

EMOTIONAL RESPONSES TOWARDS THE USE OF  
RECTILINEAR, SYMMETRICAL CURVILINEAR AND ASYMMETRICAL CURVILINEAR  
FORMS IN VIRTUAL ENVIRONMENTS

A Master's Thesis

by

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The Department of  
Interior Architecture and Environmental Design  
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ANKARA  
July 2016





To my family



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RECTILINEAR, SYMMETRICAL CURVILINEAR AND ASYMMETRICAL CURVILINEAR  
FORMS IN VIRTUAL ENVIRONMENTS

The Graduate School of Economics and Social Sciences

of

İhsan Doğramacı Bilkent University

by

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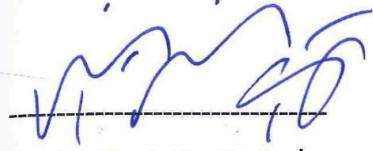
In Partial Fulfillment of the Requirements for the Degree of  
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THE DEPARTMENT OF  
INTERIOR ARCHITECTURE AND ENVIRONMENTAL DESIGN  
İHSAN DOĞRAMACI BİLKENT UNIVERSITY

ANKARA

July 2016

I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Arts in Interior Architecture and Environmental Design.



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## ABSTRACT

### EMOTIONAL RESPONSES TOWARDS THE USE OF RECTILINEAR, SYMMETRICAL CURVILINEAR AND ASYMMETRICAL CURVILINEAR FORMS IN VIRTUAL ENVIRONMENTS

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The aim of the study is to understand the effect of various forms in designs of interior environments and compare different emotional responses of people towards those environments. Therefore, this study was conducted to compare positive or negative emotional responses of people experiencing interior environments designed by three different forms: rectilinear, symmetrical curvilinear and asymmetrical curvilinear. Twelve virtual interior settings were created according to these forms. A questionnaire involving Mehrabian and Russell's PAD adjective pairs was utilized to measure emotional responses of 61 volunteer respondents contacted on Balgat Campus of Çankaya University. The results of one way ANOVA tests illustrated that respondents felt more pleasant and aroused in the setting designed with asymmetrical curvilinear forms than other settings. Moreover, men tended to be more aroused in the setting designed with symmetrical curvilinear forms than women.

**Keywords:** Curvilinear Forms, Emotion, Mehrabian and Russell's PAD model, Rectilinear Forms, Virtual Environments.

## ÖZET

### SANAL ORTAM DENEYİMİNDE DOĞRUSAL, SİMETRİK EĞRİSEL VE ASİMETRİK EĞRİSEL FORMLARIN İNSANLAR ÜZERİNDEKİ DUYGUSAL ETKİLERİ

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Bu çalışmanın amacı farklı formlarda tasarlanmış iç mekânların kullanıcılar üzerindeki etkisini anlamak ve kullanıcıların bu mekânlarda hissettikleri farklı duyguları karşılaştırmaktır. Bu nedenle, doğrusal, simetrik eğrisel ve asimetrik eğrisel formlarla tasarlanmış iç mekânlarda kullanıcıların hissettikleri olumlu veya olumsuz duyguları karşılaştırmak için bu çalışma oluşturulmuştur. Doğrusal, simetrik eğrisel ve asimetrik eğrisel formlar kullanılarak 12 sanal iç mekân yaratılmıştır. Çankaya Üniversitesi'nde gönüllü olarak ankete katılan 61 kişinin duygularını ölçmek için Mehrabian ve Russell'ın PAD sıfat tamlamaları kullanılmıştır. Tek yönlü varyans analizi sonuçları katılımcıların kendilerini asimetrik eğrisel formlarla tasarlanmış iç mekânlarda diğer mekânlara göre daha keyifli ve canlı hissettiklerini göstermiştir. Bu sonuçlara ek olarak, erkekler kadınlara nazaran simetrik eğrisel formlarla tasarlanmış iç mekânlarda daha canlı hissetmişlerdir.

**Anahtar Kelimeler:** Doğrusal/Düz Formlar, Duygular, Eğrisel/Yuvarlak Formlar, Mehrabian ve Russell'ın PAD modeli, Sanal Ortamlar

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## TABLE OF CONTENTS

|                                                                 |            |
|-----------------------------------------------------------------|------------|
| <b>ABSTRACT .....</b>                                           | <b>iii</b> |
| <b>ÖZET .....</b>                                               | <b>iv</b>  |
| <b>ACKNOWLEDGEMENT .....</b>                                    | <b>v</b>   |
| <b>TABLE OF CONTENTS .....</b>                                  | <b>vi</b>  |
| <b>LIST OF TABLES.....</b>                                      | <b>ix</b>  |
| <b>LIST OF FIGURES .....</b>                                    | <b>x</b>   |
| <b>CHAPTER I: INTRODUCTION .....</b>                            | <b>1</b>   |
| 1.1. Aim of the Study.....                                      | 2          |
| 1.2 Structure of the Thesis.....                                | 3          |
| <b>CHAPTER II: LITERATURE REVIEW .....</b>                      | <b>5</b>   |
| 2.1. Physical Environment .....                                 | 6          |
| 2.1.1. Aesthetic Experience.....                                | 7          |
| 2.1.2. Form.....                                                | 8          |
| 2.1.3. Previous Studies on<br>Curvilinear Forms and design..... | 9          |
| 2.2. Emotion.....                                               | 10         |
| 2.2.1. Elements of Emotion.....                                 | 11         |
| 2.2.2. Measuring Emotion .....                                  | 12         |
| 2.3. Virtual Environments.....                                  | 13         |
| 2.3.1. Feeling Presence in Virtual Environments.....            | 14         |
| 2.3.2. Measuring Presence .....                                 | 15         |

|                                                  |           |
|--------------------------------------------------|-----------|
| <b>CHAPTER III: METHODOLOGY .....</b>            | <b>17</b> |
| 3.1. Objectives of the Study .....               | 17        |
| 3.2. Research Questions and Hypotheses .....     | 18        |
| 3.3. Instruments .....                           | 19        |
| 3.3.1. Visual Setting .....                      | 19        |
| 3.3.2. Questionnaire .....                       | 29        |
| 3.4. Sample Group .....                          | 30        |
| <b>CHAPTER IV: RESULTS AND DISCUSSION.....</b>   | <b>32</b> |
| 4.1. Presence Test Results.....                  | 33        |
| 4.2. Level of Liking the Settings.....           | 34        |
| 4.3. Comparison of PAD.....                      | 36        |
| 4.3.1. Pleasure.....                             | 36        |
| 4.3.2. Arousal.....                              | 38        |
| 4.3.3. Dominance.....                            | 49        |
| 4.3.4. Demographics with PAD .....               | 40        |
| 4.4. Analytical Plane of Bipolar Dimensions..... | 41        |
| 4.5. Internal Consistency Test.....              | 45        |
| 4.6. Correlations between Variables.....         | 46        |
| 4.7. Discussion.....                             | 47        |
| <b>CHAPTER V: CONCLUSION.....</b>                | <b>52</b> |
| 5.1. Limitations of the Research .....           | 53        |
| 5.2. Suggestions for Future Research.....        | 55        |
| <b>REFERENCES.....</b>                           | <b>56</b> |
| <b>APPENDICES .....</b>                          | <b>60</b> |
| <b>APPENDIX A .....</b>                          | <b>61</b> |

|                         |           |
|-------------------------|-----------|
| <b>APPENDIX B .....</b> | <b>66</b> |
| <b>APPENDIX C .....</b> | <b>67</b> |
| <b>APPENDIX D.....</b>  | <b>69</b> |
| <b>APPENDIX E.....</b>  | <b>72</b> |



## LIST OF TABLES

|                                                                                            |    |
|--------------------------------------------------------------------------------------------|----|
| <b>Table 1:</b> Settings with mean scores and standard deviations of presence levels ..... | 34 |
| <b>Table 2:</b> Settings with mean scores and standard deviations of level of liking ..... | 35 |
| <b>Table 3:</b> Descriptive statistics of pleasure scores of settings .....                | 37 |
| <b>Table 4:</b> Descriptive statistics of arousal scores of settings.....                  | 38 |
| <b>Table 5:</b> Descriptive statistics of dominance scores of settings .....               | 40 |

## LIST OF FIGURES

|                                                                                                                                                  |    |
|--------------------------------------------------------------------------------------------------------------------------------------------------|----|
| <b>Figure 1:</b> Circular ordering of eight effective descriptors .....                                                                          | 13 |
| <b>Figure 2:</b> Setting 1 with Three Manipulations; S1RL Rectilinear, S1SC<br>Symmetrical Curvilinear, S1AC Asymmetrical Curvilinear Form.....  | 22 |
| <b>Figure 3:</b> Setting 2 with Three Manipulations; S1RL Rectilinear, S1SC<br>Symmetrical Curvilinear, S1AC Asymmetrical Curvilinear Form ..... | 23 |
| <b>Figure 4:</b> Setting 3 with Three Manipulations; S1RL Rectilinear, S1SC<br>Symmetrical Curvilinear, S1AC Asymmetrical Curvilinear Form ..... | 24 |
| <b>Figure 5:</b> Buffer Setting a - Buffer Setting b - Buffer Setting c.....                                                                     | 26 |
| <b>Figure 6:</b> The research room .....                                                                                                         | 28 |
| <b>Figure 7:</b> Current emotional state question on a 7 point Likert scale.....                                                                 | 33 |
| <b>Figure 8:</b> Setting 1 with three variations .....                                                                                           | 42 |
| <b>Figure 9:</b> Setting 2 with three variations .....                                                                                           | 43 |
| <b>Figure 10:</b> Setting 3 with three variations .....                                                                                          | 44 |
| <b>Figure 11:</b> Total of settings with three variations .....                                                                                  | 45 |

## **CHAPTER I**

### **INTRODUCTION**

Interior environments such as residences, working areas, commercial and public places are fundamental places where people spend most of their time in their daily lives. Therefore, people are exposed to what interior environments offer them such as functionality, form, odor, noise, natural or artificial light, texture, etc. Exposing of a nonfunctional space, malodor, loud or disturbing noise, insufficient or extreme levels of light in interior environments could make people feel uncomfortable or have negative emotions attached to this environment.

Form is one of the factors that affect emotions of humans. According to Lang (1988), interaction between humans and environments creates aesthetic experience that involves form. The use of various forms in designs of interior environments could influence different emotional responses of people. Therefore, this study aimed to compare positive or negative emotional responses of people experiencing interior environments designed by rectilinear, symmetrical curvilinear and asymmetrical curvilinear forms.

Emotion is one of the fundamental factor affecting our daily lives. According to Mehrabian and Russell (1974), our near environment has an effect on our emotions and behaviors. Therefore, it is important to be aware of what elements in interior environments have positive or negative effects on our emotions. Forms such as rectilinear or curvilinear can be one of the factors affecting our emotions. Previous studies suggested that curvilinear forms trigger more positive emotions (Kuller, 1980; Shepley, 1981; Hesselgren, 1987; Papanek, 1995; Salingaros, 1998; Madani Nejad, 2007) than rectilinear forms. Also, Hopkins, Kagan, Brachfeld, Hans and Linn (1976) found that curvilinear lines draw more attention than straight lines in infants.

### **1.1 Aim of the Study**

The main purpose of this study is to find out whether people trigger different emotions in interior environments designed by rectilinear, symmetrical curvilinear and asymmetrical curvilinear settings or not, compare their emotional responses towards those interior environments and understand their relationship. Examining previous studies, it is seen that there is insufficient knowledge in the effect of various forms such as rectilinear, symmetrical curvilinear and asymmetrical curvilinear used in interior environments on people. The results of this study might increase the awareness of interior architects in using different forms in their designs. Designers could also have knowledge that their preference of forms in designing an interior environment evokes positive or negative emotions on possible users.

## **1.2 Structure of the Thesis**

This thesis involves five chapters. The introduction which consists of two parts as aim of the study and structure of the study is the first chapter. This chapter introduces the importance of forms used in interior environments and their possible effects onto emotional responses of people.

The second chapter involves literature review consisting of three sub headings as physical environment, emotion and virtual environments. The sub heading physical environment gives information about aesthetic experience, form and their relationships with humans. It also mentions about previous studies conducted for different forms. The second sub heading emotion enlightens reader about the studies on emotion, elements and various ways to measure it. The second chapter ends with the information of virtual environments, feeling presence in virtual environments and the measurement of it.

The methodology of the experiment is explained in the third chapter that has four sub headings as objectives of the study, research questions and hypotheses, instruments and sample group. Also the process of creating visual settings, conducting questionnaires, are presented in this chapter under the sub heading of instruments.

The fourth chapter: results and discussion consists of seven sub headings as presence test results, level of liking the settings, comparison of pleasure, arousal and dominance scores, analytical plane of bipolar dimensions, internal consistency test, correlations between variables and discussions. The results of the study is comprehensively and statistically analyzed, evaluated and discussed in this chapter.

The thesis finishes with the last chapter: conclusion which involves conclusion remarks of the study, limitations of the study and suggestions for future researches.

## **CHAPTER II**

### **LITERATURE REVIEW**

Environment is an inseparable part of human beings. From the earliest times, humans tend to create and alter their own physical environment according to their needs. First, they found enclosed areas in nature, such as caves to protect themselves from various threats such as climatic changes, other species etc. After that they started to build their own shelter, in another words; their own environment to fulfill their newly occurred demands with developing technology. Humans had power to create and design environments. Therefore, understanding manmade near environment and its effect on humans play a fundamental role in the design process. The following literature survey involves two main topics as physical environment and emotion. First topic, physical environment has subtopics as aesthetic experience, form and lastly curvilinear forms and design. After evaluating physical environment in detail, emotion will be presented as latter main topic that involves subtopics elements of emotion and measuring emotion.

## **2.1 Physical Environment**

Physical environment involves oxygen, atmosphere, oceans, and land, nature, odor, and so on that supports human life. It may be divided into two categories as manmade physical environment and natural physical environment. The design, shape and materials of built environment changes according to developed technologies and also societies; however, in natural environment, they hardly change. The current study mainly focuses on built environment instead of natural environment.

Various studies have been conducted to understand the relationship between environment and humans. According to Rafaeli and Vilnai-Yavetz (2004), functionality, aesthetic qualities and meanings attached specific environments are the three main factors for humans while they are evaluating their near environment. In addition, Hekkert (2006), suggested a definition of product experience: interaction between a user and a product provokes aesthetic experience, experience of meaning and emotional experience. According to Hekkert (2006), all human senses are gratified in aesthetic experience. In both studies, aesthetic factor is one of the fundamental factors in evaluating environments. It affects humans while they are evaluating an environment or a product. Therefore, the next chapter will focus on aesthetic experience.

### **2.1.1 Aesthetic Experience**

According to Lang (1988), interaction between humans and environments creates aesthetic experience. He categorizes aesthetic experience as sensory, formal and symbolic interaction. In sensory aesthetics, received sensation from the near environment is the main concern. Received sensation creates arousal according to noise, color, odor, and texture of the environment. In addition to sensory aesthetics, there is an approach as formal aesthetics in architecture, which appears with an appreciation of the visual world, involving a variety of forms, rhythms, complexities, etc. Lastly, symbolic aesthetic occurs with the related meaning of near environment that gives humans pleasure.

In addition to the symbolic aesthetics, Lang (1988) suggested five variables as building configuration, spatial configuration, material configuration, nature of illumination and lastly pigmentation. In more detail, building configuration is related with specific shapes and patterns such as rectilinear and symmetry. Spatial configuration involves consumption of space, proportion and volume of enclosed space. Thirdly, material configuration has associations with visual character, sonic, haptic, and olfactory nature. Nature of illumination is related to natural or artificial source of light. Lastly, pigmentation involves colors that humans perceive within their environments. Briefly, aesthetic experience as a term states that humans have strong association with near environment and its elements. Therefore, form in the following chapter becomes one of the fundamental elements affecting humans.

### **2.1.2 Form**

As literature has indicated so far, form of the interior space creates a subjective experience related to aesthetic experience. Therefore, it is crucial to discover which elements create form. Environment or in more specific words, interior space is a three-dimensional area, which involves a variety of volumes. As Ching (2007) explains, volume initiates with a single point and combination of points creates a line. Therefore, lines produce plane and accordingly, planes generate a volume. Ching (2007) also indicates that form is the primary identifying characteristic of volume. Various interrelations of planes create different shapes and forms such as circle, triangle, square, polygons, etc. Interior space is mostly made of cubical volumes, in another words rectilinear forms. Rectilinear forms are the compositions of straight lines. As Ching (2007) suggests, motion of straight lines creates ruled surfaces. Hence, rectilinear forms can be called as angular nature. However, it is hard to recognize rectilinear forms in nature. Curvilinear forms are more recognizable when compared to rectilinear forms. According to Ching (2007), curvilinear form is the composition of curved lines and motion of curved lines creates fluid surfaces. Moreover, curvilinear forms can be divided into two as symmetrical curvilinear and asymmetrical curvilinear forms. Symmetrical curvilinear forms are made of symmetrical curvilinear surfaces, which are inherently stable. Barrels and domes are the precise examples of symmetrical curvilinear forms. Asymmetrical curvilinear forms, which are made of asymmetrical curvilinear surfaces are dynamic and expressive in nature. According to change of perspectives, form of interior space changes dramatically in asymmetrical curvilinear forms. In addition, the amount of

complexity level increases while forms change from rectilinear to symmetrical curvilinear and symmetrical curvilinear to asymmetrical curvilinear. Form is a crucial element in the design process; therefore, there are studies related to form and its effects on humans. The next chapter will review studies on the effect of curvilinear forms on design.

### **2.1.3 Previous Studies on Curvilinear Form and Design**

In design literature on form, there are studies which mainly focus on curvature-curvilinear form. Hopkins, Kagan, Brachfeld, Hans and Linn(1976) found that curvilinear lines draw more attention than straight line in infants. Moreover, Hesselgren (1987), found that stimulations of curved streets were evaluated more positively than straight ones. Papanek (1995) illustrated why people are more likely to find curvilinear forms cuter. He suggested that child physiognomy evokes feeling of warmth and protectiveness in human according to different curvilinear forms.

In addition to these studies, Salingaros (1998) claimed that buildings with natural and biological forms appear to be psychologically more comfortable. Similarly, Shepley (1981) and Kuller (1980) found that curvilinear interior forms in architecture evoke feelings that are more positive. Madani Nejad (2007) tried to discover different emotional responses of designers and non-designers in curvilinear architectural settings. The result illustrated that non-architects had significant positive response to curvilinear architectural forms. Moreover, non-architects rated curvilinear forms to be more pleasant, uplifting and stress reducing.

Dazkir and Read (2011) studied people's emotional reactions to different furniture forms (as a visual characteristic of the environment) and used three different furniture forms such as rectilinear, curvilinear and a combination of the two. The results showed that rectilinear settings were associated with emotional states such as stressed, annoyed, and angry while curvilinear settings were associated with emotional states such as pleased, peaceful, contented, calm, and relaxed. Pearson (2001) stated another hypothesis about why humans prefer organic forms. He suggested that organic forms have an association with nature and human body. Therefore, forms evoke feelings in humans. Humans feel more positive when they encounter with organic shapes. To be able to understand various reactions of human towards different interior settings, people's emotions appears as the second main topic in literature.

## **2.2 Emotion**

According to Schachter and Singer (1962), emotion is a state of physiological arousal and of cognition appropriate to this state of arousal. Even though authors suggested a clear meaning of emotion, sources in the literature of emotion indicate that there is uncertainty. In the literature, there is a confusion about the words feeling and emotion. Feeling and emotion are different, and feeling is just one component of emotion. Desmet (2010) preferred to distinguish emotions from other affective states such as moods, attitudes, sentiments, preferences, and personality traits. Moreover, it is challenging to isolate emotion or emotional states from sentiments,

interpersonal stances and emotional traits. Desmet (2010) explained that affective states influence each other and emotion. In addition, he suggested that in product experience, sentiments are dependent on artifacts while moods and emotional traits are independent.

Previous studies focus more on basic emotions more than mixed emotions. Ekman (1992) explained that mixed emotions involve more than one emotional state. Basic emotions such as surprise, joy, sadness, disgust, fear, and contempt are universal. To understand and measure emotion, elements of emotions should be studied.

### **2.2.1 Elements of Emotion**

Scherer (2005) suggested that cognitive appraisal, bodily symptoms, action tendencies, expression and feelings are components of emotions. Cognitive appraisal provides an evaluation of events and objects. Bodily symptoms are the physiological responses such as sweating, increase of heartbeat. Action tendencies are responses such as laughing, touching. Expression is a response with facial or vocal expressions such as smiling. Lastly, feelings are the subjective experiences such as anger, happiness, and excitement.

Scherer (2005) stated that there is a need to measure all those components to be able to uncover a real emotional state. However, it is difficult to measure all components. In the literature, there are examples of various studies, which focus on different components to measure emotions. The following chapter will review the methods of measuring emotions.

### **2.2.2 Measuring Emotion**

According to Desmet (2010), emotional response should be measured at the time of experience because emotions are short-term reactions. He suggested three ways to measure emotion. The first way is measuring facial and vocal expressions, which only measures basic emotions. In this way, there is also a need for complex equipment and experts. The second way is measuring physiological reactions such as blood pressure, heart beat, brain waves. This method also needs complex and expensive equipment. The result is reliable and objective, however; this method cannot measure mixed emotions. Lastly, the subjective feeling method is a convenient way to reach data of mixed emotions. It also involves both verbal and nonverbal methods to measurement.

The literature illustrated Mehrabian and Russell (1974) model of emotion as a reliable way to measure how people evaluate their near environment; they proposed 18 semantic differential descriptors with three dimensions of emotions as pleasure, arousal and dominance. Their bipolar method contained three dimensions of emotion as pleasure-displeasure, arousal-non-arousal, and dominance-submissiveness. Pleasure-displeasure involves emotional states such as pleasant-unpleasant and happy-unhappy. Arousal-non-arousal includes sleepy-aroused, excited-depressed. Lastly, dominance-submissiveness has a range from feeling extremely controlled to feelings of mastery. Many studies preferred using this method in their surveys.

According to Russell and Pratt (1980), perceptual cognitive meaning and affective meaning are two sub categories of the meaning that persons attribute to environments. Affective meaning involves two dimensional bipolar space which has eight variables in the analytical plane (See Figure 1). The plane is combination of pleasant (0°), exciting (45°), aroused (90°), distressing (135°), unpleasant (180°), gloomy (225°), sleepy (270°), and relaxing (315°).

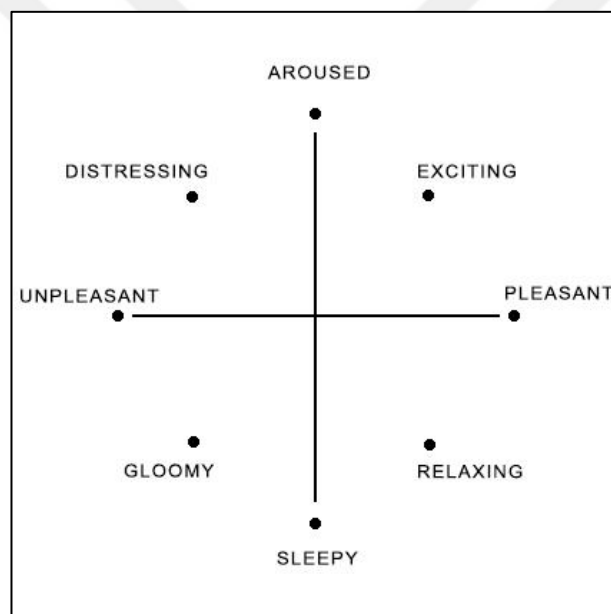


Figure 1. Circular ordering of eight effective descriptors

## 2.3 Virtual Environments

Barfield and Williges (1998: 351) described the term virtual environment as "computer generated virtual representations of human visual, proprioceptive, haptic, auditory and olfactory displays". They also defined virtual environment technology as all the technology related to virtual reality,

augmented reality, visualization, head-mounted displays, desktop computer displays, wall/room projections, perspective displays, computer walk-through, stereoscopic displays, wearable computers, computer based stimulations, and so forth". According to Belingard and Peruch (2000) and Moffat, Zoderman and Resnick (2001) (as cited in Memikoglu, 2012: 6) stated that:

Virtual environments allow simulated exploration of three-dimensional (3D) environments from a view-centered perspective, allow the creation of environments with different complexity, allow the researchers to have greater control over visual features and complexity of the environment than the real world environments and allow interactive navigation with continuous measurements within it.

Since the virtual environments is not real environments, feeling presence in virtual environments come as an important topic.

### **2.3.1 Feeling Presence in Virtual Environments**

According to Witmer and Singer (1998), the term presence is defined as a person's subjective experience of being in an environment, even though the person is physically located in another environment. In addition to this definition, Slater (1999) claimed that the term presence is a subjective and psychological sense. Witmer and Singer (1998) claimed that focus and attention of people make them to feel more involved and attached to virtual environment of stimuli.

Studies such as Danford and Willems (1975), Daniel and Meitner (2000), Hendrick, Martyniuk, Spencer and Flynn (1977) (as cited in İmamoğlu, Şenyapılı & Demirbaş, 2009) illustrates that representatives of physical

environments may produce similar evaluations like actual environments in the researches. Previous studies show that researchers used virtual environments instead of real environments in their researches (Memikoglu, 2012; Gras, Gyselinck, Perrusel, Orriols, Piolino, 2012; Memikoglu, 2014; Shushan, Portugali, Blumenfeld-Liebertal, 2016). Using virtual environments have certain advantages and disadvantages. It saves time and money as an advantage, however; there is common thought that people attending the research do not feel fully present in the environment. According to Lilly (1977) (cited in Malbos, Rapee & Kavakli, 2012: 268), "In the province of the mind, what one believes to be true is true or becomes true, within certain limits to be found experientially and experimentally. These limits are further beliefs to be transcended. In the mind, there are no limits." Therefore, there is a strong possibility that participants feel presence in the virtual environments.

### **2.3.1 Measuring Presence**

There are different approaches towards the measurement styles of presence. According to Lombard and Ditton (1997), there are physical and social approaches of six conceptualizations of presence. The six conceptualizations of presence are social richness, realism, transportation, immersion, social actor within medium, and medium within social actor. Ijsselsteijn, De Ridder, Freeman and Avons (2000) indicate that the sense of being physically located is physical presence and the feeling of being together is social presence. Moreover, Ijsselsteijn (2004) states that there are two main approaches as subjective and objective in measuring presence. He also

stated that subjective measure involves participants' conscious judgement of their psychological state or response. The objective measure involves measuring participants' automatic responses without conscious deliberation (Ijsselstein, 2004).



## **CHAPTER III**

### **THE STUDY**

#### **3.1 Objectives of the study**

Literature suggests that our environments may have an influence on our emotions. This effect could be more pronounced in interiors where we spend most of our time. Form is one of the factors which belongs to components of interior environments. Therefore, the aim of the study was to compare different emotional responses of respondents towards interior environments predominantly designed with using different line qualities in their forms namely rectilinear, symmetrical curvilinear and asymmetrical curvilinear forms.

To discover differences between emotional responses to various environments, virtual interior settings were created according to three dominant forms: rectilinear, symmetrical curvilinear and asymmetrical curvilinear. A questionnaire which used Mehrabian and Russell's PAD

adjective pairs was utilized to measure emotional response of respondents. Before starting data collection, a pilot study was conducted with 10 participants, and according to the feedbacks, required alterations were applied to the questionnaire. The finalized version of the questionnaire was applied to 61 volunteer participants contacted in Çankaya University. The answers of participants then evaluated and compared by using statistical analysis.

### **3.2 Research Questions and Hypotheses**

Form is one of the important factors which affects the emotions of people (Lang, 1988). The various forms which comes forward as a dominant input of environment changes human perception and emotion. Previous studies discovered that our reactions and emotions to different forms may differ; such as curvilinear or rectilinear forms of a furniture (Dazkir & Read 2011), curvilinear or straight street (Hesselgren, 1987) etc. (Kuller, 1980; Papanek, 1995; Salingaros 1998; Madani Nejad, 2007). Therefore, relying on the results of previous studies, the research questions and hypothesis are conducted as they are presented below;

RESEARCH QUESTION 1: Are there any differences between emotional responses of people to interior settings designed with rectilinear and curvilinear forms?

RESEARCH QUESTION 2: Are there any differences between emotional responses of people interior settings designed with symmetrical curvilinear settings and asymmetrical curvilinear forms?

HYPOTHESIS 1: Interior settings with curvilinear forms evoke more positive emotions in respondents than those with rectilinear forms.

HYPOTHESIS 2: Interior settings with symmetrical curvilinear forms evoke more positive emotions in respondents than those with asymmetrical curvilinear forms.

### **3.3 Instruments**

To measure different emotional responses of participants towards settings designed with rectilinear, symmetrical curvilinear and asymmetrical curvilinear forms, there were four main heading came forward as visual setting, questionnaire, sample group and assessment.

#### **3.3.1 Visual Setting**

Earlier studies mostly used 2D images as instruments in creating virtual environments (Hesselgren, 1987; Madani Nejad, 2007; Dazkir & Read, 2011). Generally, hand drawings or computer programs were used as visual settings. In this study, video was selected as a digital communication tool

instead of 2D drawings of settings. Thus, a total of 12 videos were prepared to present visual settings. There were three main interior setting designs, and each was manipulated to three similar settings which were predominantly formed by rectilinear, symmetrical curvilinear and asymmetrical curvilinear lines. In addition to three main interior settings with three manipulations, there were also three buffer settings in order to increase variation of the stimuli, and reduce bias that may result from respondents becoming aware of the aims of the study.

Lobbies, entrance and/or waiting areas of interior spaces were used in creating the representative settings to give a general impression, and reduce effects that may be associated with spaces with specific functions. Another aim in creating the spaces was creating interior settings which were difficult to be named or labeled easily by the respondents. We tried to eliminate the positive or negative feelings that would come with respondents' real life experience of the real life, therefore, it was avoided to design interior settings from real interior places that respondents might have been experienced. We wanted to make interior settings that respondents realize them as interior places of some building, but not name where they are from exactly. In addition, we created settings with different scales and ceiling heights to better represent everyday environments.

The settings involved interior space elements such as floors, ceilings, walls, columns, windows, doors, plinths, crown moldings and some built-in or

mobile furniture, such as desks, sitting elements, frames, etc. In all settings, human figures were located to provide scale and appear more realistic. Monochromatic color scheme was used to avoid effect of color towards emotional responses of respondents.

In the first setting (See Figure 2), there was an L shaped interior with a ceiling, suspended ceiling emphasizing the entrance direction, crown molding, walls, window, door, plinth, floor, desk, frame with no image and banks. In S1RL, all interior elements and furniture involved linear direction and cubic or rectangular prism. In S1SC, the rectilinear forms turned to be curvilinear in the edges of elements. Lastly, in S1AC, the rectilinear forms; cubic or rectangular prisms transmuted into asymmetrical rounded forms.

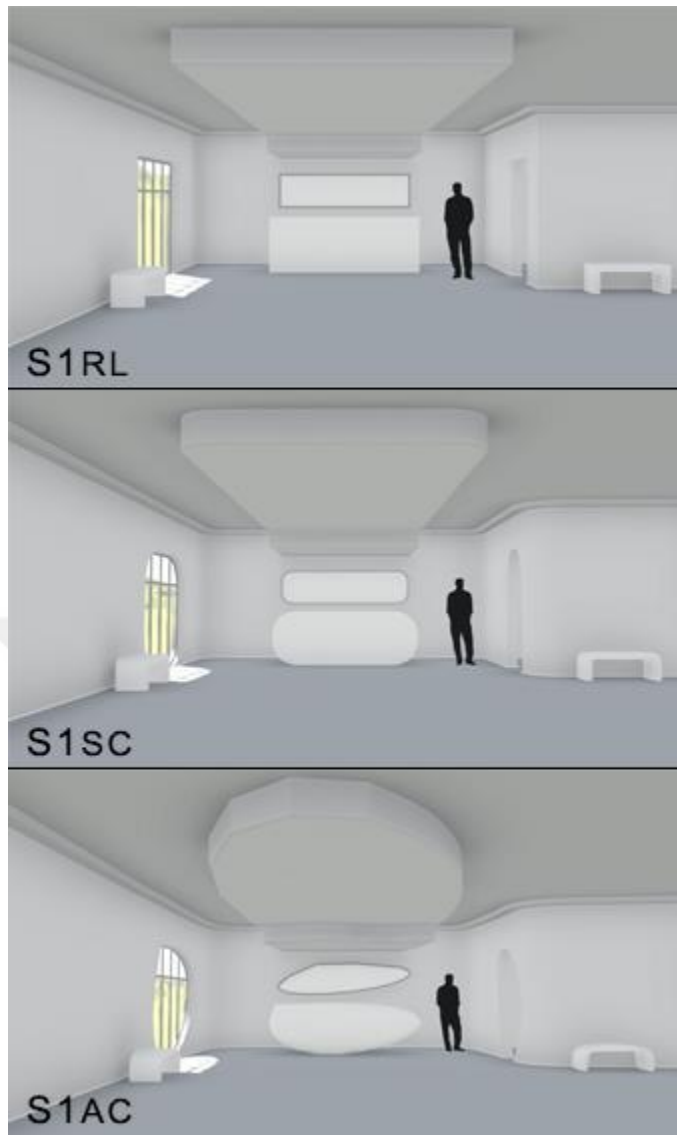


Figure 2: Setting 1 with Three Manipulations; S1RL Rectilinear, S1SC Symmetrical Curvilinear, S1AC Asymmetrical Curvilinear Form

In the second setting (See Figure 3), there was a lower case t-shaped interior which involved a ceiling, suspended ceilings emphasizing the walls and the desk area, walls, window, floor, angular L-shaped desk, and built in sitting element. In S2RL, all interior elements and furniture involved linear direction and cubic or rectangular prisms. In S2SC, as it was done in setting one, the rectilinear forms turned to be curvilinear in the edges of elements. In S2AC,

the rectilinear forms; cubic or rectangular prisms transmuted into asymmetrical rounded forms.

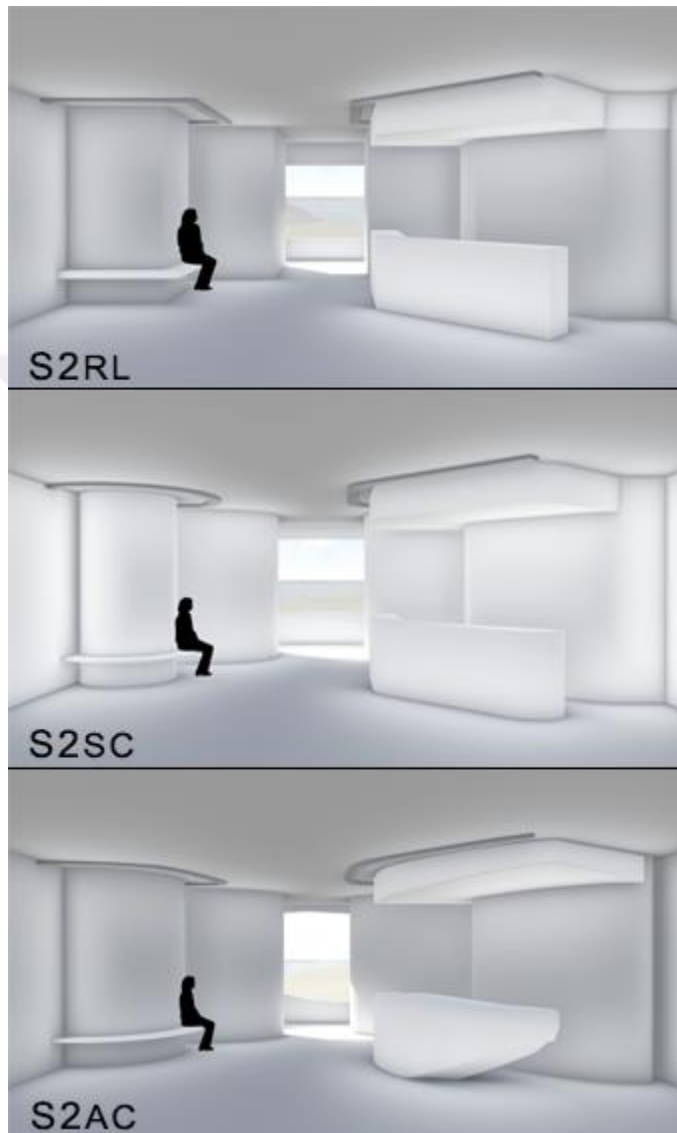


Figure 3: Setting 2 with Three Manipulations; S2RL Rectilinear, S2sc Symmetrical Curvilinear, S2AC Asymmetrical Curvilinear Form

In the third setting (See Figure 4), there was rectangular interior which involved an atrium, ceilings of first floor and second floor, columns, walls,

skylight, floor, door, rectangular desk and frame with no image. In S3RL, all interior elements and furniture involved linear direction and cubic or rectangular prisms. In S3SC, as it was done in setting one and setting two, the rectilinear forms turned to be curvilinear in the edges of elements. In S3AC, the rectilinear forms; cubic or rectangular prisms transmuted into asymmetrical rounded forms.

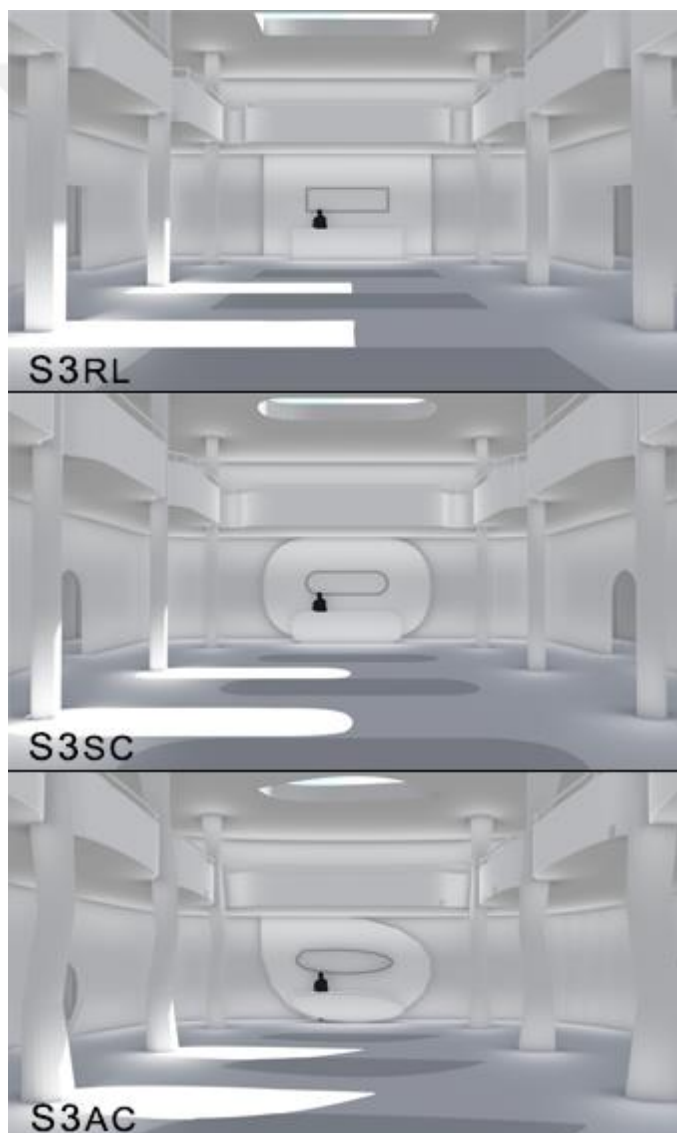


Figure 4: Setting 3 with Three Manipulations; S3RL Rectilinear, S3SC Symmetrical Curvilinear, S3AC Asymmetrical Curvilinear Form

Three buffer settings were designed with the same approach of three settings (See Figure 5). The reason of adding buffer settings in the research was to prevent learning effect. In the buffer setting a, there were L-shaped interior which involved a ceiling, walls, windows, floor, L-shaped desk and a frame with no image. Buffer setting b had a rectangular interior which involved a ceiling, a suspended ceilings emphasizing the desk walls, windows, floor, L-shaped desk, a passageway, and built in sitting elements. In the buffer setting c, there were rectangular interior which involved a ceiling, two storeys, two columns, walls, floor, angular rectangular desk, and a frame with no image.

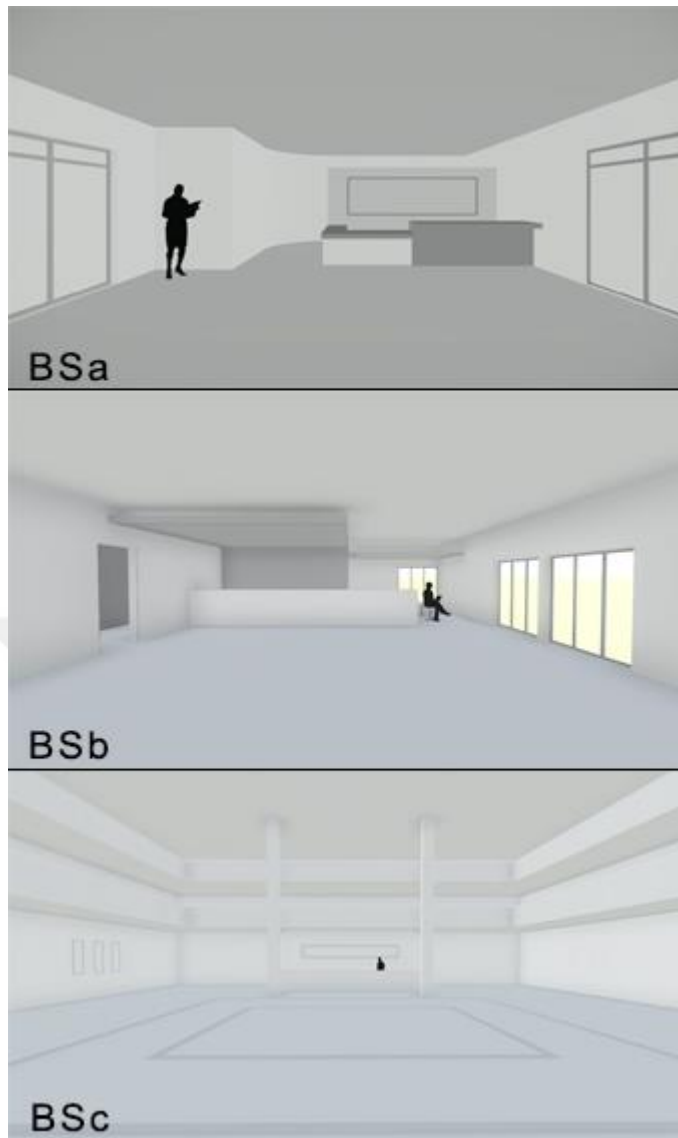


Figure 5: Buffer Setting a, BSa - Buffer Setting b, BSb - Buffer Setting c, BSc

The computer programs AutoCAD, 3Ds MAX, Lumion and After Effects were used to create the twelve videos. AutoCAD was used to draw 2D plans of the each setting. Curvature levels increased with each alternative settings. After drawing plans in AutoCAD, they were imported into the 3Ds MAX program to model the 3D versions. The light and realistic effects were applied by Lumion. The models of the settings were imported into Lumion and twelve frames were photographed for each setting. The photographs started to be

taken in a wider point of view in the setting and was approached with every frame. The twelfth frame was the closest to the focal area in the room. With the help of After Effects program, these twelve frames of photographs composed an eight seconds video at the end. In the videos predetermined path was used and the viewpoint of videos were first person viewpoint. In the first four seconds of every video the point of view was getting closer from a wider view and in the following four seconds, the point of view was getting wider from the closer view as if someone was approaching the setting, and then retreating from the setting (See Appendix A).

The respondents encountered the videos of settings in two different orders to eliminate the order effect. Twelve videos which involved three sets of settings with three manipulations each, (plus three buffer settings; twelve in total) were arranged in an order by using After Effects program so that they become one video in total. In the end, there were two videos in two different orders. Each video was two minutes and twenty six seconds long and involved a starting page explaining the study, ending page with an appreciation letter, twelve break pages following the twelve videos to offer time to respondents to fill out the ratings of the questions on the questionnaire for each video. The two orders of settings were collated by randomly picking cards from a box with twelve cards having names of all settings. See Appendix B for the orders of twelve settings in the first and second videos.

The participants sat on a stool and watched the videos from a screen of a laptop located on a black desk placed toward a white wall. The screen size of the laptop was 15 inches and respondents watched the videos in full size video format (See Figure 6).



Figure 6: The research room

### **3.3.2 Questionnaire**

The questionnaire included a paragraph that provided information about the survey and contacts. It also included a statement that participation in the study was voluntary. The questionnaire was divided into two parts. The first part aimed to get general information about respondents and in the second part there were questions to measure reactions of respondents towards the videos.

In the first part, there were five questions involving age, gender, level of education, the subjects of education, and current emotional state (See Appendix C). The respondents answered a question about their emotional state before watching the videos. The aim of the question was to control respondents' emotional states that may affect the results of the tests.

In the second part of the questionnaire, the aim was to measure respondents' presence levels in the videos, their level of liking of the settings and their emotional responses towards the settings. The presence test was applied to the participants to measure their impressions of being existent in the virtually created videos of settings. Presence test (See Appendix C) involved two questions which were taken from Hendrix and Barfield questionnaire (1996). The question following the presence test questions measured the respondents' level of liking towards the settings (See Appendix C). The aim of the question was see if there is a correlation between respondent's level of liking the settings and pleasure arousal, dominance results.

Lastly, PAD adjective pairs of Mehrabian and Russell (1974) were used to measure respondents' emotional response. In total, there were 16 adjectives used in the study. Six of them were classified as pleasure and following six were classified as arousal and last four were related to dominance. In the PAD adjective pairs of Mehrabian and Russell, there were six adjective pairs suggested for each heading pleasure, arousal and dominance. A seven point scale was used for measurement. Pleasure adjectives were Unhappy – Happy, Annoyed – Pleased, Unsatisfied – Satisfied, Melancholic – Contented, Despairing – Hopeful and Bored – Entertained. Arousal adjectives were Uninterested – Stimulated, Calm – Excited, Sluggish – Frenzied, Jittery - Dull, Sleepy - Wide-awake, Unaroused – Aroused. Lastly, dominance adjectives used in the study were Submissive – Dominant, Cared for - In control, Guided – Autonomous, Influenced – Influential. In the original test, there were two more adjective pairs for dominance however; they were removed to reduce the duration of the study.

Since the respondents were native Turkish speakers, Turkish translations of the adjective pairs and the questionnaire were conducted. The Turkish versions of adjective pairs were adopted from the research of Yekaniyalibeiglou (2015) (See Appendix D).

### **3.4 Sample Group**

Convenience sampling was used to reach the participants. After contacting the volunteering respondents, they were invited to the research room at

Çankaya University. In total, 61 respondents participated in the research. Twenty seven of them were women and 34 were men. The survey took 25 to 30 minutes for each respondent. The respondents were between 19 - 35 years old with the mean age of 26. The level of education of participants were predominantly graduate or undergraduate with the 77% also 19.7% were master - PhD and 3.3% were in high school. There were 32 participants whose majors were interior architecture and 29 respondents whose majors were social sciences, sciences and etc. (See Appendix E, Table E1).



## **CHAPTER IV**

### **RESULTS AND DISCUSSION**

In the survey, all statistical analyses were conducted using Statistics Package for the Social Sciences (SPSS 21). To analyze the collected data, the mean scores of pleasure, arousal and dominance were examined and compared between the three main settings. Independent ANOVA tests were run to compare mean scores. In addition, demographics, level of liking, current emotional state were used as dependent variables and dependent ANOVA test were run for pleasure, arousal and dominance means. Internal reliability test was run for pleasure, arousal and dominance adjectives.

The respondents marked their current emotional states on a 7 point Likert scale before starting the test (See Figure 7). They answered "somewhat good" as lower emotional state and "very good" as highest. No one marked "bad" or "very bad" as an answer. The majority of them rated their emotional state as between "somewhat good" and "good" ( $M= 5.54$ ,  $SD= 1.06$ ).

|          |                                |              |                       |               |      |           |
|----------|--------------------------------|--------------|-----------------------|---------------|------|-----------|
| 5        | How are you feeling right now? |              |                       |               |      |           |
| Very bad | Bad                            | Somewhat bad | Neither bad, nor good | Somewhat good | Good | Very good |
|          |                                |              |                       |               |      |           |

Figure 7: Current emotional state question on a 7 point Likert scale

#### 4.1 Presence Tests Results

According to the presence test of Hendrix and Barfield (1996), the majority of the respondents rated their level of presence strong in the settings. The total mean score in all settings were 65.94 with SD= 15.37 (See Table 1). Total mean scores of three variations illustrated that settings with symmetrical curvilinear lines (SSC) had the highest presence score (M= 67.17, SD=16.74). Settings with rectilinear (SRL) and asymmetrical curvilinear lines (SAC) had slightly lower presence scores Moreover, one-way repeated measure analysis of variance (ANOVA) was conducted to compare the three mean scores and the results illustrated that there were no significant difference between three variations (Wilks' Lambda=0.97, F (2, 59)=0.80,  $p=0.45>0.05$ ,  $\eta^2=0.2$  (See Appendix E, Table E2). The level of presence was highest in symmetrical curvilinear version of setting 3 (S3SC) and lowest in asymmetrical curvilinear variation of setting 1 (S1AC). The respondents had more presence in setting 3 and less presence in setting 1 (See Table 1).

Table 1: Settings with mean scores and standard deviations of presence levels

| Settings       | Presence Mean Scores | Standard Deviation |
|----------------|----------------------|--------------------|
| S1RL           | 61.40                | 22.94              |
| S2RL           | 66.40                | 21.72              |
| S3RL           | 68.28                | 21.72              |
| S1SC           | 64.73                | 19.26              |
| S2SC           | 64.13                | 21.81              |
| S3SC           | 72.65                | 21.71              |
| S1AC           | 60.18                | 23.28              |
| S2AC           | 66.54                | 22.21              |
| S3AC           | 69.19                | 23.72              |
| Total Settings | Presence Mean Scores | Standard Deviation |
| SRL            | 65.37                | 18.37              |
| SSC            | 67.17                | 16.74              |
| SAC            | 65.30                | 18.60              |
| Total          | 65.94                | 15.37              |

#### 4.2 Level of Liking the Settings

The respondents answered the question “how much have you liked the setting that you have watched?” on three point Likert scale. The majority of them had positive ratings for liking the settings that were presented to them in the video format. The total mean score in all settings were 2.38 out of three with 0.42 standard deviation. Total mean scores of three variations illustrated that respondents liked settings with symmetrical curvilinear lines (SSC) and asymmetrical curvilinear lines (SAC) slightly more than rectilinear lines (SRL) (See Table 3). One-way repeated measure analysis of variance (ANOVA) was conducted to compare three mean scores of liking the settings. The

comparison illustrated that there were no significant difference between three variations (Wilks' Lambda=0.91,  $F(2, 59) = 2.80$ ,  $p=0.07 > 0.05$ ,  $\eta^2=0.09$ ) (See Appendix E, Table E3). The respondents rated symmetrical curvilinear variation of setting 3 (S3SC) the highest. They rated rectilinear (S1RL) and symmetrical curvilinear (S1SC) variations of setting 1 as the lowest (See table 2).

Table 2: Settings with mean scores and standard deviations of level of liking

| Settings       | Level of Liking<br>the Settings<br>Mean Scores | Standard<br>Deviation |
|----------------|------------------------------------------------|-----------------------|
| S1RL           | 2.08                                           | 0.86                  |
| S2RL           | 2.33                                           | 0.83                  |
| S3RL           | 2.43                                           | 0.81                  |
| S1SC           | 2.15                                           | 0.85                  |
| S2SC           | 2.49                                           | 0.72                  |
| S3SC           | 2.67                                           | 0.68                  |
| S1AC           | 2.39                                           | 0.76                  |
| S2AC           | 2.43                                           | 0.83                  |
| S3AC           | 2.48                                           | 0.83                  |
| Total Settings | Level of Liking<br>the Settings<br>Mean Scores | Standard<br>Deviation |
| SRL            | 2.28                                           | 0.58                  |
| SSC            | 2.44                                           | 0.55                  |
| SAC            | 2.43                                           | 0.55                  |
| Total          | 2.38                                           | 0.42                  |

### **4.3 Comparison of PAD**

To see the different emotional responses of respondents between the settings rectilinear, symmetrical curvilinear and asymmetrical curvilinear variations, pleasure, arousal and dominance scores of all settings were compared conducting one-way repeated measure analysis of variance (ANOVA).

#### **4.3.1 Pleasure**

The pleasure scores were compared between the nine manipulated settings. As mentioned previously, the pleasure ranged between one and seven in all settings. Scores from five to seven states positive, four states neutral and three and below states negative ratings for pleasure. The mean scores of pleasure were negative in setting one variation of rectilinear (S1RL), setting one variation of symmetrical curvilinear (S1SC) and setting two variation of rectilinear (S2RL). The rest of the settings received positive ratings (See Table 5). Mean scores of pleasure had consistent increase starting from rectilinear setting to asymmetrical setting. In another words, rectilinear settings of three variations had the lowest mean scores of pleasure, whereas asymmetrical curvilinear settings had the highest (See Table 3). The total mean scores of three main settings illustrates that mean of pleasure score was the highest in symmetrical linear settings (SSC) and the lowest in rectilinear settings (SRL), (See Appendix E, Table E4).

Table 3: Descriptive statistics of pleasure scores of settings.

| Settings       | Minimum | Maximum | Pleasure Mean Scores | Standard Deviation |
|----------------|---------|---------|----------------------|--------------------|
| S1RL           | 1.00    | 6.67    | 3.70                 | 1.45               |
| S1SC           | 1.00    | 6.67    | 3.86                 | 1.51               |
| S1AC           | 1.33    | 6.83    | 4.09                 | 1.43               |
| S2RL           | 1.17    | 7.00    | 3.95                 | 1.39               |
| S2SC           | 1.00    | 7.00    | 4.30                 | 1.43               |
| S2AC           | 1.00    | 6.83    | 4.31                 | 1.49               |
| S3RL           | 1.00    | 7.00    | 4.52                 | 1.43               |
| S3SC           | 1.00    | 7.00    | 4.81                 | 1.32               |
| S3AC           | 1.50    | 7.00    | 4.87                 | 1.29               |
| Total Settings | Minimum | Maximum | Pleasure Mean Scores | Standard Deviation |
| SRL            | 1.06    | 6.56    | 4.06                 | 1.00               |
| SSC            | 1.11    | 6.00    | 4.32                 | 0.93               |
| SAC            | 1.39    | 6.78    | 4.42                 | 1.09               |

Moreover, according to the result of one way ANOVA, there were significant differences between the mean scores of the settings (Wilks' Lambda=0.87,  $F(2, 59) = 4.16$ ,  $p=0.02<0.05$ ,  $\eta^2=0.12$ ). The null hypothesis was rejected as there was significant difference between interior settings with curvilinear lines and rectilinear lines according to pleasure scores. In pairwise comparisons, there was significant difference between asymmetrical curvilinear and rectilinear settings with  $p \text{ value}=0.03<0.05$ . Also, there was no significant difference between rectilinear and symmetrical curvilinear with  $p \text{ value}=0.06>0.05$  (See Appendix E, Table E4).

### 4.3.2 Arousal

The arousal scores were compared between the nine manipulated settings. It ranged between one and seven in all settings as was the case in pleasure scores. The mean scores of arousal were negative in setting one variation of rectilinear (S1RL), setting one variation of symmetrical curvilinear (S1SC) and setting two variation of rectilinear (S2RL). The rest of the settings scored positive (See Table 4). Rectilinear setting of three variations had the lowest mean scores and asymmetrical curvilinear settings had the highest scores of arousal. The total mean scores of three main settings illustrates that mean of arousal score was the highest in asymmetrical linear settings (SAC) and the lowest in rectilinear settings (SRL).

Table 4: Descriptive statistics of arousal scores of settings

| <b>Settings</b>       | <b>Minimum</b> | <b>Maximum</b> | <b>Arousal Mean Scores</b> | <b>Standard Deviation</b> |
|-----------------------|----------------|----------------|----------------------------|---------------------------|
| S1RL                  | 1.00           | 7.00           | 3.72                       | 1.31                      |
| S1SC                  | 1.00           | 6.17           | 3.71                       | 1.29                      |
| S1AC                  | 1.00           | 6.50           | 4.12                       | 1.29                      |
| S2RL                  | 1.00           | 6.83           | 3.90                       | 1.24                      |
| S2SC                  | 1.00           | 6.83           | 4.05                       | 1.32                      |
| S2AC                  | 1.00           | 6.33           | 4.18                       | 1.32                      |
| S3RL                  | 1.00           | 6.83           | 4.43                       | 1.24                      |
| S3SC                  | 1.67           | 7.00           | 4.74                       | 1.10                      |
| S3AC                  | 1.83           | 7.00           | 4.85                       | 1.20                      |
| <b>Total Settings</b> | <b>Minimum</b> | <b>Maximum</b> | <b>Arousal Mean Scores</b> | <b>Standard Deviation</b> |
| SRL                   | 1.17           | 5.83           | 4.01                       | 0.86                      |
| SSC                   | 1.44           | 5.83           | 4.17                       | 0.84                      |
| SAC                   | 1.72           | 6.28           | 4.38                       | 0.96                      |

Moreover, according to the result of one way ANOVA, there were significant differences between the mean scores of the settings (Wilks' Lambda=0.87,  $F(2, 59) = 4.36$ ,  $p=0.02 < 0.05$ ,  $\eta^2=0.13$ ). The null hypothesis was rejected as there was significant difference between interior settings with curvilinear lines and rectilinear lines according to arousal scores. In pairwise comparisons, there was significant difference between asymmetrical curvilinear and rectilinear settings ( $p=0.02 < 0.05$ ). There were no significant differences between rectilinear and symmetrical curvilinear settings with  $p$  value=0.33 $>0.05$  and between symmetrical curvilinear and asymmetrical curvilinear settings ( $p=0.27 > 0.05$ ), (See Table Appendix E, Table E5).

#### **4.3.3 Dominance**

The dominance scores were compared between the nine manipulated settings. It ranged between one and seven in all settings as was the case in pleasure and arousal scores. The mean scores of dominance were negative in setting one variation of rectilinear (S1RL), setting one variation of symmetrical curvilinear (S1SC) and setting two variation of rectilinear (S2RL). The rest of the settings scored positive (See Table 5). In setting one, symmetrical curvilinear variation had the lowest mean score while symmetrical curvilinear had the highest, rectilinear variations had lowest in setting two and three while symmetrical curvilinear variation had the highest mean score. The total mean scores of three main settings illustrates that mean of dominance score was the highest in asymmetrical linear settings (SAC) and the lowest in rectilinear settings (SRL).

Table 5: Descriptive statistics of dominance scores of settings

| <b>Settings</b>       | <b>Minimum</b> | <b>Maximum</b> | <b>Dominance Mean Scores</b> | <b>Standard Deviation</b> |
|-----------------------|----------------|----------------|------------------------------|---------------------------|
| S1RL                  | 1.00           | 6.75           | 3.81                         | 1.37                      |
| S1SC                  | 1.00           | 7.00           | 3.75                         | 1.51                      |
| S1AC                  | 1.25           | 7.00           | 4.14                         | 1.30                      |
| S2RL                  | 1.00           | 7.00           | 3.84                         | 1.40                      |
| S2SC                  | 1.00           | 7.00           | 4.07                         | 1.52                      |
| S2AC                  | 1.00           | 7.00           | 4.06                         | 1.49                      |
| S3RL                  | 1.00           | 7.00           | 4.45                         | 1.42                      |
| S3SC                  | 1.00           | 7.00           | 4.64                         | 1.34                      |
| S3AC                  | 1.00           | 7.00           | 4.59                         | 1.32                      |
| <b>Total Settings</b> | <b>Minimum</b> | <b>Maximum</b> | <b>Dominance Mean Scores</b> | <b>Standard Deviation</b> |
| SRL                   | 1.00           | 6.25           | 4.04                         | 0.89                      |
| SSC                   | 1.17           | 6.08           | 4.16                         | 0.95                      |
| SAC                   | 1.17           | 6.75           | 4.26                         | 1.00                      |

The results of one way ANOVA indicated that there were no significant differences between the mean scores of the settings (Wilks' Lambda=0.93,  $F(2, 59)=2.08$ ,  $p=0.13>0.05$ ,  $\eta^2=0.07$ ) (See Table Appendix E, Table E6).

#### 4.3.4 Demographics with PAD

One way ANOVA test was conducted on dependent pleasure, arousal and dominance scores with factors; age, gender, level of education, area of education and current emotional state. There were no significant difference in factors age, level of education and current emotional state. There were significant differences examined in factors; gender and level of education.

One way ANOVA illustrated that there was a significant difference in arousal

of symmetrical curvilinear settings ( $F(1,60)=4.52, p=0.04<0.05$ ). Men had higher ratings for arousal in symmetrical curvilinear setting than women (See Appendix E, Table E7). Moreover, the results showed that there was a significant difference in arousal of symmetrical curvilinear settings ( $F(1,59)=4.73, p=0.03<0.05$ ). Interior architects had higher ratings for arousal in symmetrical curvilinear setting than respondents whose majors were other studies (See Appendix E, Table E8).

#### **4.4 Analytical Plane of Bipolar Dimensions**

In the study, pleasure and arousal scores of all settings were applied to this analytical plane. In the first set of rectilinear, symmetrical and asymmetrical curvilinear settings, results illustrated that all variations of settings had scatters mostly in unpleasant-sleepy (gloomy) and pleasant-aroused (exciting) emotions; however, the percentages change according to rectilinear, symmetrical and asymmetrical curvilinear settings (See Figure 8). In the first set of variations, gloomy was dominant in rectilinear setting, gloomy and exciting were dominant in symmetrical curvilinear setting and exciting was dominant in asymmetrical curvilinear setting.

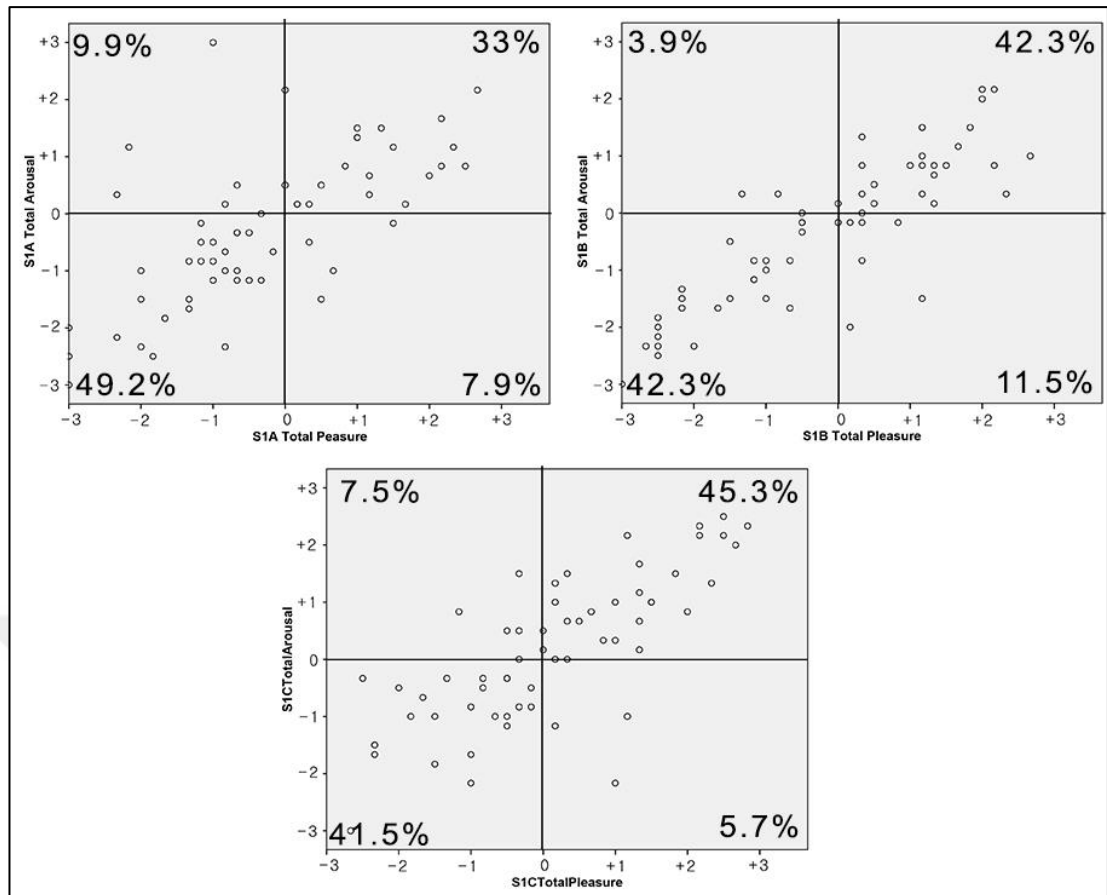


Figure 8: Setting 1 with three variations

In the second set of variations, results illustrated that all variations of setting second had scatters dominant in pleasant-aroused (exciting) emotions; however, the percentages of exciting changes according to rectilinear, symmetrical and asymmetrical curvilinear settings. Exciting was dominant in rectilinear setting with 43.6%, in symmetrical curvilinear setting with 45% and in asymmetrical curvilinear setting with 56.6% (See Figure 9).

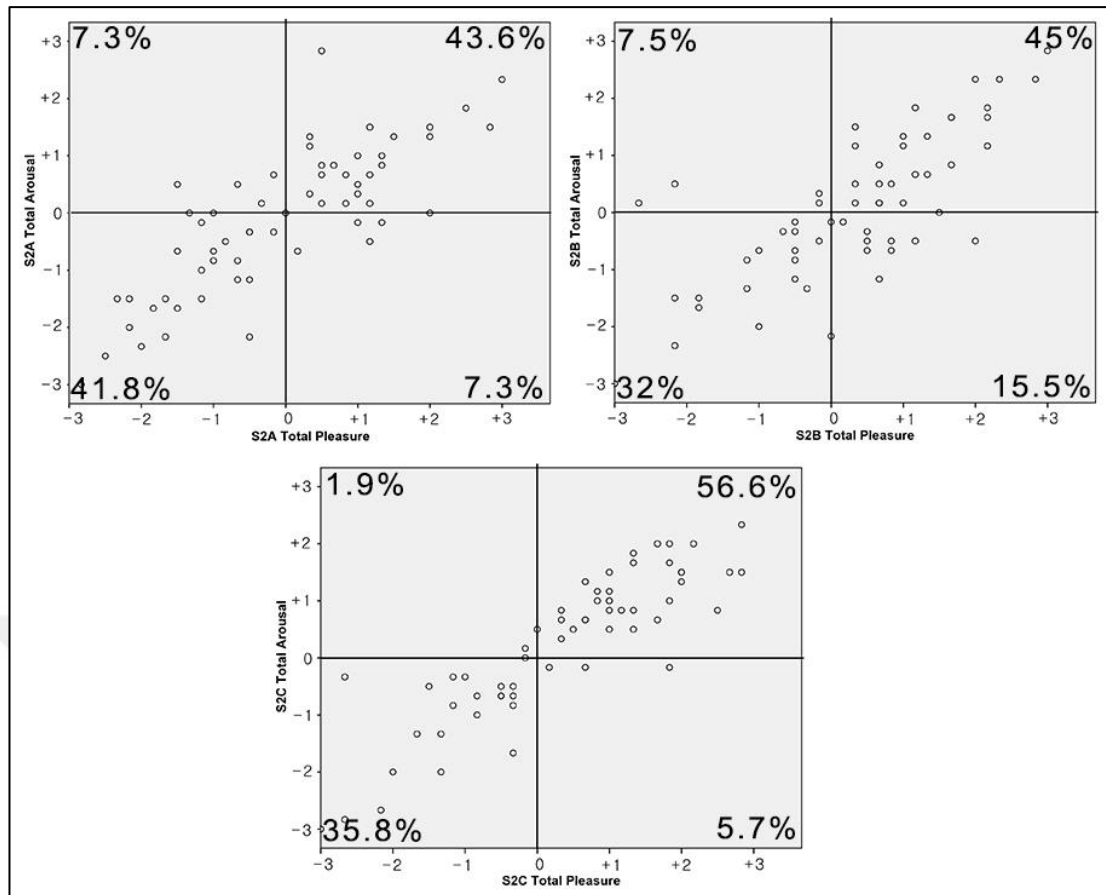


Figure 9: Setting 2 with three variations

In the third set of variations, results illustrated that all variations of setting third had scatters more dominant in pleasant-aroused (exciting) emotions than in the second set of variations. The percentages of exciting changes according to variations like the first and the second set of variations. Exciting was dominant in rectilinear setting with 64.6%, in symmetrical curvilinear setting with 75.4% and in asymmetrical curvilinear setting with 71.6% (See Figure 10). The difference of this set is that there is no rise in asymmetrical curvilinear setting like previous set of variations. In variation of asymmetrical curvilinear 3.8% of excitement moved to distressing.

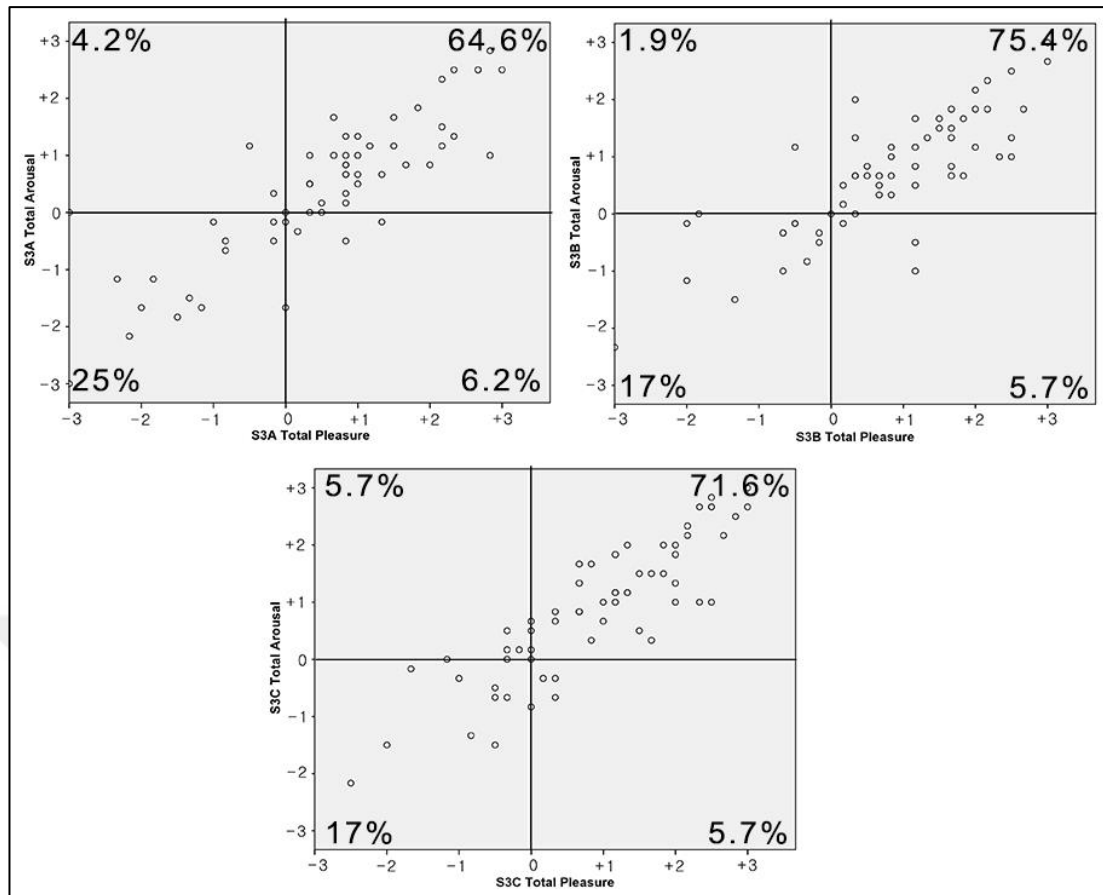


Figure 10: Setting 3 with three variations

In the all set of variations, results illustrated that rectilinear variations of three settings had 42.4% dominance in gloomy part of the analytical plane.

Symmetrical and asymmetrical curvilinear variations had dominance in excited part. Moreover, rectilinear variation had second dominance in exciting, symmetrical curvilinear had in relaxing and asymmetrical curvilinear had in gloomy parts of the analytical plane. The results illustrates that the change of forms in interior settings affects emotional responses of people (See figure 11).

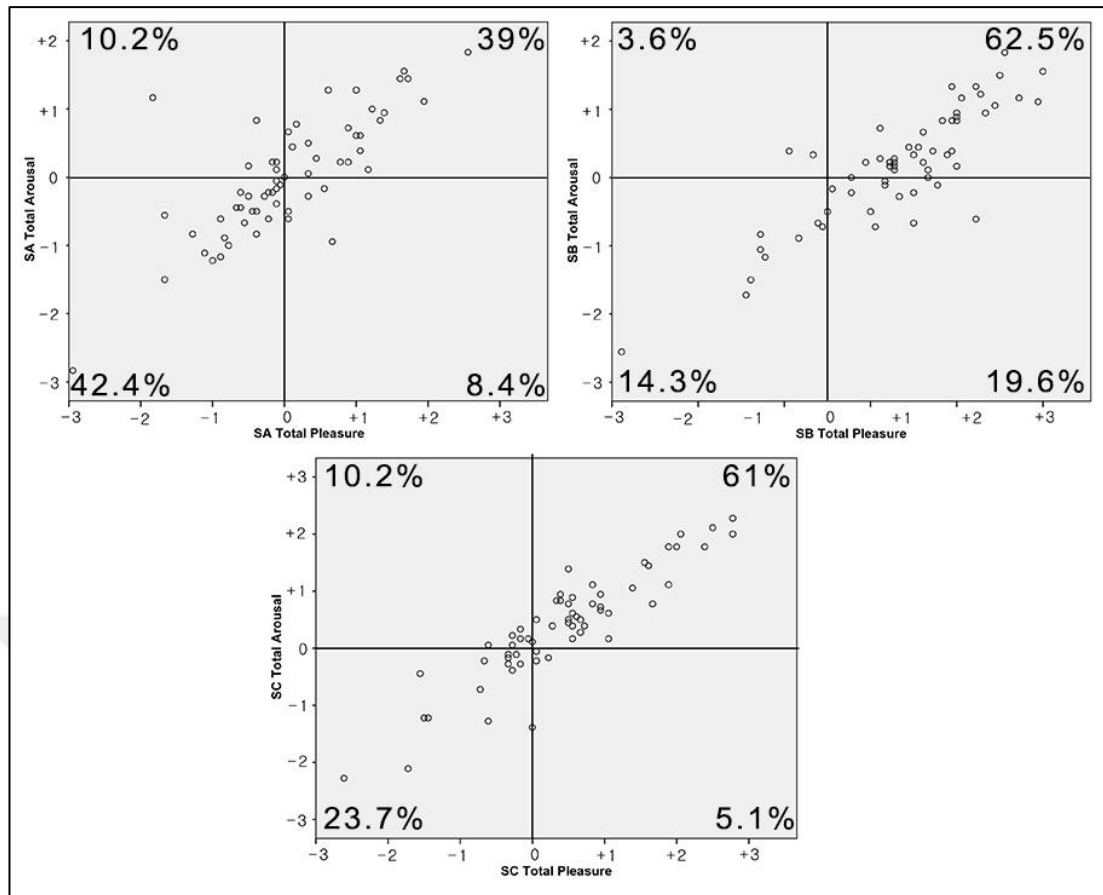


Figure 11: Total of settings with three variations

#### 4.5 Internal Consistency Reliability Test

To eliminate unreliable factors out of the test, the internal consistency reliability test was conducted before conducting correlation and ANOVA tests. Six adjective pairs of pleasure were reliable with 0.94 Cronbach's coefficient alpha and no adjective was excluded. Six adjective pairs of arousal were also reliable with 0.92 Cronbach's coefficient alpha and no adjective was excluded. Lastly, four adjective pairs of dominance were reliable with 0.89 Cronbach's coefficient alpha and no adjective was excluded (See Appendix E, Table E9, E10, E11).

#### 4.6 Correlations between Variables

Correlations were conducted for demographics, current emotional statement, level of liking and sixteen adjective pairs of PAD. According to the result of correlation matrix table, adjective pairs of pleasure, arousal and dominance had positive and high correlation with each other. Each six adjective pairs of pleasure had the highest correlation with pleasure adjective pairs. They also had lowest correlation with five arousal adjective and one dominance adjective pair (Alpha= 0.01). For pleasure adjectives, the highest correlation was between “Unhappy- Happy” and “Bored-Entertained” (0.90, Alpha=0.01) and the lowest was between “Unsatisfied-Satisfied” and “Calm-Excited” of arousal adjective pairs and also “Melancholic-Contented” and “Guided-Autonomous” of dominance adjective pairs (0.34, Alpha=0.01).

The six arousal adjective pairs had the highest correlations with four arousal adjective pairs and two pleasure adjective pairs. They also had lowest correlations with three arousal, two dominance and one pleasure adjective pairs (Alpha= 0.01). The highest correlation was between “Uninterested-Stimulated” and “Melancholic-Contented” of pleasure adjective pairs (0.83, Alpha=0.01) and the lowest was between “Dull-Jittery” and “Sluggish-Frenzied” of arousal adjective pairs and also “Sleepy-Wide awake” and “Melancholic-Contented” adjective pairs (0.34, Alpha=0.01). Moreover, “Sleepy-Wide awake” had no correlation with “Calm-Excited”.

The four dominance adjective pairs had the highest correlations with three dominance and one pleasure adjective pairs. They also had lowest correlations with four arousal adjective pairs ( $\text{Alpha} = 0.01$ ). The highest correlation was between "Cared for-In control" and "Submissive-Dominant" ( $0.81 \text{ Alpha} = 0.001$ ) and the lowest was between "Guided-Autonomous" and "Calm-Excited" of arousal adjective pairs ( $0.34, \text{Alpha} = 0.01$ ). Lastly, "Submissive-Dominant" had negative correlation with age ( $-0.25 \text{ Alpha} = 0.05$ ) (See Appendix E, Table E12).

#### **4.7 Discussion**

The purpose of the research was to emphasize the importance on usage of form as a design decision in interior environments. In the research, respondents' different emotional responses towards different interior environments designed by rectilinear, symmetrical curvilinear and asymmetrical curvilinear forms were studied. It was hypothesized that there were differences between respondents' emotional responses towards different interior environments. Therefore, pleasure, arousal and dominance scores of respondents were compared according to settings designed by rectilinear, symmetrical curvilinear and asymmetrical curvilinear forms.

The results indicate a significant difference between the pleasure mean scores of the three settings. Moreover, there is a significant difference between asymmetrical curvilinear and rectilinear settings and no significant difference between rectilinear and symmetrical curvilinear settings. In all

three settings, there was increasing mean ratings starting from rectilinear and getting increased towards asymmetrical curvilinear. In another words, the lowest scores were in rectilinear, the mediocre ratings were in symmetrical curvilinear and the highest ratings were in asymmetrical curvilinear settings for all three settings. In setting one, rectilinear and symmetrical curvilinear forms had negative pleasure scores while asymmetrical curvilinear forms had positive. In setting two, only rectilinear forms had negative pleasure ratings. In setting three, all forms had positive pleasure scores.

The results show that respondents had more pleasant feelings such as happiness, satisfaction, content, hope and excitement in asymmetrical curvilinear settings rather than rectilinear settings. Therefore, as stated in the literature, curvy forms seem to evoke more positive emotions than rectilinear forms. Designers can prefer using asymmetrical curvilinear forms in interior environments such as public and commercial areas, when they want visitors to feel more pleasant feelings. Moreover, designers or users can add curvy formed interior design elements to their environments to increase their feeling of pleasantness.

In addition to pleasure, statistical results of arousal revealed that there was a significant difference between the arousal mean scores of the settings. The significant difference was between asymmetrical curvilinear and rectilinear settings like pleasure and there was no significant difference between symmetrical curvilinear and rectilinear or asymmetrical curvilinear settings.

Just like the pleasure, there was increasing mean scores starting from rectilinear and getting increased towards asymmetrical curvilinear in all three settings. In setting one, rectilinear and symmetrical curvilinear forms had negative pleasure scores while asymmetrical curvilinear forms had positive. In setting two, only rectilinear forms had negative pleasure scores. In setting three, all forms had positive pleasure scores.

The respondents had more arousing feelings such as stimulation, excitement, frenzy, jitteriness, being wide-awake etc. in asymmetrical curvilinear settings rather than rectilinear settings. Therefore, the results supports the literature as curvy forms evokes more arousing feelings in curvilinear forms than rectilinear forms. Designers can prefer using asymmetrical curvilinear forms in their designs when they want to add arousing factors to the atmosphere or concept of the interiors.

Lastly, there was no significant difference between the dominance mean scores of the three settings. The mean scores of dominance had an inconsistent increase in settings unlike pleasure and arousal scores. Therefore, we can state that, in the comparison of dominance mean scores, the respondent did not feel dominant in any of the rectilinear, symmetrical curvilinear and asymmetrical curvilinear settings.

The scores of pleasure, arousal and dominance adjective pairs also tested with factors; age, gender, level of education, area of education and current

emotional state by one way ANOVA test. There were no significant differences in all factors, but gender and area of education. The results illustrated that there was a significant difference in arousal for symmetrical curvilinear settings. Therefore, our results states that men tended to be more aroused in symmetrical curvilinear setting than women. Moreover, the results illustrated that interior architects tended to be more aroused in symmetrical curvilinear setting than people from other majors.

According to Russell and Pratt (1980), the combination of pleasure and arousal adjective pairs creates an analytical plane of bipolar dimensions which involves mixed emotions such as exciting, distressing, gloomy and relaxing. In the study, the first setting of rectilinear, symmetrical and asymmetrical curvilinear variations had scatters mostly in gloomy and exciting emotions. In the first set of variations, respondents felt gloomy mostly in rectilinear variation, both gloomy and excited in asymmetrical curvilinear variation and excited in asymmetrical curvilinear variation.

In the second set of variations, respondents felt excited in all variations rectilinear, symmetrical curvilinear and asymmetrical curvilinear. However, there was a consistent increase in the levels of excitement of respondents to the variations of the setting. The respondents felt the most excited in asymmetrical curvilinear variation and the least excited in rectilinear curvilinear variation.

In the third set of variations, respondents felt excited in all variations. The respondents felt the most excited in symmetrical curvilinear variation and the least excited in rectilinear curvilinear variation. Unlike the first and second set of variations (S1, S2), respondents felt more excited in the symmetrical curvilinear rather than asymmetrical curvilinear in the third set of variations (S3). The reason for this can be volumetric difference between the settings. The third set of variations (S3) was the wider or larger setting compared to other two settings. Therefore, the volumetric approach towards the form can be studied more detailed.

In all three settings, respondents felt gloomy in rectilinear curvilinear variation and excited in symmetrical and asymmetrical curvilinear variation. In addition to their dominant emotions towards different variations, respondents felt also exciting in rectilinear variation and relaxing in symmetrical curvilinear variation and gloomy in asymmetrical curvilinear variation. Therefore, the study illustrates that interior environments designed by different forms evoke different emotional responses and asymmetrical curvilinear forms triggers the feeling of excitement.

## **CHAPTER V**

### **CONCLUSION**

In this study, occupants' emotional responses towards various forms used in interior environments were studied and compared. The compared forms were rectilinear, symmetrical curvilinear and asymmetrical curvilinear. In the measurement of emotional response, Mehrabian and Russell's PAD test and analytical plane of bipolar dimensions were conducted.

People spend most of their times in interior environments and this make interior environments one of the most influential spaces. According to Rafaeli and Vilnai-Yavetz (2004) and Hekkert (2006) aesthetic factor is one of the fundamental factors of evaluating environment. It affects human while they are evaluating an environment or a product. Also Lang (1988) suggested that interaction between human and near environment creates aesthetic experience. He stated that visual world involves variety of forms, rhythms, complexities, etc. Form of the interior space creates a subjective experience related to aesthetic experience. Therefore, it is crucial to discover which form had positive or negative effects on people. If designers are aware of the

effects of forms in design of interior environments, they would have the chance to design more influential and functional interior environments for users. There is a gap in the literature on exploring the effects of different forms used in interior environments to users. More studies related to this topic can be conducted in the future.

In this study, the results illustrated that even though there was no difference on the level of liking to rectilinear, symmetrical and asymmetrical curvilinear interior environments, people felt more exciting, pleased and aroused in the interior environments designed by asymmetrical curvilinear forms more than rectilinear forms. Therefore, designers can use asymmetrical curvilinear forms more in their designs to create more pleasant and arousing environments. Public or commercial interior environments can be the target in using asymmetrical curvilinear forms to evoke more positive emotions.

To conclude, the research illustrated that interior environments and the forms used in interior environments have direct effect on people's emotion. The forms can evoke negative emotions and lead to some environments to be perceived as undesirable.

### **5.1 Limitations of the Research**

There were several limitations of the study. We used virtual reality to create interior environments instead of real environments in the research. Therefore, this might decrease the reliability of the results even though studies of

Danford and Willems (1975), Daniel and Meitner (2000), and Hendrick et al. (1977) shows that representatives of physical environments may produce similar evaluations as actual environments. The respondents were mainly young adults with a mean age of 26 because the research was conducted in Çankaya University. It was difficult to reach younger or older respondents in the university environment. Increasing range of age would be more representatives of general population.

Another limitation that we encountered on the process of the research was having only respondents from one university to conduct the research. Since university environment have specific profile of people, results might have been homogeneous. We expected to have more heterogeneous results to have more reliable results.

Moreover, the questionnaire took 25 to 30 minutes to finish for each respondents. The long duration time of answering the questionnaire decreased the estimated number of respondents which was around 120. We expected to have more respondents to increase the reliability of statistical results. The long duration time of answering the questionnaire also made respondents to get bored and tired at the end of the research. Different orders of settings were demonstrated to respondents to control this side effect of the questionnaire.

## **5.2 Suggestions for Future Research**

Since there are not a wide range of researches related to the effects of various forms used in interior environments towards people, researchers should focus on this topic in other aspects. Similar research can be conducted with using real time environments or virtual reality with more realistic instruments such as virtual reality machines instead of videos on computer screen. Moreover, future research might be conducted on specific functions related to interior environments such as residence, working place, public places, and commercial places. Results may change in different interior environments according to the expectations of occupants. Also, future research might be conducted on different field related designing such as furniture design, TV and set designs, product design, graphic design, landscape design and architecture.

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## APPENDICES



## APPENDIX A:

### Video Frames of All Settings

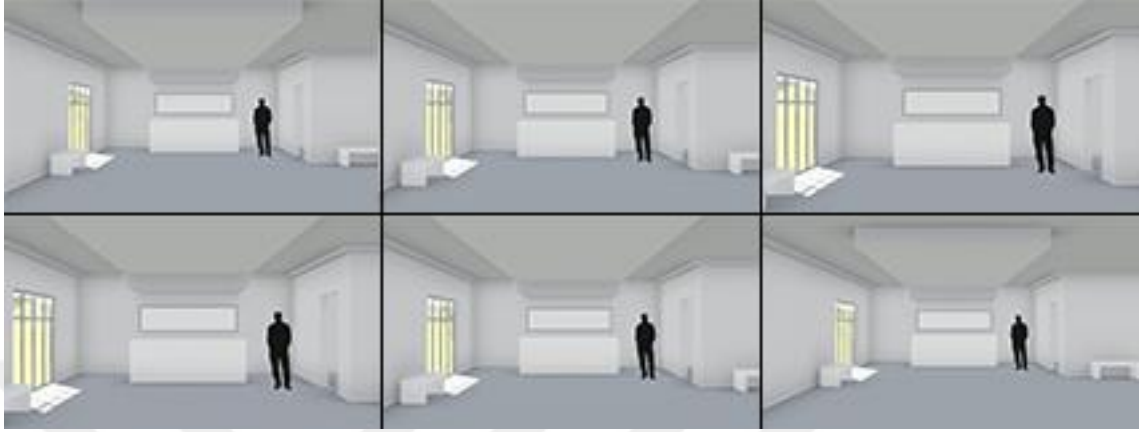


Figure A1: Video Frames of S1RL

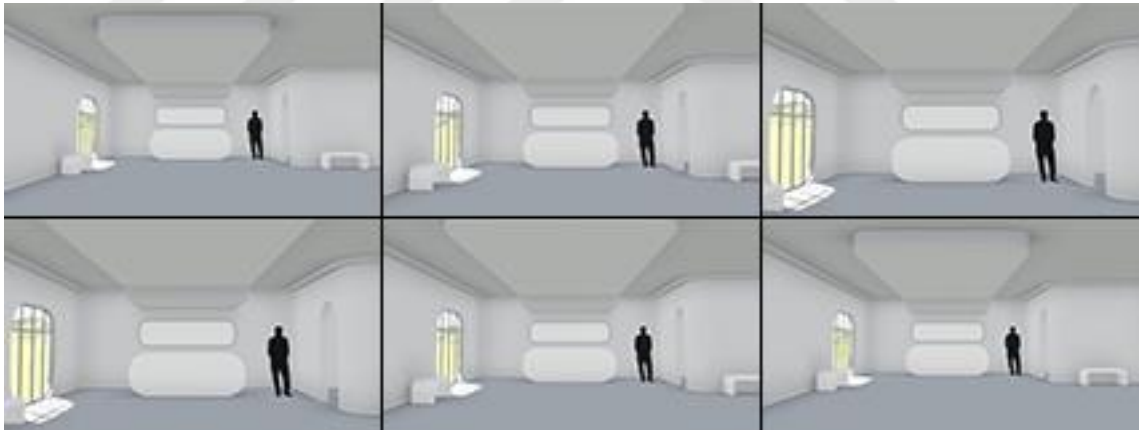


Figure A2: Video Frames of S1SC

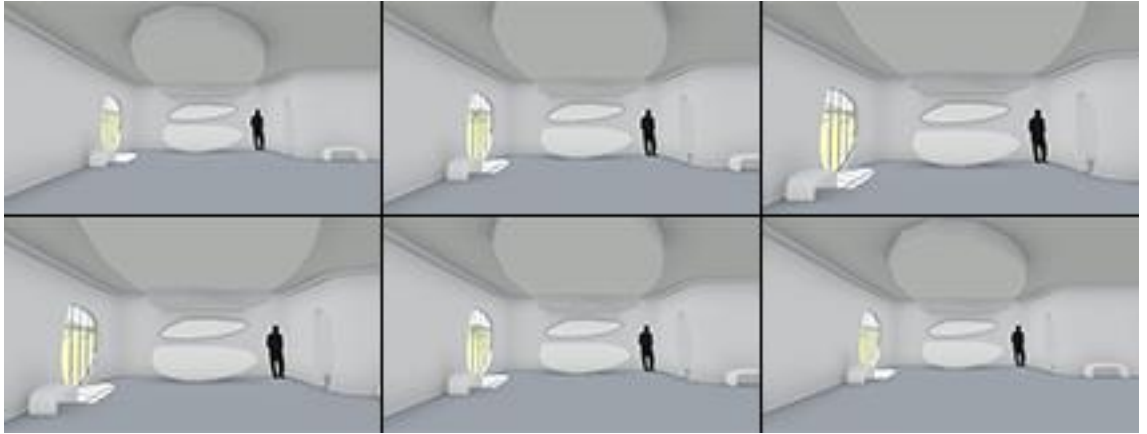


Figure A3: Video Frames of S1AS

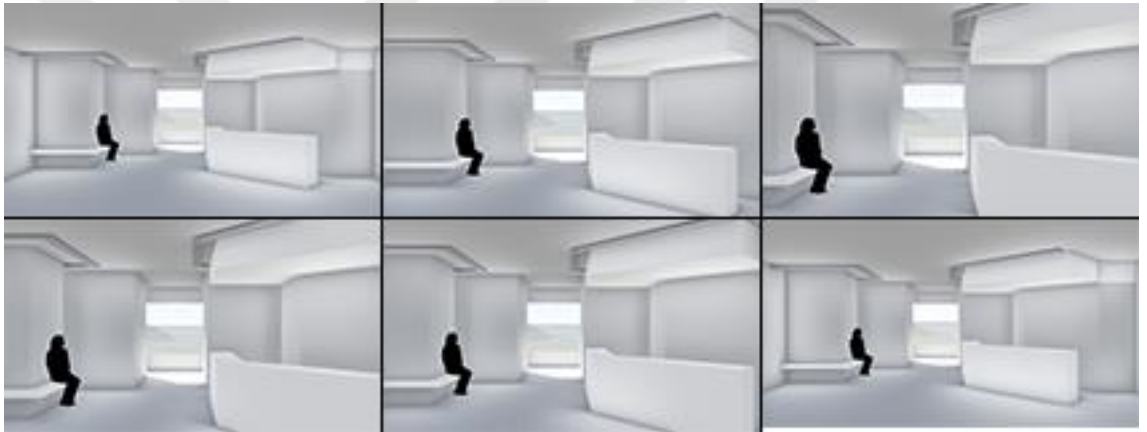


Figure A4: Video Frames of S2RL

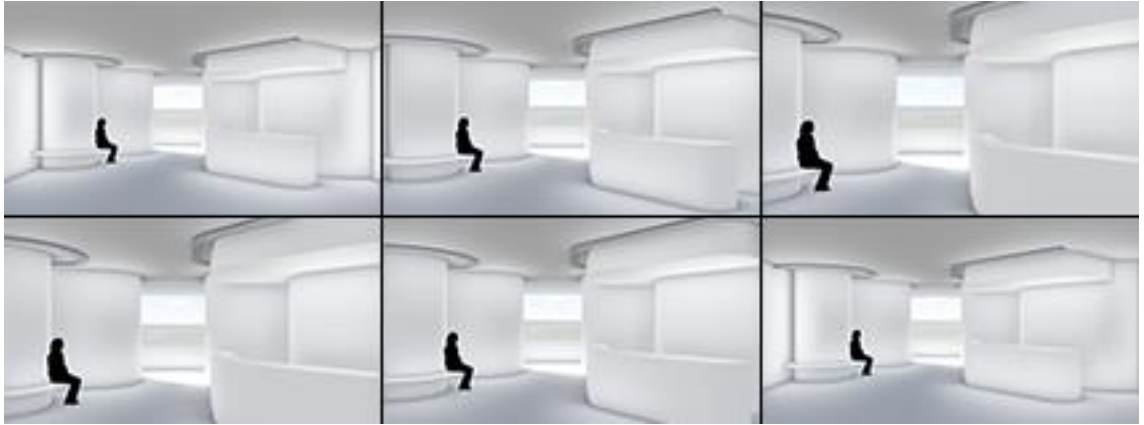


Figure A5: Video Frames of S2sc

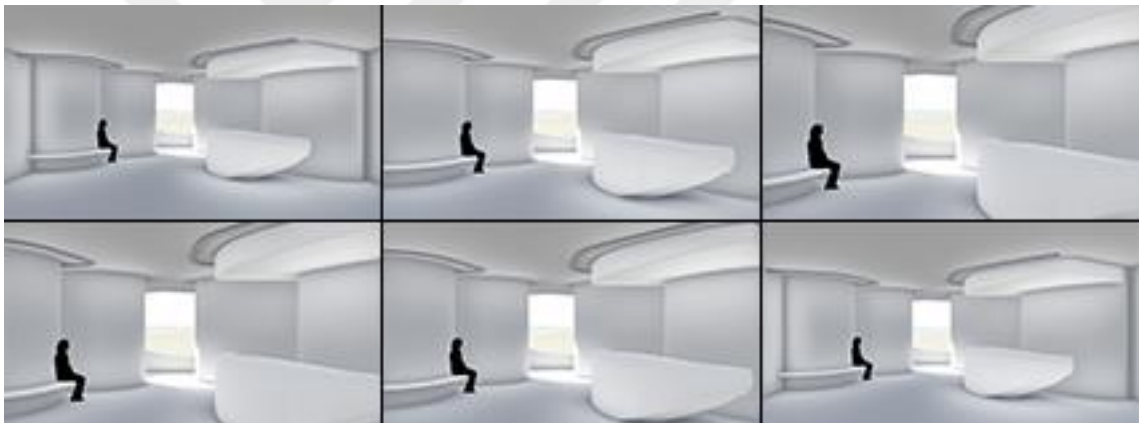


Figure A6: Video Frames of S2AC

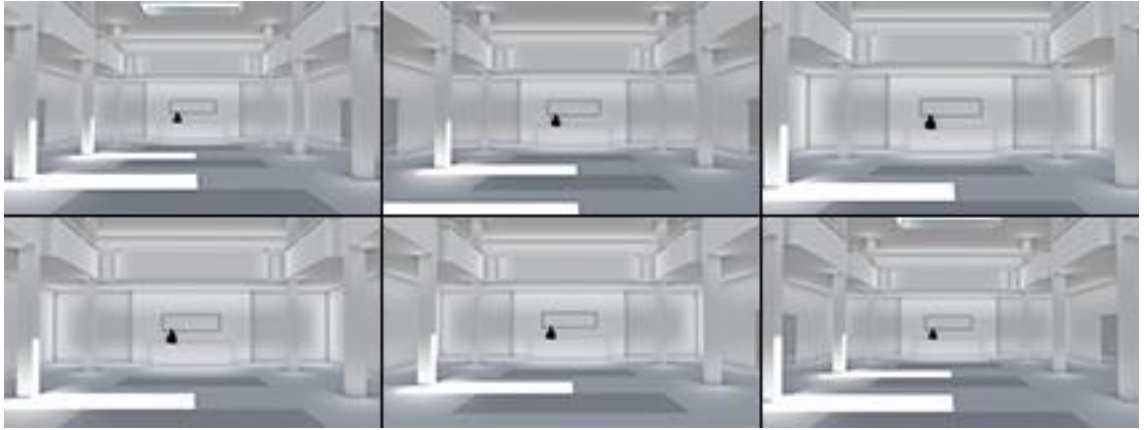


Figure A7: Video Frames of S3RL

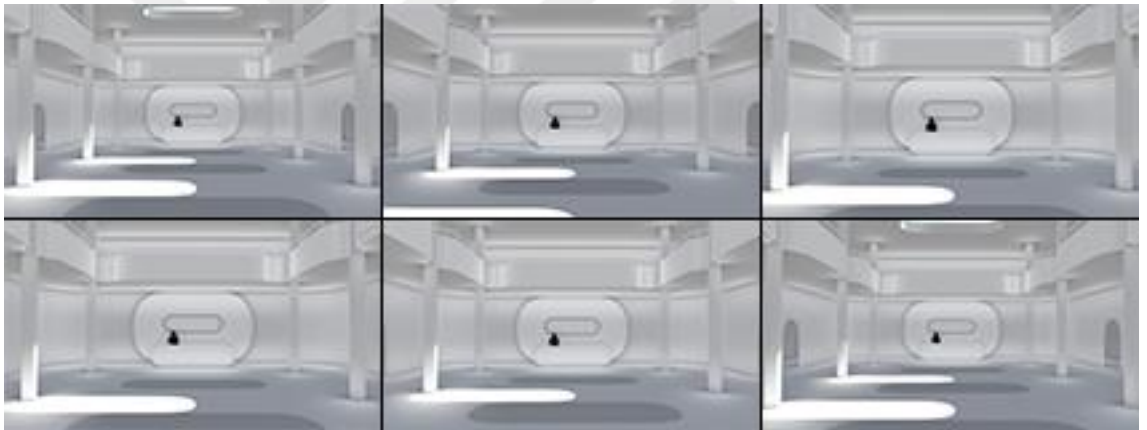


Figure A8: Video Frames of S3sc

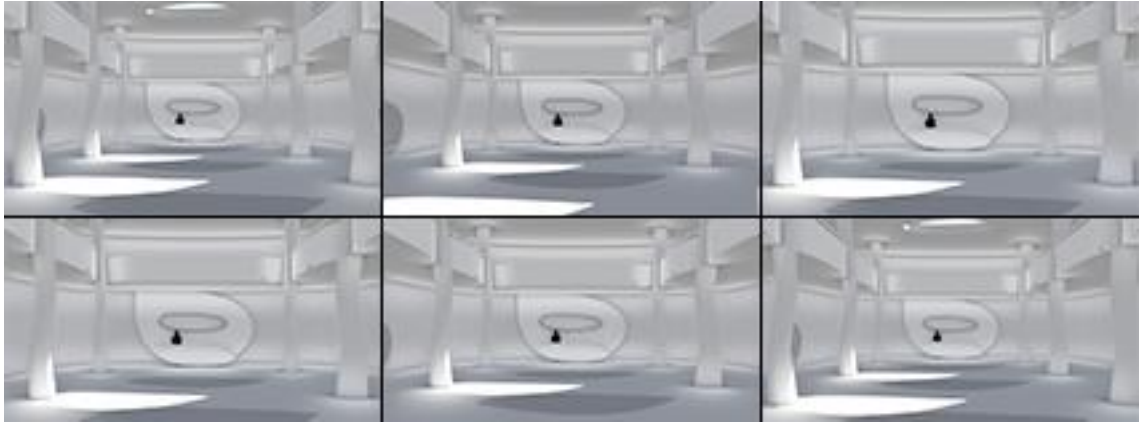


Figure A9: Video Frames of S3AC

## APPENDIX B:

### The Order of Twelve Settings in Two Videos

| #  | The First Order  |
|----|------------------|
| 1  | Setting 1AC      |
| 2  | Setting 2RL      |
| 3  | Buffer Setting b |
| 4  | Setting 3SC      |
| 5  | Setting 1RL      |
| 6  | Buffer Setting a |
| 7  | Setting 3RL      |
| 8  | Buffer Setting c |
| 9  | Setting 2SC      |
| 10 | Setting 1SC      |
| 11 | Setting 2AC      |
| 12 | Setting 3AC      |

| #  | The Second Order |
|----|------------------|
| 1  | Setting 2SC      |
| 2  | Buffer Setting c |
| 3  | Buffer Setting a |
| 4  | Setting 1RL      |
| 5  | Setting 1AC      |
| 6  | Setting 2AC      |
| 7  | Buffer Setting b |
| 8  | Setting 3AC      |
| 9  | Setting 2RL      |
| 10 | Setting 3SC      |
| 11 | Setting 1SC      |
| 12 | Setting 3RL      |

## APPENDIX C:

### English Version of the Questionnaire

|   |     |  |
|---|-----|--|
| 1 | Age |  |
|---|-----|--|

|   |        |        |      |       |
|---|--------|--------|------|-------|
| 2 | Gender | Female | Male | Other |
|   |        |        |      |       |

|   |                    |            |             |          |               |
|---|--------------------|------------|-------------|----------|---------------|
| 3 | Level of Education | Elementary | High School | Graduate | Masters / PhD |
|   |                    |            |             |          |               |

|   |                           |                 |          |                      |       |
|---|---------------------------|-----------------|----------|----------------------|-------|
| 4 | The subject of education? | Social Sciences | Sciences | Fine Arts and Design | Other |
|   |                           |                 |          |                      |       |

|   |                                |     |              |                       |               |      |           |
|---|--------------------------------|-----|--------------|-----------------------|---------------|------|-----------|
| 5 | How are you feeling right now? |     |              |                       |               |      |           |
|   | Very bad                       | Bad | Somewhat bad | Neither bad, nor good | Somewhat good | Good | Very good |
|   |                                |     |              |                       |               |      |           |

|                                                                |                                                                                                                                                           |   |   |   |   |   |   |                               |
|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|-------------------------------|
| Please watch the related video before answering the questions. |                                                                                                                                                           |   |   |   |   |   |   |                               |
| 6                                                              | If your level in the real world is 100, and your level of presence is 1 if you have no presence, rate your level of presence in the video of the setting? |   |   |   |   |   |   |                               |
|                                                                |                                                                                                                                                           |   |   |   |   |   |   |                               |
| 7                                                              | How strong was your sense of presence, "being there", in the video of the setting?                                                                        |   |   |   |   |   |   |                               |
|                                                                |                                                                                                                                                           | 3 | 2 | 1 | 0 | 1 | 2 | 3                             |
|                                                                | Very weak sense of presence                                                                                                                               |   |   |   |   |   |   | Very strong sense of presence |

|   |                                                            |   |   |   |   |   |   |           |
|---|------------------------------------------------------------|---|---|---|---|---|---|-----------|
| 8 | How much have you liked the setting that you have watched? |   |   |   |   |   |   |           |
|   |                                                            | 3 | 2 | 1 | 0 | 1 | 2 | 3         |
|   | Not like at all                                            |   |   |   |   |   |   | Very like |

|              | 3 | 2 | 1 | 0 | 1 | 2 | 3 |             |
|--------------|---|---|---|---|---|---|---|-------------|
| Unhappy      |   |   |   |   |   |   |   | Happy       |
| Annoyed      |   |   |   |   |   |   |   | Pleased     |
| Unsatisfied  |   |   |   |   |   |   |   | Satisfied   |
| Melancholic  |   |   |   |   |   |   |   | Contented   |
| Despairing   |   |   |   |   |   |   |   | Hopeful     |
| Bored        |   |   |   |   |   |   |   | Entertained |
| Uninterested |   |   |   |   |   |   |   | Stimulated  |
| Calm         |   |   |   |   |   |   |   | Excited     |
| Sluggish     |   |   |   |   |   |   |   | Frenzied    |
| Jittery      |   |   |   |   |   |   |   | Dull        |
| Sleepy       |   |   |   |   |   |   |   | Wide-awake  |
| Unaroused    |   |   |   |   |   |   |   | Aroused     |
| Influenced   |   |   |   |   |   |   |   | Influential |
| Cared for    |   |   |   |   |   |   |   | In control  |
| Submissive   |   |   |   |   |   |   |   | Dominant    |
| Guided       |   |   |   |   |   |   |   | Autonomous  |

## APPENDIX D:

### Turkish Version of the Questionnaire

#### Mekân Çalışması

Bu anket, Bilkent Üniversitesi, İç Mimarlık ve Çevre Tasarımı Bölümünde hazırlanan bir yüksek lisans tez çalışmasında kullanılacaktır. Bu ankette kimliğiniz ve vereceğiniz cevaplar kesinlikle gizli tutulacaktır. Vermiş olduğunuz cevaplar sadece akademik amaçla kullanılacaktır. Bu çalışmaya katılım tamamen isteğe bağlıdır. Araştırmayla ilgili bilgi almak için: zeyca.orer@bilkent.edu.tr.

|   |              |       |       |       |
|---|--------------|-------|-------|-------|
| 1 | Yaşınız      |       |       |       |
| 2 | Cinsiyetiniz | Kadın | Erkek | Diğer |
|   |              |       |       |       |

|   |                  |         |      |        |                            |
|---|------------------|---------|------|--------|----------------------------|
| 3 | Eğitim Seviyeniz | İlkokul | Lise | Lisans | Yüksek Lisans /<br>Doktora |
|   |                  |         |      |        |                            |

|   |                |                 |               |                           |                              |
|---|----------------|-----------------|---------------|---------------------------|------------------------------|
| 4 | Eğitim Konunuz | Sosyal Bilimler | Fen Bilimleri | Güzel Sanatlar ve Tasarım | Diğer<br>(Lütfen<br>Yazınız) |
|   |                |                 |               |                           |                              |

|   |                                          |      |            |        |           |                |
|---|------------------------------------------|------|------------|--------|-----------|----------------|
| 5 | Şu anda kendinizi nasıl hissediyorsunuz? |      |            |        |           |                |
|   | Çok Kötü                                 | Kötü | Biraz Kötü | Normal | Biraz İyi | İyi            |
|   |                                          |      |            |        |           | Oldukça<br>İyi |

Soruları cevaplamadan önce lütfen size gösterilen videoyu izleyiniz.

|   |                                                                                                                                                                       |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6 | Eğer gerçek hayatta var olmama düzeyiniz 1 ise ve var olma düzeyiniz 100 ise, bu mekânı izlerken kendinizi ne kadar var olmuş (videodaki mekânın içinde) hissettiniz? |
|   |                                                                                                                                                                       |

|                                              |                                                                                                                 |    |    |   |   |   |   |                                                   |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------|----|----|---|---|---|---|---------------------------------------------------|
| 7                                            | Kendinizi izlemiş olduğunuz videodaki mekânda ne kadar var olmuş (videodaki mekânda bulunduğunuzu) hissettiniz? |    |    |   |   |   |   |                                                   |
|                                              | -3                                                                                                              | -2 | -1 | 0 | 1 | 2 | 3 |                                                   |
| Bu mekânda kendimi hiç var olmuş hissetmedim |                                                                                                                 |    |    |   |   |   |   | Bu mekânda kendimi son derece var olmuş hissettim |

|                |                                                                          |   |   |   |   |   |   |              |
|----------------|--------------------------------------------------------------------------|---|---|---|---|---|---|--------------|
| 8              | Lütfen izlemiş olduğunuz videodaki mekânı beğenme düzeyinizi belirtiniz. |   |   |   |   |   |   |              |
|                | 3                                                                        | 2 | 1 | 0 | 1 | 2 | 3 |              |
| Hiç beğenmedim |                                                                          |   |   |   |   |   |   | Çok beğendim |

|                |                                                                                                  |   |   |   |   |   |   |                   |
|----------------|--------------------------------------------------------------------------------------------------|---|---|---|---|---|---|-------------------|
| 9              | İzlemiş olduğunuz mekânın sizde uyandırdığı hisleri aşağıdaki sıfatlar doğrultusunda belirtiniz. |   |   |   |   |   |   |                   |
|                | 3                                                                                                | 2 | 1 | 0 | 1 | 2 | 3 |                   |
| Mutsuz         |                                                                                                  |   |   |   |   |   |   | Mutlu             |
| Rahatsız       |                                                                                                  |   |   |   |   |   |   | Rahat             |
| Tatmin olmamış |                                                                                                  |   |   |   |   |   |   | Tatmin Olmuş      |
| Hüzünlü        |                                                                                                  |   |   |   |   |   |   | Halinden Memnun   |
| Umutsuz        |                                                                                                  |   |   |   |   |   |   | Umut Dolu         |
| Sıkılmış       |                                                                                                  |   |   |   |   |   |   | Eğlenmiş          |
| İlgisiz        |                                                                                                  |   |   |   |   |   |   | İlgili            |
| Sakin          |                                                                                                  |   |   |   |   |   |   | Heyecanlı         |
| Uyuşuk         |                                                                                                  |   |   |   |   |   |   | Coşkulu           |
| Donuk          |                                                                                                  |   |   |   |   |   |   | Yerinde Duramayan |
| Uykulu         |                                                                                                  |   |   |   |   |   |   | Uyanık            |
| Uyarılmamış    |                                                                                                  |   |   |   |   |   |   | Uyarılmış         |

|                |  |  |  |  |  |  |  |                |
|----------------|--|--|--|--|--|--|--|----------------|
| Etkilenen      |  |  |  |  |  |  |  | Etkileyen      |
| Desteęe muhtaç |  |  |  |  |  |  |  | Kontrol sahibi |
| Boyun eęen     |  |  |  |  |  |  |  | Baskın         |
| Yönlendirilen  |  |  |  |  |  |  |  | Baęımsız       |



## APPENDIX E:

### Statistical Analysis

Table E1: Demographics of respondents

| Age                        | Freq. | Percent |
|----------------------------|-------|---------|
| 19-22                      | 19    | 31,2    |
| 23-26                      | 12    | 19,6    |
| 27-30                      | 16    | 26,2    |
| 31-35                      | 14    | 22,9    |
|                            |       |         |
| Gender                     | Freq. | Percent |
| Female                     | 27    | 44,3    |
| Male                       | 34    | 55,7    |
|                            |       |         |
| Level of Education         | Freq. | Percent |
| High School                | 2     | 3,3     |
| Undergraduate/<br>Graduate | 47    | 77      |
| Master/Phd                 | 12    | 19,7    |
|                            |       |         |
| Major                      | Freq. | Percent |
| Interior                   | 32    | 52,5    |
| Others Studies             | 29    | 47,5    |

Table E2: Comparison of Presence Levels of Three Settings

| Multivariate Tests <sup>a</sup> |                    |       |                   |               |          |      |                     |                    |                             |
|---------------------------------|--------------------|-------|-------------------|---------------|----------|------|---------------------|--------------------|-----------------------------|
| Effect                          |                    | Value | F                 | Hypothesis df | Error df | Sig. | Partial Eta Squared | Noncent. Parameter | Observed Power <sup>c</sup> |
| PresenceLevels                  | Pillai's Trace     | ,027  | ,809 <sup>b</sup> | 2,000         | 59,000   | ,450 | ,027                | 1,618              | ,182                        |
|                                 | Wilks' Lambda      | ,973  | ,809 <sup>b</sup> | 2,000         | 59,000   | ,450 | ,027                | 1,618              | ,182                        |
|                                 | Hotelling's Trace  | ,027  | ,809 <sup>b</sup> | 2,000         | 59,000   | ,450 | ,027                | 1,618              | ,182                        |
|                                 | Roy's Largest Root | ,027  | ,809 <sup>b</sup> | 2,000         | 59,000   | ,450 | ,027                | 1,618              | ,182                        |

a. Design: Intercept  
Within Subjects Design: PresenceLevels

b. Exact statistic

c. Computed using alpha = ,05

Table E3: Comparison of Level of Liking the Settings

| Multivariate Tests <sup>a</sup> |                    |       |                    |               |          |      |                     |                    |                             |
|---------------------------------|--------------------|-------|--------------------|---------------|----------|------|---------------------|--------------------|-----------------------------|
| Effect                          |                    | Value | F                  | Hypothesis df | Error df | Sig. | Partial Eta Squared | Noncent. Parameter | Observed Power <sup>c</sup> |
| LevelofLikingtheSettings        | Pillai's Trace     | ,087  | 2,807 <sup>b</sup> | 2,000         | 59,000   | ,068 | ,087                | 5,615              | ,532                        |
|                                 | Wilks' Lambda      | ,913  | 2,807 <sup>b</sup> | 2,000         | 59,000   | ,068 | ,087                | 5,615              | ,532                        |
|                                 | Hotelling's Trace  | ,095  | 2,807 <sup>b</sup> | 2,000         | 59,000   | ,068 | ,087                | 5,615              | ,532                        |
|                                 | Roy's Largest Root | ,095  | 2,807 <sup>b</sup> | 2,000         | 59,000   | ,068 | ,087                | 5,615              | ,532                        |

a. Design: Intercept  
Within Subjects Design: LevelofLikingtheSettings

b. Exact statistic

c. Computed using alpha = ,05

Table E4: Comparison of Pleasure Scores of the settings

| Multivariate Tests <sup>a</sup> |                    |       |                    |               |          |      |                     |                    |                             |
|---------------------------------|--------------------|-------|--------------------|---------------|----------|------|---------------------|--------------------|-----------------------------|
| Effect                          |                    | Value | F                  | Hypothesis df | Error df | Sig. | Partial Eta Squared | Noncent. Parameter | Observed Power <sup>c</sup> |
| Pleasure                        | Pillai's Trace     | ,124  | 4,161 <sup>b</sup> | 2,000         | 59,000   | ,020 | ,124                | 8,321              | ,712                        |
|                                 | Wilks' Lambda      | ,876  | 4,161 <sup>b</sup> | 2,000         | 59,000   | ,020 | ,124                | 8,321              | ,712                        |
|                                 | Hotelling's Trace  | ,141  | 4,161 <sup>b</sup> | 2,000         | 59,000   | ,020 | ,124                | 8,321              | ,712                        |
|                                 | Roy's Largest Root | ,141  | 4,161 <sup>b</sup> | 2,000         | 59,000   | ,020 | ,124                | 8,321              | ,712                        |

a. Design: Intercept  
Within Subjects Design: Pleasure

b. Exact statistic

c. Computed using alpha = ,05

Table E5: Comparison of Arousal Scores of the settings

| Multivariate Tests <sup>a</sup> |                    |       |                    |               |          |      |                     |                    |                             |
|---------------------------------|--------------------|-------|--------------------|---------------|----------|------|---------------------|--------------------|-----------------------------|
| Effect                          |                    | Value | F                  | Hypothesis df | Error df | Sig. | Partial Eta Squared | Noncent. Parameter | Observed Power <sup>c</sup> |
| Arousal                         | Pillai's Trace     | ,129  | 4,356 <sup>b</sup> | 2,000         | 59,000   | ,017 | ,129                | 8,712              | ,733                        |
|                                 | Wilks' Lambda      | ,871  | 4,356 <sup>b</sup> | 2,000         | 59,000   | ,017 | ,129                | 8,712              | ,733                        |
|                                 | Hotelling's Trace  | ,148  | 4,356 <sup>b</sup> | 2,000         | 59,000   | ,017 | ,129                | 8,712              | ,733                        |
|                                 | Roy's Largest Root | ,148  | 4,356 <sup>b</sup> | 2,000         | 59,000   | ,017 | ,129                | 8,712              | ,733                        |

a. Design: Intercept  
Within Subjects Design: Arousal

b. Exact statistic

c. Computed using alpha = ,05

Table E6: Comparison of Dominance Scores of the settings

| Multivariate Tests <sup>a</sup> |                    |       |                    |               |          |      |                     |                    |                             |
|---------------------------------|--------------------|-------|--------------------|---------------|----------|------|---------------------|--------------------|-----------------------------|
| Effect                          |                    | Value | F                  | Hypothesis df | Error df | Sig. | Partial Eta Squared | Noncent. Parameter | Observed Power <sup>c</sup> |
| Dominance                       | Pillai's Trace     | ,066  | 2,076 <sup>b</sup> | 2,000         | 59,000   | ,134 | ,066                | 4,152              | ,411                        |
|                                 | Wilks' Lambda      | ,934  | 2,076 <sup>b</sup> | 2,000         | 59,000   | ,134 | ,066                | 4,152              | ,411                        |
|                                 | Hotelling's Trace  | ,070  | 2,076 <sup>b</sup> | 2,000         | 59,000   | ,134 | ,066                | 4,152              | ,411                        |
|                                 | Roy's Largest Root | ,070  | 2,076 <sup>b</sup> | 2,000         | 59,000   | ,134 | ,066                | 4,152              | ,411                        |
|                                 |                    |       |                    |               |          |      |                     |                    |                             |

a. Design: Intercept  
Within Subjects Design: Dominance

b. Exact statistic

c. Computed using alpha = ,05

Table E7: Ssc Total Arousal Scores for Factor Gender

| Descriptives      |       |    |        |                |            |                                  |             |         |         |
|-------------------|-------|----|--------|----------------|------------|----------------------------------|-------------|---------|---------|
|                   |       | N  | Mean   | Std. Deviation | Std. Error | 95% Confidence Interval for Mean |             | Minimum | Maximum |
|                   |       |    |        |                |            | Lower Bound                      | Upper Bound |         |         |
| SRLTotalPleasure  | WOMAN | 27 | 4,0905 | 1,14002        | ,21940     | 3,6396                           | 4,5415      | 1,06    | 6,56    |
|                   | MAN   | 34 | 4,0278 | ,89740         | ,15390     | 3,7147                           | 4,3409      | 2,17    | 5,94    |
|                   | Total | 61 | 4,0556 | 1,00354        | ,12849     | 3,7985                           | 4,3126      | 1,06    | 6,56    |
| SSTotalPleasure   | WOMAN | 27 | 4,1893 | 1,07806        | ,20747     | 3,7628                           | 4,6158      | 1,11    | 5,72    |
|                   | MAN   | 34 | 4,4248 | ,79595         | ,13650     | 4,1471                           | 4,7026      | 2,72    | 6,00    |
|                   | Total | 61 | 4,3206 | ,93058         | ,11915     | 4,0822                           | 4,5589      | 1,11    | 6,00    |
| SACTotalPleasure  | WOMAN | 27 | 4,2243 | 1,12728        | ,21695     | 3,7783                           | 4,6702      | 1,39    | 6,78    |
|                   | MAN   | 34 | 4,5784 | 1,05188        | ,18040     | 4,2114                           | 4,9455      | 2,44    | 6,78    |
|                   | Total | 61 | 4,4217 | 1,09118        | ,13971     | 4,1422                           | 4,7011      | 1,39    | 6,78    |
| SRLTotalArousal   | WOMAN | 27 | 3,9300 | 1,04443        | ,20100     | 3,5169                           | 4,3432      | 1,17    | 5,83    |
|                   | MAN   | 34 | 4,0817 | ,68932         | ,11822     | 3,8412                           | 4,3222      | 2,78    | 5,44    |
|                   | Total | 61 | 4,0146 | ,86012         | ,11013     | 3,7943                           | 4,2349      | 1,17    | 5,83    |
| SBTotalArousal    | WOMAN | 27 | 3,9157 | ,97001         | ,18668     | 3,5320                           | 4,2994      | 1,44    | 5,50    |
|                   | MAN   | 34 | 4,3644 | ,67506         | ,11577     | 4,1288                           | 4,5999      | 2,94    | 5,83    |
|                   | Total | 61 | 4,1658 | ,84194         | ,10780     | 3,9501                           | 4,3814      | 1,44    | 5,83    |
| SACTotalArousal   | WOMAN | 27 | 4,2325 | 1,05128        | ,20232     | 3,8166                           | 4,6484      | 1,72    | 6,28    |
|                   | MAN   | 34 | 4,5049 | ,87182         | ,14952     | 4,2007                           | 4,8091      | 2,61    | 6,11    |
|                   | Total | 61 | 4,3843 | ,95685         | ,12251     | 4,1393                           | 4,6294      | 1,72    | 6,28    |
| SRLTotalDominance | WOMAN | 27 | 4,0556 | 1,09217        | ,21019     | 3,6235                           | 4,4876      | 1,00    | 6,25    |
|                   | MAN   | 34 | 4,0196 | ,70683         | ,12122     | 3,7730                           | 4,2662      | 2,33    | 5,42    |
|                   | Total | 61 | 4,0355 | ,88995         | ,11395     | 3,8076                           | 4,2634      | 1,00    | 6,25    |
| SSTotalDominance  | WOMAN | 27 | 4,0278 | 1,09046        | ,20986     | 3,5964                           | 4,4591      | 1,17    | 5,67    |
|                   | MAN   | 34 | 4,2598 | ,82998         | ,14234     | 3,9702                           | 4,5494      | 2,42    | 6,08    |
|                   | Total | 61 | 4,1571 | ,95271         | ,12198     | 3,9131                           | 4,4011      | 1,17    | 6,08    |
| SACTotalDominance | WOMAN | 27 | 4,1296 | 1,15339        | ,22197     | 3,6734                           | 4,5859      | 1,17    | 6,75    |
|                   | MAN   | 34 | 4,3652 | ,86286         | ,14798     | 4,0641                           | 4,6663      | 1,50    | 6,50    |
|                   | Total | 61 | 4,2609 | ,99994         | ,12803     | 4,0048                           | 4,5170      | 1,17    | 6,75    |

**ANOVA**

|                    |                | Sum of Squares | df | Mean Square | F     | Sig. |
|--------------------|----------------|----------------|----|-------------|-------|------|
| SRL TotalPleasure  | Between Groups | ,059           | 1  | ,059        | ,058  | ,811 |
|                    | Within Groups  | 60,367         | 59 | 1,023       |       |      |
|                    | Total          | 60,426         | 60 |             |       |      |
| SSC TotalPleasure  | Between Groups | ,835           | 1  | ,835        | ,964  | ,330 |
|                    | Within Groups  | 51,124         | 59 | ,867        |       |      |
|                    | Total          | 51,959         | 60 |             |       |      |
| SAC TotalPleasure  | Between Groups | 1,888          | 1  | 1,888       | 1,601 | ,211 |
|                    | Within Groups  | 69,553         | 59 | 1,179       |       |      |
|                    | Total          | 71,441         | 60 |             |       |      |
| SATotalArousal     | Between Groups | ,346           | 1  | ,346        | ,464  | ,499 |
|                    | Within Groups  | 44,042         | 59 | ,746        |       |      |
|                    | Total          | 44,388         | 60 |             |       |      |
| SSC TotalArousal   | Between Groups | 3,030          | 1  | 3,030       | 4,525 | ,038 |
|                    | Within Groups  | 39,502         | 59 | ,670        |       |      |
|                    | Total          | 42,532         | 60 |             |       |      |
| SAC TotalArousal   | Between Groups | 1,117          | 1  | 1,117       | 1,224 | ,273 |
|                    | Within Groups  | 53,817         | 59 | ,912        |       |      |
|                    | Total          | 54,934         | 60 |             |       |      |
| SRL TotalDominance | Between Groups | ,019           | 1  | ,019        | ,024  | ,877 |
|                    | Within Groups  | 47,501         | 59 | ,805        |       |      |
|                    | Total          | 47,520         | 60 |             |       |      |
| SSC TotalDominance | Between Groups | ,810           | 1  | ,810        | ,891  | ,349 |
|                    | Within Groups  | 53,650         | 59 | ,909        |       |      |
|                    | Total          | 54,460         | 60 |             |       |      |
| SAC TotalDominance | Between Groups | ,835           | 1  | ,835        | ,833  | ,365 |
|                    | Within Groups  | 59,158         | 59 | 1,003       |       |      |
|                    | Total          | 59,993         | 60 |             |       |      |

Table E8: Ssc Total Arousal Scores for Factor Area of Education

| Descriptives       |                     |    |        |                |            |                                  |             |         |         |
|--------------------|---------------------|----|--------|----------------|------------|----------------------------------|-------------|---------|---------|
|                    |                     | N  | Mean   | Std. Deviation | Std. Error | 95% Confidence Interval for Mean |             | Minimum | Maximum |
|                    |                     |    |        |                |            | Lower Bound                      | Upper Bound |         |         |
| SRL TotalPleasure  | Other Studies       | 28 | 3,8274 | ,93445         | ,17659     | 3,4650                           | 4,1897      | 2,17    | 5,72    |
|                    | Interior Architects | 32 | 4,2656 | 1,04525        | ,18478     | 3,8888                           | 4,6425      | 1,06    | 6,56    |
|                    | Total               | 60 | 4,0611 | 1,01107        | ,13053     | 3,7999                           | 4,3223      | 1,06    | 6,56    |
| SSC TotalPleasure  | Other Studies       | 28 | 4,1448 | ,79109         | ,14950     | 3,8381                           | 4,4516      | 2,56    | 5,22    |
|                    | Interior Architects | 32 | 4,4757 | 1,03838        | ,18356     | 4,1013                           | 4,8501      | 1,11    | 6,00    |
|                    | Total               | 60 | 4,3213 | ,93842         | ,12115     | 4,0789                           | 4,5637      | 1,11    | 6,00    |
| SAC TotalPleasure  | Other Studies       | 28 | 4,3829 | ,92794         | ,17536     | 4,0231                           | 4,7428      | 2,44    | 6,50    |
|                    | Interior Architects | 32 | 4,4670 | 1,24369        | ,21986     | 4,0186                           | 4,9154      | 1,39    | 6,78    |
|                    | Total               | 60 | 4,4278 | 1,09934        | ,14192     | 4,1438                           | 4,7118      | 1,39    | 6,78    |
| SRL TotalArousal   | Other Studies       | 28 | 3,9544 | ,82361         | ,15565     | 3,6350                           | 4,2737      | 2,50    | 5,44    |
|                    | Interior Architects | 32 | 4,0764 | ,91164         | ,16116     | 3,7477                           | 4,4051      | 1,17    | 5,83    |
|                    | Total               | 60 | 4,0194 | ,86653         | ,11187     | 3,7956                           | 4,2433      | 1,17    | 5,83    |
| SSC TotalArousal   | Other Studies       | 28 | 3,9187 | ,70796         | ,13379     | 3,6442                           | 4,1932      | 2,28    | 5,33    |
|                    | Interior Architects | 32 | 4,3819 | ,91219         | ,16125     | 4,0531                           | 4,7108      | 1,44    | 5,83    |
|                    | Total               | 60 | 4,1658 | ,84905         | ,10961     | 3,9464                           | 4,3851      | 1,44    | 5,83    |
| SSC TotalArousal   | Other Studies       | 28 | 4,3849 | ,87239         | ,16487     | 4,0466                           | 4,7232      | 2,61    | 6,11    |
|                    | Interior Architects | 32 | 4,3976 | 1,05013        | ,18564     | 4,0190                           | 4,7762      | 1,72    | 6,28    |
|                    | Total               | 60 | 4,3917 | ,96320         | ,12435     | 4,1428                           | 4,6405      | 1,72    | 6,28    |
| SRL TotalDominance | Other Studies       | 28 | 3,9226 | ,72823         | ,13762     | 3,6402                           | 4,2050      | 2,33    | 5,42    |
|                    | Interior Architects | 32 | 4,1380 | 1,02382        | ,18099     | 3,7689                           | 4,5071      | 1,00    | 6,25    |
|                    | Total               | 60 | 4,0375 | ,89732         | ,11584     | 3,8057                           | 4,2693      | 1,00    | 6,25    |
| SSC TotalDominance | Other Studies       | 28 | 3,9375 | ,80464         | ,15206     | 3,6255                           | 4,2495      | 2,42    | 5,67    |
|                    | Interior Architects | 32 | 4,3490 | 1,05419        | ,18636     | 3,9689                           | 4,7290      | 1,17    | 6,08    |
|                    | Total               | 60 | 4,1569 | ,96075         | ,12403     | 3,9088                           | 4,4051      | 1,17    | 6,08    |
| SAC TotalDominance | Other Studies       | 28 | 4,1131 | ,87642         | ,16563     | 3,7733                           | 4,4529      | 1,50    | 5,33    |
|                    | Interior Architects | 32 | 4,3984 | 1,10670        | ,19564     | 3,9994                           | 4,7974      | 1,17    | 6,75    |
|                    | Total               | 60 | 4,2653 | 1,00780        | ,13011     | 4,0049                           | 4,5256      | 1,17    | 6,75    |

**ANOVA**

|                    |                | Sum of Squares | df | Mean Square | F     | Sig. |
|--------------------|----------------|----------------|----|-------------|-------|------|
| SRL TotalPleasure  | Between Groups | 2,868          | 1  | 2,868       | 2,896 | ,094 |
|                    | Within Groups  | 57,445         | 58 | ,990        |       |      |
|                    | Total          | 60,313         | 59 |             |       |      |
| SSC TotalPleasure  | Between Groups | 1,635          | 1  | 1,635       | 1,884 | ,175 |
|                    | Within Groups  | 50,323         | 58 | ,868        |       |      |
|                    | Total          | 51,957         | 59 |             |       |      |
| SAC TotalPleasure  | Between Groups | ,106           | 1  | ,106        | ,086  | ,770 |
|                    | Within Groups  | 71,199         | 58 | 1,228       |       |      |
|                    | Total          | 71,304         | 59 |             |       |      |
| SRL TotalArousal   | Between Groups | ,222           | 1  | ,222        | ,293  | ,591 |
|                    | Within Groups  | 44,079         | 58 | ,760        |       |      |
|                    | Total          | 44,301         | 59 |             |       |      |
| SSC TotalArousal   | Between Groups | 3,205          | 1  | 3,205       | 4,726 | ,034 |
|                    | Within Groups  | 39,327         | 58 | ,678        |       |      |
|                    | Total          | 42,532         | 59 |             |       |      |
| SAC TotalArousal   | Between Groups | ,002           | 1  | ,002        | ,003  | ,960 |
|                    | Within Groups  | 54,735         | 58 | ,944        |       |      |
|                    | Total          | 54,737         | 59 |             |       |      |
| SRL TotalDominance | Between Groups | ,693           | 1  | ,693        | ,858  | ,358 |
|                    | Within Groups  | 46,813         | 58 | ,807        |       |      |
|                    | Total          | 47,506         | 59 |             |       |      |
| SSC TotalDominance | Between Groups | 2,528          | 1  | 2,528       | 2,824 | ,098 |
|                    | Within Groups  | 51,931         | 58 | ,895        |       |      |
|                    | Total          | 54,460         | 59 |             |       |      |
| SAC TotalDominance | Between Groups | 1,216          | 1  | 1,216       | 1,201 | ,278 |
|                    | Within Groups  | 58,708         | 58 | 1,012       |       |      |
|                    | Total          | 59,923         | 59 |             |       |      |

Table E9. Internal Consistency Reliability Test Scores of Pleasure

**Case Processing Summary**

|       |                       | N  | %     |
|-------|-----------------------|----|-------|
| Cases | Valid                 | 61 | 100,0 |
|       | Excluded <sup>a</sup> | 0  | ,0    |
|       | Total                 | 61 | 100,0 |

a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|----------------------------------------------|------------|
| ,944             | ,945                                         | 54         |

**Summary Item Statistics**

|                | Mean  | Minimum | Maximum | Range | Maximum / Minimum | Variance | N of Items |
|----------------|-------|---------|---------|-------|-------------------|----------|------------|
| Item Means     | 4,266 | 3,197   | 5,164   | 1,967 | 1,615             | ,198     | 54         |
| Item Variances | 2,806 | 1,785   | 4,183   | 2,398 | 2,344             | ,260     | 54         |

**Scale Statistics**

| Mean   | Variance | Std. Deviation | N of Items |
|--------|----------|----------------|------------|
| 230,36 | 2066,168 | 45,455         | 54         |

**Item-Total Statistics**

|                              | Scale Mean if<br>Item Deleted | Scale<br>Variance if<br>Item Deleted | Corrected<br>Item-Total<br>Correlation | Squared<br>Multiple<br>Correlation | Cronbach's<br>Alpha if Item<br>Deleted |
|------------------------------|-------------------------------|--------------------------------------|----------------------------------------|------------------------------------|----------------------------------------|
| S1AUnhappyHappyP             | 226,43                        | 1994,782                             | ,427                                   | .                                  | ,943                                   |
| S1AAnnoyedPleasedP           | 226,62                        | 2006,172                             | ,316                                   | .                                  | ,944                                   |
| S1AUnsatisfiedSatisfiedP     | 226,80                        | 1982,794                             | ,539                                   | .                                  | ,943                                   |
| S1AMelancholicContende<br>P  | 226,26                        | 2005,130                             | ,355                                   | .                                  | ,944                                   |
| S1ADespairingHopefulP        | 226,69                        | 2003,485                             | ,436                                   | .                                  | ,943                                   |
| S1BoredEntertained           | 227,16                        | 1982,106                             | ,658                                   | .                                  | ,942                                   |
| S1BUnhappyHappyP             | 226,49                        | 2001,421                             | ,393                                   | .                                  | ,944                                   |
| S1BAnnoyedPleasedP           | 226,49                        | 2001,954                             | ,370                                   | .                                  | ,944                                   |
| S1BUnsatisfiedSatisfiedP     | 226,56                        | 1991,084                             | ,464                                   | .                                  | ,943                                   |
| S1BMelancholicContende<br>P  | 226,20                        | 2020,761                             | ,287                                   | .                                  | ,944                                   |
| S1BDespairingHopefulP        | 226,38                        | 1995,339                             | ,493                                   | .                                  | ,943                                   |
| S1BBoredEntertained          | 226,92                        | 2003,277                             | ,397                                   | .                                  | ,944                                   |
| S1CUnhappyHappyP             | 226,33                        | 1978,557                             | ,525                                   | .                                  | ,943                                   |
| S1CAnnoyedPleasedP           | 226,13                        | 2012,183                             | ,325                                   | .                                  | ,944                                   |
| S1CUnsatisfiedSatisfied<br>P | 226,38                        | 1968,239                             | ,627                                   | .                                  | ,942                                   |
| S1CMelancholicContend<br>eP  | 226,23                        | 1993,213                             | ,413                                   | .                                  | ,944                                   |
| S1CDespairingHopefulP        | 226,11                        | 2023,470                             | ,243                                   | .                                  | ,945                                   |
| S1CBoredEntertained          | 226,43                        | 1979,682                             | ,549                                   | .                                  | ,943                                   |
| S2AUnhappyHappyP             | 226,21                        | 1997,970                             | ,502                                   | .                                  | ,943                                   |
| S2AAnnoyedPleasedP           | 226,34                        | 1982,196                             | ,438                                   | .                                  | ,943                                   |
| S2AUnsatisfiedSatisfiedP     | 226,41                        | 1985,513                             | ,565                                   | .                                  | ,943                                   |
| S2AMelancholicContende<br>P  | 226,23                        | 1965,613                             | ,596                                   | .                                  | ,942                                   |
| S2ADespairingHopefulP        | 226,38                        | 1988,639                             | ,523                                   | .                                  | ,943                                   |
| S2ABoredEntertained          | 226,89                        | 2003,937                             | ,433                                   | .                                  | ,943                                   |
| S2BUnhappyHappyP             | 226,15                        | 1981,028                             | ,529                                   | .                                  | ,943                                   |
| S2BAnnoyedPleasedP           | 225,77                        | 1985,213                             | ,457                                   | .                                  | ,943                                   |
| S2BUnsatisfiedSatisfiedP     | 226,16                        | 1983,239                             | ,535                                   | .                                  | ,943                                   |
| S2BMelancholicContende<br>P  | 225,79                        | 1978,870                             | ,577                                   | .                                  | ,943                                   |
| S2BDespairingHopefulP        | 226,10                        | 1997,290                             | ,428                                   | .                                  | ,943                                   |
| S2BBoredEntertained          | 226,41                        | 1991,579                             | ,499                                   | .                                  | ,943                                   |
| S2CUnhappyHappyP             | 225,93                        | 1956,329                             | ,695                                   | .                                  | ,942                                   |
| S2CAnnoyedPleasedP           | 225,74                        | 1966,730                             | ,584                                   | .                                  | ,942                                   |
| S2CUnsatisfiedSatisfied<br>P | 226,13                        | 1967,116                             | ,647                                   | .                                  | ,942                                   |
| S2CMelancholicContend<br>eP  | 225,95                        | 1973,881                             | ,651                                   | .                                  | ,942                                   |
| S2CDespairingHopefulP        | 226,13                        | 1965,683                             | ,637                                   | .                                  | ,942                                   |
| S2CBoredEntertained          | 226,44                        | 1971,417                             | ,642                                   | .                                  | ,942                                   |
| S3AUnhappyHappyP             | 225,85                        | 1989,728                             | ,537                                   | .                                  | ,943                                   |
| S3AAnnoyedPleasedP           | 225,67                        | 1986,257                             | ,459                                   | .                                  | ,943                                   |
| S3AUnsatisfiedSatisfiedP     | 225,72                        | 2000,304                             | ,381                                   | .                                  | ,944                                   |
| S3AMelancholicContende<br>P  | 225,56                        | 1993,851                             | ,502                                   | .                                  | ,943                                   |
| S3ADespairingHopefulP        | 226,05                        | 2010,414                             | ,450                                   | .                                  | ,943                                   |
| S3ABoredEntertained          | 226,21                        | 2005,370                             | ,412                                   | .                                  | ,943                                   |
| S3BUnhappyHappyP             | 225,49                        | 1995,221                             | ,548                                   | .                                  | ,943                                   |
| S3BAnnoyedPleasedP           | 225,56                        | 1996,751                             | ,449                                   | .                                  | ,943                                   |
| S3BUnsatisfiedSatisfiedP     | 225,54                        | 1992,452                             | ,482                                   | .                                  | ,943                                   |
| S3BMelancholicContende<br>P  | 225,28                        | 2024,371                             | ,298                                   | .                                  | ,944                                   |
| S3BDespairingHopefulP        | 225,64                        | 2006,134                             | ,442                                   | .                                  | ,943                                   |
| S3BBoredRelaxed              | 225,80                        | 1994,627                             | ,517                                   | .                                  | ,943                                   |
| S3CUnhappyHappyP             | 225,34                        | 1980,463                             | ,545                                   | .                                  | ,943                                   |
| S3CAnnoyedPleasedP           | 225,34                        | 2007,096                             | ,426                                   | .                                  | ,943                                   |
| S3CUnsatisfiedSatisfied<br>P | 225,62                        | 2005,105                             | ,372                                   | .                                  | ,944                                   |
| S3CMelancholicContend<br>eP  | 225,20                        | 2027,194                             | ,275                                   | .                                  | ,944                                   |
| S3CDespairingHopefulP        | 225,70                        | 2008,045                             | ,411                                   | .                                  | ,943                                   |
| S3CBoredEntertained          | 225,75                        | 1982,989                             | ,549                                   | .                                  | ,943                                   |

Table E10. Internal Consistency Reliability Test Scores of Arousal

**Case Processing Summary**

|       |                       | N  | %     |
|-------|-----------------------|----|-------|
| Cases | Valid                 | 60 | 98,4  |
|       | Excluded <sup>a</sup> | 1  | 1,6   |
|       | Total                 | 61 | 100,0 |

a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|----------------------------------------------|------------|
| ,922             | ,923                                         | 54         |

**Summary Item Statistics**

|                | Mean  | Minimum | Maximum | Range | Maximum / Minimum | Variance | N of Items |
|----------------|-------|---------|---------|-------|-------------------|----------|------------|
| Item Means     | 4,193 | 3,233   | 5,183   | 1,950 | 1,603             | ,257     | 54         |
| Item Variances | 2,676 | 1,682   | 4,197   | 2,514 | 2,495             | ,216     | 54         |

**Scale Statistics**

| Mean   | Variance | Std. Deviation | N of Items |
|--------|----------|----------------|------------|
| 226,40 | 1523,905 | 39,037         | 54         |

**Item-Total Statistics**

|                           | Scale Mean if<br>Item Deleted | Scale<br>Variance if<br>Item Deleted | Corrected<br>Item-Total<br>Correlation | Squared<br>Multiple<br>Correlation | Cronbach's<br>Alpha if Item<br>Deleted |
|---------------------------|-------------------------------|--------------------------------------|----------------------------------------|------------------------------------|----------------------------------------|
| S1AUninterestedStimulated | 222,37                        | 1471,084                             | ,376                                   | ,921                               | ,921                                   |
| S1ACalmExcitedA           | 222,98                        | 1461,542                             | ,443                                   | ,921                               | ,921                                   |
| S1ASluggishFrenziedA      | 222,60                        | 1482,380                             | ,342                                   | ,921                               | ,921                                   |
| S1ADullJitteryA           | 223,17                        | 1473,328                             | ,416                                   | ,921                               | ,921                                   |
| S1ASleepyWideawakeA       | 222,38                        | 1486,783                             | ,237                                   | ,923                               | ,923                                   |
| S1AUnarousedArousedA      | 222,45                        | 1478,421                             | ,352                                   | ,921                               | ,921                                   |
| S1BUninterestedStimulated | 222,60                        | 1441,261                             | ,597                                   | ,919                               | ,919                                   |
| S1BCalmExcitedA           | 223,03                        | 1492,846                             | ,245                                   | ,922                               | ,922                                   |
| S1BSluggishFrenziedA      | 222,75                        | 1472,869                             | ,394                                   | ,921                               | ,921                                   |
| S1BDullJitteryA           | 222,78                        | 1474,918                             | ,407                                   | ,921                               | ,921                                   |
| S1BSleepyWideawakeA       | 222,27                        | 1460,673                             | ,447                                   | ,921                               | ,921                                   |
| S1BUnarousedArousedA      | 222,60                        | 1452,719                             | ,515                                   | ,920                               | ,920                                   |
| S1CUninterestedStimulated | 222,33                        | 1470,768                             | ,441                                   | ,921                               | ,921                                   |
| S1CCalmExcitedA           | 222,23                        | 1479,063                             | ,283                                   | ,922                               | ,922                                   |
| S1CSluggishFrenziedA      | 222,48                        | 1497,949                             | ,206                                   | ,922                               | ,922                                   |
| S1CDullJitteryA           | 222,87                        | 1472,524                             | ,345                                   | ,921                               | ,921                                   |
| S1CSleepyWideawakeA       | 221,93                        | 1481,928                             | ,285                                   | ,922                               | ,922                                   |
| S1CUnarousedArousedA      | 221,97                        | 1468,406                             | ,404                                   | ,921                               | ,921                                   |
| S2AUninterestedStimulated | 222,28                        | 1451,325                             | ,598                                   | ,919                               | ,919                                   |
| S2ACalmExcitedA           | 223,00                        | 1437,729                             | ,609                                   | ,919                               | ,919                                   |
| S2ASluggishFrenziedA      | 222,52                        | 1477,135                             | ,441                                   | ,921                               | ,921                                   |
| S2ADullJitteryA           | 223,03                        | 1453,829                             | ,576                                   | ,920                               | ,920                                   |
| S2ASleepyWideawakeA       | 221,87                        | 1453,982                             | ,498                                   | ,920                               | ,920                                   |
| S2AUnarousedArousedA      | 222,47                        | 1452,355                             | ,572                                   | ,920                               | ,920                                   |
| S2BUninterestedStimulated | 222,17                        | 1459,870                             | ,473                                   | ,920                               | ,920                                   |
| S2BCalmExcitedA           | 222,60                        | 1482,956                             | ,233                                   | ,923                               | ,923                                   |
| S2BSluggishFrenziedA      | 222,28                        | 1460,037                             | ,489                                   | ,920                               | ,920                                   |
| S2BDullJitteryA           | 222,93                        | 1466,267                             | ,390                                   | ,921                               | ,921                                   |
| S2BSleepyWideawakeA       | 221,87                        | 1459,643                             | ,488                                   | ,920                               | ,920                                   |
| S2BUnarousedArousedA      | 222,30                        | 1478,586                             | ,340                                   | ,921                               | ,921                                   |
| S2CUninterestedStimulated | 221,95                        | 1437,540                             | ,664                                   | ,919                               | ,919                                   |
| S2CCalmExcitedA           | 222,43                        | 1438,928                             | ,594                                   | ,919                               | ,919                                   |
| S2CSluggishFrenziedA      | 222,32                        | 1454,457                             | ,553                                   | ,920                               | ,920                                   |
| S2CDullJitteryA           | 222,53                        | 1449,745                             | ,601                                   | ,919                               | ,919                                   |
| S2CSleepyWideawakeA       | 222,08                        | 1459,468                             | ,467                                   | ,920                               | ,920                                   |
| S2CUnarousedArousedA      | 222,10                        | 1462,363                             | ,483                                   | ,920                               | ,920                                   |
| S3AUninterestedStimulated | 221,70                        | 1476,858                             | ,333                                   | ,922                               | ,922                                   |
| S3ACalmExcitedA           | 222,15                        | 1483,452                             | ,314                                   | ,922                               | ,922                                   |
| S3ASluggishFrenziedA      | 222,30                        | 1484,281                             | ,353                                   | ,921                               | ,921                                   |
| S3ADullJitteryA           | 222,47                        | 1482,965                             | ,315                                   | ,922                               | ,922                                   |
| S3ASleepyWideawakeA       | 221,58                        | 1474,417                             | ,371                                   | ,921                               | ,921                                   |
| S3AUnarousedArousedA      | 221,58                        | 1481,874                             | ,353                                   | ,921                               | ,921                                   |
| S3BUninterestedStimulated | 221,23                        | 1466,623                             | ,465                                   | ,920                               | ,920                                   |
| S3BCalmExcitedA           | 221,83                        | 1486,243                             | ,277                                   | ,922                               | ,922                                   |
| S3BSluggishFrenziedA      | 221,65                        | 1485,350                             | ,369                                   | ,921                               | ,921                                   |
| S3BDullJitteryA           | 222,17                        | 1493,734                             | ,243                                   | ,922                               | ,922                                   |
| S3BSleepyWideawakeA       | 221,22                        | 1478,376                             | ,366                                   | ,921                               | ,921                                   |
| S3BUnarousedArousedA      | 221,70                        | 1482,451                             | ,305                                   | ,922                               | ,922                                   |
| S3CUninterestedStimulated | 221,47                        | 1479,134                             | ,337                                   | ,921                               | ,921                                   |
| S3CCalmExcitedA           | 221,60                        | 1482,753                             | ,344                                   | ,921                               | ,921                                   |
| S3CSluggishFrenziedA      | 221,67                        | 1456,226                             | ,540                                   | ,920                               | ,920                                   |
| S3CDullJitteryA           | 221,82                        | 1464,796                             | ,469                                   | ,920                               | ,920                                   |
| S3CSleepyWideawakeA       | 221,25                        | 1492,360                             | ,219                                   | ,923                               | ,923                                   |
| S3CUnarousedArousedA      | 221,28                        | 1480,003                             | ,334                                   | ,921                               | ,921                                   |

Table E11. Internal Consistency Reliability Test Scores of Dominance

**Case Processing Summary**

|       |                       | N  | %     |
|-------|-----------------------|----|-------|
| Cases | Valid                 | 61 | 100,0 |
|       | Excluded <sup>a</sup> | 0  | ,0    |
|       | Total                 | 61 | 100,0 |

a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|----------------------------------------------|------------|
| ,898             | ,899                                         | 36         |

**Summary Item Statistics**

|                | Mean  | Minimum | Maximum | Range | Maximum / Minimum | Variance | N of Items |
|----------------|-------|---------|---------|-------|-------------------|----------|------------|
| Item Means     | 4,151 | 3,656   | 4,869   | 1,213 | 1,332             | ,125     | 36         |
| Item Variances | 2,931 | 2,249   | 4,524   | 2,275 | 2,011             | ,218     | 36         |

**Scale Statistics**

| Mean   | Variance | Std. Deviation | N of Items |
|--------|----------|----------------|------------|
| 149,44 | 830,417  | 28,817         | 36         |

**Item-Total Statistics**

|                               | Scale Mean if<br>Item Deleted | Scale<br>Variance if<br>Item Deleted | Corrected<br>Item-Total<br>Correlation | Squared<br>Multiple<br>Correlation | Cronbach's<br>Alpha if Item<br>Deleted |
|-------------------------------|-------------------------------|--------------------------------------|----------------------------------------|------------------------------------|----------------------------------------|
| S1AInfluencedInfluential<br>D | 145,67                        | 804,691                              | ,256                                   | ,849                               | ,898                                   |
| S1A                           | 145,57                        | 803,715                              | ,267                                   | ,853                               | ,898                                   |
| S1ASubmissiveDominantD<br>D   | 145,59                        | 801,313                              | ,272                                   | ,868                               | ,898                                   |
| S1AGuidedAutonomousD          | 145,70                        | 791,745                              | ,329                                   | ,680                               | ,897                                   |
| S1BInfluencedInfluential<br>D | 145,49                        | 794,987                              | ,357                                   | ,884                               | ,896                                   |
| S1BCaredforIncontroID         | 145,75                        | 788,855                              | ,419                                   | ,924                               | ,895                                   |
| S1BSubmissiveDominantD<br>D   | 145,74                        | 783,663                              | ,459                                   | ,905                               | ,895                                   |
| S1BGuidedAutonomousD          | 145,77                        | 794,580                              | ,320                                   | ,861                               | ,897                                   |
| S1CInfluencedInfluential<br>D | 145,36                        | 786,368                              | ,424                                   | ,743                               | ,895                                   |
| S1CCaredforIncontroID         | 145,39                        | 788,109                              | ,411                                   | ,841                               | ,895                                   |
| S1CSubmissiveDominantD<br>D   | 145,05                        | 794,714                              | ,377                                   | ,764                               | ,896                                   |
| S1CGuidedAutonomous<br>D      | 145,41                        | 802,946                              | ,205                                   | ,675                               | ,899                                   |
| S2AInfluencedInfluential<br>D | 145,79                        | 770,704                              | ,560                                   | ,776                               | ,893                                   |
| S2ACaredforIncontroID         | 145,51                        | 784,654                              | ,456                                   | ,783                               | ,895                                   |
| S2ASubmissiveDominantD<br>D   | 145,56                        | 778,917                              | ,547                                   | ,824                               | ,893                                   |
| S2AGuidedAutonomousD          | 145,54                        | 785,252                              | ,414                                   | ,836                               | ,895                                   |
| S2BInfluencedInfluential<br>D | 145,54                        | 785,952                              | ,445                                   | ,827                               | ,895                                   |
| S2BCaredforIncontroID         | 145,38                        | 791,039                              | ,367                                   | ,827                               | ,896                                   |
| S2BSubmissiveDominantD<br>D   | 145,44                        | 777,617                              | ,562                                   | ,875                               | ,893                                   |
| S2BGuidedAutonomousD          | 145,11                        | 767,337                              | ,497                                   | ,790                               | ,894                                   |
| S2CInfluencedInfluential<br>D | 145,51                        | 780,121                              | ,523                                   | ,845                               | ,894                                   |
| S2CCaredforIncontroID         | 145,20                        | 771,194                              | ,582                                   | ,906                               | ,893                                   |
| S2CSubmissiveDominantD<br>D   | 145,51                        | 770,354                              | ,605                                   | ,897                               | ,892                                   |
| S2CGuidedAutonomous<br>D      | 145,33                        | 780,891                              | ,438                                   | ,899                               | ,895                                   |
| S3AInfluencedInfluential<br>D | 145,16                        | 786,406                              | ,451                                   | ,908                               | ,895                                   |
| S3ACaredforIncontroID         | 144,93                        | 793,262                              | ,356                                   | ,842                               | ,896                                   |
| S3ASubmissiveDominantD<br>D   | 144,70                        | 781,611                              | ,502                                   | ,870                               | ,894                                   |
| S3AGuidedAutonomousD          | 145,15                        | 783,295                              | ,460                                   | ,888                               | ,895                                   |
| S3BInfluencedInfluential<br>D | 145,00                        | 792,267                              | ,387                                   | ,797                               | ,896                                   |
| S3BCaredforIncontroID         | 144,57                        | 786,249                              | ,468                                   | ,800                               | ,895                                   |
| S3BSubmissiveDominantD<br>D   | 144,57                        | 784,315                              | ,522                                   | ,849                               | ,894                                   |
| S3BGuidedAutonomousD          | 145,05                        | 782,781                              | ,451                                   | ,827                               | ,895                                   |
| S3CInfluencedInfluential<br>D | 144,92                        | 783,777                              | ,493                                   | ,854                               | ,894                                   |
| S3CCaredforIncontroID         | 144,90                        | 790,457                              | ,396                                   | ,825                               | ,896                                   |
| S3CSubmissiveDominantD<br>D   | 144,72                        | 800,138                              | ,318                                   | ,771                               | ,897                                   |
| S3CGuidedAutonomous<br>D      | 144,89                        | 795,437                              | ,301                                   | ,751                               | ,897                                   |

Table E12: Correlations between Variables

|                                               | TotalHappyUnhappy | TotalAnnoyedPleased | TotalUnsatisfiedSatisfied | TotalMeancholiceContented | TotalDespairingHopeful | TotalBotheredEntertained | TotalUninterestedStimulated | TotalCalmExcited | TotalSatisfiedUninterested | TotalDullLively | TotalSleepyAwake | TotalUnarousedAroused | TotalInfluencedUninfluenced | TotalControlledUncontrolled | TotalSubmissiveDominant | TotalGuaranteedAutonomous | Age   | Gender | LevelofEducation | AreaofEducation | CurrentEnrollmentStatus |
|-----------------------------------------------|-------------------|---------------------|---------------------------|---------------------------|------------------------|--------------------------|-----------------------------|------------------|----------------------------|-----------------|------------------|-----------------------|-----------------------------|-----------------------------|-------------------------|---------------------------|-------|--------|------------------|-----------------|-------------------------|
| TotalHappyUnhappy Pearson Correlation         | 1                 | .773**              | .864**                    | .849**                    | .851**                 | .902**                   | .723**                      | .618**           | .729**                     | .740**          | .647**           | .615**                | .721**                      | .728**                      | .749**                  | .657**                    | -.191 | .110   | .012             | .024            | .130                    |
| Sig. (2-tailed)                               |                   | .000                | .000                      | .000                      | .000                   | .000                     | .000                        | .000             | .000                       | .000            | .000             | .000                  | .000                        | .000                        | .000                    | .000                      | .140  | .397   | .926             | .852            | .320                    |
| N                                             | 61                | 61                  | 61                        | 61                        | 61                     | 61                       | 61                          | 61               | 61                         | 61              | 61               | 61                    | 61                          | 61                          | 61                      | 61                        | 61    | 61     | 61               | 61              | 61                      |
| TotalAnnoyedPleased Pearson Correlation       |                   | 1                   | .820**                    | .764**                    | .719**                 | .702**                   | .663**                      | .344**           | .601**                     | .545**          | .644**           | .548**                | .687**                      | .726**                      | .680**                  | .744**                    | -.148 | .060   | .035             | .127            | .101                    |
| Sig. (2-tailed)                               |                   |                     | .000                      | .000                      | .000                   | .000                     | .000                        | .007             | .000                       | .000            | .000             | .000                  | .000                        | .000                        | .000                    | .000                      | .256  | .645   | .787             | .329            | .438                    |
| N                                             | 61                | 61                  | 61                        | 61                        | 61                     | 61                       | 61                          | 61               | 61                         | 61              | 61               | 61                    | 61                          | 61                          | 61                      | 61                        | 61    | 61     | 61               | 61              | 61                      |
| TotalUnsatisfiedSatisfied Pearson Correlation |                   |                     | 1                         | .770**                    | .788**                 | .842**                   | .669**                      | .465**           | .722**                     | .686**          | .604**           | .606**                | .667**                      | .746**                      | .764**                  | .680**                    | -.181 | .060   | .083             | .071            | -.001                   |
| Sig. (2-tailed)                               |                   |                     | .000                      | .000                      | .000                   | .000                     | .000                        | .000             | .000                       | .000            | .000             | .000                  | .000                        | .000                        | .000                    | .000                      | .164  | .648   | .527             | .588            | .997                    |
| N                                             | 61                | 61                  | 61                        | 61                        | 61                     | 61                       | 61                          | 61               | 61                         | 61              | 61               | 61                    | 61                          | 61                          | 61                      | 61                        | 61    | 61     | 61               | 61              | 61                      |
| TotalMeancholiceContented Pearson Correlation |                   |                     |                           | 1                         | .782**                 | .767**                   | .830**                      | .601**           | .632**                     | .623**          | .715**           | .693**                | .694**                      | .780**                      | .723**                  | .558**                    | -.083 | .209   | .040             | -.020           | .080                    |
| Sig. (2-tailed)                               |                   |                     | .000                      | .000                      | .000                   | .000                     | .000                        | .000             | .000                       | .000            | .000             | .000                  | .000                        | .000                        | .000                    | .000                      | .524  | .106   | .762             | .881            | .541                    |
| N                                             | 61                | 61                  | 61                        | 61                        | 61                     | 61                       | 61                          | 61               | 61                         | 61              | 61               | 61                    | 61                          | 61                          | 61                      | 61                        | 61    | 61     | 61               | 61              | 61                      |
| TotalDespairingHopeful Pearson Correlation    |                   |                     |                           |                           | 1                      | .826**                   | .697**                      | .532**           | .698**                     | .681**          | .675**           | .575**                | .695**                      | .714**                      | .721**                  | .518**                    | -.101 | -.005  | .099             | .018            | .154                    |
| Sig. (2-tailed)                               |                   |                     | .000                      | .000                      | .000                   | .000                     | .000                        | .000             | .000                       | .000            | .000             | .000                  | .000                        | .000                        | .000                    | .000                      | .437  | .967   | .448             | .893            | .236                    |
| N                                             | 61                | 61                  | 61                        | 61                        | 61                     | 61                       | 61                          | 61               | 61                         | 61              | 61               | 61                    | 61                          | 61                          | 61                      | 61                        | 61    | 61     | 61               | 61              | 61                      |
| TotalBotheredEntertained Pearson Correlation  |                   |                     |                           |                           |                        | 1                        | .691**                      | .662**           | .799**                     | .811**          | .583**           | .577**                | .715**                      | .722**                      | .766**                  | .606**                    | -.220 | .139   | -.014            | .064            | .053                    |
| Sig. (2-tailed)                               |                   |                     | .000                      | .000                      | .000                   | .000                     | .000                        | .000             | .000                       | .000            | .000             | .000                  | .000                        | .000                        | .000                    | .000                      | .088  | .284   | .912             | .627            | .684                    |
| N                                             | 61                | 61                  | 61                        | 61                        | 61                     | 61                       | 61                          | 61               | 61                         | 61              | 61               | 61                    | 61                          | 61                          | 61                      | 61                        | 61    | 61     | 61               | 61              | 61                      |

|                                                 | TotalHa<br>ppyUnh<br>appy | TotalAn<br>noyedPI<br>eased | TotalUn<br>satisfie<br>dSatisfi<br>ed | TotalMe<br>lancholi<br>cConte<br>nded | TotalDe<br>spairing<br>Hopeful | TotalBo<br>redEnte<br>rtained | TotalUn<br>interest<br>edStim<br>ulated | TotalCa<br>ImExcit<br>ed | TotalSI<br>uggishF<br>renzied | TotalDu<br>IlJittery | TotalSI<br>eepyWi<br>deawak<br>e | TotalUn<br>aroused<br>Arouse<br>d | TotalInfl<br>uenced<br>al | TotalCa<br>redforh<br>control | TotalSu<br>bmisssiv<br>eDomin<br>ant | TotalGu<br>idedAut<br>onomou<br>s | Age   | Gender | Levelof<br>Educati<br>on | AreaofE<br>ducation<br>n | Current<br>Emotio<br>nalStat<br>e |
|-------------------------------------------------|---------------------------|-----------------------------|---------------------------------------|---------------------------------------|--------------------------------|-------------------------------|-----------------------------------------|--------------------------|-------------------------------|----------------------|----------------------------------|-----------------------------------|---------------------------|-------------------------------|--------------------------------------|-----------------------------------|-------|--------|--------------------------|--------------------------|-----------------------------------|
| TotalUn Pearson<br>interest<br>edStim<br>ulated | .723**                    | .663**                      | .669**                                | .830**                                | .697**                         | .691**                        | 1                                       | .537**                   | .627**                        | .575**               | .678**                           | .793**                            | .526**                    | .669**                        | .589**                               | .491**                            | -.078 | .210   | .157                     | -.041                    | .035                              |
| Sig. (2-<br>tailed)                             | .000                      | .000                        | .000                                  | .000                                  | .000                           | .000                          |                                         | .000                     | .000                          | .000                 | .000                             | .000                              | .000                      | .000                          | .000                                 | .000                              | .549  | .104   | .227                     | .753                     | .791                              |
| N                                               | 61                        | 61                          | 61                                    | 61                                    | 61                             | 61                            | 61                                      | 61                       | 61                            | 61                   | 61                               | 61                                | 61                        | 61                            | 61                                   | 61                                | 61    | 61     | 61                       | 61                       | 61                                |
| TotalCa Pearson<br>ImExcit<br>ed                | .618**                    | .344**                      | .465**                                | .601**                                | .532**                         | .662**                        | .537**                                  | 1                        | .564**                        | .731**               | .174                             | .426**                            | .499**                    | .421**                        | .368**                               | .337**                            | -.139 | .220   | -.176                    | -.013                    | -.045                             |
| Sig. (2-<br>tailed)                             | .000                      | .007                        | .000                                  | .000                                  | .000                           | .000                          | .000                                    |                          | .000                          | .000                 | .180                             | .001                              | .000                      | .001                          | .003                                 | .008                              | .285  | .088   | .174                     | .924                     | .728                              |
| N                                               | 61                        | 61                          | 61                                    | 61                                    | 61                             | 61                            | 61                                      | 61                       | 61                            | 61                   | 61                               | 61                                | 61                        | 61                            | 61                                   | 61                                | 61    | 61     | 61                       | 61                       | 61                                |
| TotalSI Pearson<br>uggishF<br>renzied           | .729**                    | .601**                      | .722**                                | .632**                                | .698**                         | .799**                        | .627**                                  | .564**                   | 1                             | .828**               | .541**                           | .546**                            | .672**                    | .703**                        | .630**                               | .583**                            | -.093 | .207   | .133                     | .008                     | -.054                             |
| Sig. (2-<br>tailed)                             | .000                      | .000                        | .000                                  | .000                                  | .000                           | .000                          | .000                                    | .000                     |                               | .000                 | .000                             | .000                              | .000                      | .000                          | .000                                 | .000                              | .476  | .110   | .307                     | .949                     | .681                              |
| N                                               | 61                        | 61                          | 61                                    | 61                                    | 61                             | 61                            | 61                                      | 61                       | 61                            | 61                   | 61                               | 61                                | 61                        | 61                            | 61                                   | 61                                | 61    | 61     | 61                       | 61                       | 61                                |
| TotalDu Pearson<br>IlJittery                    | .740**                    | .545**                      | .686**                                | .623**                                | .681**                         | .811**                        | .575**                                  | .731**                   | .828**                        | 1                    | .340**                           | .445**                            | .697**                    | .642**                        | .619**                               | .571**                            | -.217 | .118   | .030                     | .079                     | -.120                             |
| Sig. (2-<br>tailed)                             | .000                      | .000                        | .000                                  | .000                                  | .000                           | .000                          | .000                                    | .000                     | .000                          |                      | .007                             | .000                              | .000                      | .000                          | .000                                 | .000                              | .093  | .366   | .818                     | .544                     | .358                              |
| N                                               | 61                        | 61                          | 61                                    | 61                                    | 61                             | 61                            | 61                                      | 61                       | 61                            | 61                   | 61                               | 61                                | 61                        | 61                            | 61                                   | 61                                | 61    | 61     | 61                       | 61                       | 61                                |
| TotalSI Pearson<br>eepyWi<br>deawak<br>e        | .647**                    | .644**                      | .604**                                | .715**                                | .675**                         | .583**                        | .678**                                  | .174                     | .541**                        | .340**               | 1                                | .641**                            | .558**                    | .711**                        | .671**                               | .503**                            | -.040 | .105   | .073                     | -.034                    | .091                              |
| Sig. (2-<br>tailed)                             | .000                      | .000                        | .000                                  | .000                                  | .000                           | .000                          | .000                                    | .180                     | .000                          | .007                 |                                  | .000                              | .000                      | .000                          | .000                                 | .000                              | .762  | .423   | .575                     | .793                     | .485                              |
| N                                               | 61                        | 61                          | 61                                    | 61                                    | 61                             | 61                            | 61                                      | 61                       | 61                            | 61                   | 61                               | 61                                | 61                        | 61                            | 61                                   | 61                                | 61    | 61     | 61                       | 61                       | 61                                |
| TotalUn Pearson<br>aroused<br>Arouse<br>d       | .615**                    | .548**                      | .606**                                | .693**                                | .575**                         | .577**                        | .793**                                  | .426**                   | .546**                        | .445**               | .641**                           | 1                                 | .526**                    | .608**                        | .562**                               | .364**                            | -.054 | .086   | .109                     | -.043                    | -.071                             |
| Sig. (2-<br>tailed)                             | .000                      | .000                        | .000                                  | .000                                  | .000                           | .000                          | .000                                    | .001                     | .000                          | .000                 | .000                             |                                   | .000                      | .000                          | .000                                 | .004                              | .682  | .512   | .402                     | .743                     | .586                              |
| N                                               | 61                        | 61                          | 61                                    | 61                                    | 61                             | 61                            | 61                                      | 61                       | 61                            | 61                   | 61                               | 61                                | 61                        | 61                            | 61                                   | 61                                | 61    | 61     | 61                       | 61                       | 61                                |

|                                     | TotalHa<br>ppUnh<br>TotalAn<br>noyesP<br>eased | TotalUn<br>satisfie<br>dSatisfi<br>ed | TotalMe<br>lancholi<br>cConte<br>ind | TotalDe<br>spairing<br>Hopeful | TotalBo<br>reEnfe<br>rained | TotalUn<br>interest<br>edSim<br>ulated | TotalCa<br>lInExcit<br>ed | TotalCa<br>lTotalSi<br>gluglInF<br>renized | TotalSi<br>deavak<br>e | TotalUn<br>aroused<br>d | TotalInfl<br>uenced<br>al | TotalCa<br>lredInfl<br>control | TotalSu<br>bmissiv<br>edDomn<br>ant | TotalGu<br>idesAut<br>onomou<br>s | Age   | Gender | Levelof<br>Educati<br>on | AreaofE<br>ducatio<br>n | Current<br>Emotio<br>nalStat<br>e |
|-------------------------------------|------------------------------------------------|---------------------------------------|--------------------------------------|--------------------------------|-----------------------------|----------------------------------------|---------------------------|--------------------------------------------|------------------------|-------------------------|---------------------------|--------------------------------|-------------------------------------|-----------------------------------|-------|--------|--------------------------|-------------------------|-----------------------------------|
| TotalInfl<br>uenced<br>al           | .721**                                         | .687**                                | .667**                               | .695**                         | .715**                      | .526**                                 | .499**                    | .672**                                     | .697**                 | .526**                  | 1                         | .793**                         | .754**                              | .553**                            | -.166 | .113   | -.083                    | .147                    | .037                              |
| Sig. (2-<br>tailed)                 |                                                |                                       |                                      |                                |                             |                                        |                           |                                            |                        |                         |                           |                                |                                     |                                   |       |        |                          |                         |                                   |
| N                                   | 61                                             | 61                                    | 61                                   | 61                             | 61                          | 61                                     | 61                        | 61                                         | 61                     | 61                      | 61                        | 61                             | 61                                  | 61                                | 61    | 61     | 61                       | 61                      | 61                                |
| TotalCa<br>lredInfl<br>control      | .728**                                         | .726**                                | .746**                               | .714**                         | .722**                      | .669**                                 | .421**                    | .703**                                     | .642**                 | .608**                  | .793**                    | 1                              | .806**                              | .591**                            | -.239 | .038   | .068                     | .117                    | -.136                             |
| Sig. (2-<br>tailed)                 |                                                |                                       |                                      |                                |                             |                                        |                           |                                            |                        |                         |                           |                                |                                     |                                   |       |        |                          |                         |                                   |
| N                                   | 61                                             | 61                                    | 61                                   | 61                             | 61                          | 61                                     | 61                        | 61                                         | 61                     | 61                      | 61                        | 61                             | 61                                  | 61                                | 61    | 61     | 61                       | 61                      | 61                                |
| TotalSu<br>bmissiv<br>edDomn<br>ant | .749**                                         | .680**                                | .764**                               | .723**                         | .766**                      | .569**                                 | .368**                    | .630**                                     | .619**                 | .562**                  | .754**                    | .806**                         | 1                                   | .618**                            | -.253 | .035   | -.099                    | .147                    | .100                              |
| Sig. (2-<br>tailed)                 |                                                |                                       |                                      |                                |                             |                                        |                           |                                            |                        |                         |                           |                                |                                     |                                   |       |        |                          |                         |                                   |
| N                                   | 61                                             | 61                                    | 61                                   | 61                             | 61                          | 61                                     | 61                        | 61                                         | 61                     | 61                      | 61                        | 61                             | 61                                  | 61                                | 61    | 61     | 61                       | 61                      | 61                                |
| TotalGu<br>idesAut<br>onomou<br>s   | .657**                                         | .744**                                | .680**                               | .518**                         | .606**                      | .491**                                 | .337**                    | .583**                                     | .571**                 | .364**                  | .553**                    | .591**                         | 1                                   | .618**                            | -.231 | .120   | -.038                    | .131                    | .009                              |
| Sig. (2-<br>tailed)                 |                                                |                                       |                                      |                                |                             |                                        |                           |                                            |                        |                         |                           |                                |                                     |                                   |       |        |                          |                         |                                   |
| N                                   | 61                                             | 61                                    | 61                                   | 61                             | 61                          | 61                                     | 61                        | 61                                         | 61                     | 61                      | 61                        | 61                             | 61                                  | 61                                | 61    | 61     | 61                       | 61                      | 61                                |
| Age                                 |                                                |                                       |                                      |                                |                             |                                        |                           |                                            |                        |                         |                           |                                |                                     |                                   |       |        |                          |                         |                                   |
| Sig. (2-<br>tailed)                 |                                                |                                       |                                      |                                |                             |                                        |                           |                                            |                        |                         |                           |                                |                                     |                                   |       |        |                          |                         |                                   |
| N                                   | 61                                             | 61                                    | 61                                   | 61                             | 61                          | 61                                     | 61                        | 61                                         | 61                     | 61                      | 61                        | 61                             | 61                                  | 61                                | 61    | 61     | 61                       | 61                      | 61                                |
| Gender                              |                                                |                                       |                                      |                                |                             |                                        |                           |                                            |                        |                         |                           |                                |                                     |                                   |       |        |                          |                         |                                   |
| Sig. (2-<br>tailed)                 |                                                |                                       |                                      |                                |                             |                                        |                           |                                            |                        |                         |                           |                                |                                     |                                   |       |        |                          |                         |                                   |
| N                                   | 61                                             | 61                                    | 61                                   | 61                             | 61                          | 61                                     | 61                        | 61                                         | 61                     | 61                      | 61                        | 61                             | 61                                  | 61                                | 61    | 61     | 61                       | 61                      | 61                                |
| Levelof<br>Educati<br>on            |                                                |                                       |                                      |                                |                             |                                        |                           |                                            |                        |                         |                           |                                |                                     |                                   |       |        |                          |                         |                                   |
| Sig. (2-<br>tailed)                 |                                                |                                       |                                      |                                |                             |                                        |                           |                                            |                        |                         |                           |                                |                                     |                                   |       |        |                          |                         |                                   |
| N                                   | 61                                             | 61                                    | 61                                   | 61                             | 61                          | 61                                     | 61                        | 61                                         | 61                     | 61                      | 61                        | 61                             | 61                                  | 61                                | 61    | 61     | 61                       | 61                      | 61                                |
| AreaofE<br>ducatio<br>n             |                                                |                                       |                                      |                                |                             |                                        |                           |                                            |                        |                         |                           |                                |                                     |                                   |       |        |                          |                         |                                   |
| Sig. (2-<br>tailed)                 |                                                |                                       |                                      |                                |                             |                                        |                           |                                            |                        |                         |                           |                                |                                     |                                   |       |        |                          |                         |                                   |
| N                                   | 61                                             | 61                                    | 61                                   | 61                             | 61                          | 61                                     | 61                        | 61                                         | 61                     | 61                      | 61                        | 61                             | 61                                  | 61                                | 61    | 61     | 61                       | 61                      | 61                                |
| Current<br>Emotio<br>nalStat<br>e   |                                                |                                       |                                      |                                |                             |                                        |                           |                                            |                        |                         |                           |                                |                                     |                                   |       |        |                          |                         |                                   |
| Sig. (2-<br>tailed)                 |                                                |                                       |                                      |                                |                             |                                        |                           |                                            |                        |                         |                           |                                |                                     |                                   |       |        |                          |                         |                                   |
| N                                   | 61                                             | 61                                    | 61                                   | 61                             | 61                          | 61                                     | 61                        | 61                                         | 61                     | 61                      | 61                        | 61                             | 61                                  | 61                                | 61    | 61     | 61                       | 61                      | 61                                |