of lower levels of role balance for married women (Marks, Huston, Johnson, & MacDermid, 2001).⁹

Environments may also encourage and support activity patterns through the availability and character of physical and social resources (Gibson, 1979). For example, having family and friends who are physically active, or living in communities that have

⁹This, and the following paragraph were previously published in: Matuska, K., & Christiansen, C. (2008). A proposed model of lifestyle balance. *Journal of Occupational Science*, 15(1), 15. See Appendix H for copyright permission.

attractive parks and recreational facilities, represent helpful environmental features for maintaining an exercise regimen. There are also advantages to having stable living environments, since consistent and recurring features, such as social conventions, customs and rituals, can influence habits and routines that provide helpful rhythms to sustain activity patterns (Clark, 2000; Zerubavel, 1981). Lawton, Nahemow, & Yeh (1980) contributed important research showing the associations between neighborhood environmental factors and well-being. For example, among 3000 older tenants in 153 planned housing units, living in safe, quiet, and small communities accounted for a significant proportion of variance in every index of well-being. The LBM accounts for the profound impact of the environment on activity choices and opportunities, the various ways that needs are met given the context and that in some contexts, essential needs cannot be met.

Summary

The concept of life balance has been considered for centuries and has had different meanings in different historical contexts. There appears to be accumulating empirical support for the interaction of certain patterns of living and healthy life outcomes as conceptualized in the LBM. The need-based dimensions of the LBM were supported through interdisciplinary research and theories. There are many gaps in what is known about life balance, however, with very little research testing the construct directly. There is no universally agreed-upon definition of the term, conceptualizations of the life balance construct are widely different, and measures used in life balance research have tested different constructs and have not been validated.

Chapter Three

Methods

The Life Balance Model (LBM) proposes that activity congruence (match between desired and actual time spent in activities) and equivalence (equal perceived satisfaction across four activity need-based dimensions) represent the construct of a balanced life. The purpose of this research is to find evidence for the validity of the Life Balance Inventory (LBI), the instrument used to measure the construct of life balance proposed in the LBM (also lending validity to the LBM). The development and pilot testing of the LBI was described in Chapter one. This current research tested the LBM predicted relationships between life balance and stress, need satisfaction and personal well-being. Each of these variables were measured using tools and procedures described below and were tested for their relationship to congruence and equivalence.

Measures Used

Life Balance Inventory. The LBI is an instrument developed by the researcher to measure life balance. Its theoretical foundation is the lifestyle balance model (Matuska & Christiansen, 2008). A detailed description of the LBI was provided in Chapter One. In brief, the LBI measures the degree of congruence between desired and actual time use in 53 activity categories and equivalence among the four need-based scales of physiological health, relationships, identity, and challenge/interest. The present study is intended to determine if the LBI is a valid measure of life balance.

Stress. Stress is one of the outcomes of interest in the life balance model and was tested for its relationship to congruence and equivalence. The stress subscale of the *Depression Anxiety Stress Scales: Short Version (DASS21)* was used to measure the

perceived stress variable. The Depression Anxiety Stress Scales (DASS) (Lovibond & Lovibond, 1995) is a set of three self-report scales designed to measure the negative emotional states of depression, anxiety and stress. The three scales (depression, anxiety, stress) can be used independently as they have internal consistency and yield meaningful discriminative scores. The short version of the scales is referred to as the DASS21. The Stress subscale of the short version was used for this research. The Stress subscale contains seven items that assess a self-reported state of stress over the past week, such as difficulty relaxing, nervous arousal, being easily upset/agitated, irritable/over-reactive, or impatient. Item examples include, “I found it hard to wind down” and “I tended to over-react to situations.” The items on the Stress subscale are rated on a 4 point scale, 0.)“Did not apply to me at all,” 1.) “Applied to me to some degree,” 2.) “Applied to me to a considerable degree,” 3.) “Applied to me very much, or most of the time.” The reliability of the DASS21, Stress subscale is acceptable, with an alpha value of 0.81 (one normal sample of N=717). The DASS 21 stress subscale was chosen for the study because it has good psychometric properties, it is relatively short and easy to administer and score, and it was built from a very large there are normative data set. It is also sensitive to the state of stress and changes over time. Another stress measure, the Perceived Stress Scale (PSS) (Cohen, Kamark & Mermelstein, 1983) was not chosen for this research because it measures the degree to which situations in life are perceived stressful rather than a current *state* of stress as measured by the DASS 21. The PSS is also longer to administer, which was viewed as a limitation given the overall length of the other instruments in this study. The DASS items are located on the last page of the LBI survey in Appendix A.

Personal Wellbeing Index-Adult (PWI-A). Personal well-being was tested for its relationship to congruence and equivalence. The Personal Wellbeing Index-Adult (International Wellbeing Group, 2006) is designed to measure the subjective dimensions of quality of life and personal well-being, through questions of satisfaction directed to people's feelings about themselves. The PWI-A contains eight items of satisfaction, each one corresponding to a quality of life domain: standard of living, health, achieving in life, relationships, safety, community-connectedness, future security, and spirituality/religion. On an 11 point rating scale with 0 representing completely dissatisfied, 5 being neutral, and 10 representing completely satisfied, participants rate their current level of satisfaction in each of the eight areas. The PWI-A has demonstrated construct validity evidence in multiple studies in multiple countries (International Wellbeing Group, 2006). Each domain has been regressed with "satisfaction with life as a whole" with results showing that each domain makes a unique contribution to the explained variance (International Wellbeing Group, 2006). Convergent validity (relationship to an instrument measuring a similar construct) evidence was demonstrated ($r = .78$) with another well known subjective well being measure, the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985). The PWI-A has demonstrated good sensitivity, and acceptable reliability, (test-retest reliability, with intra-class correlation of .84) and Cronbach alpha between .70 and .85. The PWI-A was chosen for this study rather than the Satisfaction with Life Scale because, although they both measure the same construct (well-being), the PWI-A can be analyzed at the level of individual domains that may be useful in subsequent analysis of the data from this research.

Basic Psychological Needs Scale (BPNS). The Basic Psychological Needs Scale (BPNS) was developed according to the Self-Determination Theory (SDT) proposed by Deci & Ryan, (2000). According to the SDT theory, it is assumed that some basic psychological needs are innate and universal. The theory identifies competence, autonomy, and relatedness as the universal needs that must be satisfied for people to develop and function in optimal ways. The BPNS measures the degree to which people experience satisfaction in autonomy, competence, and relatedness yielding subscale scores for each need area. Participants are asked to respond to 21 items, thinking about how each item relates to their life, and how true the statement is for them using a seven-point scale: e.g., 1.) not true at all, 4.) somewhat true, 7.) very true. Items are phrased both positively and negatively. Examples include, “I really like the people I interact with,” “I feel pressured in my life” and “Most days I feel a sense of accomplishment from what I do.” Psychometric properties of the scale are not published; the scale has been widely used in psychological research. The BPNS scale was chosen for this research because it measures autonomy, competence and relatedness which have been theoretically linked to the life balance model and there is no other direct measure for the Self-Determination Theory. See Appendix B for the PWI-A and BPNS scales.

Demographic questions added to the LBI. The demographic questionnaire was created by the researcher to measure the environmental context represented in the LBM, and assess characteristics of participants in the study. The questions included the following items: age, gender, race, marital status, number of children, number of children living with the respondent, employment status, education level, and income. On the demographic survey, participants were instructed to choose the one item that best

described them. For example, it was possible that a participant was both a student, and working full-time, or retired and working part time. The researcher instructed student groups to choose “student” and retired groups to choose “retired.” (See Appendix A for the LBI and demographic questions)

Participant Recruitment

Recruitment and data collection began after receiving IRB approval from the University of Minnesota and St. Catherine University in the spring of 2009. Data collection occurred between June, 2009 and September, 2009. Subjects were recruited as indicated below. In each recruitment situation, the researcher contacted a key leader who had access to the group to gain permission to administer the measurements. For example, college professors were asked to provide access to students in their classes, and community leaders were asked to provide access to group members.

A deliberate attempt was made to have a sample that reflected demographic characteristics of the general U.S. population. The researcher attempted to have equal representation of both men and women; across the adult lifespan, at least 25% of the participants from diverse racial groups, and different income and education levels, marital statuses, and various employment situations represented. To recruit such a diverse sample, stratified and snowballing sampling methods (Dillman, 2007; Goodman, 1961) were used. Stratified sampling purposefully samples from selected demographic groups, and snowballing asks participants to provide information or contacts for additional participants. All participants were recruited from a Midwest USA, urban or suburban area. Following is a summary of the recruitment strategies used.

- Young women (ages 18-30) were recruited in summer classes at a private university.
- Young men (ages 18-22) were recruited through the varsity football team at another private university.
- Middle-aged women and men (ages 30-60) were recruited through 1.) friends, family, acquaintances, and professional colleagues, 2.) two evening classes at a private university consisting of older women, and 3.) two retail work-sites employing primarily men.
- Older men and women (ages 60- 90) were recruited from 1.) a senior high rise, 2.) a senior citizen educational event at a private university, and 3.) a retired men's Habitat for Humanity work group.
- Asian adults were recruited through a community center serving neighborhood Hmong Americans. The researcher made contact with the director of the center who distributed the surveys to her staff (who were primarily Hmong). Then, several staff members who were contacted by the researcher agreed to bring surveys to their family, friends or acquaintances. The surveys were provided in a packet with a stamped envelope addressed to the researcher.
- Hispanic adults were recruited through a community center with a large population of Hispanic members, and Spanish-speaking members of a suburban church.
- African American participants were recruited through a church with a large African American membership, and through acquaintances of the researcher.

Diversity within the sample also occurred naturally within all the recruitment sites. For example, there were racially diverse individuals within the university student samples, and within the elderly sample. Diversity in marital status, employment status, education levels, income levels, number of children, and number of children at home also occurred naturally within the other variables used to stratify the sample and were not used to further stratify the sample.

Data Collection Procedures

There were two procedures used for data collection: in-person, and U.S mail. For the in-person procedure, with permission from a key contact person, the potential participants were approached when they were already in a group or classroom for another purpose (class, church meeting, registration event, etc.). The researcher introduced herself and explained the purpose of the research and gave willing participants a packet of information. The packet contained an invitation for them to participate with instructions, a consent form, demographic form, Lifestyle Balance Inventory, the Depression Anxiety Stress Scale: Stress subscale (DASS21), the Personal Wellbeing Index – Adult (PWI-A), and the Basic Psychological Needs Scale (BPNS). The consent process was conducted before they were asked to complete the surveys. The consent process included an explanation of the purpose of the research, what was expected from the participant, the potential risks, confidentiality, and contact information for answers to additional questions about the research. If potential participants agreed to participate after the explanation was given, they would sign the consent form and return it with the surveys. Potential subjects were asked to complete the surveys and return them

immediately to the researcher who was present. The researcher assigned a subject number to each of the documents completed by a participant.

For the U.S mail procedure, the same packet of information described above and a stamped envelope addressed to the researcher were given to people who wanted to complete the surveys at another time, or who agreed to bring a packet to family or friends. Return of the surveys implied consent.

Data Analysis

Data analysis occurred in several steps. First, analysis was conducted to assess the validity of the LBI, and second, analysis was conducted to assess validity of the LBM. To assess validity of the LBI, Rasch analysis was run to determine the appropriateness of the LBI items, and confirmatory factor analysis (CFA) was run to determine if there was empirical evidence to support the LBI subcategories.

To assess validity of the LBM, several data analysis steps were taken. First, the ordinal raw data from the LBI total score was converted to interval data using Rasch analysis, creating the *congruence* score. Second, the LBI subscales were converted to a single *equivalence* score by determining the Euclidian distance between subscale scores. Third, structural equation modeling (SEM) was run for both the LBI total (congruence) scores and the LBI subscales (euclidian distance) scores with the scores from the Personal Well-being Index (PWI), Depression, Anxiety, Stress Scale (DASS21) and the Basic Psychological Needs Scale (BPNS) measuring Autonomy, Relatedness, and Competence.

Additionally, demographic variables were analyzed descriptively using SPSS 11.5.0 software. Mean scores for the nominal variables (gender, age categories, race,

education levels, employment, and marital status) were compared using multiple t-tests based on two-sided tests assuming equal variances with significance level of 0.05. Adjustments were made for multiple comparisons using the Bonferroni correction (desired critical value, divided by number of comparisons). Multiple t-tests were used because the comparisons were exploratory rather than testing a directional hypothesis. Pearson's r correlations were used to determine the relationship between congruence, equivalence, stress, personal well-being and need satisfaction and the continuous demographic variables of number of children and number of children living with you. Finally demographic variables were added to the SEM models to determine whether any demographic variables moderated and improved the models. Each of the data analysis procedures are described below.

Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) was used to determine if the LBI subscales were supported sufficiently to be used for subsequent analysis. This procedure is appropriate when there is a theoretical basis for organization of the instrument subscales (Pett, Lackey & Sullivan, 2003). Factor analysis is not a single statistical method but is a complex array of procedures used to identify the interrelationships among a large set of observed variables and then to group of smaller sets of these variables into dimensions or *factors* that have common characteristics (Pett, et al., 2003). Confirmatory factor analysis was used to assess the extent to which the hypothesized organization of the LBI subscales (Health, Relationships, Identity and Challenge/interest) fit the data. The analysis was run using software (Version 6; Muthén & Muthén, 2010).

The first step in analysis of factors was to examine the model fit statistics that support whether or not the grouping of items into subscales indicated an improved model relative to a baseline model, where predicted correlations and covariance equal the observations (Klein, 2005). The Root Mean Square Error of Approximation (RMSEA) is a “badness of fit” (p.138) index in that a value of 0 indicates the best fit and higher values indicate a worse fit. The general rule of thumb is that when $RMSEA \leq .10$, the fit is acceptable (Kline, 2005).

The other model fit statistic used, the Comparative Fit Index (CFI) assessed the relative improvement in fit of the LBI subscales compared to a baseline model that assumes zero covariance. Assumed zero covariance means that when one variable changes, it does not change the other variable of interest. In other words, there is no relationship between the variables. The general rule of thumb is that CFI should be at least $\geq .90$ (Kline 2005) to indicate a good fit. The CFI may provide useful model information, but it has received some criticism because zero covariance in a baseline model is usually implausible (Klein, 2005).

The second part of the confirmatory factor analysis was an analysis of factor loadings among items on each subscale to determine how each item contributed to the overall subscale. The LBI gives a choice for each item of “No” I don’t do or want to do this activity (scored 0), or “Yes” I do or want to do this activity (scored 1). The “Yes” items are then rated by the individual as to his or her satisfaction with the time spent in each activity category. The confirmatory factor analysis used the yes/no (1/0) ratings in determining loadings of each item on its subscale. The STDYX estimates (standardized coefficient) were calculated, which are the standardized factor loadings of each item and

its contribution to the overall subscale. The associated p value is the probability of choosing the item being experienced as well as the other items in the subscale. A factor loading of .40 or higher and a p value of $\leq .05$ were considered acceptable for this analysis.

Item Response Testing (Rasch Analysis)

The ordinal ratings on the LBI (total score indicating congruence between actual and desired time doing activities) were converted to interval level scores with Rasch analysis using the Winsteps program (version 3.62.1; Linacre, 2006) through a series of logarithmic calculations. The converted raw score is called a “theta” rating. The theta scores were used in all subsequent analyses representing *congruence*. In other words, the higher the theta value, the more *congruence* between actual and desired time doing activities. People with high congruence will have high theta values compared to people with low congruence who will have lower theta values.

Rasch analysis also provides information about the test items. The 53 items on the LBI and the people taking the LBI were placed on the same hierarchical scale according to people’s relative trait of *congruence*. The items that most respondents reported “about right for me” (or congruence) were placed on the low end of the *congruence* continuum and the items rarely rated “about right for me” even for the most congruent individuals (highest overall scores) were placed on the other end of the *congruence* continuum. The continuum can then be examined for its intuitive fit with the underlying theory.

Calculating Euclidian distance

Equivalence reflects the variable in the life balance model suggesting that optimal life balance includes relatively equal satisfaction with time spent in activities that meet health, relationship, challenge/interest, and identity needs. The subscales on the LBI reflect these need-based activity categories. The Euclidian distance calculation determines the average difference between scores on each of the four LBI subscales. This represents the sum of the individual's raw score on each of the 4 subscales minus the average score across subscales, squared or $(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + (X_3 - \bar{X})^2 + (X_4 - \bar{X})^2 = ED$. An ED value of 0 means that there was no difference in scores between subscales, and ED values that are larger suggest a larger difference among subscale scores. Thus, low ED scores reflect a high equivalence and high ED scores reflect low equivalence. These ED scores were entered in the structural equation model to determine the relationship of equivalence to stress, personal well-being, and need satisfaction.

Structural Equation Modeling

Structural equation modeling (SEM) was run to determine the fit of the data to the hypothesized model. Structural equation modeling was necessary instead of path analysis because of the multiple indicators for "need satisfaction." In other words, the observable variables, relatedness, autonomy, and competence were indicators presumed to measure basic psychological need satisfaction, a latent (unobserved) variable (Kline, 2005). All of the factors in the hypothesized life balance model (congruence, equivalence, stress, personal well-being, psychological need satisfaction) are assumed to covary with each other, meaning that change in one variable will affect change in another variable (Kline, 2005).

Several indicators of model fit were used; root mean square error of approximation (RMSEA), the standardized root mean square residual (SRMR), and the Comparative Fit Index (CFI). RMSEA assumes the model in the population is not perfect and a rule of thumb is that $RMSEA \leq .10$ is acceptable (Kline, 2005). The RMSEA 90% confidence interval (CI) is given in the analysis which means a 90% confidence that the true RMSEA value falls between the two given numbers on the CI. SRMR is a measure of the mean absolute correlation residual, the overall difference between the observed and predicted correlations. “Values of SRMR of less than .08 are generally considered favorable” and support the hypothesized model (Kline, 2005, p.141). And commonly, the cutoff score for adequate fit using the CFI is $\geq .90$ (Kline 2005). Chi square was not used for model fit analysis because the chi square test is highly sensitive to sample size (Hu & Bentler, 1999) where larger samples produce larger chi-squares that are more likely to be significant (Type I error). However, chi square values were used when comparing two models but one of the models had added variables that increased its complexity (see next section).

Estimated standard path coefficients among all the variables are calculated in the SEM analysis. Using standardized coefficients allows different variables to be directly compared when they have different scales (Klein, 2005). The coefficient is reported in a proportion of 1.0 where, for example, a coefficient of .822 means a .82 to 1 relationship between variables. When one variable is one full standard deviation above the mean, the variable with a coefficient of .822 will be .822 standard deviations above the mean. Probability (p values) are also estimated indicating whether or not the observed relationship can be by chance.

Demographic variables added to the SEM

To determine if certain demographic groups changed the basic model, all demographic groups were added to the SEM analysis at once. Prior to this, categorical demographic data were dichotomized in the following way: Gender (male/female), race (white/non-white), education (\leq high school/ $>$ high school), marital status (single, divorced, widowed/married, partnered), employment status (working or in school/retired, unemployed, homemaker). The continuous variables of age, income, number of children, and number of children living at home were also entered into the SEM analysis. Model fit indices were then analyzed for the new demographic-added model.

Additionally, chi square values were compared between the basic models of congruence and equivalence and the models with demographics-added. If chi square values were significantly different for the basic model and a model with added variables, it indicated that the more complicated model was a better fit (Kline, 2005). To calculate this, the chi square values from one model were subtracted from the chi square values from the other model. Additionally, the degrees of freedom (df) from one model were subtracted from the other model. The calculated difference between models (and df) was the value used in the chi square tables to determine the p value. If the p value was $\leq .05$, then the models were considered significantly different and the more complicated model was the better fit.

Chapter Four

Findings

The purpose of this research was twofold. The first purpose was to test the content validity of the instrument used to measure the construct of life balance, the LBI. The preliminary Rasch analysis and confirmatory factor analysis were done for the purpose of providing sufficient validity evidence to justify use of the LBI in this research. Results of this analysis are presented next. The second purpose was to test the proposed life balance model and hypothesized relationships among its variables for construct validity.

It was proposed that having congruence and equivalence in satisfaction with time use in categories of everyday activities represent the construct of *life balance*. Life balance was expected to be associated with higher personal well-being, greater need satisfaction, and lower stress. This research tested those associations and the results of these tests will be presented following the presentation of evidence regarding the validity of the LBI.

Participants

A total of 458 participants completed the surveys with approximate demographic representation from the general population; 45% male, 55% female, 25% non-white, ages from 18 years to 90 years with a mean age of 41.1 years and mix of education levels, income, marital status, and employment status. There were 373 in-person respondents and 95 mailed-in respondents. See table 4 for a summary of the demographic characteristics.

Table 4

Demographic Summary (N = 458)

	n	%
Age*		
18-30 years	212	46.1
31-50 years	88	19.1
51-65 years	82	17.8
66 years and older	<u>71</u>	<u>15.4</u>
Total	453	98.4
Gender		
Male	205	45.0
Female	<u>253</u>	<u>55.0</u>
Total	458	100.0
Race		
American Indian or Alaskan native	8	1.8
Asian	39	8.5
Black	37	8.0
Hispanic or Latino	30	6.5
Native Hawaiian or Pacific Islander	3	1.0
White	<u>341</u>	<u>74.1</u>
Total	458	100.0
Marital status*		
Single	195	42.4
Married/Partnered	227	49.3
Divorced	16	3.5
Separated	2	4.0
Widowed	<u>15</u>	<u>3.3</u>
Total	455	98.9
Employment Status*		
Full time	174	37.8
Part time	45	9.8
Temporary leave	2	4.0
Unemployed and looking	11	2.4
Retired	104	22.6
In School	118	25.7
Keeping house	<u>1</u>	<u>0.2</u>
Total	455	98.9
Education*		
Less than high school	10	2.2
High school graduate or GED	115	25.0
Associate degree	43	9.3

Bachelor's degree	197	42.8
Master's/professional degree	71	15.4
Doctoral degree	<u>17</u>	<u>3.7</u>
Total	453	98.4
Household Income*		
Less than 10,000	78	17.3
10-24,000	61	13.3
25-39,000	73	15.9
40-54,000	68	14.8
55-74,000	65	14.1
75-149,000	85	18.5
150,000 or more	<u>18</u>	<u>3.9</u>
Total	448	97.8
Number of Children*		
0	235	51.0
1	48	11.0
2	77	17.0
3	56	12.0
4	23	0.5
5	11	0.2
6	4	0.1
7	2	0.0
8	<u>1</u>	<u>0.0</u>
Total	457	99.0
Number of Children Living with you		
0	347	76.0
1	47	10.0
2	39	9.0
3	18	4.0
4	2	0.0
5	2	0.0
6	2	0.0
7	<u>1</u>	<u>0.0</u>
Total	458	100.0

* Missing data: Participants left item blank.

LBI validity

Research question one. The first research question explored content validity of the Life Balance Inventory (LBI) and its subscales.

One of the important components of this research was to demonstrate that the measure used to represent life balance (LBI) has some validity, that it is measuring what it purports to measure. To provide this evidence, Rasch analysis was done to determine the contribution of each item to the overall measure and whether or not the items capture the range of congruence (balance) traits as expected. Additionally, confirmatory factor analysis was done to determine whether use of the subscales in subsequent analysis could be supported.

Rasch Analysis for the LBI. The Rasch analysis of the LBI (see Figure 3) showed that its items are capturing a range of congruence traits and that the items fit intuitively with the model of life balance (Matuska & Christiansen, 2008). The majority of items were responded to with “about right for me.” In other words, for most common everyday activity categories, people felt that they participated in the activity about as much as they wanted to. People who chose “about right for me” for dance, travel, exercise, art, composing, music, outdoor activities, relaxation, and sleep (the items listed high on the item map) had especially high overall congruence scores. This indicates that the people with the highest overall congruence scores, also generally felt that they spent time in those activities as they wanted, and people with low overall congruence scores were less likely to report satisfaction with the time spent in those activities.

All the items on the LBI as a whole fit the expectations of the Rasch model, with every item having a Mean Square value between 1.82 and .82, meaning that each item contributed positively to the total score (Thorndike, 2006). Mean square values of 2.0 or larger indicate the item does not contribute to the overall measure (See Appendix C for the Rasch output table including Mean square values). The internal consistency was good

($r = .97$) meaning 97 % of observed score variance is the true score variance and 3% is measurement error variance. The results support the use of the LBI as a measure for the proposed construct of life balance used in this research.



Figure 3. Construct map indicating location of people and items scored 2 and 3.

Confirmatory Factor Analysis

The model fit statistics for the four-factor (Health, Relations, Identity, and Challenge/interest) LBI indicated a reasonable error of approximation with (RMSEA) = .08. However, the CFI results did not indicate a good fit, CFI = .70.

In the Health subscale (Table 5), the factor loadings showed that all the items had a reasonable contribution to the subscale. The two items, *taking care of hygiene* and *managing health needs* were unusually high because almost everyone indicated that it was something they “do or want to do,” with very little variance. All the other items also contributed to the scale. The STDYX is the standardized coefficient of each item.

Table 5

Health Subscales: Standardized Factor Loadings and *p* Values

Item (abbreviated)	STDYX Estimate	Two-tailed <i>p</i> Value
1. Hygiene	.99	.000
2. Managing Health Needs	.99	.000
3. Eating nutritiously	.83	.000
4. Relaxing	.67	.000
5. Exercising regularly	.57	.000
6. Getting adequate sleep	.54	.000

In the Relationship subscale (Table 6), the factor loadings showed that all the items had a reasonable contribution to the subscale, except *doing things with your spouse/significant other* that was lower than the general parameter of approximately .40, considered acceptable for this analysis. This may indicate that the item is unrelated to the subscale or that there is little variance in responses. In other words, most respondents selected this item as something they do or want to do. Since theoretically, the item can be

justified as a relationship factor, it has reasonable theoretical support for remaining in the relationship subscale.

Table 6

Relationship Subscale: Standardized Factor Loading and *p* Values

Item (abbreviated)	STDYX Estimate	Two-tailed <i>p</i> Value
1. Socializing at work	.82	.000
2. Meeting new people	.64	.000
3. Mentoring others	.61	.000
4. Doing things with family	.57	.000
5. Participating in groups	.50	.000
6. Having an intimate sexual relationship	.45	.000
7. Doing things with friends	.42	.002
8. Caring for pets	.40	.000
9. Taking care of others	.39	.000
10. Doing things with spouse	.31	.000

In the Identity subscale (Table 7) *taking care of appearance* had very little variability (most did this) and participating in religious events and organized sports had weaker contributions to the scale. These are two items where responses of either No (0) or Yes (1) were evenly split, more so than any of the other items, perhaps explaining the weaker contribution to the subscale.

Table 7

Identity Subscale: Standardized Factor Loading and *p* Values

Item (abbreviated)	STDYX Estimate	Two-tailed <i>p</i> Value
1. Taking care of appearance	.99	.000

2. Demonstrating competence at work	.86	.000
3. Journaling	.76	.000
4. Participating in Professional events	.65	.000
5. Composing (music, poetry)	.64	.000
6. Participating in Education	.59	.000
7. Going to plays	.59	.000
8. Doing housework	.57	.000
9. Shopping	.55	.000
10. Volunteering in community	.51	.000
11. Cooking	.48	.000
12. Meditating	.47	.000
13. Participating in traditions/holidays	.46	.000
14. Participating in organized sports	.31	.000
15. Participating in religious events	.28	.000
16. Going to restaurants/bars	.26	.000

In the Challenge/interest subscale (Table 8), all the items had a reasonable contribution to the subscale, except *managing money*, that was clearly an outlier. Examination of the CFA output indicates that there was essentially no variation in this item. Four percent of the participants did not choose this item, thus the lack of variation was a likely cause for this result. *Watching TV* was another item with little variation and a poor contribution to the scale with only seven percent of the participants not choosing the item.

Table 8

Challenge/Interest Subscale: Standardized Factor Loading and *p* Values

Item (abbreviated)	STDYX Estimate	Two-tailed <i>p</i> Value
1. Making art	.69	.000
2. Dancing	.67	.000
3. Decorating spaces	.67	.000
4. Reading	.59	.000
5. Traveling	.57	.000
6. Planning events	.57	.000

7. Storytelling	.55	.000
8. Making Crafts	.54	.000
9. Communing with nature	.54	.000
10. Sewing	.53	.000
11. Gardening	.52	.000
12. Making music	.51	.000
13. Using computers	.46	.000
14. Outdoor activities	.40	.000
15. Working for pay	.40	.000
16. Playing games of skill	.37	.000
17. Repairing	.30	.000
18. Watching TV	.15	.062
19. Managing Money	.11	.316

One of the goals in the development of the LBI was to reflect the uniqueness of individuals, and the activities they engage in or want to engage in. There is no theoretical expectation that someone who wants to *dance* for example, will also want to *sew*, for example. However, both could theoretically be described as an activity that provides challenge or interest, but choosing one may not be related to choosing the other. Therefore, the confirmatory factor analysis was used as a guide for overall fit of the subscales to support the theoretical foundation of their development. Individuals are expected to have variation within the items they choose, with the theoretical expectation that everyone would choose at least a few items in each subscale to reflect breadth of daily activities.

Since some of the items in the relationship, challenge/interest, and identity subscales had weak factor loadings, an additional confirmatory factor analysis was run with every item with a factor loading of less than .40 removed from the subscale. The revised subscales were analyzed for Euclidian distance and CFA was run for the revised equivalence model. Results showed very little difference in model fit or path coefficients

from the original model. This may suggest that the omitted items neither detracted nor added to the subscales.

Based on Rasch analysis, CFA, and the underlying theoretical support, it was determined that validity evidence for the LBI was good enough to use it as a measure of life balance in this research. Additional research related to the subscales and their scoring needs to be done, however to increase confidence in their use.

LBM Validity Evidence

The overarching research question for this study addressed the relationships between congruence and equivalence (proposed factors in the LBM), and stress, well-being, and need satisfaction, and demographic groups. The data presented will indicate the degree of support that was found for these relationships, providing construct validity evidence for the LBM (Matuska & Christiansen, 2008).

Research question two. Does overall congruence as measured by the LBI total score relate to lower perceived stress, higher personal well-being, and higher need satisfaction?

The null hypothesis for this research question is that there is no relationship between congruence and perceived stress, personal well-being, or need satisfaction, or a relationship in the opposite direction. SEM was run with the total congruence score, stress scale (DASS21), personal well-being index-adult (PWI-A), and basic psychological need satisfaction (BPNS, by relatedness, autonomy, competence) for the entire sample. Table 9 illustrates the model fit indices for the congruence model, and Figure 4 shows the congruence model with path coefficients.

Table 9

Congruence Model Fit Indices (N= 458)

	SRMR (Good fit \leq .08)	RMSEA (Good fit \leq .10)	RMSEA (90% CI)	CFI (Good fit \geq .90)
Congruence Model	.03	.10	(.073-.144)	.97

Based on these fit indices, congruence between actual and desired time spent in valued activities fits the observed data, and the congruence model is supported. There were no additional model fit indices recommended in the output. All pathways in the model were significant ($p \leq .000$) and in the directions expected based on the life balance theory and existing research. Congruence was positively associated with personal well being (.49), and basic psychological need satisfaction (.47) in relatedness (.62), competence (.67), and autonomy (.86). Congruence was negatively associated with stress (-.40). In other words, high congruence scores were significantly related to higher personal well-being scores, higher psychological need satisfaction scores, and lower stress scores. The null hypothesis is rejected.

Congruence Model

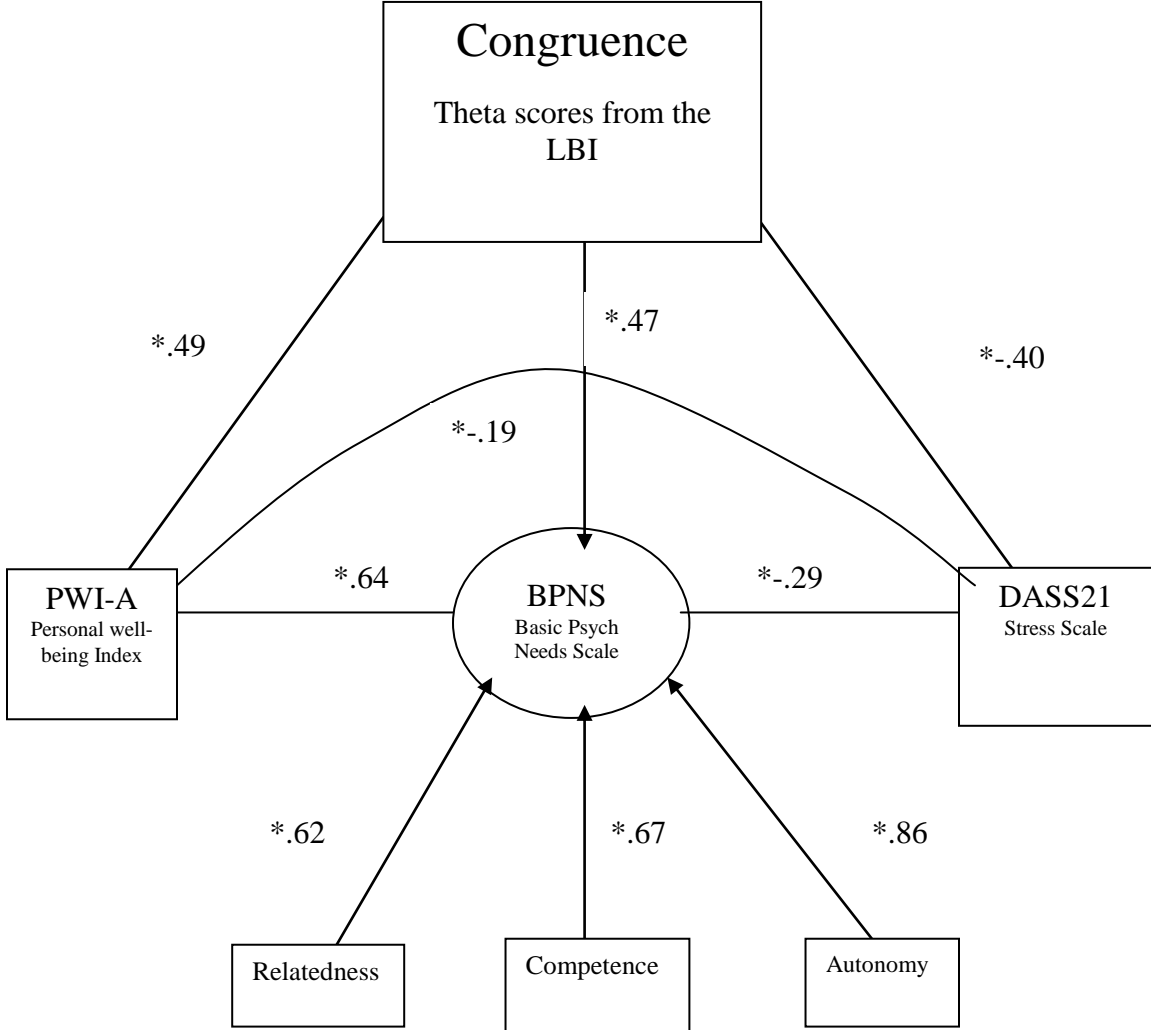


Figure 4. Structural model with standardized path coefficients (Congruence Model) (N=468).

* $p \leq .000$

Research question three. Does equivalence as measured by the degrees of equality among the scores on the LBI subscales (euclidian distance values [ED]) relate to lower perceived stress, higher personal well-being, and higher need satisfaction?

The null hypothesis for this research question is that equality among scores (equivalence) on the LBI subscales shows no relationship to perceived stress, personal well-being, or need satisfaction, or relationships are in the opposite direction. SEM was run with ED values, stress scale (DASS21), personal well-being index-adult (PWI-A), and basic psychological need satisfaction (BPNS, by relatedness, autonomy, competence) for the entire sample.

Prior to running the ED analysis, the subscale means and ranges for the entire sample were recorded and are reported below. The highest possible subscale mean score is 3.0 meaning every item in the subscale was rated 3, “about right for me” by everyone. Lower mean subscale scores indicate that some items were rated as either spending too much or too little time in the subscale activities.

- In the Health subscale, the mean value of the raw score was 2.33 with a range from 1.67 to 3.0,
- In the Relationship subscale, the mean value of the raw score was 2.29 with a range from 1.56 to 3.0,
- In the Identity subscale the mean value of the raw score was 2.38 with a range from .46 to 3.0,
- In the Challenge/interest subscale the mean value of the raw score was 2.22 with a range from .93 to 3.0.

The mean scores of the health and identity subscales were higher than the mean scores of the relationship and challenge/interest subscales. This suggests that on average, participants were more satisfied with the actual versus desired time spent in health and identity categories of activities than in relationship and challenge/interest categories of activities. Additionally, there was a wider range of scores (and lower means across respondents) in the challenge/interest and identity subscales than in the relationship and health subscales, suggesting that more people report higher levels of dissatisfaction in these activity areas.

Table 10 illustrates the model fit indices for the equivalence model for the full sample, and Figure 5 shows the equivalence model with path coefficients for the full sample.

Table 10
Equivalence Model Fit Indices (N= 458)

	SRMR (Good fit \leq .08)	RMSEA (Good fit \leq .10)	RMSEA (90% CI)	CFI (Good fit \geq .90)
Equivalence Model	.03	.10	(.082-.147)	.95

Based on these fit indices, equivalence between subscales fits the observed data, and the model is supported. There were no additional model fit indices recommended in the output. However, even though some of the model fit indices support the equivalence model, it is clear in the path coefficients that equivalence is not strongly related to personal well-being ($-.02$ $p=.63$), or basic psychological need satisfaction ($.00$ $p=.99$). There is a significant negative relationship with stress, however ($-.09$ $p=.04$).

The equivalence model is not as favorable as the congruence model, but seems to contribute to the other variables only through its association with stress. The favorable fit indices may be a result of a strong relationship between equivalence and congruence, discussed next. The null hypothesis cannot be rejected.

Equivalence Model

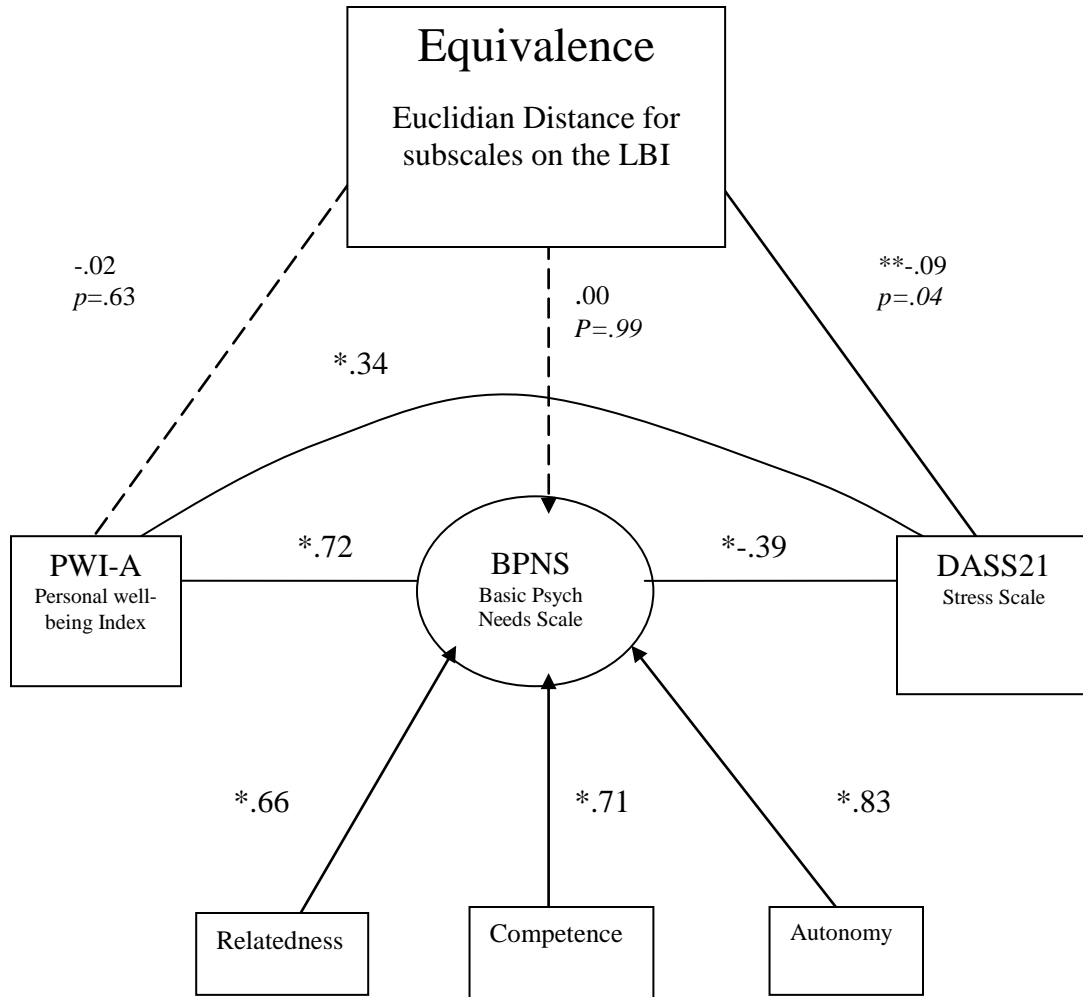


Figure 5. Structural model with standardized path coefficients (Equivalence Model) (N=468).

* = $p \leq .000$

** = $\leq .05$

Broken/dashed lines indicate an insignificant relationship.

Research question four. Is congruence (as measured by the total LBI score) related to equivalence (an equal distribution of grouped item scores on the LBI)?

The null hypothesis for this research question was that congruence is unrelated to equivalence, that when congruence and equivalence are combined in the same SEM model, there is no additional strength in the relationships among the other variables. Table 11 shows the model fit indices for the combined model and Figure 6 shows the combined model with path coefficients.

Table 11

Combined Model Fit Indices (N= 458)

	SRMR (Good fit \leq .08)	RMSEA (Good fit \leq .10)	RMSEA (90% CI)	CFI (Good fit \geq .90)
Combined Model	.03	.09	(.069-.127)	.96

Based on these fit indices, a combined model of congruence and equivalence fits the observed data. To test if the combined model is better than the equivalence or congruence models alone, the difference in model chi square values were compared. If there was a significant difference in chi square values between models, then the model with added variables is a better fit. The combined model chi square value was 42.400 (df, 8) and congruence model chi square was 31.226 (df, 5). The difference between chi square values for the congruence model and combined model was significant ($p \leq .01$, df, 3), indicating the combined model is the best fit. The equivalence model chi square value was 37.587 (df, 6). The difference between the chi square values for the equivalence

model and the combined model was not significant ($p \leq .10$, df, 2), indicating the equivalence model alone is a better fit (See Table 12).

Table 12

Model Chi Square Comparisons

	Model Chi Square and (df)	Difference Between Baseline Model and Combined Model Chi Square and (df)	Critical Value of Chi Square
Congruence Baseline Model	31.226 (df, 5)	11.174 (df 3)	α .01
Equivalence Baseline Model	37.587 (df, 6)	4.813 (df 2)	α .10
Congruence and Equivalence Combined Model	42.400 (df,8)		

The congruence and equivalence models are unique from each other and viewed as separate models and analyzed with their dependent variables separately. The equivalence model alone was not as robust as the congruence model alone and did not account for major differences among variables in the combined model (models were not significantly different from each other). The congruence model alone, however, was robust with significant path coefficients, and was strengthened even more when combined with equivalence. Congruence and equivalence were also significantly related to each other in the combined model. This suggests that the congruence model as the baseline model is good, and when combined with equivalence, it is even better. The equivalence model as a baseline model is not good and adding congruence does not improve it. In other words, having a good match between desired and actual time spent in

valued activities (congruence) and having a relatively equal (equivalence) scores among the health, relationship, identity, and challenge/interest subscales predicts lower stress, higher need satisfaction, and higher personal well-being better than congruence or equivalence alone. Figure 6 shows the standardized path coefficients of the combined model.

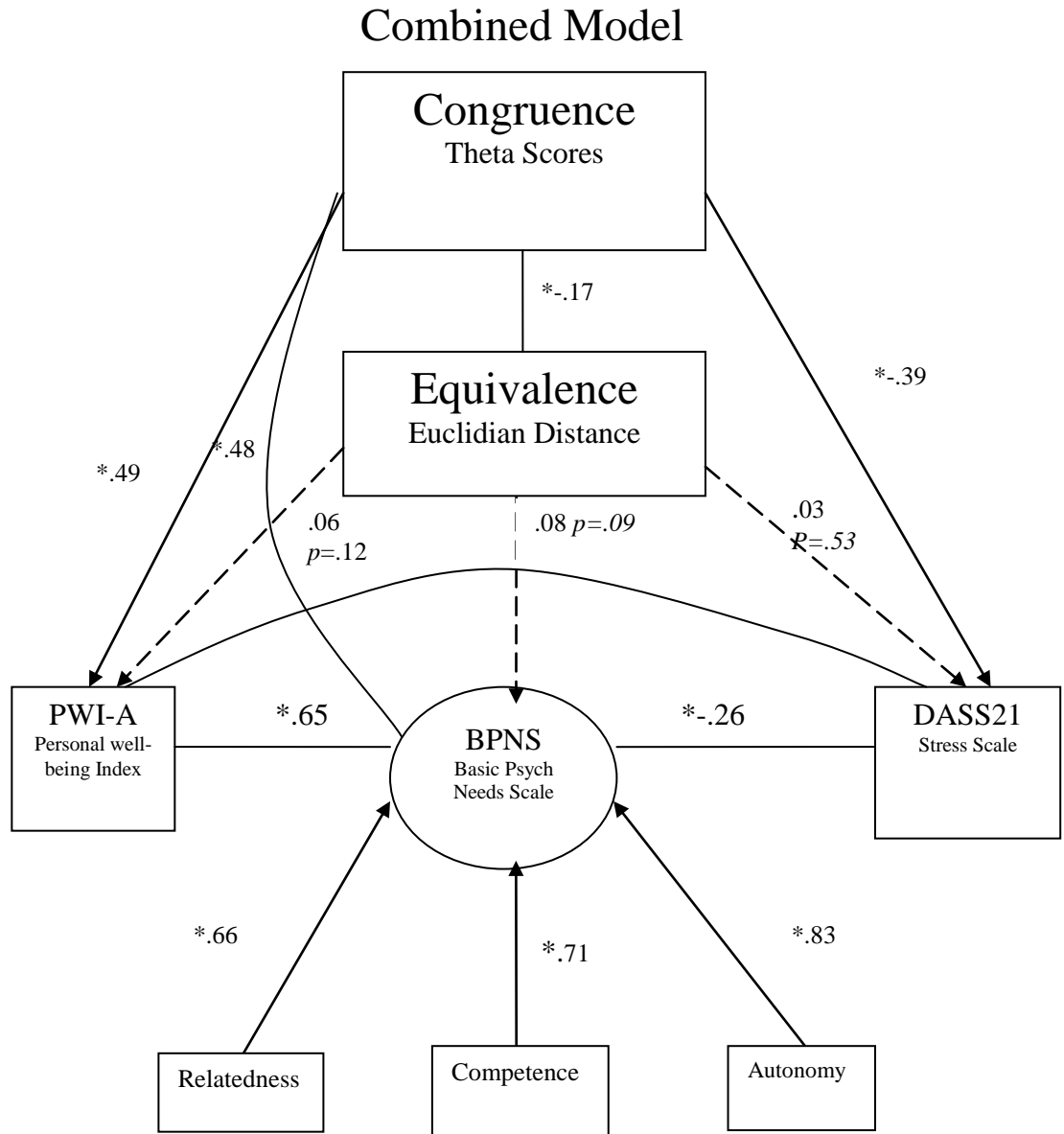


Figure 6. Structural model with standardized path coefficients (Combined Model) (N=468).

* $p \leq .000$

Broken/dashed lines indicate an insignificant relationship.

It is clear in the path coefficients that equivalence contributes to the model through its relationship to congruence only. The significant relationship is negative, as expected, because a low equivalence score (a score of 0 means complete equivalence) and a high congruence score (about right for me) were hypothesized to each contribute to life balance in the LBM. However, the path coefficients show that equivalence alone is not significantly related to stress, psychological need satisfaction or personal well-being. Congruence is related to all the dependent variables in the predicted directions. (See Appendix E for the correlation matrix.)

Research question five. Does gender, age, race, education, marital status, income level, employment status, number of children or number of children living at home moderate congruence or equivalence?

The null hypothesis for this research question was that there are no differences in congruence or equivalence based on gender, age, race, education, marital status, income level, employment status, number of children or number of children living at home. Mean scores for congruence, stress, personal well-being, and each need variable (autonomy, relatedness and congruence) were compared across demographic variables. Appendix D shows the mean and standard deviations of the observed measures. Table 13 shows the mean and standard deviation for LBI raw scores and euclidian distance scores for each demographic group.

Table 13

Mean and Standard Deviation for LBI Raw Scores and Euclidian Distance Scores for Each Demographic Group (N = 458)

Demographic Groups	LBI Raw Score			Euclidian Distance	
	n	<i>M</i>	SD	<i>M</i>	SD
Gender					
Male	205	2.42	.33	.18	.38
Female	253	2.34	.29	.20	.35
Race					
Non-White	117	2.20	.33	.21	.20
White	341	2.42	.29	.18	.40
Age Group					
18-30 years	212	2.31	.28	.21	.37
31-50 years	88	2.24	.38	.19	.20
51-65 years	82	2.54	.32	.12	.12
66 and older	71	2.56	.28	.22	.59
Marital Status					
Single/divorced	228	2.33	.28	.19	.20
Married/partnered	227	2.41	.34	.19	.47
Employment Status					
Working or student	337	2.31	.29	.19	.32
Unemployed/retired	118	2.50	.32	.18	.47
Number of children					
0	235	2.35	.27	.19	.35
1	48	2.29	.35	.19	.21
2	77	2.42	.33	.17	.20
3	56	2.40	.39	.21	.64
4	23	2.49	.35	.20	.26
5	11	2.48	.37	.12	.11
Number of children					

at home					
0	347	2.42	.30	.18	.39
1	47	2.25	.32	.20	.21
2	39	2.24	.28	.22	.21
3	18	2.22	.38	.17	.16
Education					
< high school	10	2.21	.39	.34	.37
High school	115	2.39	.32	.20	.24
Associate degree	43	2.31	.33	.15	.18
Bachelor's degree	197	2.36	.30	.19	.49
Master's degree	71	2.45	.32	.17	.18
Doctoral degree	17	2.44	.22	.16	.21
Household Income					
Less than 10,000	78	2.39	.26	.26	.57
10-24,000	61	2.30	.31	.23	.22
25-39,000	73	2.31	.37	.15	.18
40-54,000	68	2.37	.32	.16	.17
55-74,000	65	2.38	.33	.16	.17
75-149,000	85	2.45	.32	.20	.53
150,000 or more	18	2.54	.17	.11	.13

Mean scores for congruence, stress, personal well-being, and each need variable were compared among nominal variables (gender, age categories, race, marital status, education, income, and employment categories) using multiple t-tests adjusted for multiple comparisons using the Bonferroni correction on two-sided tests assuming equal variances with a significance level adjusted to 0.01. The Bonferroni correction divides the common critical value of .05 by the number of tests, thus $.05/7$ tests equals a critical value of .01. Pearson's r correlations were used to assess relationships between congruence, stress, personal well-being, and each need variable with the continuous variables of number of children, and number of children living with you.

Equivalence values were not significantly different among any of the demographic groups. *Congruence* scores were significantly different among certain demographic groups, however, and are displayed in Table 14.

Table 14
Comparison of Demographic Groups' Mean Congruence Scores

Demographic Group	n	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i> [*]
Race					
White	341	1.16	.29	-4.84	.00
Non-white	117	0.61	.33		
Gender					
Male	205	2.42	1.14	3.04	.00
Female	253	2.34	.94		
Age					
Under 50 years old	300	0.64	.34	2.20	.02
Over 50 years old	158	1.68	.30		
Marital Status					
Single/Divorced/Widowed	231	0.90	.28	2.47	.01
Married/Partnered	227	1.15	.34		
Education					
High School education or less	125	0.83	.35	-0.90	.36
Post-high school education	333	1.02	.28		
Employment					
Working (full or part time) or student	337	0.77	.28	-5.80	.00
Retired, unemployed, or homemaker	118	1.76	.34		
Income					
<\$55K	168	0.87	.31	-2.90	.00
> \$55K	290	1.21	.32		

*Bonferroni Correction $\alpha = \leq .01$

The differences in congruence scores among demographic groups are summarized as follows:

- Men had significantly higher congruence scores than women.
- Whites had significantly higher congruence scores than non-whites (African-American, Hispanic, Asian, and Native American included as non-white).
- Participants who were married or partnered had significantly higher congruence scores than people who were single, divorced or widowed.
- Participants who were retired, unemployed or homemakers had significantly higher congruence scores than participants who were employed (full time or part time) or students.
- Participants who earned 55 thousand dollars per year or more had significantly higher congruence scores than participants who earned 55 thousand dollars per year or less.
- There was not a significant difference in congruence among participants with different ages (although it approached significance), or levels of education.

Perceived stress scores were also compared among demographic groups using t-tests and the results are displayed in Table 15.

Table 15

Comparison of Demographic Groups' Mean Perceived Stress Scores

Demographic Group	n	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i> [*]
Race					
White	341	12.40	3.86	-0.22	.82
Non-white	117	12.53	4.23		
Gender					
Male	205	11.60	3.93	-2.57	.01
Female	253	13.21	4.26		
Age					
Under 50 years old	300	13.25	3.80	2.51	.04
Over 50 years old	158	10.50	3.54		
Marital Status					
Single/Divorced/Widowed	231	12.95	4.21	2.54	.03
Married/Partnered	227	12.14	3.75		
Education					
High School education or less	125	12.69	4.21	-0.59	.55
Post-high school education	333	13.00	3.52		
Employment					
Working (Full or part time) or student	337	13.12	3.92	1.85	.03
Retired, unemployed, or homemaker	118	10.65	3.66		
Income					
<\$55K	168	12.55	3.79	1.20	.23
> \$55K	290	12.04	3.64		

*Bonferroni Correction $\alpha = \leq .01$

The differences in perceived stress scores among demographic groups are summarized as follows:

- Women reported significantly higher levels of stress than men.
- There was not a significant difference in perceived stress among participants with different ages, races, education, or income levels. Differences in stress scores for marital and employment categories approached significance.

Personal well-being scores were also compared among demographic groups using t-tests and the results are displayed in Table 16. The differences in personal well-being scores among demographic groups are summarized as follows:

- Participants who earned \$55 thousand per year or more had significantly higher personal well-being scores than participants who earned \$55 thousand per year or less.
- Personal well-being scores were not significantly different for participants with different ages, marital status, education, or income levels. Differences in personal well-being scores for race, age and employment status approached significance.

Table 16
Comparison of Demographic Groups' Mean Personal Well-being Scores

Demographic Group	n	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i> [*]
Race					
White	341	67.05	13.02	-1.90	.05
Non-white	117	61.86	14.51		
Gender					
Male	205	65.84	14.93	1.11	.21
Female	253	65.62	12.37		
Age					
Under 50 years old	300	66.01	12.55	2.09	.04

Over 50 years old	158	68.88	15.41		
Marital Status					
Single/Divorced/Widowed	231	64.60	13.03	0.22	.82
Married/Partnered	227	66.93	14.24		
Education					
High School education or less	125	62.34	13.20	-1.00	.28
Post-high school education	333	66.20	14.70		
Employment					
Working (Full or part time) or student	337	64.14	13.57	-1.97	.05
Retired, unemployed, or homemaker	118	70.42	14.97		
Income					
<\$55K	168	70.72	13.59	-3.09	.00
> \$55K	290	64.18	13.21		

*Bonferroni Correction $\alpha = \leq .01$

Relatedness, autonomy and competence were the observable scores for the psychological need satisfaction variable. These scores were not significantly different among the groups within gender, age, race, marital status, or employment status. The scores were significantly different however, among education and income levels and are displayed in Table 17, 18 and 19.

Table 17

Comparison of Demographic Groups Income Levels and Education Levels on Mean Relatedness BPNS Scores

Demographic Group	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i> [*]
Income				
<\$55K	45.31	7.33	-1.82	.06
>\$55K	47.61	7.04		
Education				
High school education or less	42.56	7.40	-3.52	.00
Post-high school education	46.70	6.50		

*Bonferroni correction $\alpha = \leq .01$

Table 18

Comparison of Demographic Groups Income Levels and Education Levels on Mean Competence BPNS Scores

Demographic Group	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i> [*]
Income				
<\$55K	30.62	5.8	-4.56	.00
>\$55K	34.12	4.9		
Education				
High school education or less	28.44	5.3	-4.54	.00
Post-high school education	32.97	5.1		

*Bonferroni Correction $\alpha = \leq .01$

Table 19

Comparison of Demographic Groups Income Levels and Education Levels on Mean Autonomy BPNS Scores

Demographic Group	<i>M</i>	<i>SD</i>	T	<i>p</i> *
Income				
<55K	35.33	6.0	-3.96	.00
>55K	39.14	5.9		
Education				
High School education or less	34.23	5.6	-4.48	.00
Post-high school education	37.20	6.2		

*Bonferroni Correction $\alpha = \leq .01$

Number of Children. For this demographic category, a correlation matrix was used because these are continuous variables and the number of cases in some categories was small. Pearson's *r* correlations were used to determine the relationship between number of children and the mean scores for each LBM variable. Higher numbers of children was significantly related to higher congruence scores ($r = .22, p \leq .000$), lower stress scores ($r = -.16, p \leq .001$), higher personal well-being scores ($r = .10, p \leq .04$) and higher autonomy scores ($r = .17, p \leq .000$).

Number of children living with you. This demographic category is also a continuous variable with a small number of cases in some categories, therefore Pearson's *r* correlations were used to determine the relationship between number of children living

with you and the mean scores in each variable. Higher numbers of children living with you was significantly related to lower congruence scores ($r = -.22, p \leq .000$), higher stress scores ($r = .10, p \leq .04$), lower personal well-being scores ($r = -.10, p \leq .05$), and lower relatedness scores ($r = -.12, p \leq .01$).

In summary, for research question five, congruence mean scores were significantly higher for men, people who were white, over 50 years old, retired or unemployed, married or partnered, had higher income, and with more children but with fewer children living with them. Equivalence scores were not significantly different between groups in any of the demographic categories. The null hypothesis that there are no differences in congruence or equivalence based on demographic categories is rejected for congruence, and accepted for equivalence.

Research question six. Are there differences in the relationships between congruence and perceived stress, personal well-being, and need satisfaction based on gender, age, race, education, marital status, income level, employment status, number of children or number of children living at home?

The null hypothesis for this research question was that there are no differences in the relationships between congruence and perceived stress, personal well-being, and need satisfaction based on gender (male/female), age, race (white/non-white), education (\leq high school/ $>$ high school), marital status (single, divorced, widowed/married, partnered), income level, employment status (working or in school/retired, unemployed, homemaker), number of children, and number of children living at home.

To answer this question, a comparison was made between the congruence SEM model and a separate SEM model that included all the demographic categories entered

simultaneously. The results showed that the congruence SEM model was improved with demographics added. Since the combined model (congruence and equivalence) was determined to be the best baseline model (research question four), however, the results of the combined model will be emphasized in this research. See Appendix F for the model fit indices and path coefficients of the congruence model with demographics added.

Research question seven. Do gender, age, race, education, marital status, income level, employment status, number of children or number of children living at home moderate equivalence, perceived stress, personal well-being, and need satisfaction?

The null hypothesis for this research question was that there are no differences in the relationships between equivalence and perceived stress, personal well-being, and need satisfaction for gender (male/female), age, race (white/non-white), education (\leq high school/ $>$ high school), marital status (single, divorced, widowed/married, partnered), income level, employment status (working or in school/retired, unemployed, homemaker), number of children, and number of children living at home.

Based on the findings described for research question 3 and 4, the equivalence model alone was not the preferred model, therefore testing it with all the demographic categories added was not expected to improve the model. As expected, the standardized path coefficients between equivalence and the demographic groups were not significantly related and did not change the overall model. The null hypothesis is accepted.

Research question eight. Do gender, age, race, education, marital status, income level, employment status, number of children or number of children living at home moderate the relationship between equivalence and congruence?

The null hypothesis for this research question was that there is no difference in the relationship between congruence and equivalence based on gender, age, race, education, marital status, income level, employment status, number of children or number of children living at home.

When the combined model (both congruence and equivalence) was combined with all the demographic variables, the model was improved. Equivalence continued to be significantly related to congruence but unrelated to the other variables. Congruence continued to be related to stress, need satisfaction and personal well-being but moderated by employment status, race, number of children, and number of children living with you.

The model fit indices for this model were good and are displayed in Table 20 and Figure 7 shows the combined model with path coefficients.

Table 20

Combined Model with Demographics-Added Model Fit Indices (N= 458)

	SRMR (Good fit \leq .08)	RMSEA (Good fit \leq .10)	RMSEA (90% CI)	CFI (Good fit \geq .90)
Demographic-Added Model	.04	.09	(.074-.10)	.92

Chi square values were compared between the combined model (42.400, df, 8) and the combined model with demographics-added (1259.563, df, 84). Results showed that the demographics-added model was significantly different ($p \leq .000$, df, 76) meaning the combined model was improved with some demographic variables as moderators (See Table 21).

Table 21

Combined Model and Combined Model with Demographics-added Comparisons

Combined Model with Demographics-added Chi Square Value and (df)	Baseline Combined Model Chi Square Value and (df)	Difference in Chi Square Values and (df)	Critical Value of Chi Square
1259.563 (df 84)	42.400 (df 8)	1217.163 (df 76)	$\alpha \leq .000$

The model was improved with employment status, race, number of children, and number of children living with you. Working or being in school, being white, having larger numbers of children, but having fewer children at home related to significantly higher levels of congruence. Additionally, education level and gender moderated need satisfaction, where higher education levels and being female related to significantly higher need satisfaction. Finally, being female or non-white related to significantly higher levels of stress. The null hypothesis is rejected. Figure 7 shows the congruence and demographic model with path coefficients.

Chapter Five

Discussion

The life balance construct was conceptualized in this research as described in the life balance model (LBM), yet central to testing a conceptual or theoretical model is testing the validity of the measure designed to assess the model construct (Fishman & Galguera, 2003). Therefore, although tests of criterion-related validity of the LBI were done prior to this study, construct validity tests of both the measure (LBI) and model (LBM) were the primary focuses of this research. This discussion will first focus on the findings regarding validity evidence for the LBI, followed by a discussion of the results as they relate to validity findings for the LBM.

LBI Validity

The criterion-related validity evidence needed for the LBI included face validity evidence, content validity evidence, predictive validity evidence, and concurrent validity evidence (Thorndike, 2006). Face validity implies that the appearance of the LBI is acceptable as a measure of lifestyle balance to the people taking the test and content validity evidence implies the particular items chosen for the LBI reflect activities typical of everyday life. Previous pilot testing of the LBI demonstrated acceptable face validity evidence through think-alouds, and content validity evidence through expert review of items, sensitivity review, and feedback about the items from 108 subjects. As shown in pilot test II and the present study, the LBI met the assumptions of Rasch analysis indicating the items are contributing to a common construct.

The present study added additional support for the content validity of the LBI through Rasch analysis. The larger sample size and more diverse participants used in the

present study produced results that were similar to those of the pilot study; i.e. each item contributed positively to the total score and the internal consistency was good, supporting the content validity of the measure.

The LBI subscales intended to reflect categories of activities corresponding with the four need-based dimensions of the life balance model (health, relationships, challenge/interest, and identity) were tested for the first time in the present study and the results are not conclusive. The confirmatory factor analysis was mixed, showing that one model fit statistic (RMSEA) was favorable, but another was not (CFI). Factor loadings for each item were generally favorable, yet several items were clearly not strong contributors to their corresponding subscale. This inconsistency might be explained by the pattern of responses on the weak items. For example, there was either very minimal variance (everyone chose the item as something they did), or there was an evenly split variance (half chose the item and half did not). These items then, did not predict responses on the other items in a meaningful way. The subscales were deemed acceptable enough to use in further analysis because of their theoretical base and the moderate factor loadings (Klein, 2005). In some ways, confirmatory factor analysis can only be a general guide for the overall fit of the LBI subscales because there is no theoretical expectation that someone who wants to dance for example, will also want to sew, for example. However, both could theoretically be described as an activity that provides challenge or interest, but choosing one may not be related to choosing the other. In sum, the face and content validity of the LBI was supported by the pilot studies and the results of the present study through Rasch analysis. Evidence for validity of the LBI

subscales is weaker and additional research is needed in order to have confidence in their use.

Construct validity of the LBI was tested in this research, or the extent to which the LBI predicted what it was hypothesized to predict, based on the theory underlying it. To do this, the LBI scores were compared to the scores of known, validated, tests of constructs (well-being, need satisfaction, stress) thought to be associated with, but not the same as life balance, from a theoretical perspective. The expectation was that if the LBI was indeed measuring something different from stress, well-being and need satisfaction (i.e. life balance), then the relationships between the LBI and measures of these other constructs should not be too strong. In other words, the LBI should predict personal well-being, need satisfaction and reduced perceived stress but have some unique variance of its own (Fishman & Galguera, 2003). The path coefficients in the combined model (Figure 6) and combined-demographics-added model (Figure 7) used in this research show acceptable correlations ($p \leq .01$) between the LBI scores and the other variables to indicate relatedness, and enough unique variance to conclude that the LBI is measuring a different construct. These correlations in the expected directions also provide rudimentary validity evidence for the LBM discussed next.

LBM Validity

Evidence for criterion-related validity of the LBI was strong enough to warrant its use as a measure of *life balance* in this research. However, the LBM construct itself needed further clarification and study. The design of this research was meant to test the construct validity of the LBM and further validate the construct validity of the LBI. Construct validity indicates the degree to which an instrument measures what it is

intended to measure (Fishman & Galguera, 2003). In order to make the claim that an instrument is measuring what it is intended to measure, it must demonstrate that it predicts or accounts for that criterion at a level that is viewed as satisfactory to the scientific community (Fishman & Galguera, 2003). The predictive validity evidence provided by this study for the LBI gives the first evidence that the LBM is indeed, a unique construct with predictable relationships to other constructs.

Congruence and Equivalence Combined

The life balance model outlined two components of life balance that were proposed to be related to positive health and well-being. The first component was congruence, or how close the match is between actual and desired time spent in valued activities. High congruence was hypothesized to relate to positive health and well being outcomes. The second component was equivalence, or the degree to which satisfaction in time spent in activities reflecting the four dimensions of the LBM is similar. More equitable satisfaction across these categories was hypothesized to relate to better health and well being outcomes than less equitable levels of satisfaction. Finally, it was expected that the environmental context would have an effect on life balance as well.

This research provided evidence of validity for the congruence hypothesis, that a good match between desired and actual time spent in activities was significantly related to lower stress, higher personal well-being, and higher basic psychological need satisfaction. Equivalence (or similar levels of satisfaction with time spent in activities across health, relationship, challenge/interest, and identity categories) moderated congruence. When both congruence and equivalence were combined in the same model, the expected relationships improved. Equivalence alone, however, did not relate

significantly to personal well-being, need satisfaction or perceived stress and will be discussed later.

The findings that the congruence data reflected the hypothesized relationships in the LBM suggests that when people are generally satisfied with their time spent in an overall configuration of activities (“about right for me”) there will be associated positive outcomes in stress levels, well-being and need satisfaction. The overall configuration of activities could vary between people; some having a wide range (choosing many items on the LBI as “I do or want to do”) and others having a more narrow range (choosing fewer items). The overall configuration of activities is without judgment in the *types* of activities people choose, as long as they are satisfied with their time spent doing them.

With equivalence moderating congruence, however, the findings also suggest that when there is satisfaction with time spent across certain *types* of activities, there is a stronger association with stress, need satisfaction and personal well-being. In other words, the equivalence variable adds a certain prescriptive quality to the LBM, where satisfaction with a certain mix of activities that meet health, relationship, identity and challenge/interest needs are also deemed important for life balance.

The findings in this research are similar to findings in other research about a match between actual and desired time spent in broad activity categories relating to positive health and well-being outcomes (Seleen, 1982; Sheldon, Cummins & Khamble, 2008; Wilcock, et al, 1997). Findings are also consistent with research showing that people need a balance of activities meeting different needs (Deci & Ryan, 2000; Ryff, 1989). Sheldon and colleagues (2008) found that relatively equal apportionment of time across ten activity categories: sleeping, school/or paid work, household chores,

community activities, recreation, commuting, relationships, health and self-care, spirituality or religious activities was associated with psychological need satisfaction and personal well-being.

The present study extends Sheldon and colleagues' "equal apportionment of time" research by addressing the *satisfaction* with time spent across activity categories, not just the time apportionment itself. In other words, the subjective satisfaction of whether time spent in activities was "about right for me" or "too much or too little" was compared across health, relationship, identity and challenge/interest activity categories. Being satisfied in all four categories equally contributed strength to the LBM.

In sum, the combination of equivalence and congruence was the strongest predictor of the outcomes. People who were most *balanced* had overall satisfaction with the actual and desired time use in activities and had relatively equal satisfaction across the four subscales of health, relationships, identity, and challenge/interest. These *balanced* individuals had higher scores in personal well-being and need satisfaction and lower scores in perceived stress than individuals with lower congruence and equivalence scores. This supports the Sheldon, et al., (2008) study finding that both equivalence and congruence among 10 broad activity categories related significantly to positive outcomes. Their study, however, measured equivalence as the within-subject standard deviation across estimates of time in each of the 10 activity categories over a 24 hour day. This study added the finding that *satisfaction* in time use across categories is also important.

Equivalence Alone

The equivalence hypothesis was supported in this research but only as a moderator to congruence. Equivalence alone did not relate to the outcomes as expected.

There are several possible explanations for the findings in this research related to equivalence. The finding that equivalence alone was not a strong predictor (but congruence was) may suggest that people simply do not need to have balanced levels of satisfaction with activities that meet physical, relational, identity, and challenge/interest needs as long as, overall, they are satisfied with what they are doing. In other words, if people are satisfied with their time use overall, even if they engage in a minimal array of activities (e.g. health activities and challenge/interest activities), then they are “balanced” and will have good associated well-being, need satisfaction and stress outcomes. Accumulated past research does not support this conclusion however, (Seleen, 1982; Sheldon, Cummins & Khamble, 2008; Wilcock, et al., 1997) and thus, other possible explanations are presented.

Another potential explanation is that equivalence might be a predictor of positive health outcomes as the life balance model suggests, but the subscales in the LBI did not adequately discriminate between activities that met health, relationship, identity and challenge/interest needs. The confirmatory factor analysis findings from this study were only moderately supportive of the LBI subscales, suggesting that there may be a better way to cluster the items. One of the possible reasons for this is that the LBI items measure satisfaction with time use in activities, not what the activities mean to the individual in context. For example, any given activity item could meet more than one of the four needs identified in the life balance model, and could change over time. Cooking for example, could meet a social need in the context of a party, a physiological health need (nutrition), a challenge/interest need when trying a new recipe, or an identity need if

cooking fulfills a valued role. Thus, housing the item of “cooking” into only one subcategory on the LBI may not reflect its meaning to the individual in context.

Activity Categories and Stress

One of the differences in this study compared to the other related studies is the use of the LBI for a measure of life balance that incorporated more specific activity categories corresponding with everyday life, including such things as participation in art, going to restaurants, dancing, and other activities that were not specified in past research. Previous research categorized activities broadly such as *leisure*, or *work*. Arguably, even if some valued activities do not consume large amounts of time, or are engaged in sporadically, the match between how often people *want* to engage in them and how often they *actually* engage in them, may influence their sense of balance and ultimately their personal well being, stress, and psychological need satisfaction. The people who engaged in the activities of dance, travel, exercise, art, composing, music, and journaling as desired had the highest congruence scores (item map from Rasch analysis) which related to higher psychological need satisfaction, personal well-being, and lower stress. This suggests that measures of life balance should include such items instead of limiting the items to typical or broad activity categories used in other research.

This research also incorporated a measurement of stress not examined in other research. This was viewed as important because of the links associated with stress and lifestyles (Marks & MacDermid, 1996; Sapolsky, 2004). Findings of the present study showed that, as predicted, when people perceive they are not spending time in activities as desired, there is an associated higher level of perceived stress. This association that could also be viewed in reverse; when people are stressed, they spend less time in desired

activities. This research used life balance as a predictor of stress in the SEM analysis, with a resulting significant negative relationship, but it would be useful to run the analysis with stress as the predictor to congruence or equivalence for further understanding of the direction of the relationship. Similarly, the directionality between life balance, personal well-being and need satisfaction was run with life balance as the predictor, but these could also be run the other way around in future studies.

Life Balance as a Universal Construct

The LBM (Matuska & Christiansen, 2008) proposed that congruence and equivalence would relate to positive health and well-being outcomes and that life balance is a universal, human construct. This research used a sample from the population that included men and women across race, wide age ranges, income levels, education levels, marital status, employment status, numbers of children, and numbers of children living at home. Twenty five percent of the sample represented African-American, Hispanic, Asian, and Native American people. The sample was broad enough that it can be generalized to the U.S population (US Census Bureau, 2000), supporting in part, the claim that life balance is a universal human construct. Additional testing is required with non-western cultures before universality can be fully asserted, however.

The Environmental Context as an Influence on Life Balance

The life balance model identified the environment (physical, social, economic, cultural, political, and temporal contexts) as influencing congruence and equivalence and the associated health outcomes. The environment can provide either supports or barriers to engagement in meaningful activities, influencing whether or not people can engage in activities as they desire. The environmental context includes the physical context, (such

as where one lives and works); the social context, (such as social roles and responsibilities); the cultural context, (such as values and traditions); the political and economic contexts, (such as availability of resources); and the temporal context, (such as age or life stage). The findings related to different demographic groups in this study support the hypothesis that life balance is influenced by the environmental context. There were several groups (i.e., non-white, people working or in school, and people with children living at home) for which congruence was low and was associated with significantly lower personal well-being, psychological need satisfaction and higher stress.

Work. Employment status (social/economic contexts) moderated congruence which is consistent with a theoretical view that participating in work or school would likely interfere with satisfaction of time spent in other activities. This supports the finding that nearly half of U.S. workers report that their jobs interfere some or a lot with their personal lives, and nearly three quarters of working mothers and fathers feel they do not have enough time to spend with their children (Bond, et al., 2002). The findings in this research that employed people report lower congruence and associated higher perceived stress, lower personal well being and need satisfaction than people who are not working contributes to the work-life balance body of literature. This research showed that managing work with other demands can be challenging, as found in other research (Wallen, 2002). This present research supports the idea that employees may benefit from family friendly practices that are supportive of their personal and family lives, while employers benefit from having more engaged employees, higher retention, and potentially lower health care costs (Bond, et al., 2002; Clayton, 2004; Halpern & Murphy, 2006; Wallen, 2002). In other words, congruence between desired and actual

time use in valued activities has beneficial consequences for workers, and other research shows that healthy workers benefit their employers (Wallen, 2002). The present study also showed a significant difference in mean congruence scores between working and retired participants ($p \leq 0.00$). Since congruence is related to positive well-being, need satisfaction and stress outcomes, it adds further evidence to the importance of supporting work-life balance for working adults.

Family. The number of children at home (social context) moderated congruence and suggested that having children at home interfered with satisfaction in time spent doing other activities. Having children at home was associated with higher stress and lower need satisfaction and personal well-being. The idea that parenting is stressful is not new. There is a large body of literature about family stress, much of it built from family stress theory (Hill, 1949; 1971; 2003), that emphasizes the significance of stress consequences in families. For example, parenting stress has been linked to high blood pressure (Taylor, Washington, Artiniam, & Lichtenberg, 2007), lower marital satisfaction (Lavee, Sharlin & Katz, 1996), and perceived time stress (Craig & Pooja, 2009) among others.

This study adds a new perspective to the stress research, however, suggesting that parents with children at home are not satisfied with their time use in activities, a possible contributor to the stress parents experience. Time use studies show that the time impact of becoming a parent is considerable. Leisure time use changes for parents, but more so for mothers (Beck & Arnold, 2009) and women take on the greater workload associated with parenting (Craig, 2006). In this study, women had significantly higher perceived

stress than men which seems consistent with research showing the increased role demands of motherhood.

The only group that had a significant and *positive* relationship with congruence was, interestingly, the group with the largest *total* number of children, whether the children were at home or not. This group included more people across more age categories because it was basically a rating of family size, not a rating of having young children or adolescents at home. The positive relationship of congruence with the other overall positive outcomes might be explained by the increased type of social activity opportunities when families are larger; more people to visit and do things with, frequent get-togethers, inter-generational activities, etc. There is considerable evidence showing the positive mental and physical health effects of social support (Achat, et al, 1998; Repetti, Taylor, & Seeman, 2002; Seeman, Lusignolo, Albert, & Berckman, 2001; Thompson & Heller, 1990) and larger families could conceivably be providing that positive support to each other. Family size as a moderator to congruence might also reflect a more satisfied, less stressed, more reflective older adult (with adult children) whose life characteristics include such conditions as retirement. When a Pearson correlation was run for participants in the present study who had children, the participant's age was significantly related to number of children ($r = .38, p \leq .01$). In other words, having larger families was more typical of people who were older. Healthy aging has been associated with social support (Gurung, Taylor, & Seeman, 2003) that families may provide. This research suggests that larger families have a positive influence on life balance with associated lower perceived stress, higher need satisfaction and personal well-being.

Race. Being non-white was also related to lower congruence. Race as a modifier to life balance has no justifiable relationship other than being an outcome of systematic disparities that may reflect other compounding variables such as lower income, or education levels. Data from the US Census Bureau (2006) indicated large disparities in income by race, with Black adults earning 63% and Hispanic adults earning 75% of what White adults earned in 2006. Income levels are also related to educational levels where people with higher levels of education earn more than people with lower levels of education (US Bureau of Labor Statistics, 2008). The education and income factors combined may have influenced the finding that being non-white predicted lower congruence and higher stress in this study.

Other research found that low social class and perceived financial strain predicted lower role balance in married women (Marks et al., 2001). Low income will constrain where people can afford to live. The availability and character of physical and social resources relates to opportunities for engagement in a variety of healthful activities (Gibson, 1979). An example is the finding that the quality of one's neighborhood was associated with well-being. Living in safe, quiet, and small communities accounted for a significant proportion of variance in every index of well-being (Lawton, et al, 1980). Income and education disparities between white and non-white people continue to be present in the United States with resultant differences in lifestyle, quality of life and well-being. This research showed that disparities also exist in congruence and perceived stress. People who were non-white had lower mean levels of satisfaction with their actual versus desired time spent in activities and reported higher stress levels than people who were white. This may reflect lower income and therefore fewer resources or opportunities to

spend time in desired activities, less satisfying employment, stressful environments, or many other things. Reducing the disparities among whites and non-whites will require systemic changes with broad social policies aimed at creating more equitable opportunities for people to create satisfactory lives.

Implications

There are several findings from this research that should be of interest to researchers, individuals, health professionals, and family educators and could be used to inform both preventative and restorative goals.

Life balance is a commonly used term but with little empirical support for the construct. This research provides one way of viewing life balance that can be an anchor for additional research. With the empirical support for the life balance construct found in this research, additional research can continue to explore the relationships between life balance, and other outcomes. The LBI has shown enough validity in the present study to justify its use as a tool in this endeavor.

This research contributed additional support to the idea that a balanced life may have positive associated outcomes. This research has a practical application in that people might be encouraged to choose activities that increases their satisfaction in their overall configuration of activities. In a preventative way, life balance can be viewed through a wellness lens, or as something to strive for to promote overall health and well-being. For example, often wellness programs include coaching in physical activity, nutrition, and stress reduction (Heinz & Pentland, 2009) but perhaps this research points to the importance of also promoting an overall pattern of everyday activities that is satisfying and meaningful to people for their health and well-being. Individuals could do a self-

assessment with the LBI as a first step in assessing life choices and/or making positive lifestyle changes. In addition to an overall score, individuals taking the LBI can also assess themselves on an item by item basis, pointing out the specific activities they are most dissatisfied with, perhaps prompting some insight into positive changes they could make.

In a restorative way, professionals working with individuals or families who are struggling may address life balance as one element in a comprehensive evaluation of the situation. When families have to make adaptations in their everyday living such as having changes in daily routines, it can lead to stress (McDonald, 2008). Perhaps the configuration of activities in their everyday lives is not consistent with their health, relationships, need for challenge/interest, or satisfactory identity. Counseling, coaching, or education professionals may assist families and individuals to find ways to achieve or restore a sense of balance.

Education

One of the findings of this research was that people who had children living with them had a poorer match between desired and actual time use that was associated with higher stress, and lower psychological need satisfaction and subjective well-being. This is consistent with other research that has found significant work-pattern differences between families with children and those without children. Families with children had significantly higher annual hours of work than those without children (LaRochelle-Côté & Dionne, 2009). Since having children is an environmental context that cannot be changed, family educators have an important role in helping families manage their

stressors by educating them about how to successfully juggle the multiple demands on their time. Support for families could be through education for individual families and/or through advocating for broader social policies that will support families.

There is considerable research on how families allocate their time between work, leisure, and spending time together (Bianchi, 2000; Harvey & Singleton, 2009; LaRochelle-Côté & Dionne, 2009; Marshall, 2009; Zuzanek, 2009), which shows that increasing demands on time relates to increasing stress. This research added the variable of *life balance* (congruence and equivalence) to what is already known about family stress. The idea that life balance is associated with stress suggests that family educators may find the life balance construct useful and include it in their programming. For example, parents who are struggling with too many demands on their time may find it useful to think about their configuration of daily activities and how it matches their values and need satisfaction. With awareness and support, parents may be able to find ways to build in important activities without interfering with their valued role of parenting.

Family Educators can help parents become aware of the areas in their life where they are less satisfied with their time use. The LBI would be useful for this self-assessment. Then parents could problem solve about how they could make some adjustments in their time use for a more satisfactory balance. Such things as including their children in their regular exercise program, or limiting TV watching to allow for additional time in other pursuits, or learning short cuts to meal preparation may be helpful. Although small lifestyle changes may seem insignificant, it is important for

families to feel a sense of control of their time. McCubbin, Patterson, Bauman, & Harris, (1981) found the most significant within-family resource was a sense of mastery over events. It seems then, that educating families about life balance is a practical way of helping them make active lifestyle choices that could influence their overall well-being.

It also might be important for parents to understand that childrearing is a stage in life that will change and that it might be acceptable to let go of some past interests for a short time in lieu of new family activities. Interestingly, this study also revealed that people who have more children overall (either living at home or not) had significantly more congruence than people with fewer or no children. In other words, the short-term challenges when children are at home, may result in more long-term rewards down the road.

This research revealed that the environment has an influence on life balance. In other words, sometimes it may be impossible to have the activity choices one desires because of the constraints of the environment. It seems that working and having children is not helpful to living a balanced life, which may be even more so for individuals and families when resources are limited. Family educators have a role in advocating at a broader systems level for social changes that provide support for families that may reduce the demands of parenting for adults with limited resources. This research revealed that congruence was significantly lower for women, people with lower income, lower educational levels, and parents with children at home. This suggests that congruence is not simply an individual skill that can be improved with training or coaching. Rather, supportive social structures are needed so that individuals can attend to improving their

congruence when the other demands are lessened. Craig (2005) highlights the gap in government assistance in daycare for single working mothers, and the resultant time stress single mothers are under. For this group, individual education may be helpful, but the greatest impact may be in broad social changes. Such supports as high quality, flexible, and affordable daycare, quality after-care child programming in local schools, and businesses practices that are family-friendly would be helpful when parents are struggling with too many demands on their time and energy.

Limitations and Future Research

Limitations in this research concern the generalizability of the findings. First, the convenience and snowball sampling used in this study limits generalizability of its findings to other populations. Additionally, the inferences that can be made from this research are limited to people in developed, relatively affluent, western societies. An argument can be made that the concept of life balance may be completely inappropriate for people in environments where personal choices are constrained by poverty or limited resources (Birchenbach & Glass, 2009; Whiteford, 2009). Additionally, the life balance concept reflects a western value of individualism and may not resonate with cultures with collectivist values (Pentland & McColl, 2009).

This research tested the *life balance* component of the life balance model but did not directly test the *life imbalance* component of the model. Therefore, findings reported here regarding validity of the LBM are limited to the life balance component only. Establishing validity for the entire LBM requires that all components are tested. Future

research should directly test the relationships between life imbalance and health outcomes as indicated in the LBM.

Additionally, the LBM and LBI should be tested with other, more diverse groups. Repeating this research with groups of people from non-western cultures and with different opportunities and resources is important to support the generalization of the model.

The LBI subscales reflecting equivalence need continued testing and refinement because of their weaker contribution to the model. One of the challenges mentioned in the use of the subscales was the idea that the *meaning* of each activity in the subscales to the person responding, could change with context or over time. Qualitative research that addresses the meaning of activities to people would be a useful way to learn about the appropriateness of the subscales and to further refine them. Qualitative research to modify the items and subscales on the LBI should also occur in non-western cultures.

The directionality question is only partially answered. This research used life balance as a predictor to stress, need satisfaction and personal well-being, and found associations in expected directions. Future studies, could use the same variables as predictors to life balance. In other words, does stress predict lower life balance? Or does low personal well-being predict lower life balance, etc?

Finally, the life balance model asserts that life balance is associated with positive health and well-being outcomes. This research tested personal well-being and need satisfaction but other outcomes such as happiness, life satisfaction, and other physical and mental health indicators should also be tested.

Conclusion

This research supported the validity of the Life Balance Model and the Life Balance Inventory. Structural equation modeling showed that the best model is that in which congruence, moderated by equivalence predicts lower stress and higher need satisfaction and personal well-being. Congruence was negatively related to being non-white, having children at home, and working full time or in school. Family size was positively related to congruence. These findings indicate the impact of context on life balance. This research adds validity to the idea that having a *balanced* life is something of value and contributes to the overall evidence about what a *balanced* life might look like. This research also provided evidence that creating a *balanced* life may not be entirely within one's control, that life circumstances and contexts may limit the opportunities available for doing what one desires to do. Finally, this research is a valuable first step for additional research about life balance because it provided a model and measure that can be used as a foundation for additional study.

References

- Achat, H., Kawachi, I., Levine, S., Berkey, C., Coakle, E., & Colditz, G. (1998). Social networks, stress and health-related quality of life. *Quality of Life Research, 7*, 735-750.
- Alter, J. (1999). Heaps of health, metaphysical fitness: Aurveda and the onthology of good health in medical anthroplogy. *Current Anthropology, 40* (Supplement; Special Issue: Culture; A Second Chance), S43-S66.
- Antonovsky, A. (1979). *Health, stress, and coping: New perspectives on mental and physical well-being*. San Francisco: Jossey-Bass.
- Antonovsky, A. (1987). The salutogenic perspective: Toward a new view of health and illness. *Advances: Journal of Mind-Body Health, 4*, 47-55.
- Antonovsky, A., & Sourani, T. (2003). Family sense of coherence and family adaptation. In P. Boss (Ed.). *Family stress: Classic and contemporary reading*, (pp. 3-18). Thousand Oaks: Sage Publications.
- Aristotle. (1908). *The nicomachean ethics* (W. D. Ross, Trans.). London: Clarendon Press.
- Bachmann, K.D. (2000). *Work-life balance: Measuring what matters*. Ottawa: Conference Board of Canada.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*, 191-215.

- Bandura, A. (2000). Exercise of human agency through collective efficacy. *Current Directions in Psychological Science*, 9, 75-78.
- Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, 52, 1-26.
- Baum, A., Garofalo, J., & Yali, A. (1999). Socioeconomic status and chronic stress. Does stress account for sex effects on health? *Annals of the New York Academy of Sciences*, 896, 131-144.
- Baum, A., & Posluszny, D. (1999). Health psychology: Mapping biobehavioral contributions to health and illness. *Annual Review of Psychology* [electronic version] 50, 137-163.
- Beck, M., & Arnold, J. (2009). Gendered time use at home: An ethnographic examination of leisure time in middle-class families. *Leisure Studies*, 28, 121-142.
- Bianchi, S.M. (2000). Maternal employment and time with children: Dramatic change or surprising continuity? *Demography*, 37, 401-414. Retrieved on April 23, 2010 at <http://nieer.org/docs/?DocID=48>
- Birchenbach, J., & Glass, T. (2009). Life-balance: The meaning and the menace in a metaphor. In K. Matuska, & C. Christiansen. (Eds.) *Life balance: Multidisciplinary research and theories*. Bethesda: AOTA Press and Slack, Inc.
- Bond, J., Galinsky, E., & Swanberg, J., Prottas, D. (2002). *The national study of the changing workforce*. New York: Families and Work Institute.

- Britt, T., & Bliese, P. (2003). Testing the stress-buffering effects of self engagement among soldiers on a military operation. *Journal of Personality, 71*, 245-257.
- Britton, B. & Tesser, A. (1991). Effects of time-management practices on college grades. *Journal of Educational Psychology, 83*, 405-410.
- Brown, L., Reynolds, C., Monk, T., Prigerson, H., Dew, M., Houck, P., et al., (1996). Social rhythm stability following late-life spousal bereavement: Associations with depression and sleep impairment. *Psychiatry Research, 62*, 161-169.
- Campoprese, R., Freguja, C., & Sabbadini, L.L. (1998). Time use by gender and quality of life. *Social Indicators Research, 44*, 119-144.
- Cannon, W. B. (1939). *The wisdom of the body*. New York: Norton.
- Carstensen, L. L. (1998). A life span approach to social motivation. In J. Heckhausen, & C. Dweck, (Eds.), *Motivation and self-regulation across the life-span*. 341-364. New York: Cambridge University Press..
- Christiansen, C. H. (1999). Occupation as identity. Competence, coherence and the creation of meaning. *American Journal of Occupational Therapy, 53*, 547-558.
- Christiansen, C. H. (2000). Identity, personal projects and happiness: Self construction in everyday action. *Journal of Occupational Science, 7*, 98-107.
- Christiansen, C. H., Backman, C., Little, B., & Nguyen, A. (1999). Occupations and well-being: A study of personal projects. *American Journal of Occupational Therapy, 53*, 91-100.

- Christiansen, C., & Matuska, K. (2006). Lifestyle balance: A review of concepts and research. *Journal of Occupational Science, 13*, 49-61.
- Christiansen, C., & Townsend, E. (2004). *Introduction to occupation: The art and science of living*. New Jersey: Prentice Hall.
- Clark, F. A. (2000). The concepts of habit and routine: A preliminary theoretical synthesis. *Occupational Therapy Journal of Research, 20*, 123S-138S.
- Cohen, S., Kamark, T. & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*, 385-396.
- Craft, L., & Landers, D. (1998). The effects of exercise on clinical depression and depression resulting from mental illness: A meta-analysis. *Journal of Sport and Exercise Psychology* [electronic version]. *20*, 339-357.
- Craig, L. (2005). The money or the care: A comparison of couple and sole parent households' time allocation to work and children. *Australian Journal of Social Sciences, 40*, 4, 521-540.
- Craig, L. (2006). Children and the revolution: a time-diary analysis of the impact of motherhood on daily workload. *Journal of Sociology, 42*, 125-43.
- Craig, L. & Pooja, S. (2009). Work and family: How does the (gender) balance change as children grow? *Gender, Work and Organization, 16*, 684-709.
- Csikszentmihalyi, M. (1990). *Flow-The psychology of optimal experience*. New York: Harper and Row.

- Csikszentmihalyi, M. (1997). *Living well. The psychology of everyday life*. London: Phoenix Books.
- Cummins, R. (2009). Measuring life balance through discrepancy theories and subjective wellbeing. In K. Matuska, & C. Christiansen. (Eds.) *Life balance: Multidisciplinary research and theories*. Bethesda: AOTA Press and Slack, Inc.
- Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*, 227-268.
- Deci, E.L., Ryan, R. M., Gagne, M., Leone, D. R., Usunov, J., & Kornazheva, B. P. (2001). Need satisfaction, motivation, and well-being in the work organizations of a former Eastern Bloc country. *Personality and Social Psychology Bulletin, 27*, 930-942.
- Diener, E.F., Emmons, R., Larsen, R., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment, 49*,1, 71-75.
- Diener, E., Suh, E., & Oishi, S. (1997). Recent findings on subjective well-being. *Indian Journal of Clinical Psychology, March*.
- Dillman, D.A. (2007). *Mail and internet surveys: The tailored design method* (2nd ed.). John Wiley and Sons, Inc.: Hoboken, New Jersey.
- Emmons, R.A. (1996). Striving and feeling: Personal goals and subjective well-being. In P.M. Gollwitzer (Ed.), *The psychology of action: Linking cognition and motivation to behavior*. (pp 313-337). New York: Guilford Press.
- Erikson, E.H. (1982). *The life cycle completed*. New York: Norton

- Fishman, J. A., & Galguera, T. (2003). *Introduction to test construction in the social and behavioral sciences: A practical guide*. New York: Rowman & Littlefield Publishers.
- Frankl, V. (1984). *Man's search for meaning*. New York: Washington Square Press
- Goode, W. J. (1960). A theory of role strain. *American Sociological Review*, 25, 483-496.
- Goodman, L.A. (1961). "Snowball sampling". *Annals of mathematical statistics* 32, 148–170
- Gurung, R., Taylor, S., & Seeman, T. (2003). Accounting for changes in social support among married older adults: Insights from the MacArthur studies of successful aging. *Psychology and Aging*. 18, 487-496.
- Håkansson, C., Dahlin-Ivanoff, S., & Sonn, U. (2006). Achieving balance in everyday life. *Journal of Occupational Science*. 13, 74-82.
- Halpern, D. F., & Murphy, S. E. (Eds.). (2006). *From work-family balance to work-family interaction*. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Harvey, A. & Singleton, J. (2009). Time use and balance. In K. Matuska, & C. Christiansen. (Eds.), *Life balance: Multidisciplinary research and theories*, (pp. 95-114). Bethesda: AOTA Press and Slack, Inc.
- Havisghurst, R. (1972). *Developmental tasks and education*. New York: D. McKay
- Heinz, A. & Pentland, W. (2009). Professional coaching for life balance. In K. Matuska, & C. Christiansen. (Eds.) *Life balance: Multidisciplinary research and theories*. Bethesda: AOTA Press and Slack, Inc.

- Hill, R. (1949). *Families under stress*. New York: Harper and Row.
- Hill, R. (1971). Modern systems theory and the family: a confrontation. *Social Science Information, 10*, 5, 7-26.
- Hill, R. (2003). Generic features of families under stress. In P. Boss & C Mulligan (Eds.). *Family Stress: Classic and contemporary readings*, (pp.177-190). Thousand Oaks: Sage Publications.
- Hu, L.T. & Bentler, P.M. (1999). Cutoff criteria for fit indices in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55.
- International Wellbeing Group. (2006). *Personal Wellbeing Index*. (4th Ed.). Melbourne: Australian Centre on Quality of Life, Deakin University.
(http://www.deakin.edu.au/research/acqol/instruments/wellbeing_index.htm.)
- Jobst, K. (2006). Diseases of meaning, manifestations of health, and metaphor. *Journal of Alternative and Complementary Medicine* [electronic version]. Retrieved on February 23, 2009 at http://www.thehaymeadow.com/artman/publish/article_59.shtml.
- Jonsson, H., Borell, L., & Sadlo, G. (2000). Retirement: An occupational transition with consequences for temporality, balance and meaning of occupations. *Journal of Occupational Science, 7*, 29-37.
- Kemeny, M.E. (2003). The Psychobiology of Stress. *Current Directions in Psychological Science, 12*, 124-129.

- Kiecolt-Glaser, J., McGuire, L., Robles, T., & Glaser, R. (2002). Emotions, morbidity, and mortality: New perspectives from psychoneuroimmunology. *Annual Review of Psychology, 53*, 83-107.
- Kleist, K.M. (2002). Test-retest reliability of the Occupational Balance Inventory among 18-40 year olds. Unpublished masters thesis, College of St. Catherine, St. Paul, Minnesota.
- Kline, R.B. (2005). *Principles and practice of structural equation modeling*, (2nd ed.), New York: The Guilford Press.
- Klinger, E. (1977). *Meaning and void: Inner experience and the incentives in people's lives*. Minneapolis: University of Minnesota Press.
- Klinger, E. (1998). The search for meaning in evolutionary perspective and its clinical implications. In P.S. Fry (Ed.), *The human quest for meaning* (pp. 27-50). Mahwah, NJ: Lawrence Erlbaum.
- Langer, E. J. & Rodin, J. (1976). The effects of choice and enhanced personal responsibility for the aged: A field experiment in an institutional setting. *Journal of Personality and Social Psychology, 34*, 191-198.
- LaRochelle-Côté, S. & Dionne, C. (2009) Family work patterns: Perspectives on labour and income. *Statistics Canada*. Retrieved on April 16, 2010 at <http://www.statcan.gc.ca/pub/75-001-x/2009108/article/10912-eng.htm>
- Lavee, Y., Sharlin, S. & Katz, R. (1996). The effect of parenting stress on marital quality: An integrated mother–father model. *Journal of Family Issues, 17*, 1, 114-135.

- Lawton, M. P., Nahemow, L., & Yeh, T. (1980). Neighborhood environment and the wellbeing of older tenants in planned housing. *International Journal of Aging and Human Development*, 1, 211-227.
- Linacre, J. M. (2006) Winsteps Rasch Measurement (version 3.62.1). www.winsteps.com
- Linville, P. (1987). Self-complexity as a cognitive buffer against stress-related illness and depression. *Journal of Personality and Social Psychology*, 52, 663-676.
- Little, B. R. (1988). *Personal projects analysis: Theory, methods and research*. Ottawa: Carleton University.
- Little, B. R. (1998). Personal project pursuit: Dimensions and dynamics of personal meaning. In P. T. P. Wong & P. Fry, (Eds.), *The Human Quest for Meaning: A handbook of theory, research and application*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Little, B. R., & Chambers, N. (2003). Personal project pursuit: On human doings and well-beings. In M. Cox & E. Klinger (Eds.), *Handbook of motivational counseling: Concepts, approaches, and assessment*. Chichester, UK: Wiley.
- Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the Depression Anxiety Stress Scales*. (2nd Ed.). Sydney, Australia: The Psychology Foundation of Australia Inc.
- Macan, T.H., Shahani, C., Dipboye, R.L, & Phillips, A.P. (1990). College students' time management: Correlations with academic performance and stress. *Journal of Educational Psychology*. 82. 760-768.

- Marks, S. R., & MacDermid, S. M. (1996). Multiple roles and the self: A theory of role balance. *Journal of Marriage and Family*, 58, 417-432.
- Marks, S., Huston, T., Johnson, E., & MacDermid, S. (2001). Role balance among white married couples. *Journal of Marriage and Family*, 63, 1083-1098.
- Markus, H. (1986). Possible selves. *American Psychologist*, 41, 954-969.
- Marshall, K. (2009). The family work week: Perspectives on Labour and Income. *Statistics Canada Catalogue no. 75-001-XIE*, 10, 4, 5-13. Retrieved on April 14, 2010 at <http://www.statcan.gc.ca/pub/75-001-x/2009104/article/10837-eng.htm>.
- Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, 50, 370-396.
- Maslow, A.H. (1970). *Motivation and personality*. New York: Harper and Row.
- Matuska, K. (2009). Workaholism, life balance, and well-being: A comparative analysis. *Journal of Occupational Science*, 17, 1.
- Matuska, K., & Christiansen, C. (Eds). (2009). *Life Balance: Multidisciplinary theories and research*. Bethesda: AOTA Press and Slack, Inc.
- Matuska, K., Erickson, B. (2008). Lifestyle Balance: How it is described and experienced by women with multiple sclerosis. *Journal of Occupational Science*. 15,1, 20-26.
- Matuska, K., & Christiansen, C. (2008). A proposed model of lifestyle balance. *Journal of Occupational Science*, 15, 1, 9-19.

- McAdams, D. P. (1992). Unity and purpose in human lives: The emergence of identity as a life story. In R. A. Zuker, (Ed.), *Personality structure in the life course* (pp. 323-376). New York: Springer.
- McAdams, D. P. (1993). *The Stories we live by: Personal myths and the making of the self*. New York: Guilford Press.
- McAdams, D.P. (1999). Personal narratives and the life story. In O. P. John (Ed.), *Handbook of personality: Theory and research* (pp. 478-500). New York: Guilford Press.
- McCubbin, H.I., & Patterson, J. (1983). The family stress process: The double ABCX model of adjustment and adaptation (pp. 7-37). In H. McCubbin, & J. Patterson (Eds.) *Social Stress and the Family*. New York: Harworth Press.
- McCubbin, H.I., & Patterson, J., Bauman, E., & Harris, L. (1981). *Systematic assessment of family stress and coping*. St. Paul: University of Minnesota.
- McDonald, L. (2008). Hill's theory of family stress and buffer factors: Build the protective factor of social relationships and positive perception with multi-family groups. Retrieved on April 21, 2010 at http://cecp.air.org/vc/presentations/2selective/3lmcdon/HILL'S_FAMILY_STRESS_THEORY_AND_FAST.htm
- McEwen, B.S. (2000). Allostasis and allostatic load: Implications for neuropsychopharmacology. *Neuropsychopharmacology* 22, 108-124.
- McEwen, B., & Lasley, E. (2002). *The end of stress as we know it*. Washington, DC: National Academic Press.

- McGregor, I., & Little, B. R. (1998). Personal projects, happiness, and meaning: On doing well and being yourself. *Journal of Personality and Social Psychology*, *74*, 494-512.
- Melchoir, M., Niedhammer, I., Berkman, L., & Goldberg, M. (2003). Do psychosocial work factors and social relations exert independent effects on sickness absence? A six year prospective study of the GAZEL cohort. *Journal of Epidemiology and Community Health: Electronic version* *57*. 285-293.
- Mendes de Leon, C., Glass, T., Beckett, L., Seeman, T., Evans, D., & Berkman, L. (1999). Social networks and disability transitions across eight intervals of yearly data in New Haven EPESE. [electronic version] *Journals of Gerontology*, *54B*, S162-S172.
- Misra, R., & McKean, M. (2000). College students' academic stress and its relation to their anxiety, time management, and leisure satisfaction. *American Journal of Health Studies*, *16*, 41-50.
- Monk, T., Reynolds, C., Buysse, D., DeGrazia, J., & Kupfer, D. (2003). The relationship between lifestyle regularity and subjective sleep quality. *Chronobiology International*, *20*, 97-107.
- Monk, T., Reynolds, C., Kupfer, D., Hoch, C., Carrier, J., & Houck, P. (1997). Differences over the life span in daily life-style regularity. *Chronobiology International*, *14*, 295-306.

- Monk, T. H., Flaherty, J. F., Frank, E., Hoskinson, K., & Kupfer, D. J. (1990). The Social Rhythm Metric - An instrument to quantify the daily rhythms of life. *The Journal of Nervous and Mental Disease*, 178, 120-126.
- Muthén, L.K. and Muthén, B.O. (1998-2010). Mplus User's Guide. Sixth Edition. Los Angeles, CA: Muthén & Muthén.
- Peloquin, S. (1990). Time as a commodity. *American Journal of Occupational Therapy*, 43, 775-782.
- Pentland, W., Harvey, A., & Walker, J. S. (1998). The relationship between time use and health and well-being in men with spinal cord injury. *Journal of Occupational Science: Australia*, 5, 14-25.
- Persson, D., Eklund, M., & Isacson, Å. (1999). The experience of everyday occupations and its relation to sense of coherence: A methodological study. *Journal of Occupational Science*, 6, 13-26.
- Persson, D., Erlandsson, L., Eklund, M., & Iwarsson, S. (2001). Value dimensions, meaning, and complexity in human occupation, a tentative structure for analysis. *Scandinavian Journal of Occupational Therapy*, 8, 7-18.
- Persson, D., & Jonsson, H. (2009). The importance of experienced challenges in a balanced life – micro and macro perspectives. In K. Matuska, & C. Christiansen. (Eds.), *Life balance: Multidisciplinary research and theories*. Bethesda: AOTA Press and Slack, Inc.

- Pentland, W. & McColl. M. (2009). Another perspective on life balance - Living in integrity with values. . In K. Matuska, & C. Christiansen. (Eds.), *Life balance: Multidisciplinary research and theories*. Bethesda: AOTA Press and Slack, Inc.
- Pett, M.A., Lackey, N. R., & Sullivan, J. J. (2003). *Making sense of factor analysis: The use of factor analysis for instrument development in health care research*. Thousand Oaks: Sage Publications.
- Pierce, D. E. (2003). *Occupation by design: Building therapeutic power*. Philadelphia: F.A. Davis.
- Reker, G. T., Peacock, E. J., & Wong, P. T. P. (1987). Meaning and purpose in life and well-being: A life-span perspective. *Journal of Gerontology*, 42, 44-49.
- Repetti, R., Taylor, S., & Seeman, T. (2002). Risky families: Family social environments and the mental and physical health of offspring. *Psychological Bulletin* [electronic version] 128, 330-366.
- Robinson, J. P., & Godbey, G. (1997). *Time for life: The surprising ways Americans use their time* (2nd ed). University Park, PA: The Pennsylvania University Press.
- Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, 57, 1069-1081.
- Ryff, C. (1995). Psychological well-being in adult life. *Current directions in Psychological Science*, 4, 99-104.

- Ryff, C. D., & Singer, B. (1996). Psychological well-being: meaning, measurement, and implications for psychotherapy research. *Psychotherapy and Psychosomatics*, *65*, 14-23.
- Ryff, C. D., & Singer, B. (1998). The contours of positive human health. *Psychological Inquiry*, *9*, 1-28.
- Sapolsky, R. M. (2004). *Why zebras don't get ulcers*. (3rd ed.). New York: Henry Holt and Co., LLC.
- Seeman, T., Gleib, D., Goldman, N., Weinstein, M., Singer, B., & Lin, Y., (2004). Social relationships and allostatic load in Taiwanese elderly and near elderly. *Social Science and Medicine*. [electronic version]. *59*, 2245-2257.
- Seeman, T., Lusignolo, T., Albert, M., Berckman, L. (2001). Social relationships, social support, and patterns of cognitive aging in healthy, high-functioning older adults: MacArthur studies of successful aging. [electron version]. *Health Psychology*, *20*, 243-255.
- Seeman, T., Singer, B., Ryff, C., Love, G., & Levy-Storms, L. (2002). Social relationships, gender, and allostatic load across two age cohorts. *Psychosomatic Medicine*. [electronic version]. *64*, 395-406.
- Seleen, D. (1982). The congruence between actual and desired use of time by older adults: a predictor of life satisfaction. *The Gerontologist*, *22*, 95-99.
- Selye, H. (1946). The general adaptation syndrome and the diseases of adaptation. *Journal of Clinical Endocrinology*, *6*, 117-230.

- Shaw, R. (2003). The agent-environment interface: Simon's indirect or Gibson's direct coupling. *Ecological Psychology, 15*, 37-106.
- Sheldon, K. (2009). Defining and validating measures of life-balance: Suggestions, a new measure, and some preliminary results. In K. Matuska, & C. Christiansen. (Eds.), *Life balance: Multidisciplinary research and theories*. Bethesda: AOTA Press.
- Sheldon, K., Cummins, R., & Khambale, S. (2008). What is life-balance, and does it matter? Testing a two-pronged conceptual and measurement approach. Manuscript submitted for publication.
- Sheldon, K. M., & Niemiec, C. P. (2006). It's not just the amount that counts: Balanced need satisfaction also affects well-being. *Journal of Personality and Social Psychology, 91*, 331-344.
- Skully, D., Kremer, J., Meade, M., Graham, R., & Dudgeon, K. (1998). Physical exercise and psychological well-being: A critical review. *British Journal of Sports Medicine*, [electronic version]. 32. 111-120.
- Statistics Canada, (1998). *General social survey: cycle 12-Time use survey user's guide*. Ottawa, ON: Statistics Canada. Retrieved on 4-3-09 at <http://www.statcan.gc.ca/bsolc/0lc-cel/0lc-cel?lang=eng&catno=12M0019X>
- Statistics Canada, (2005). *General social survey: cycle 19-Time use survey user's guide*. Ottawa, ON: Statistics Canada. Retrieved on 4-14-10 at <http://www.statcan.gc.ca/bsolc/0lc-cel/0lc-cel?lang=eng&catno=12M0012G>

- Sternberg, E. (1997). Emotions and disease: From balance of humors to balance of molecules. *National Medicine* 3, 264-267.
- Szuba, M., Yager, A., Guze, B., Allen, E., & Baxter, J. (1992). Disruption of social circadian rhythms in major depression: A preliminary report. *Psychiatry Research*, 42, 221-230.
- Taylor, S., Repetti, R., & Seeman, T. (1997). Health psychology: what is an unhealthy environment and how does it get under the skin? *Annual Review of Psychology*, 48, 411-448.
- Taylor, S., & Seeman, T. (1999). Psychosocial resources and the SES-health relationship. In N. Adler, M. Marmot, B. McEwen, J. Stewart, (Eds), *Socioeconomic status and health in industrialized nations: Social, psychological, and biological pathways*. New York: New York Academy of Sciences.
- Taylor, J. Y., Washington, O.G. M., Artiniam, N., T., & Lichtenberg, P. (2007). Parental stress among African American parents and grandparents. *Issues in Mental Health Nursing*, 28, 373-387.
- Thompson, M.G., & Heller, K. (1990). Facets of support related to well-being: Quantitative social isolation and perceived family support in a sample of elderly women. *Psychology and Aging*. 5, 535-544.
- Thorndike, R.M. (2006). *Measurement and Evaluation in Psychology and Education* (7th ed). Pearson Education, Inc: Upper Saddle River.

- Uchino, B. N., Cacioppo, J. T., Kiecolt-Glaser, J. K. (1996). The relationship between social support and physiological processes: A review with emphasis on underlying mechanisms and implications or health. *Psychological Bulletin*. 119, 483-531.
- United States Bureau of Labor Statistics (2008). *Earnings by Education*. Retrieved on March 30, 2010 at <http://www.bls.gov/>
- United States Census Bureau (2000), *Census 2000 Data for the United States*. Retrieved on March 3, 2010 at Bureauhttp://factfinder.census.gov/servlet/QTTable?_bm=y&geo_id=%200%201000US&-qr_name=DEC_2000_SF1_U_DP1&-ds_name=DEC_2000_SF1_U.
- United States Census Bureau, (2006). *Income, Poverty, and Health Insurance Coverage in the United States: 2006*. Retrieved on March 30, 2010 at Web: www.census.gov .
- Veenhoven, R. (2009). Optimal Lifestyle-mix: An inductive approach. In K. Matuska, & C. Christiansen. (Eds.), *Life balance: Multidisciplinary research and theories*. Bethesda: AOTA Press and Slack, Inc.
- Verbrugge, L. M. (1983). Multiple roles and physical health of women and men. *Journal of Health & Social Behavior*, 24, 16-30.
- Wallen, J. (2002). *Balancing work and family: The role of the workplace*. Boston: Allyn & Bacon.

- Whiteford, G. (2001). The occupational agenda of the future. *Journal of Occupational Science*, 8, 13-16.
- Whiteford, G. (2004). When people cannot participate: Occupational deprivation. In C. Christiansen, & E. Townsend (Eds.), *Introduction to Occupation: The art and science of living* (pp. 221-242). Upper Saddle River, NJ: Prentice-Hall.
- Whiteford, G. (2009). Problematising life balance: Difference, diversity and disadvantage. In K. Matuska, & C. Christiansen. (Eds.), *Life balance: Multidisciplinary research and theories*. Bethesda: AOTA Press and Slack, Inc.
- Wilcock, A. A., Hall, M., Hambley, N. (1997). The relationship between occupational balance and health: A pilot study. *Occupational Therapy International*, 4, 17-30.
- World Health Organization (2008). *Global Burden of Disease: 2004 update*. WHO Press.
- Wong, P. T. P. (2000). Meaning of life and meaning of death in successful aging. In A. Tomer (Ed.), *Death attitudes and the older adult: Theories, concepts, and applications* (pp. 23-37). Philadelphia: Brunner-Routledge.
- Yalom, Y. D. (1980). *Existential psychotherapy*. New York: Basic Books
- Youngstedt, S., O'Connor, P., & Dishman, R. (1997). The effects of acute exercise on sleep: A quantitative synthesis. *Sleep: Journal of Sleep Research & Sleep Medicine*, 20, 203-214.
- Zerubavel, E. (1981). *Hidden rhythms, schedules and calendars in social life*. Chicago: The University of Chicago Press.

Zika, S., & Chamberlain, K. (1992). On the relation between meaning in life and psychological well-being. *British Journal of Psychology*, 83, 133-145.

Zuzanek, J. (1998). Time use, time pressure, personal stress, mental health and life satisfaction from a life cycle perspective. *Journal of Occupational Science*, 5, 26-39.

Zuzanek, J. (2009). Time use imbalance: Developmental and emotional costs. In K. Matuska, & C. Christiansen. (Eds.), *Life balance: Multidisciplinary research and theories*, (pp. 207-222). Bethesda: AOTA Press and Slack, Inc.

Life Balance Inventory

To rate the following items, **STEP 1** indicate if you **do** the activity or **want** to do the activity by circling YES or NO. Then, **STEP 2**, for the activities you circled YES, think about yourself doing each activity in the past month, and rate how much time you **actually** spend in each activity compared to the amount of time you **want** to spend in each activity.

STEP 2: For the activities you circled **YES**, The amount of time I spend doing this activity is:

STEP 1: I DO this activity Or WANT to do this activity			ALWAYS LESS than I want	SOMETIMES LESS than I want	ABOUT RIGHT for me	SOMETIME MORE than I want	ALWAYS MORE than I want
Yes	No	Taking care of personal hygiene and bathing	1	2	3	2	1
Yes	No	Taking care of your appearance	1	2	3	2	1
Yes	No	Getting adequate sleep	1	2	3	2	1
Yes	No	Relaxing	1	2	3	2	1
Yes	No	Getting regular exercise	1	2	3	2	1
Yes	No	Eating nutritiously	1	2	3	2	1
Yes	No	Managing your health needs	1	2	3	2	1
Yes	No	Managing money (bills/budget/investments)	1	2	3	2	1
Yes	No	Driving	1	2	3	2	1
Yes	No	Taking the bus	1	2	3	2	1
Yes	No	Doing things with family members	1	2	3	2	1
Yes	No	Doing things with spouse/significant other	1	2	3	2	1
Yes	No	Doing things with friends	1	2	3	2	1
Yes	No	Taking care of children or family members	1	2	3	2	1
Yes	No	Having an intimate sexual relationship	1	2	3	2	1
Yes	No	Participating in groups (clubs, classes, etc.)	1	2	3	2	1
Yes	No	Meeting new people	1	2	3	2	1
Yes	No	Working for pay	1	2	3	2	1
Yes	No	Gaining competence in your job	1	2	3	2	1
Yes	No	Socializing at work	1	2	3	2	1
Yes	No	Participating in formal religious activities	1	2	3	2	1
Yes	No	Participating in traditional rituals, holidays	1	2	3	2	1
Yes	No	Participating in educational opportunities	1	2	3	2	1
Yes	No	Participating in professional organizations	1	2	3	2	1
Yes	No	Volunteering in the community	1	2	3	2	1

Yes	No	Participating in organized sports	1	2	3	2	1
Yes	No	Doing outdoor activities (hunting, fishing)	1	2	3	2	1
Yes	No	Gardening	1	2	3	2	1
Yes	No	Communing with nature	1	2	3	2	1
Yes	No	Planning and coordinating events	1	2	3	2	1
Yes	No	Decorating or organizing spaces	1	2	3	2	1
Yes	No	Cooking	1	2	3	2	1
Yes	No	Doing housework	1	2	3	2	1
Yes	No	Shopping	1	2	3	2	1
Yes	No	Taking care of pets	1	2	3	2	1
Yes	No	Going to restaurants/bars	1	2	3	2	1
Yes	No	Going to plays, movies, sporting events	1	2	3	2	1
Yes	No	Doing crafts, hobbies	1	2	3	2	1
Yes	No	Making music	1	2	3	2	1
Yes	No	Making Art	1	2	3	2	1
Yes	No	Maintaining or repairing equipment	1	2	3	2	1
Yes	No	Sewing/needlework	1	2	3	2	1
Yes	No	Reading	1	2	3	2	1
Yes	No	Using computers (text, internet, blogs)	1	2	3	2	1
Yes	No	Reflecting or meditating	1	2	3	2	1
Yes	No	Journaling	1	2	3	2	1
Yes	No	Composing, writing, (music, poetry etc)	1	2	3	2	1
Yes	No	Dancing, yoga, etc.	1	2	3	2	1
Yes	No	Playing games of skill (cards, electronic, etc)	1	2	3	2	1
Yes	No	Watching TV	1	2	3	2	1
Yes	No	Mentoring (teaching) others	1	2	3	2	1
Yes	No	Traveling (any means, locally, globally)	1	2	3	2	1
Yes	No	Storytelling	1	2	3	2	1

About You

Please indicate the one option that best describes you by putting an X in the box next to the answer or fill in the blank. (choose only one)

What is your age? _____ (fill in)

What is your sex?

- Male
- Female

What is your race?

- American Indian or Alaskan native
- Asian
- Black
- Hispanic or Latino
- Native Hawaiian or Pacific Islander
- White

What is your marital status?

- Single
- Married/partnered
- Divorced
- Separated
- Widowed

Number of children _____ (fill in)

If you have children, how many are living with you?
_____ (fill in)

What is your employment status? (check all that apply)

- Full time
- Part time
- Temporary leave from job
- Unemployed and looking for work
- Retired
- In school
- Not employed outside the home

What is the highest level of education you completed?

- Less than high school
- High school diploma or GED
- Associate degree
- Bachelor's degree
- Master's or professional degree
- Doctoral degree

What is your yearly household income?

- Less than \$10,000
- \$10,000- \$24,999
- \$25,000-\$39,999
- \$40,000 –\$54,999
- \$55,000-\$74,999
- \$75,000- \$149,999
- \$150,000 or more

DASS 21 Stress subscale: For each of the statements below, please mark the statement that best indicates how much the statement applies to you **over the past week**.

1. I found it hard to wind down

- Did not apply to me at all
- Applied to me to some degree
- Applied to me a good part of the time
- Applied to me most of the time

2. I felt that I was using a lot of nervous energy

- Did not apply to me at all
- Applied to me to some degree
- Applied to me a good part of the time
- Applied to me most of the time

3. I found it difficult to relax

- Did not apply to me at all
- Applied to me to some degree
- Applied to me a good part of the time
- Applied to me most of the time

4. I found myself getting agitated

- Did not apply to me at all
- Applied to me to some degree
- Applied to me a good part of the time
- Applied to me most of the time often

5. I tended to over-react to situations

- Did not apply to me at all
- Applied to me to some degree
- Applied to me a good part of the time
- Applied to me most of the time

6. I felt I was rather touchy

- Did not apply to me at all
- Applied to me to some degree
- Applied to me a good part of the time
- Applied to me most of the time

7. I was intolerant of anything that kept me from getting on with what I was doing

- Did not apply to me at all
- Applied to me to some degree
- Applied to me a good part of the time
- Applied to me most of the time often

The Life Balance Inventory



This is an invitation for you to complete the enclosed battery of assessments related to your lifestyle. It is a group of short questionnaires that will take about 20 minutes to complete where you will be asked about your time use in activities, your feelings, and your stress. Specific instructions precede each part.

The purpose of this research is to determine how different aspects of peoples' lives are or are not related.

I deeply appreciate your willingness to fill out the assessments and assist with this research!
Please return the completed assessments to me as soon as you have finished them.
Many thanks in advance

Kathleen Matuska

Kathleen Matuska

Doctoral Student, University of Minnesota

Appendix B: PWI-A and BPNS Scales

Feelings I Have

Please read each of the following items carefully, thinking about how it relates to your life, and then indicate how true it is for you. Use the following scale to respond:

	1	2	3	4	5	6	7	
	not at all true			somewhat true			very true	
						Not at all true	Somewhat true	Very true
1. I feel like I am free to decide for myself how to live my life.	1	2	3	4	5	6	7	
2. I really like the people I interact with.	1	2	3	4	5	6	7	
3. Often, I do not feel very competent.	1	2	3	4	5	6	7	
4. I feel pressured in my life.	1	2	3	4	5	6	7	
5. People I know tell me I am good at what I do.	1	2	3	4	5	6	7	
6. I get along with people I come into contact with.	1	2	3	4	5	6	7	
7. I pretty much keep to myself and don't have a lot of social contacts.	1	2	3	4	5	6	7	
8. I generally feel free to express my ideas and opinions.	1	2	3	4	5	6	7	
9. I consider the people I regularly interact with to be my friends.	1	2	3	4	5	6	7	
10. I have been able to learn interesting new skills recently.	1	2	3	4	5	6	7	
11. In my daily life, I frequently have to do what I am told.	1	2	3	4	5	6	7	
12. People in my life care about me.	1	2	3	4	5	6	7	
13. Most days I feel a sense of accomplishment from what I do.	1	2	3	4	5	6	7	
14. People I interact with on a daily basis tend to take my feelings into consideration.	1	2	3	4	5	6	7	
15. In my life I do not get much of a chance to show how capable I am.	1	2	3	4	5	6	7	
16. There are not many people that I am close to	1	2	3	4	5	6	7	
17. I feel like I can pretty much be myself in my daily situations.	1	2	3	4	5	6	7	
18. The people I interact with regularly do not seem to like me much.	1	2	3	4	5	6	7	
19. I often do not feel very capable.	1	2	3	4	5	6	7	

20. There is not much opportunity for me to decide for myself how to do things in my daily life.	1	2	3	4	5	6	7
21. People are generally pretty friendly towards me.	1	2	3	4	5	6	7

Satisfaction with Life

The following questions ask how satisfied you feel, on a scale from zero to 10. **Zero** means you feel completely dissatisfied. **10** means you feel completely satisfied. And the **middle of the scale is 5**, which means you feel neutral, neither satisfied nor dissatisfied.”

	Completely dissatisfied				Neutral		Completely satisfied				
	0	1	2	3	4	5	6	7	8	9	10
1. Thinking about your own life and personal circumstances, how satisfied are you with your life as a whole ?	0	1	2	3	4	5	6	7	8	9	10
2. How satisfied are you with your standard of living ?	0	1	2	3	4	5	6	7	8	9	10
3. How satisfied are you with your health ?	0	1	2	3	4	5	6	7	8	9	10
4. How satisfied are you with what you are achieving in life ?	0	1	2	3	4	5	6	7	8	9	10
5. How satisfied are you with your personal relationships ?	0	1	2	3	4	5	6	7	8	9	10
6. How satisfied are you with how safe you feel ?	0	1	2	3	4	5	6	7	8	9	10
7. How satisfied are you with feeling part of your community ?	0	1	2	3	4	5	6	7	8	9	10
8. How satisfied are you with your future security ?	0	1	2	3	4	5	6	7	8	9	10
9. How satisfied are you with your spirituality or religion ?	0	1	2	3	4	5	6	7	8	9	10

Appendix C: Rasch Analysis output

INPUT: 458 PERSON 53 ITEM MEASURED: 458 PERSON 53 ITEM 159 CATS 3.69.1.6

PERSON: REAL SEP.: 2.79 REL.: .89 ... ITEM: REAL SEP.: 5.49 REL.: .97

ITEM STATISTICS: MEASURE ORDER

ENTRY	TOTAL	MODEL	INFINIT	OUTFIT	PT-MEASURE	EXACT MATCH								
NUMBER	SCORE	COUNT	MEASURE	S.E.	MNSQ	ZSTD	MNSQ	ZSTD	CORR.	EXP.	OBS%	EXP%	ITEM	G
52	822	419	1.09	.07	1.02	.4	1.06	1.0	.50	.51	51.6	50.5	travel	0
47	215	113	1.01	.14	.82	-1.7	.86	-1.2	.57	.48	51.4	48.1	compose	0
10	209	101	.84	.14	1.35	2.9	1.82	4.3	.31	.52	37.0	46.5	bus	0
46	279	142	.79	.12	.91	-.9	.90	-1.0	.51	.45	49.6	48.4	journal	0
39	349	167	.76	.12	.82	-2.2	.81	-2.0	.59	.49	53.3	51.3	music	0
40	355	172	.74	.12	.87	-1.4	.87	-1.4	.56	.48	57.3	54.3	art	0
43	896	426	.71	.08	.88	-2.0	.87	-2.1	.56	.49	57.8	55.9	read	0
48	481	233	.71	.10	.95	-.7	.94	-.7	.49	.46	53.2	53.9	dance	0
5	945	446	.68	.08	1.04	.7	1.06	1.0	.45	.48	50.5	54.9	exercise	0
27	715	338	.65	.09	1.03	.5	1.03	.5	.46	.49	54.9	55.2	outdoor	0
42	294	136	.59	.13	.81	-2.0	.82	-1.5	.61	.52	53.3	48.7	sew	0
28	586	268	.51	.09	1.01	.1	1.04	.4	.48	.49	46.8	48.8	garden	0
25	811	371	.50	.09	1.02	.4	1.00	.0	.47	.48	55.4	55.9	volunteer	0
29	719	327	.45	.09	.89	-1.7	.88	-1.7	.55	.48	56.5	55.6	commune	0
45	765	348	.42	.09	.98	-.3	.96	-.5	.49	.47	57.1	55.6	meditate	0
38	777	343	.22	.09	.87	-2.1	.84	-2.3	.56	.46	62.2	56.7	crafts	0
4	1005	447	.22	.09	.99	-.1	.98	-.3	.46	.46	62.2	60.9	relax	0
26	527	231	.19	.10	.95	-.6	.91	-1.0	.50	.46	55.2	53.0	sports	0
3	1009	449	.17	.09	1.11	1.7	1.15	2.2	.36	.45	58.7	62.1	sleep	0

	12	903	391	.16	.09	.93	-1.1	.91	-1.3	.51	.47	61.1	56.6	spouse	0	
	15	870	371	.11	.08	1.17	2.5	1.42	4.5	.35	.47	52.4	54.8	sex	0	
	33	903	393	.09	.09	1.00	.1	.98	-.3	.45	.45	55.6	57.6	housewrk	0	
	6	1035	448	.05	.08	.98	-.4	.99	-.1	.46	.45	59.5	59.6	eat	0	
	13	1033	449	.03	.09	1.02	.3	1.00	.0	.44	.45	59.1	60.5	friends	0	
	44	1004	428	.03	.08	1.04	.7	1.03	.4	.43	.45	56.6	57.1	surf	0	
	41	487	202	.03	.12	.96	-.4	.92	-.6	.49	.46	55.8	57.0	repair	0	
	51	778	330	.02	.09	1.01	.2	.99	-.1	.45	.46	55.0	55.1	mentor	0	
	31	708	300	-.01	.09	.98	-.2	.98	-.2	.48	.47	54.8	55.3	decorate	0	
	32	950	404	-.01	.08	.98	-.3	.97	-.4	.46	.45	57.1	57.3	cook	0	
	21	740	314	-.07	.10	1.04	.6	1.03	.4	.41	.44	56.3	58.8	religious	0	
	8	1059	438	-.10	.08	1.00	.0	.98	-.3	.46	.45	57.6	58.1	money	0	
	11	1060	450	-.10	.08	1.02	.4	1.03	.4	.42	.44	56.4	59.9	family	0	
	18	854	364	-.12	.09	1.10	1.5	1.09	1.3	.36	.44	57.0	56.7	work	0	
	37	987	418	-.14	.09	1.00	.0	.99	-.2	.44	.44	57.6	59.5	plays	0	
	9	1095	442	-.22	.08	1.19	2.8	1.15	1.7	.34	.44	58.0	60.3	drive	0	
	24	585	247	-.22	.11	.89	-1.4	.87	-1.6	.52	.44	56.1	57.5	professio	0	
	23	939	390	-.29	.09	.95	-.7	.93	-1.0	.47	.44	58.4	59.8	educate	0	
	30	673	275	-.32	.11	1.08	1.0	1.11	1.1	.39	.44	57.1	60.3	planning	0	
	35	631	247	-.32	.11	.87	-1.4	.84	-1.2	.51	.43	66.3	63.2	pets	0	
	49	829	338	-.33	.10	.89	-1.6	.88	-1.5	.50	.42	63.0	60.0	games	0	
	16	963	392	-.36	.09	.98	-.3	1.00	.0	.43	.42	60.1	60.7	groups	0	
	50	1072	425	-.43	.09	1.04	.6	1.20	2.2	.39	.42	61.0	62.6	TV	0	
	17	1038	422	-.45	.09	.96	-.6	.95	-.7	.45	.42	62.9	61.4	meeting	0	
	34	1026	403	-.54	.09	1.07	.9	1.11	1.2	.36	.42	60.3	64.0	shop	0	
	36	1119	435	-.55	.09	1.02	.3	1.01	.1	.40	.41	60.7	65.0	restraunts	0	
	7	1134	447	-.57	.09	.96	-.6	.92	-1.0	.45	.41	62.7	63.9	health	0	

53	545	214	-.69	.13	1.06	.7	1.08	.7	.38	.41	71.7	64.2	storytel	0
14	845	329	-.71	.10	.90	-1.3	.92	-.8	.47	.42	68.2	65.5	caring fam0	0
20	966	366	-.98	.10	1.08	.9	1.02	.2	.34	.39	65.4	69.3	socialwk	0
19	969	366	-1.01	.10	1.09	1.1	1.09	.9	.32	.38	67.9	69.7	competnc	0
22	1155	424	-1.05	.10	.90	-1.1	.91	-.6	.41	.37	76.0	75.6	holiday	0
1	1278	458	-1.08	.10	1.11	1.0	1.07	.4	.29	.35	80.1	81.6	hygien	0
2	1212	456	-1.11	.10	.96	-.6	.91	-.9	.41	.38	71.6	70.3	appear	0
-----+-----+-----+-----+-----+-----														
MEAN	815.2	344.4	.00	.10	.99	-.1	1.00	-.1			58.6	58.8		
S.D.	264.7	101.3	.56	.02	.10	1.2	.16	1.4			7.0	6.6		

The table shows the Winsteps output with the item analysis results. The most critical columns show the mean squares (MNSQ). Item scores of 2.0 or less indicate that the item is contributing significantly to the overall test. This output shows that each item is contributing to the overall test.

Appendix D: Mean and Standard deviation for demographic groups for LBI raw score, DASS, need satisfaction (autonomy, relatedness, and competence) and PWI

		LBI raw score		DASS21		Autonomy		Relatedness		Competence		PWI	
		\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD
gender:													
	Male n=205	2.42	.33	11.60	3.58	35.28	6.08	44.81	7.52	30.8	5.52	65.84	14.93
	Female n=253	2.34	.29	13.21	4.01	36.85	5.96	46.85	6.50	32.16	5.27	65.62	12.37
Age group:													
	18 – 30 years	2.31	.28	13.44	3.81	34.72	5.77	46.27	6.47	31.28	5.35	64.46	12.38
	31 – 50 years	2.24	.38	13.15	3.80	35.11	5.53	44.50	9.17	31.49	5.31	62.17	12.90
	51- 65 years	2.54	.32	11.16	3.67	38.95	5.81	46.27	6.22	32.99	4.93	68.70	13.15
	65 years and over	2.56	.28	10.51	3.26	38.75	6.03	45.82	6.14	30.82	6.09	70.83	16.21
Race:													
	Asian n=39	2.13	.32	12.74	4.84	34.08	6.22	42.72	7.51	29.90	5.82	59.77	14.74
	Black n= 37	2.26	.33	11.19	2.93	36.89	6.12	45.68	6.79	32.49	5.61	63.35	13.83
	Hispanic or Latino n =30	2.30	.34	13.00	4.16	35.97	4.82	44.83	6.09	30.87	5.17	64.80	14.52
	White n =341	2.42	.29	12.58	3.86	36.41	6.09	46.34	6.95	31.75	5.33	67.05	13.02
Marital Status:													
	Single n=195	2.34	.28	13.07	3.90	34.67	5.71	45.78	6.75	31.04	5.49	64.41	12.34
		2.41	.34	12.14	3.75	36.99	6.07	45.66	7.41	31.99	5.34	66.93	14.24

Married/partnered n=227													
Divorced n=16	2.33	.28	13.44	4.66	37.88	5.03	46.88	5.67	32.38	4.98	57.50	13.23	
Widowed n=15	2.49	.33	10.80	2.91	40.47	5.96	48.80	5.12	30.73	5.98	74.20	12.35	
Employment													
Full time n= 174	2.27	.31	13.35	3.97	35.11	5.72	44.78	7.18	31.19	5.26	61.84	12.96	
Part time n= 45	2.33	.30	12.40	4.08	35.22	6.40	46.69	9.81	31.36	5.47	63.60	14.57	
Unemployed n=11	2.31	.44	11.45	2.70	36.09	7.94	45.64	7.42	29.55	7.12	64.36	15.74	
Retired n =104	2.59	.30	10.57	3.66	39.30	5.77	45.80	6.07	31.28	5.94	71.08	14.97	
In school n=118	2.37	.24	13.05	3.51	35.41	5.66	47.12	6.11	32.58	4.82	67.74	10.47	
Education													
Less than HS n=10	2.21	.39	13.30	5.72	35.80	6.46	41.10	7.45	27.30	3.53	57.20	16.94	
HS or GED n =115	2.39	.32	12.29	3.81	33.95	5.64	44.67	7.10	30.41	5.31	66.37	13.25	
AA degree n=43	2.31	.33	12.35	3.96	35.72	5.75	44.19	8.51	29.81	5.77	62.60	13.18	
BS/BA degree n=197	2.36	.30	12.77	3.97	*36.8 4	6.22	46.97	6.16	*32.2 7	5.45	66.08	12.93	
Masters Degree n=71	2.45	.32	11.97	3.34	*37.9 7	5.18	46.30	7.67	*33.1 7	4.78	67.37	13.84	
Dr degree n = 17	2.44	.22	13.06	3.82	36.41	7.02	45.41	6.55	31.00	5.10	64.29	19.47	
Income													
Less than \$10K n= 78	2.39	.26	12.55	3.79	34.82	5.79	47.15	6.15	31.86	5.05	68.18	10.94	
\$10K- \$24K n=61	2.30	.31	12.60	3.69	35.38	6.00	45.31	7.33	30.62	5.48	63.57	12.65	

—	\$25K - \$39K n= 73	2.31	.37	12.56	4.43	35.33	5.88	44.07	7.46	29.96	5.77	60.68	14.41
	\$40K - \$54K n =68	2.37	.32	12.93	3.71	35.74	6.08	44.84	7.22	30.18	5.82	64.44	13.59
	\$55K -\$74K n = 65	2.38	.33	12.65	3.64	36.43	5.81	45.91	6.24	33.12	5.19	66.17	13.86
	\$75K-\$149K n =85	2.45	.32	12.00	3.88	37.99	6.18	46.68	7.72	32.65	4.88	68.61	14.33
	Over \$150K n = 18	2.54	.17	11.56	3.38	40.00	5.42	49.06	4.73	34.72	3.63	74.94	6.58
	Number of Children:												
	None n =235	2.35	.27	12.99	3.71	35.13	5.86	46.26	7.26	31.26	5.37	64.76	12.70
	One n= 48	2.29	.35	12.96	3.54	36.40	6.25	45.75	6.14	32.35	4.90	65.31	12.56
	Two n =77	2.42	.33	12.03	3.67	37.35	5.79	45.13	6.21	31.65	5.42	67.71	12.43
	Three n = 56	2.40	.39	11.54	3.88	37.27	6.08	45.04	7.77	31.74	5.75	65.98	15.86
	Four n = 23	2.49	.35	11.70	4.74	37.43	7.67	45.52	7.16	31.61	6.42	63.91	20.20
	Five n = 11	2.48	.37	12.82	5.53	36.73	5.27	44.82	8.06	30.18	5.42	69.18	13.60
	Number of children living at home												
	None n = 347	2.42	.30	12.23	3.79	36.41	6.12	46.22	6.91	31.53	5.62	66.48	13.67
	One n = 47	2.25	.32	13.28	3.55	35.83	6.26	45.62	6.26	32.49	4.30	63.98	12.14
	Two n = 39	2.24	.28	13.67	3.72	34.72	5.43	43.69	6.77	30.62	5.17	62.97	13.19
	Three n = 18	2.22	.38	13.56	3.94	35.11	5.30	45.00	8.33	31.89	4.95	63.89	15.86

Appendix E

Pearsons Correlations Among Observed Variables

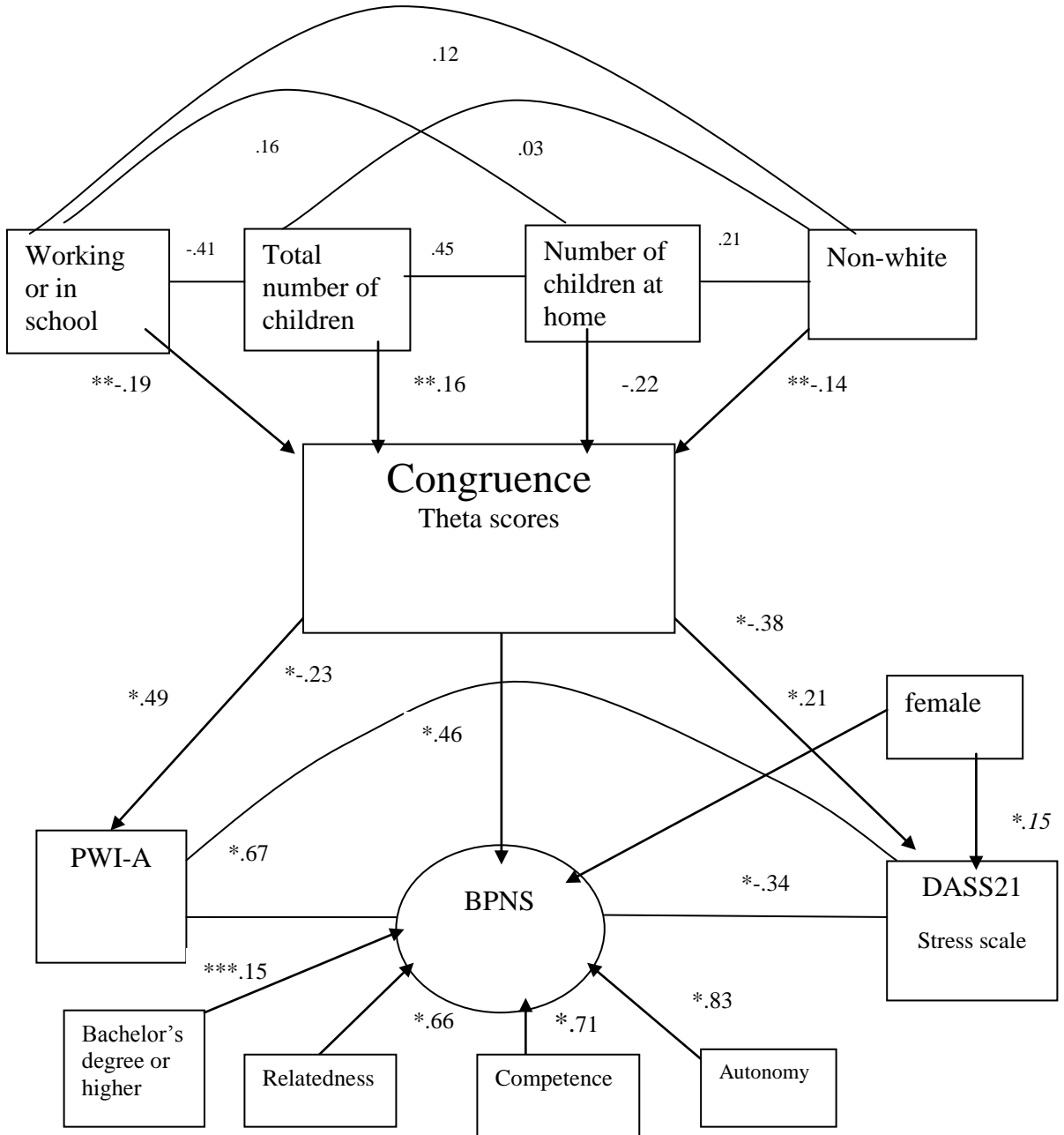
	PWI	Autonomy	Competence	Relatedness	DASS	Congruence
PWI						
Autonomy	** .60					
Competence	** .52	** .57				
Relatedness	** .47	** .54	** .52			
DASS	** -.35	** -.41	** -.21	** -.14		
Congruence	** .48	** .42	** .27	** .23	** -.39	
Equivalence	-.02	-.01	.001	.02	* .09	** -.17

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

Appendix F: Model Fit Indices and Path Coefficients of the Congruence Model with Demographics- added.

Congruence Model with Demographics-Added

Demographic-Added Model with Standardized Path Coefficients N=468



Note: * = $p \leq .000$, ** = $p \leq .001$ and *** = $p \leq .006$

Congruence Model with Demographic-Added Model Fit Indices (N= 458)

	SRMR (Good fit \leq .08)	RMSEA (Good fit \leq .10)	RMSEA (90% CI)	CFI (Good fit \geq .90)
Demographic-Added Model	.04	.09	(.078-.11)	.92

CONSENT STATEMENT

Validity Evidence for a Model and Measure of Life Balance

You are invited to complete several surveys related to lifestyle balance, subjective well-being, need satisfaction, and stress. You were selected as a possible participant because you are an adult and because you are available at this time. I ask that you read this form and ask any questions you may have before agreeing to complete the survey. This study is being conducted by me, Kathleen Matuska as part of the requirements for my dissertation at the University of Minnesota.

Background Information:

The purpose of this study is to test a theoretical model of lifestyle balance and provide validity evidence for a measure of lifestyle balance, the Lifestyle Balance Inventory (LBI). The LBI will be tested against subjective well being, basic need satisfaction, and perceived stress, to determine if the relationships among them are as predicted. The research will help determine if LBI is measuring life balance and if lifestyle balance is a legitimate and separate construct from stress, well being and need satisfaction.

Procedures:

If you agree to participate, you will be asked to complete 4 short surveys. The total time to complete all the surveys should be about 15 minutes.

Risks and Benefits of Being in the Study:

The only risk for participating in the study is that you might feel embarrassed about answering personal questions about your feelings and lifestyle. There are also no immediate or expected benefits for you for participating in the survey. Your participation will allow me to learn about how perceived life balance is related to well-being and stress and to test the LBI.

Confidentiality:

The surveys are completely anonymous and confidential. Once your responses are entered into an electronic file, the original nameless surveys will be destroyed.

Results will be reported in aggregate only.

Voluntary Nature of the Study:

Your decision whether or not to participate will not affect your current or future relations with the University. If you decide to participate, you are free to withdraw at any time without affecting that relationship.

Contacts and Questions:

I am the researcher conducting this study, and my name is Kathleen Matuska. You may ask any questions by contacting me at 651-690-6627. If you have any questions or concerns regarding the study and would like to talk to someone other than the researcher, contact Research Subjects' Advocate line, D528 Mayo, 420 Delaware Street S.E., Minneapolis, Minnesota 55455; telephone (612) 625-1650.

You may keep this form to keep for your records.

Appendix H: Journal of Occupational Science Copyright Permission

Kathleen Matuska
College of St. Catherine
Occupational Science and Occupational Therapy Department
4141
2004 Randolph Ave
St. Paul, MIN 55105
USA

15 June 2010

Dear Kathleen

Re: Copyright Permission

I am pleased to grant you copyright permission to reproduce sections of text from your article:

Christiansen, C., & Matuska, K. (2006). Lifestyle balance: A review of concepts and research. *Journal of Occupational Science*, 13(1), 49-61.

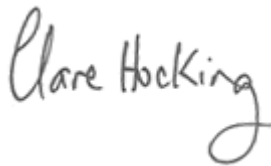
I further grant you permission to reproduce sections of text and Table 1 from:

Matuska, K., & Christiansen, C. (2008). A proposed model of lifestyle balance. *Journal of Occupational Science*, 15(1), 9-19.

This permission is granted on the basis that all text is identified as having been previously published in the Journal of Occupational Science, will full referencing information provided. As discussed, some minor wording alterations may exist.

I am aware that ProQuest may supply single copies on demand.

Yours sincerely

A handwritten signature in cursive script that reads "Clare Hocking". The signature is written in dark ink and is positioned above the printed name and title.

Clare Hocking
Editor