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Expected Profiles and Temporal Stability of The LOOK

Sierra Marie Baird

A dissertation submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy

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ABSTRACT

Expected Profiles and Temporal Stability of The LOOK

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Doctor of Philosophy

The LOOK is an iOS based iPad app designed to measure viewing time as an estimate of sexual interest. Participants used a 7-point Likert scale to rate 154 images based on sexual attractiveness. The images belonged to 14 differentiated gender and age categories from infants to elderly adults. Before rating each image participants were asked to complete an additional task of locating and touching a small dot found in one of the four corners of the screen. This was included to make sure that participants were attending to each image, and to add another level of information to the results.

The purpose of this study was to establish the expected reference group viewing time expected patterns and temporal stability using the LOOK, for nonpedophilic, exclusively heterosexual, college-age males and females. 56 male and 75 female undergraduate students from BYU psychology classes participated. The expected patterns were established and are similar to previously established sexual attraction patterns with slight difference due to the additional categories in the LOOK. The results are broken up into three different sections: dot time (the time from when the image appears to when the dot is touched), rate time (the time from when the dot is touched to when the image is rated), and total time (the combined dot and rate time). Results of the analysis indicate that dot time stability is 96.43% for males and 100% for females. Rate time stability is 64.29% for males, and 73.33% for females. And the total temporal stability is 98.21% for males and 100% for females.

Keywords: sexual interest, viewing time, phallometry, penile plethysmography, reliability, temporal stability

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I also owe thanks to my cohorts for their love and support. I'm grateful for their influence on me. I am a better person for knowing them. I'm thankful to have the support of my mom, who encouraged me to stay in school and who made me believe that I could do anything.

Lastly, I'm thankful for my husband and best friend, Cameron, for putting endless hours into developing the LOOK. I'm thankful for every time that he saw in me something that I didn't see in myself, and for his encouragement for me to make life whatever I wanted it to be.

TABLE OF CONTENTS

| | |
|--|------|
| TITLE PAGE | i |
| ABSTRACT | ii |
| ACKNOWLEDGEMENTS | iii |
| TABLE OF CONTENTS | iv |
| LIST OF TABLES | vi |
| LIST OF FIGURES | vii |
| LIST OF EQUATIONS | viii |
| DESCRIPTION OF DISSERTATION STRUCTURE | ix |
| Introduction..... | 1 |
| Viewing Time | 2 |
| Available Instruments | 4 |
| Abel Assessment of Sexual Interest..... | 4 |
| Affinity 2.5 | 5 |
| Ipsative Versus Reference Group Scoring..... | 6 |
| Statement of Problem..... | 7 |
| Statement of Purpose | 7 |
| Method | 8 |
| Participants..... | 8 |
| Procedures..... | 8 |
| Measures | 9 |
| Data Analysis | 11 |

| | |
|---|----|
| Results..... | 12 |
| Norm-Referenced Patterns..... | 13 |
| Chi-Square | 19 |
| Discussion..... | 20 |
| Implications..... | 23 |
| Limitations | 23 |
| Future Research | 24 |
| Conclusion | 25 |
| References..... | 26 |
| Appendix A Literature Review..... | 33 |
| Appendix B Consent to be a Research Subject..... | 56 |
| Appendix C Demographics, Attitudes, and Sexual Interest Questionnaire | 58 |
| Appendix D LOOK Chi-Square Results for a Sample of Exclusively Heterosexual, Nonpedophilic Males, for Dot Time, Rate Time, and Total Time | 60 |
| Appendix E LOOK Chi-Square Results for a Sample of Exclusively Heterosexual, Nonpedophilic Females, for Dot Time, Rate Time, and Total Time..... | 63 |

LIST OF TABLES

| | |
|--|----|
| Table 1 <i>Comparison of LOOK Proportion Means of Viewing Time by Category</i> | 13 |
| Table 2 <i>Number and Percentage of Stable, Nonsignificant Chi-Square Values</i> | 20 |
| Table 3 <i>LOOK Internal Consistency</i> | 20 |
| Table 4 <i>Chi-Square Results for Dot Time: Males</i> | 60 |
| Table 5 <i>Chi-Square Results for Rate Time: Males</i> | 61 |
| Table 6 <i>Chi-Square Results for Total Time: Males</i> | 62 |
| Table 7 <i>Chi-Square Results for Dot Time: Females</i> | 63 |
| Table 8 <i>Chi-Square Results for Rate Time: Females</i> | 65 |
| Table 9 <i>Chi-Square Results for Total Time: Females</i> | 67 |

LIST OF FIGURES

| | |
|---|----|
| <i>Figure 1.</i> Proportion means for dot time for males, time 1 and time 2 of the LOOK. | 14 |
| <i>Figure 2.</i> Proportion means for rate time for males, time 1 and time 2 of the LOOK. | 14 |
| <i>Figure 3.</i> Proportion means for total time for males, time 1 and time 2 of the LOOK. | 16 |
| <i>Figure 4.</i> Average Likert scale ratings for males, times 1 and 2. | 16 |
| <i>Figure 5.</i> Proportion means for dot time for females, time 1 and time 2 of the LOOK. | 17 |
| <i>Figure 6.</i> Proportion means for rate time for females, time 1 and time 2 of the LOOK. | 17 |
| <i>Figure 7.</i> Proportion means for total time for females, time 1 and time 2 of the LOOK. | 18 |
| <i>Figure 8.</i> Average Likert scale ratings for females, times 1 and 2. | 18 |

LIST OF EQUATIONS

| | |
|-----------|----|
| (1) | 19 |
|-----------|----|

DESCRIPTION OF DISSERTATION STRUCTURE

This dissertation is written in a hybrid form that integrates current journal publication format with the traditional dissertation format. This includes updated university format requirements for submission. This dissertation is part of a larger collaborative project, portions of which may be submitted for publication. Appendix A includes an extended literature review including a detailed description regarding pedophilia and current assessment and treatment options. Appendix B includes the consent form used with research subjects, Appendix C contains the Demographics, Attitudes, and Sexual Interest Questionnaire. Appendix D includes the LOOK Chi-Square Results for a Sample of Exclusively Heterosexual, Nonpedophilic Males, for Dot Time, Rate Time, and Total Time, and Appendix E includes the LOOK Chi-Square Results for a Sample of Exclusively Heterosexual, Nonpedophilic Females, for Dot Time, Rate Time, and Total Time.

Introduction

Sexual arousal has been explained as following a three-step sequence: the aesthetic response, the approach response and the genital response (Singer, 1984). The aesthetic response is characterized by a person's hedonic feeling in response to an attractive sight. At this point in sexual arousal the person might continue to view the sight and make an effort to continue viewing (head turning, long glances). The aesthetic response leads to the approach response, which is concerned with physical proximity and moving toward the attractive person. Singer, (1984) explains:

In humans, the approach response has been cited as an important component of sexual arousal by authors in psychology, psychiatry, anthropology, and ethology (Beach, 1977; Hite, 1976; Hollender, 1970; Mandler, 1972; Money, 1965; Shupe, 1975). Several assert that it is correlated with feelings of love. Social psychologists have repeatedly found that physical proximity is correlated with intimate feelings, liking, and subjective ratings of sexual attraction (Bakken, 1979; McAdams & Powers, 1981). (p. 233)

The approach response and proximity to the desired person can lead to general somatic response, which can include increased heart rate, muscle tension, becoming flushed, and in extreme cases can cause genital response (Patterson, 1976). The genital response is the third step in the sexual arousal sequence and is characterized as a change in genital tumescence.

Penile and vaginal plethysmographies are used to assess the genital tumescence during the third stage of sexual arousal. This is done while the person views and/or listens to erotic material (Chivers, Rieger, Latty, & Bailey, 2004; Gaither & Plaud, 1997; Haywood, Grossman, & Cavanaugh, 1990; Lawson, 2000; Letourneau, 2002; Richards, Kalucy, Wood, & Marshal, 1990). Plethysmography is currently the most common way to assess sexual attraction in people

that have been accused of sexual crimes. While all approaches to assessing sexual attraction have their limitations, plethysmography is the most invasive and controversial (Laws & Gress, 2004; Marshall & Fernandez, 2000; Marshall & Fernandez, 2003).

Another approach to measuring sexual arousal is viewing time. Viewing time tools have emerged out of a need for a less invasive instrument to test a person's sexual arousal. Viewing time is used to assess sexual attraction during the first stage of response in the sexual attraction process, the aesthetic response (Singer, 1984). This is done by measuring the length of time a person takes to view specific images. Viewing time is a less invasive approach to measuring a person's sexual arousal and research on its effectiveness continues to advance (Rupp & Wallen, 2009).

Viewing Time

An early example of researchers using viewing time to assess sexual interest is Rosenzweig's 1942 study with 20 inpatient clients who had been diagnosed with schizophrenia. The 20 patients were divided into two groups based on their sexual behavior (masturbation and extended physical contact with others). The researcher used a photoscope, which included three sets of 24 images, sized 8"x 9", that were mounted on heavy cardboard. The images included sexual and non-sexual images. Of the non-sexual images there were images of landscapes, animals and people. The sexual images included images of nude people, of heterosexual and homosexual intercourse, and of other sexual acts.

The participants were permitted to examine the photoscope without supervision and at their own leisure. They were monitored through a hidden two-way mirror; and the amount of time participants spent viewing each item was surreptitiously recorded, along with any general observable reactions (e.g., grimaces; Rosenzweig, 1942). The goal of this study was to measure

sexual arousal in response to hormone therapy. Rosenzweig (1942) described the results of this study saying, "findings based mainly on these time results and secondarily on certain more qualitative observations give a fairly valid and dependable estimate of the subject's sexual interest." (p. 150)

Subsequent research has also shown that a person will look longer at images of people that they find sexually attractive. Harmon (2006) used the Affinity 2.0, a viewing time measure, to test the viewing time patterns of exclusively heterosexual, nonpedophilic, college age females across time. The females in the study viewed the preferred sexual stimulus the longest. These viewing time results confirmed previous norm-reference patterns for heterosexual females (Quinsey, Ketsetzis, Earls, & Karamanoukian, 1996; Quinsey, Rice, Grant, & Reid, 1993; Wright & Adams, 1994).

Crosby (2008) also used the Affinity 2.0, this time to test for sexual attraction patterns of exclusively heterosexual, nonpedophilic, college age males. He explains, "At test and retest administrations of the Affinity 2.0, slides of adult females (ADF) and adolescent females (JUF) were the clearly preferred visual stimuli. . . This consistent viewing time preference for depictions of nubile females, paired with the dramatic decline in viewing time scores for slides of males and children seems to suggest that this curve is representative of a normal heterosexual male response to the Affinity 2.0." (p. 16-17)

A newer version of the Affinity, the Affinity 2.5, was also tested on a university sample (Hansen, 2011). This study was to establish the norm-reference samples of college age males and females. Hansen also tested the participants twice to establish temporal stability. She found similar norm-referenced patterns as previous research using earlier versions of Affinity (Boardman, 2009; Crosby, 2008; Harmon, 2006; Worsham, 2009). These findings support

previous research on using viewing time to understand sexual attraction patterns (Gress, 2005; Gress, 2007; Harris, Rice, Quinsey, & Chaplin, 1996; Israel & Strassberg, 2009; Mokros, Dombert, Osterheider, Zappala, & Santtila, 2010; Quinsey et al., 1996; Rosenwasser, Adams, & Tansil, 1983).

Viewing time instruments are used in clinical settings to assess the possibility that a sex offender will reoffend. Research has found that "the strongest predictors of sexual recidivism were factors related to sexual deviance" (Hanson & Bussière, 1998, p. 351). In sexual abuse against children "deviant sexual interest (e.g., in sex with children) is one of the strongest risk factors for reoffending" (Banse, Schmidt, & Clarbour, 2010, p. 319). In the 2009 Census (the most recent statistical report) 67,032 cases of sexual abuse against children were reported (U.S. Census Bureau, 2011). The need to understand the sexual attraction patterns of persons who offend against children are overwhelming. The goal of keeping children safe from sex offenders is what drives further research into the assessment and treatment of sex offenders (Crooks, Rostill-Brooks, Beech, & Bickley, 2009).

Viewing time is used to assess sexual attraction by measuring the length of time a person views gender and age specific images (Israel & Strassberg, 2009). There are two current viewing time tools in use, the Abel Assessment for Sexual Interest (AASI) and the Affinity 2.5.

Available Instruments

Abel Assessment of Sexual Interest. The Abel Assessment of Sexual Interest (AASI) is a computer software viewing time measure. The AASI relies on a person's aesthetic response (viewing time) to measure their sexual interest. While images are being overtly rated by the test taker, a covert measure is taking place, measuring the amount of time the individual spends looking at each image. Those times are then summed to a constant, making the data ipsative

(Cattell, 1944). The AASI uses images of fully clothed males and females of varying ages (Abel, Huffman, Warberg, & Holland, 1998; Abel et al., 2004; Abel, Lawry, Karlstrom, Osborn, & Gillespie, 1994; Tong, 2007).

Since the assessment is happening at the first stage of sexual arousal, the aesthetic response, and not the physiological stage, the test is less invasive than plethysmography, which measures genital tumescence. Other strengths of the AASI are its standardized administration procedure and the use of non-pornographic images (Smith & Fischer, 1999). Despite these strengths, however, there are concerns about how AASI controls and manages data (Fischer & Smith, 1999; Sachsenmaier & Gress, 2009; Smith & Fischer, 1999). Sachsenmaier and Gress (2009) explain their concerns about the data being kept proprietary, "There could be no truly independent research, as all raw data are owned and controlled by Abel Screen Inc." (p. 41)

Other researchers have questioned the AASI method of trimming the data, which includes removing outliers according to methods that are held proprietary, and possibly compromising the raw data (Fischer & Smith, 1999; Letourneau, 2002). Fischer and Smith (1999) and Smith and Fischer (1999) also question the use of the AASI with adolescents, explaining that the screening and predictive validity results of using the AASI with adolescents was no better than chance.

Affinity 2.5. The Affinity 2.5 is a computer software viewing time tool that also measures sexual attraction at the first stage of Singer's model by tracking sustained visual attention. The Affinity measures sexual attraction by measuring the length of time a person looks at images in different gender and age categories (Crosby, 2008; Gress, 2005; Harmon, 2006; Harris et al., 1996; Israel & Strassberg, 2009; Quinsey et al., 1996). In using the Affinity, like the AASI, the individual overtly rates images as they appear on the computer screen, while the time

in microseconds (otherwise known as computer ticks) is covertly measuring how long the person spends looking at each image. The data from the Affinity 2.5 is reported in two ways: the raw data, and mean ranks. Mean ranks consist of assigning a rank to each of the 80 images, according to viewing time, which always sum to 3240 and makes the data ipsative. After the images are ranked, the ranks are averaged by differentiated gender and age categories. The mean rank generated for each category is the "score" for that category. Unlike the AASI, the Affinity 2.5 does make the raw data available. This makes it possible to conduct independent research on the data.

As mentioned earlier, data from the Affinity 2.0 and 2.5 have been used to establish reference group patterns (Boardman, 2009; Caswell, 2009; Crosby, 2008; Hansen, 2011; Harmon, 2006; Worsham, 2009). Establishing reference group patterns allows for research on deviations from expectation. Since it is irrational to assume that there is a "pedophile pattern," it is better to establish an empirically derived pattern of non-pedophiles and to allow myriad deviations therefrom.

Although reference group patterns have been established for the Affinity, the developers of the Affinity have decided not to integrate reference group scoring into the newest version of the instrument, Affinity 3.0 (Personal communication, David Glasgow, 2012). As for the AASI, no reference group procedures have ever been attempted. In order to move forward with a reference group scoring and logic, a new instrument was developed.

Ipsative Versus Reference Group Scoring

Both the AASI and the Affinity render ipsatized profiles. The data are ipsatized by always summing to a constant (Smith & Fischer, 1999). This means that an individual can only be compared to himself and not to another person. Ipsatized results, by nature, cannot be labeled

"deviant" because there is no reference group with which to compare the outcomes.

Unfortunately, often when viewing time data is reported, it is made to resemble norm-referenced data. This can mislead people to think that the data is compared against a norm-referenced group (Smith, 2010). When using ipsative data with viewing time measures, clinicians are only able to say how a person's sexual attraction to different gender and age groups varies within that one person. Unless the ipsatized profile has a standard against which to compare, one cannot draw conclusions about how deviant any individual profile may be.

Statement of Problem

The viewing time tools currently used to assess deviant sexual attraction use an ipsative (intra-individual) measurement approach. The individuals tested are being compared against themselves. For example, in both the AASI and the Affinity individuals are being tested on how long they look at images in different gender and age categories. Those categories are then compared within the individual using an ipsative measure (Madsen, 2008).

Because individuals are scored on an intra-individual basis, their test scores can only be compared intra-individually. In order to test an individual for *deviant* characteristics there needs to be a reference pattern against which to compare it. Without a reference pattern, conclusions of *deviance* mislead people to believe that there is in fact a norm-referenced, and that the person deviates from that norm (Baron, 1996; Broverman, 1962; Brown, 2005; Cattell, 1944; Closs, 1996; Cornwell & Dunlap, 1994; Stricker, 1965; Tamir & Lunetta, 1977).

Statement of Purpose

The purpose of this study is to establish the expected reference group viewing time patterns and the temporal stability using the LOOK (an iPad-based viewing time measure) for nonpedophilic, exclusively heterosexual, college age males and females.

Method

Participants

The participants recruited for this study included exclusively heterosexual, nonpedophilic, college age males and females who are currently attending Brigham Young University (BYU). These students were recruited from undergraduate psychology courses and awarded extra credit for being involved in the study. Because this study is testing for exclusively heterosexual participants, those who identified as not exclusively heterosexual were removed from the data. Of the participants who completed the study, there were 56 males and 75 females who were exclusively heterosexual and participated for both time 1 and time 2.

Procedures

Participants completed the LOOK, a viewing time iPad app. Assessment with the LOOK begins by first asking participants to rank their preferred and non-preferred sexual attraction. This is done by choosing among different gender and age category descriptors. After the sexual attraction ranking process, participants then rated on a seven-point Likert scale 154 images of fully-clothed people according to their sexual attractiveness. Before each picture was rated, the participant had to first locate and touch a small dot that was randomly located in one of the four corners of the image. The purpose of the dot is to add an additional task that requires that participants attend more fully to the images (Mokros et al., 2010).

When the participants completed the image-rating portion, the assessment was concluded. They were then asked to complete a short social desirability scale (Crowne & Marlowe, 1960). Participants were also asked to rate their sexual preference according to the Kinsey Scale, a seven point scale to rate sexual preference: 0 - Exclusively heterosexual with no homosexual interest, 1 - Predominantly heterosexual, only incidentally homosexual interest, 2 -

Predominantly heterosexual, but more than incidentally homosexual interest, 3 - Equally heterosexual and homosexual interests, 4 - Predominantly homosexual, but more than incidentally heterosexual interest, 5 - Predominantly homosexual, only incidentally heterosexual interest, 6 - Exclusively homosexual interest (Kinsey, Pomeroy, & Martin, 2003). This final step was another way to ensure that all of the data included in the final analysis was from participants who rated themselves as exclusively heterosexual. Subjects were asked to return no sooner than 14 days to take the LOOK a second time. At that point they were not asked to complete the social desirability scale nor the Kinsey scale a second time because these ratings were assumed to be stable.

Measures

The LOOK is an iPad-based viewing time app that builds on previous viewing time research. The LOOK utilizes touch screen technology, which makes it more intuitive and faster to use. All participants in our study completed the LOOK in less than 10 minutes, the majority in less than 7 minutes.

The LOOK includes 14 differentiated categories. Those categories are elderly female (ELF), elderly male (ELM), mature adult female (MAF), mature adult male (MAM), adult female (ADF), adult male (ADM), juvenile female (JUF), juvenile male (JUM), pre-juvenile female (PJF), pre-juvenile male (PJM), small child female (SCF), small child male (SCM), infant female (INF), infant male (INM). Each category has 11 images. One image from each group is used at the beginning of the assessment to help the user become familiar with how to use the test. The data from those 14 test images are not recorded.

The other 10 images from each group are used in the actual assessment. When an image appears on the iPad, the user first completes the task of locating a dot that will appear in one of

the four corners. The dot is an example of choice-reaction time (CRT) and Mokros et al. (2010) explained it this way, “in general, CRT is an information-processing method to measure the interest or preference of individuals by determining the amount of attention that they allocate to given stimuli.” (p. 1082) Adding the additional task of locating the dot allows the determination how the participants allocate their time while completing the LOOK. Once the person has located and touched the dot he or she can then rate the image using a seven-point Likert scale found on the bottom of the screen. The Likert scale is as follows; 3 very sexually attractive, 2 sexually attractive, 1 mildly sexually attractive, 0 neutral, -1 mildly sexually unattractive, -2 sexually unattractive, -3 very sexually unattractive. Once the image has been rated, the next image appears immediately. The images appear in random order to prevent subject familiarity at retest and to control for possible order effects. The small dot that appears in one of the four corners also appears randomly and has no connection to which image is being shown. This randomization was also included for test-retest purposes.

The images for the LOOK were purchased from Shutterstock, an online stock photo company. The variance of racial groups was determined by considering data of the proportional variance in the United States. Several selection factors were considered; age, body type, hair color, facial expression and body position. Photos chosen varied in the above categories. Except that for facial expression and body position, only photos that did not have a sexual expression or sexual body position, as determined by the LOOK research team, were included. The images of the people are intentionally, for the most part, full body shots as opposed to shoulder-up portraits. After the photos were chosen, an editing filter was put on each photo, which created a more uniform brightness and color of the photos. Additionally an effect that darkened the edges of the photos was added, with the intent to focus the viewer on the center of the image where the

person was located. The data collected by the LOOK is kept in its raw state to allow for alternative scoring and analyses.

Data Analysis

This research is an examination of the expected mean proportions of sexual attraction, as measured by the LOOK, for exclusively heterosexual, nonpedophilic males and females using our sample of college age participants. This study also assessed temporal stability of the LOOK by comparing viewing patterns of the data across two administrations at least two weeks apart.

Results

There were 82 males and 112 females who participated in the study. Of those participants, 26 males and 37 females did not meet inclusion requirements. Thirteen males and 16 females did not return for part two of the study. Twelve males and 21 females reported a sexual preference on the Kinsey scale that was not exclusively heterosexual. The data of one male was unusable due to data collection error. The data of participants who did not meet the requirements were excluded from the final data analysis. There was also one female's questionnaire that was not completed, but she participated both time 1 and time 2, and met the requirements, so her data were still included in the analysis. The remaining usable data set included 56 males and 75 females.

The age range for the male participants was 18 to 28. Of the males, 15 (26.5%) were freshmen, 18 (32%) were sophomores, 10 (18%) were juniors, and 13 (23.5%) were seniors. Thirty-nine (69.5%) of the males were single, 16 (29%) were married, 1 (1.5%) was divorced, and none described themselves as widowed. The ethnicity of the males is as follows: 48 (86%) Caucasian, 4 (7%) Hispanic, 2 (4%) Asian, 1 (1.5%) Korean, and 1 (1.5%) identified as mixed, Caucasian and Native American. The age range for the female participants was 18 to 30. Of the females, 36 (49%) were freshmen, 15 (20%) were sophomores, 12 (16%) were juniors, and 11 (15%) were seniors. The marital status of the females is as follows: 69 (93%) were single, 5 (7%) were married, and none described themselves as either divorced or widowed. The ethnicity of the females is: 61 (82.4%) Caucasian, 1 (1.4%) Hispanic, 5 (7%) Asian, 1 (1.4%) Native American, and 6 identified as mixed race: 1 (1.4%) as Caucasian/Native American, 1 (1.4%) Caucasian/Asian/Pacific Islander, 2 (2.5%) Caucasian/African American, and 2 (2.5%) Caucasian/Hispanic (percentages for all sub-groups are rounded).

Norm-Referenced Patterns

The viewing time data collected for the LOOK is broken up into three portions. The amount of time spent from the time the image appears to when the dot is selected, the amount of time from when the dot is selected to when the image is rated on the Likert scale, and the sum of both dot and rate time, for a total time. The norm-referenced patterns for the LOOK were calculated by summing the averages of all gender and age categories in each test portion (dot, rate, and total) for males and females, for time 1 and time 2. Those averages were then divided by the total time to yield a proportion of the total time spent selecting the dot and rating the image. Table 1 details the proportion means for the LOOK.

The LOOK includes 14 differentiated groups. Those groups are, elderly female (ELF), elderly male (ELM), mature adult female (MAF), mature adult male (MAM), adult female (ADF), adult male (ADM), juvenile female (JUF), juvenile male (JUM), pre-juvenile female (PJF), pre-juvenile male (PJM), small child female (SCF), small child male (SCM), infant female (INF), infant male (INM). Figures 1-8 demonstrate the proportion means for each category for males and females, time 1 and time 2, for each portion of the test (dot, rate, and total), followed by the average Likert scale ratings.

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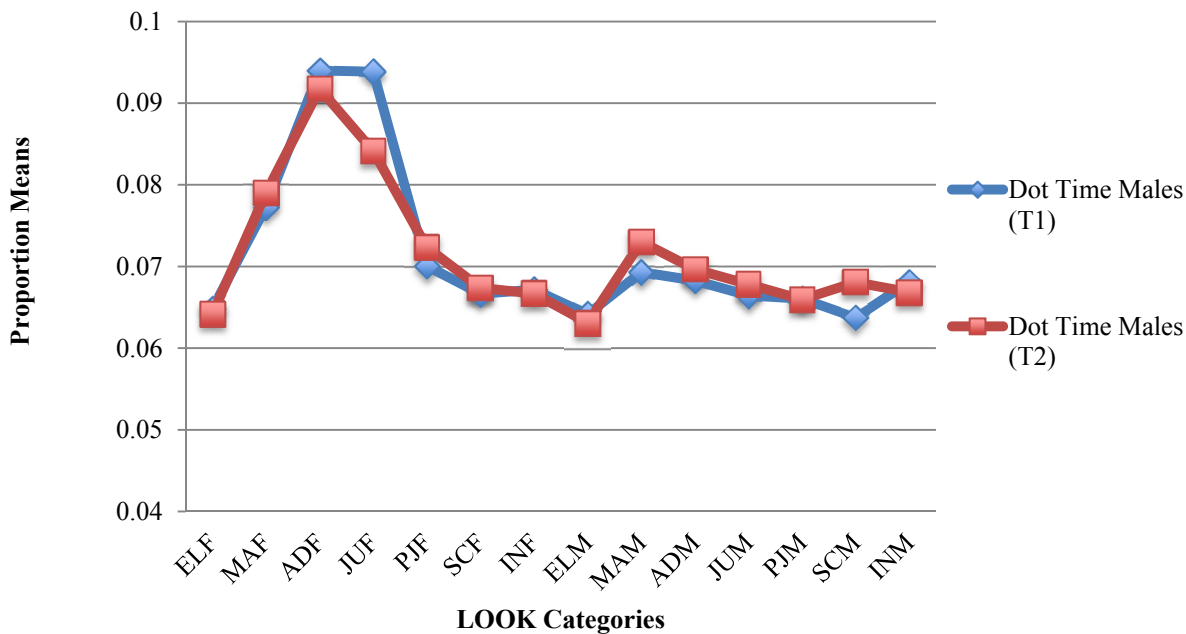


Figure 1. Proportion means for dot time for males, time 1 and time 2 of the LOOK.

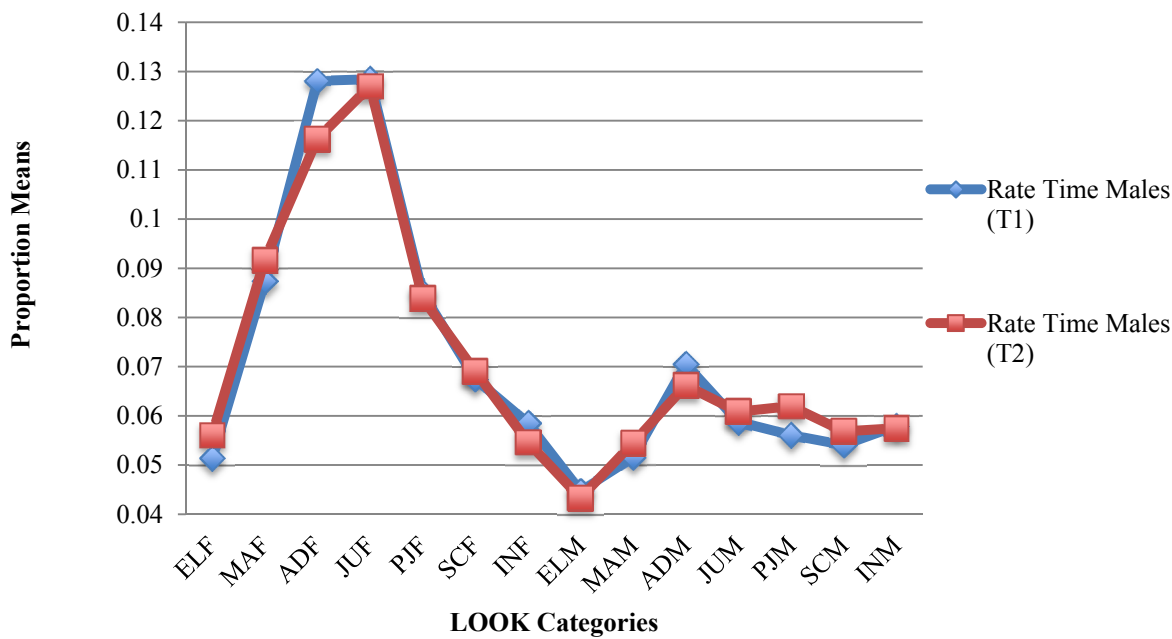


Figure 2. Proportion means for rate time for males, time 1 and time 2 of the LOOK.

Table 1

Comparison of LOOK Proportion Means of Viewing Time by Category

| | ELF | MAF | ADF | JUF | PJF | SCF | INF | ELM | MAM | ADM | JUM | PJM | SCM | INM |
|--------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Dot/M (T1) | .065 | .077 | .094 | .094 | .070 | .067 | .067 | .064 | .069 | .068 | .066 | .066 | .064 | .068 |
| Dot/M (T2) | .064 | .079 | .092 | .084 | .072 | .067 | .067 | .063 | .073 | .070 | .068 | .066 | .068 | .067 |
| Dot/F (T1) | .068 | .075 | .078 | .073 | .069 | .066 | .068 | .067 | .082 | .074 | .074 | .067 | .069 | .070 |
| Dot/F (T2) | .066 | .075 | .075 | .073 | .068 | .068 | .068 | .067 | .080 | .075 | .078 | .070 | .068 | .070 |
| Rate/M (T1) | .051 | .087 | .128 | .128 | .085 | .067 | .059 | .045 | .052 | .071 | .059 | .056 | .054 | .058 |
| Rate/M (T2) | .056 | .092 | .116 | .127 | .084 | .069 | .055 | .043 | .055 | .066 | .061 | .062 | .057 | .057 |
| Rate/F (T1) | .062 | .076 | .078 | .079 | .063 | .066 | .060 | .062 | .091 | .085 | .092 | .065 | .062 | .060 |
| Rate/F (T2) | .058 | .075 | .077 | .081 | .063 | .063 | .055 | .060 | .095 | .082 | .097 | .067 | .067 | .060 |
| Total/M (T1) | .058 | .082 | .111 | .111 | .077 | .067 | .063 | .055 | .061 | .069 | .063 | .061 | .059 | .063 |
| Total/M (T2) | .060 | .085 | .104 | .105 | .078 | .068 | .061 | .053 | .064 | .068 | .064 | .064 | .062 | .062 |
| Total/F (T1) | .066 | .075 | .078 | .075 | .066 | .066 | .064 | .065 | .086 | .079 | .082 | .066 | .066 | .065 |
| Total/F (T2) | .062 | .075 | .076 | .077 | .066 | .066 | .062 | .064 | .087 | .078 | .086 | .069 | .068 | .065 |

Note. ELF = elderly female; MAF = mature adult female; ADF = adult female; JUF = juvenile female; PJF = pre-juvenile female; SCF = small child female; INF = infant female; ELM = elderly male; MAM = mature adult male; ADM = adult male; JUM = juvenile male; PJM = pre-juvenile; SCM = small child male; INM = infant male.

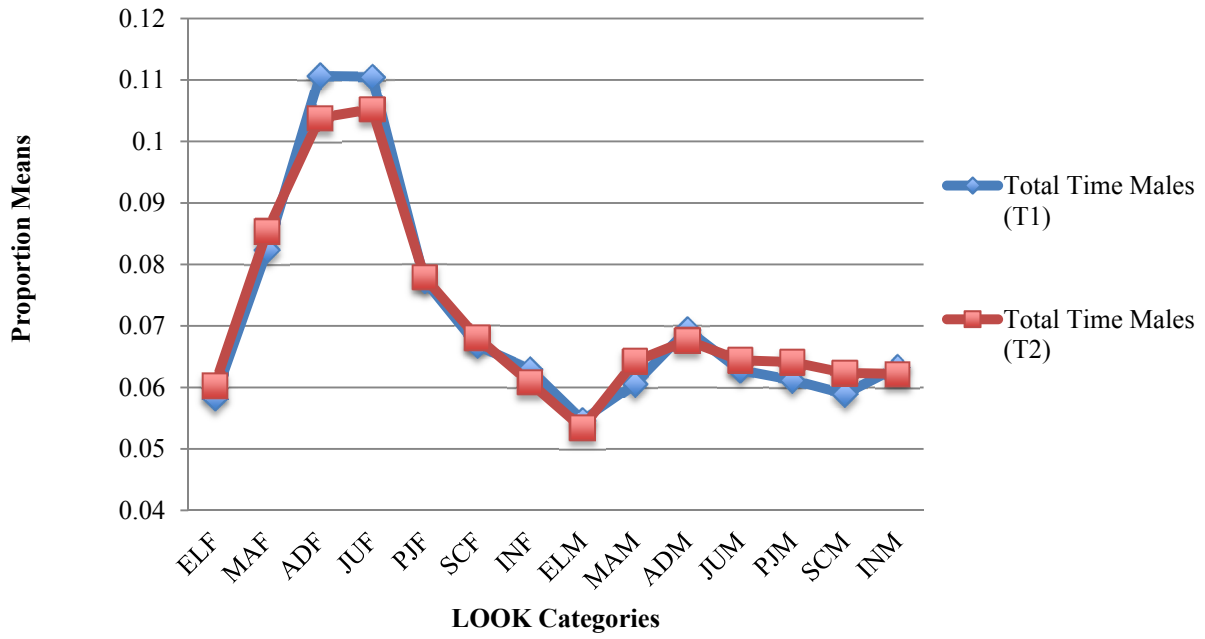


Figure 3. Proportion means for total time for males, time 1 and time 2 of the LOOK.

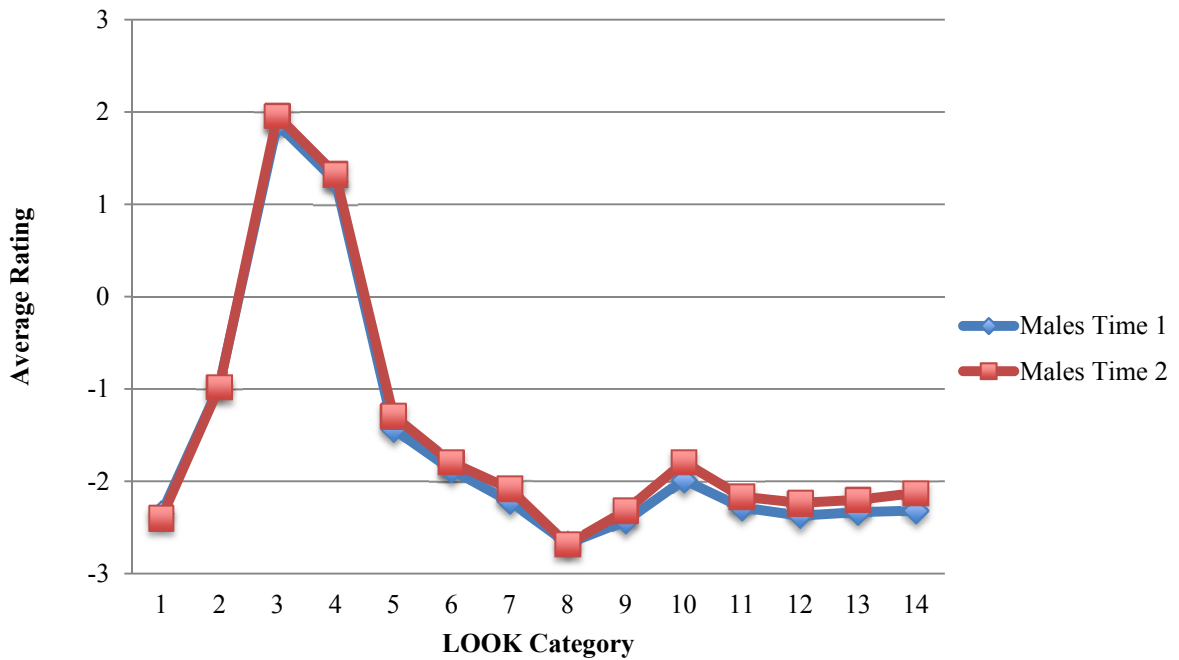


Figure 4. Average Likert scale ratings for males, times 1 and 2.

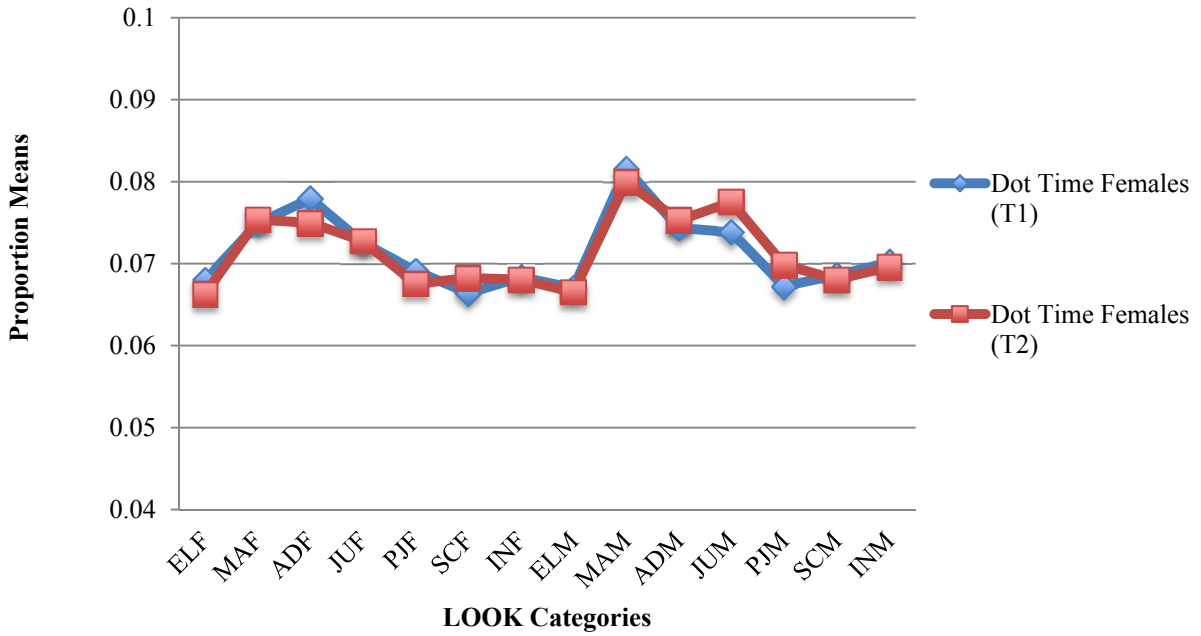


Figure 5. Proportion means for dot time for females, time 1 and time 2 of the LOOK.

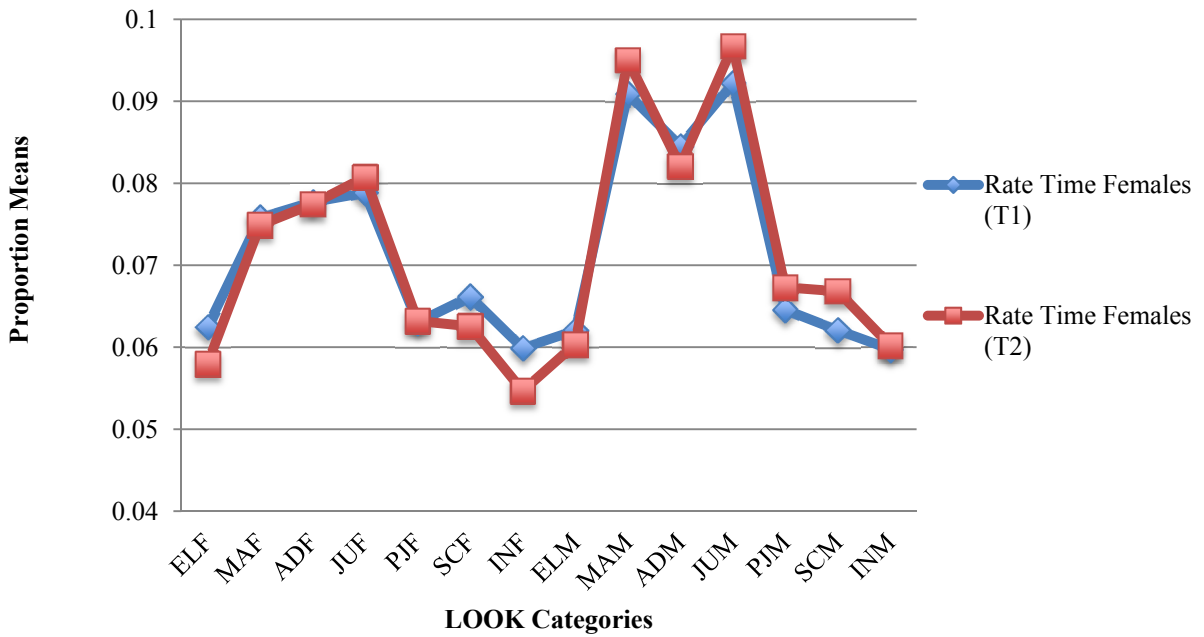


Figure 6. Proportion means for rate time for females, time 1 and time 2 of the LOOK.

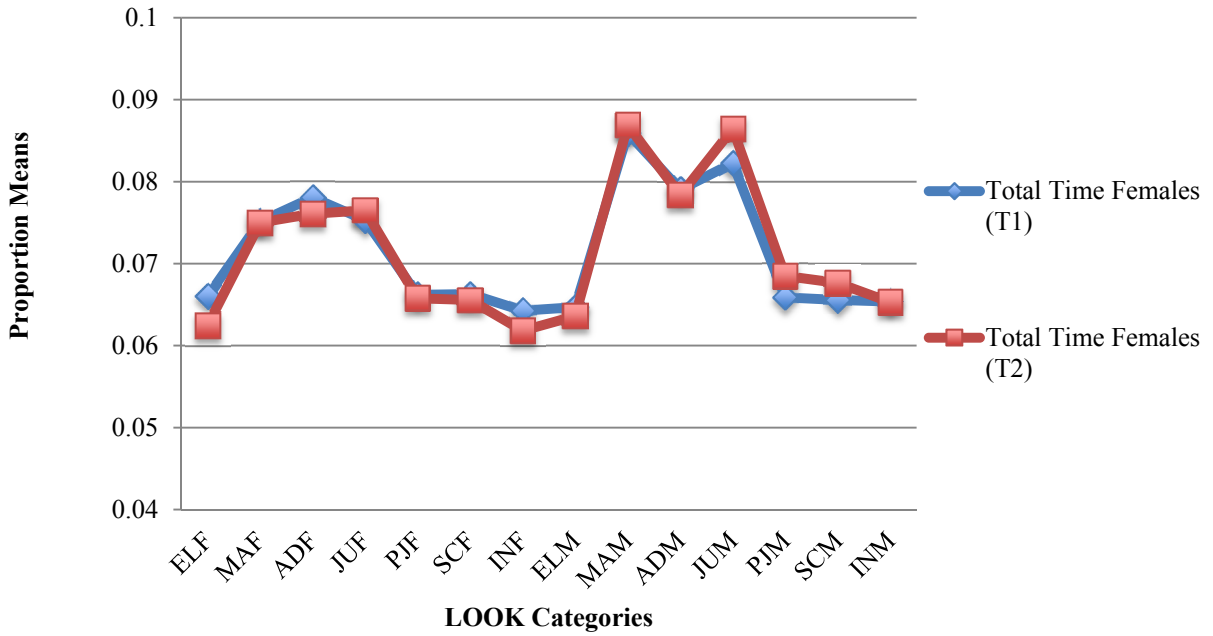


Figure 7. Proportion means for total time for females, time 1 and time 2 of the LOOK.

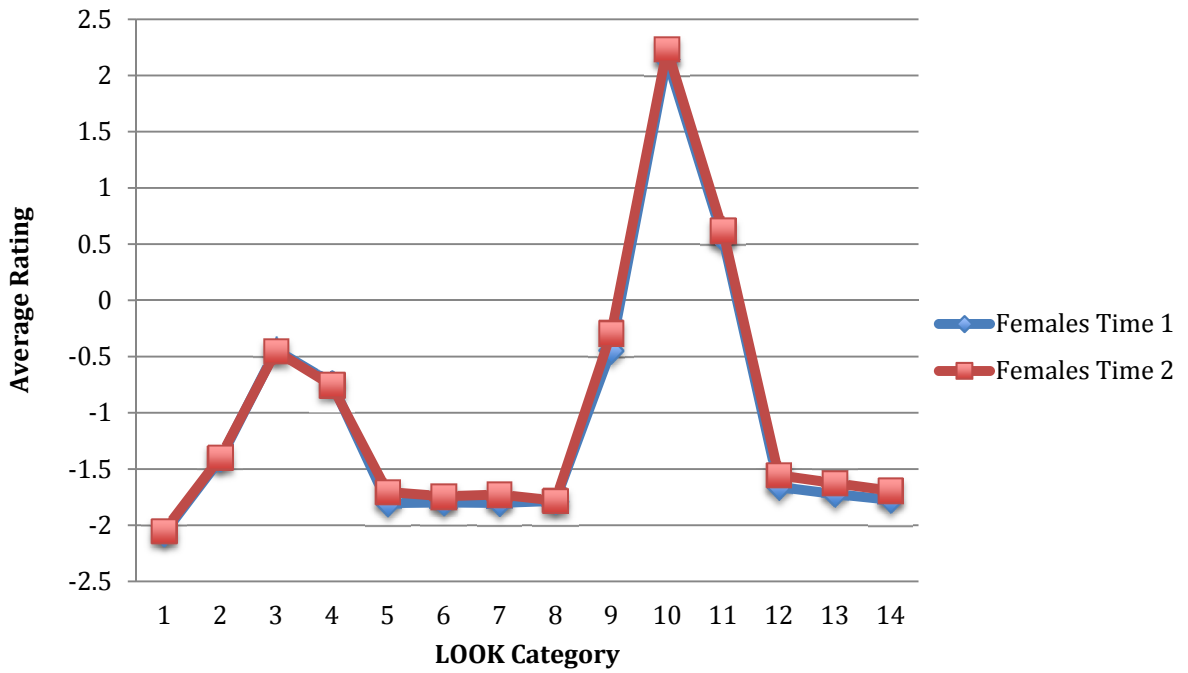


Figure 8. Average Likert scale ratings for females, times 1 and 2.

Chi-Square

To test for temporal stability the chi-square goodness-of-fit approach was used using the following formula.

$$\chi^2 = n \cdot \sum_{j=1}^J \frac{(P_j - \pi_j)^2}{\pi_j} \quad (1)$$

To calculate the Chi-square goodness of fit, researchers used 115 as the constant multiplier (n). This constant multiplier was also used in Hansen (2011). This multiplier was chosen so that the data from this research would be consistent with previous viewing time research and therefore comparable.

At a significance level of .05 with 13 degrees of freedom, the Chi-square critical value is 22.3. A significant chi-square value indicates inconsistency or instability, in the participant's pattern of responses from time 1 to time 2. Using the critical value of 22.3, two males and zero females had significant Chi-square coefficients at dot time, 20 males and 20 females had significant chi-square coefficients at rate time, and one male and zero females had significant chi-square coefficients at total time. Nonsignificant (reliable) scores were found for 54 of the 56 males and 75 of the 75 females at dot time, 36 of the 56 males and 55 of the 75 females at rate time, and 55 of the 56 males and 75 of the 75 females at total time. Appendix D contains a list of the Chi-square values for the males in the current study, and Appendix E lists the Chi-square values for the females. Table 2 shows the number and percentage of stable, nonsignificant chi-square values for each portion of the LOOK, and Table 3 shows the internal consistency of the LOOK based on coefficient α .

Table 2

Number and Percentage of Stable, Nonsignificant Chi-Square Values

| Test Portion | Males Number | Males Percent | Females Number | Females Percent |
|--------------|--------------|---------------|----------------|-----------------|
| Dot | 54/56 | 96.43% | 75/75 | 100.00% |
| Rate | 36/56 | 64.29% | 55/75 | 73.33% |
| Total | 55/56 | 98.21% | 75/75 | 100.00% |

Table 3

LOOK Internal Consistency

| | Categories of females | | | | | | |
|---|-----------------------|-------|-------|-------|-------|-------|-------|
| | ELF | MAF | ADF | JUF | PJF | SCF | INF |
| F | 0.514 | 0.654 | 0.762 | 0.699 | 0.636 | 0.663 | 0.731 |
| M | 0.727 | 0.658 | 0.835 | 0.721 | 0.683 | 0.774 | 0.755 |

| | Categories of males | | | | | | |
|---|---------------------|-------|-------|-------|-------|-------|------|
| | ELM | MAM | ADM | JUM | PJM | SCM | INM |
| F | 0.746 | 0.633 | 0.657 | 0.579 | 0.663 | 0.728 | 0.63 |
| M | 0.502 | 0.653 | 0.748 | 0.633 | 0.673 | 0.716 | 0.8 |

Discussion

The viewing time patterns of proportional means across 14 differentiated gender and age categories for exclusively heterosexual, nonpedophilic males and females are distinct and appear to be generally consistent for time 1 to time 2. The patterns resemble the general shape of previous sexual attraction norm-reference results for exclusively heterosexual, nonpedophilic males and females (Hansen, 2011; Worsham, 2009); however, the LOOK has 14 categories, which is six more than the Affinity. These additional categories allow for more sensitive results. For example, the adult categories of the LOOK include elderly adults, mature adults, and adults for both males and females. These additional categories provided more information about the viewing time patterns of heterosexual women.

The women in our sample on average looked longest at the mature adult males and the juvenile males. They viewed the category of adult males for about the same amount of time as they did the mature adult females, adult females and juvenile females. This pattern did not follow their reported sexual attraction averages, which was highest on adult males. Males on the other hand look longest at their reported sexual attraction categories, adult females and juvenile females. This begs the question: do viewing time patterns for heterosexual women accurately report their sexuality? If not, what else is viewing time capturing for heterosexual women?

Adding the additional task of locating a dot before rating each image also allows for more in-depth analysis of what is happening at different stages in the viewing time process. The time spent during dot time in each category is stable from time 1 to time 2, meaning that the participants are spending approximately the same amount of proportional time in each category for time 1 and time 2. This implies that while the participants are supposed to be focusing on finding the dot, they are also attending to the image, and their interest in the image is reflecting

in their dot viewing time (Mokros, 2010). On the other hand, when the participants are supposed to be attending to and rating the image, their viewing time shows that the time they spend in each category is not as stable as dot time or total time from time 1 to time 2.

The reliability of rate time is lower than expected. When the participants are supposed to be attending to and rating the image, their viewing time shows that the time they spend in each category is not as stable as dot time or total time from time 1 to time 2. At first glance someone might speculate that this could be due to any number of distractions (sneezing, background noise), anything that would distract the participant from the task of rating the image. However, this phenomenon is only happening in the *rate* section of the test, which implies that it is specific to this section of the viewing time process. This could be reflecting that the participant has already viewed the image during dot time and is ready to rate the image as soon as they can. But since rating times have a lower consistency from time 1 to time 2, they were not consistent with whether they rated the image shortly after touching the dot, or waited a short while and then rated the image. The instability of rate time from time 1 to time 2 allows for a more sensitive analysis of what is happening during the different stages of the viewing time process.

The temporal stability of the total viewing time scores for the LOOK is higher than those found for the Affinity 2.0 and 2.5 (Crosby, 2008; Hansen, 2011; Worsham, 2009). When viewing time is broken up and examined at different points in the LOOK, an interesting phenomenon emerges. Dot time, the time recorded from when an image appears and the dot (located in one of the four corners) is touched, appears to have a high stability, 96.43% for males and 100% for females. However, rate time, the time recorded from when the dot is touched to when the image is rated, has lower temporal stability, 64.29% for males, and 73.33% for females. The low temporal stability for rate time does not seem to affect the temporal stability for the total time,

the combination of dot time and rate time. The total temporal stability showed the males at 98.21% stable and the females at 100% stable.

Implications

The use of viewing time in a clinical setting offers a less invasive way to understand a person's sexual attraction patterns. The data from viewing time measures are currently being analyzed as ipsative, how long people spend looking at each category of images compared within themselves. From our analysis we found that the sexual attraction patterns are stable from test time 1 to time 2 (98.21% stable for the males and 100% stable for the females). Reliability then becomes an attribute of the individual's viewing time pattern and not an attribute of the instrument. To test if an individual has a reliable sexual attraction pattern or not the test will need to be administered twice. Worsham (2009) and Hansen (2011) also recommend administering the viewing time instrument twice.

This study and others (Hansen, 2011; Worsham, 2009) have demonstrated that it is possible to obtain empirically derived expected sexual attraction patterns for exclusively heterosexual, nonpedophilic males and females. This has important implications for clinical use since now an individual's sexual attraction profile can be compared against a norm-referenced mean pattern of responding. With a mean proportional pattern for exclusively heterosexual, nonpedophilic males and females the jump can be made to norm-referenced decision making.

Limitations

The LOOK was tested at a university, which produced a sample of participants that were between the ages of 18-30. This limits the generalizability of the obtained norm-referenced patterns. A broader sample size would be necessary to more fully understand the viewing time patterns of older adults. Also, the ethnicity of the majority of our participants was Caucasian.

While this reflects the demographic found at Brigham Young University, it should be taken into consideration when generalizing to other more diverse populations.

Future Research

Research on viewing time patterns of the LOOK can be expanded to include larger, more varied samples. For example, it would be helpful to have norm-referenced patterns for adults of all ages. It would also be helpful to have sample populations from a variety of ethnic backgrounds. A community sample with varying educational backgrounds would give additional insight. Also, this study focused on an exclusively heterosexual population. The research would benefit from understanding the norm-reference curves of people who identify as exclusively homosexual, or bisexual.

Since research shows antisocial personality disorder can be considered a risk factor for people with pedophilia (DSM-V, 2013), future research could be done using viewing time and personality assessment. Also, research has also shown that about half of the people who act out sexually against children also have a diagnosis of substance abuse or dependence (Hall & Hall, 2007). Future research could also be done using viewing time while also assessing for a history of substance abuse.

Another question for future research is, can viewing time patterns from the LOOK be faked? This can be done by testing a sample of people who know about the covert time measure of the LOOK, to see if knowing how it works allows them to alter their scores in a predictable way. Additional research would be helpful to understand why rate time is less stable than dot or total time. Also, temporal stability was established by testing the participants twice after a 14-day time period. It would be informative to know if we get the same reliability after a one-hour time

period. This would have important clinical implications, since testing the same individual twice after a one-hour lag is more convenient for clinicians than after 14 days.

Viewing time measures are used to make important decisions regarding cases of sexual violence and sexual abuse against children. It will be important for future research to understand the viewing time patterns of an incarcerated population who have been accused of sex crimes. Do the viewing time patterns of those populations vary from the established norm-reference patterns?

Lastly, to create the LOOK the researchers imposed 14 expected age and gender categories. Another important research question would be: are there really 14 differentiated categories? This could be analyzed using a factor analysis to understand the natural divisions of the age and gender categories.

Conclusion

The goal of this study was to establish norm-reference patterns for exclusively heterosexual, nonpedophilic males and females using the LOOK, a viewing time iOS application. Another goal was to test the temporal stability of these patterns by testing the participants twice, at least two weeks apart. The findings of this study suggest that there are expected viewing time reference curves for exclusively heterosexual, nonpedophilic males and females. The findings also establish that those curves are stable across time.

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Appendix A

Literature Review

The term *paraphilia* is used in the American Psychiatric Association's Diagnostic and Statistical Manual (DSM) as a diagnostic term for people who have unusual sexual interests or who are involved in illegal sexual acts (DSM-V, 2013). Paraphilias are divided into two categories: those that are concerned with the sexual activities, and those that are concerned with the sexual target. The paraphilia scope is wide, and includes voyeurism (viewing sexual acts), frotteurism (the act of touching and rubbing a person who does not consent), and exhibitionism (exposing ones genitals). The diagnosis of paraphilia also covers other deviant sexual arousal acts not mentioned above but which are intense and recurrent (DSM–V, 2013).

Pedophilia

Diagnosis. Pedophilia falls within the scope of paraphilia, and the DSM diagnostic criteria are, "A. Over a period of at least 6 months, recurrent, intense sexually arousing fantasies, sexual urges, or behaviors involving sexual activity with a prepubescent child or children (generally age 13 years or younger). B. The individual has acted on these sexual urges, or the sexual urges or fantasies cause marked distress or interpersonal difficulty. C. The individual is at least age 16 years and at least 5 years older than the child or children in Criterion A" (DSM–V, 2013, 302.2).

There are admittedly some problems with this diagnosis. The words "acted on" have the potential to cause problems with the percentage of false positives identifications (Blanchard, 2010; First, 2010). Also, a temperamental risk factor for pedophilia is antisociality. The DSM–V, (2013) explains this risk factor, "There appears to be an interaction between pedophilia and antisociality, such that males with both traits are more likely to act out sexually with children

(Seto 2008b; Seto, 2009). Thus, antisocial personality disorder may be considered a risk factor for pedophilic disorder in males with pedophilia." (302.2) The DSM explains that, "assessment can also be complicated by the fact that the characteristics that define a personality disorder may not be considered problematic by the individual (i.e., the traits are often ego-syntonic)." (302.2) A person with antisocial personality disorder, who has pedophilic sexual interest may not view sexual acts with children as problematic. These issues should be considered in assessment and ongoing research into pedophilia.

As described in the DSM–V (2013), pedophiles can have a *specific* sexual attraction to children (Exclusive Type), or they can have a sexual attraction to children, at the same time that they are attracted to adults (Non-Exclusive Type). Pedophiles can have a specific age and/or gender attraction, or they can have a more omnivorous approach, offending without regard to age or gender. Another sub-group of pedophilia includes incest, which describes offending only against members of a person's own family (children, step children, nieces, nephews, etc.; Phelan, 1995).

If a person has pedophilic impulses, but by self report and legal report have not acted on those impulses, then they have a pedophilic sexual interest but they are not diagnosed with pedophilic disorder (DSM–V, 2013). An associated feature that support the diagnosis of pedophilia is explained in the DSM-V (2013) as, "The extensive use of pornography depicting prepubescent children ... (Seto, Cantor, & Blanchard, 2006). This is a specific instance of the general case that individuals are likely to choose the kind of pornography that corresponds to their sexual interests." (302.2)

When diagnosing pedophilia it is important to also assess the person's substance use. Research has shown that about half of the people who act out sexually against children also have

a diagnosis of substance abuse or dependence. It is important to distinguish when a person is acting out due to intoxication, and when they are acting out due to a sexual attraction to children. The distinction of pedophilia is made if the attraction to children persists when intoxicated and sober (Hall & Hall, 2007).

Understanding pedophilia. Since there is not one sexual interest profile for pedophilia, it is important to attempt to understand the differences found between people who sexually offend against children. Hall and Hall (2007) explain how attraction to different age groups calls for different classifications. The term for sexual attracted to children younger than 5 is *infantophilia*. The term *hebophilia* is used to refer sexual attraction to pubescent teenagers, who are under the age of consent (ages 13-16). Hall and Hall (2007) also explain that generally, persons with pedophilia do not use force when coercing children, instead they will attempt to desensitize and manipulate children. Once caught, sex offenders will respond to accusations in common ways:

A US Department of Justice manual for law enforcement officers identifies 5 common psychological defense patterns in pedophiles: (a) denial (e.g., “Is it wrong to give a child a hug?”), (b) minimization (“It only happened once”), (c) justification (e.g., “I am a boy lover, not a child molester”), (d) fabrication (activities were research for a scholarly project), and (e) attack (character attacks on child, prosecutors, or police, as well as potential for physical violence). (Hall & Hall, 2007, p. 458)

Research is ongoing in the field of pedophilia with the hopes of understanding the root causes (Grubin, 1999). Hall and Hall (2007) explain that differences in the pedophile population include lower intelligence, a slight prominence in left-handedness, neuroendocrine differences, impaired cognitive abilities, and brain abnormalities. Also, 30%-55% have been found to have

impulse control disorders. Schiffer et al., (2007) report decreased grey matter in the frontal lobe, and explain that these differences imply a disruption in neurophysiologic attributes. Other areas of study related to pedophilia that are being explored include self-regulation (Stinson, Becker, & Sales, 2008), the impact of personality disorders on child sexual abuse (Dudeck, Spitzer, Stopsack, Freyberger, & Barnow, 2007) and environmental factors that are present throughout the lifespan of a person with pedophilia.

Wilcox and Sosnowski (2005) have also worked to understand the patterns of offenses among people with pedophilia, since historically it was believed that sex offender patterns were somewhat predictable—meaning that persons who were interested in a specific sub-category of victim (incest), or type of offense (voyeurism, exhibitionism) would likely not venture outside of their patterns. However, Abel and Rouleau (1990) refuted this notion with data to the contrary. Abel and Rouleau explain that "these data are very important because they not only enabled workers to establish more comprehensive treatment and relapse prevention plans, but in addition, the number of paraphilias and amount of crossover evidence is an extremely good risk assessment indicator."

Assessments

Results of assessing a person's deviant sexual interest can have lasting effects for that person, and for any potential victims of that person. In the 2009 Census (the most recent statistical report) 67,032 cases of sexual abuse against children were reported (U.S. Census Bureau, 2011). The problem of pedophilia is far reaching. The negative effects of child sexual abuse are lasting. Accurate assessment is critical in the detection of pedophilic interest (Wright & Adams, 1994). There are four main ways to assess sexual interest: clinical interviews, self-report, plethysmography, and viewing time.

Clinical interview. The clinical interview is a subjective measure for detecting pedophilic interest. A strength of the clinical interview is that it opens up the channels of communication and allows for information gathering. It has also received criticism, since it depends on the accused sex offender to be forthright with information, leaving the possibility for deception (Gress, 2005; Groth & Lored, 1981; Marshall, 1996; Meston, Heiman, Trapnell, & Paulhus, 1998; Wincze, Hoon, & Hoon, 1978; Wright & Adams, 1994). The punishments for sexually offending against children are strict, so people have reason to withhold information about their deviant sexual attractions and actions. Fear of punishment can keep people from disclosing information that would lead to legal punishment. Along those same lines, people have a desire to appear "normal," and because of this they may answer questions about their sexuality in ways that satisfy social norms (Quinsey, Rice, Grand, & Reid, 1993). Due to limitations related to human social desirability and a person's ability for deception, clinical interviews can be a first step in the assessment process, but there is a need for other assessment measures.

Self-report. Another way to understand a person's sexual interest is self-report. However, as mentioned above, given the sensitive nature of sexual attraction and the consequences of admitting deviant or illegal sexual attraction, this method of gathering data is incomplete. Pedophilia is also a very taboo topic in the U.S. and other cultures, and the sensitivity of this issue creates an atmosphere in which people who have a sexual desire for children do not often seek help due to the fear of punishment or imprisonment (DSM–V, 2013). This results in most offenders being identified only after a crime has been committed and action taken against the perpetrator. Self-report approaches can be useful in understanding what a person is willing to report about his or her sexual interest, but additional measures are needed—especially in a situation where someone is being accused of sexual crimes against children.

Hanson and Bussière reported that the best predictor of sexual offense recidivism is sexual attraction to a specific gender and age group against which one has offended (1998). According to Singer (1984) sexual attraction happens in 3 stages, (a) the aesthetic response, or viewing the person of interest, (b) the approach response, moving closer to the person, and (c) the genital response. The genital response is part of a larger physiological response grouping that also includes other physical responses to sexual attraction including increased heart rate, respiration changes and muscle changes.

Plethysmography. Another way to test a person's sexual attraction is to do so at Singer's third stage of arousal, the genital response. Plethysmography measures genital tumescence, either penile or vaginal. This is done while the person views or listens to erotic material (Chivers, Rieger, Latty, & Bailey, 2004; Gaither, & Plaud, 1997; Haywood et al., 1990; Lawson, 2000; Letourneau, 2002; Richards, Kalucy, Wood, & Marshal, 1990). Plethysmography used with males, otherwise known as penile plethysmography (PPG) or phallometry, was first developed by Kurt Freund (1957) in Czechoslovakia, for use with sex offenders. The first versions of the test were expensive and had a tendency to break down. Since then newer versions were made to improve upon the first model (Marshall & Fernandez, 2000). Plethysmography is now the most common way to assess sexual attraction in people that have been accused of sexual crimes. While all approaches to assessing sexual attraction have their limitations, plethysmography is the most controversial.

Laws and Gress (2004) express that plethysmography is fraught with issues regarding standardization of the instrument as well as the scoring and interpretation of data. They also explain how the equipment to test plethysmography is expensive, and the procedure to collect data is time-intensive and invasive. Marshall and Fernandez (2000) point to the lack of

standardization as a limitation of plethysmography, explaining that in order for a plethysmography test to be reliable and valid, "it is necessary to identify the standards against which these procedures will be assessed." Marshall and Fernandez reiterate this in their 2003 article, adding that, "unless a test can be shown to be reliable, there is essentially no point in giving it further consideration. Somewhat surprisingly, there are very few studies available evaluating the reliability of phallometry testing. Unfortunately, of the only three investigations we could find, none provided data indicating clearly satisfactory levels of reliability."

Singer (1984) outlined some of the limitation of plethysmography when he said, "Men's subjective reports of arousal agree well with physiological measures, except at low levels of tumescence. Women, on the other hand, often fail to report arousal, even at maximum physiological response, and under some conditions may report high arousal at low physiological levels." This causes gender limitation with the use of plethysmography. While most pedophiles are men, there is a small percentage of women who sexually offend against children (Beech, Parrett, Ward, & Fisher, 2009).

Another area of concern related to plethysmography is the question of whether or not tools that measure sexual attraction at the physiological level can be faked. Can people suppress their physical sexual attraction response when presented with pornographic images of their desired gender and age group? Similarly, can the test also be faked by having a person intentionally create a physical sexual attraction response when they are not sexually aroused by the gender and age of the presented image?

This latter question was addressed by Adams, Motsinger, McAnulty and Moore in their 1992 article *Voluntary Control of Penile Tumescence Among Homosexual and Heterosexual Subjects*. The researchers found that, "under instructions to suppress penile tumescence, both

homosexual and heterosexual participants were able to do so to a significant degree (i.e., approximately 37% of maximum erections). On the other hand, the amount of enhancement of penile tumescence in the presence of nonpreferred sexual material was insignificant" (Adams, Motsinger, McAnulty, & Moore, 1992).

Another study addressing the same issue of faking by Marshall & Fernandez (2000) states, "numerous studies have shown that rapists and child molesters (Avery-Clark & Laws, 1984; Hall, 1989; Hall, Proctor, & Nelson, 1988; Laws & Holmen, 1978; Quinsey, Steinman, Bergersen, & Holmes, 1975; Wydra, Marshall, Earls, & Barbaree, 1983) are able to both inhibit arousal to preferred stimuli and generate arousal to nonpreferred stimuli."

Marshall & Fernandez (2000) also bring up issues of child sex offenders who exclusively offend against their own family. The plethysmography results of pedophiles who practice incest, but who do not offend against other children would be markedly different from pedophiles who offend against any child. They state, "incest offenders should generate erectile responses only to their own victims or to children remarkably similar to their own children. At phallometric assessments using visual stimuli, then, incest offenders should display normative responding. Freund, Watson and Dickey (1991) report data that essentially confirm these expectations" (Marshall & Fernandez, 2000).

They go on to say, "The majority of studies have found that incestuous offenders respond to adult and child stimuli in much the same way as do non-offenders (Frenzel & Lang, 1989; Freund et al., 1991; Grossman et al., 1992; Marshall et al., 1986; Murphy et al., 1986; Quinsey et al., 1975), although two studies have reported greater arousal to children than to adults (Abel et al., 1981; Murphy et al., 1986)." The two studies differ from the other studies mentioned in that they used audio descriptions, and the other tests used images (Marshall & Fernandez, 2000).

Despite several limitations to plethysmography, some of which have been mentioned, it is still the most widely used tool for assessing sexual deviance in accused child sex offenders.

Viewing time. An early example of researchers using viewing time to assess sexual interest is Rosenzweig's 1942 study with 20 inpatient clients who had been diagnosed with schizophrenia. The 20 patients were divided into two groups based on their sexual behavior (masturbation and extended physical contact with others). The researcher used a photoscope, which included three sets of 24 images, sized 8"x 9", that were mounted on heavy cardboard. The images included sexual and non-sexual images. Of the non-sexual images there were images of landscapes, animals and people. The sexual images included images of nude people, of heterosexual and homosexual intercourse, and of other sexual acts.

The participants were permitted to examine the photoscope without supervision and at their own leisure. They were monitored through a hidden two-way mirror; and the amount of time participants spent viewing each item was surreptitiously recorded, along with any general observable reactions (grimaces; Rosenzweig, 1942). The goal of this study was to measure sexual arousal in response to hormone therapy. Rosenzweig (1942) described the results of this study saying, "Findings based mainly on these time results and secondarily on certain more qualitative observations give a fairly valid and dependable estimate of the subject's sexual interest."

Subsequent research has also shown that a person will look longer at images of people that they find sexually attractive. Harmon (2006) used the Affinity 2.0, a viewing time measure, to test the viewing time patterns of college age females across time. The females in the study viewed the preferred sexual stimulus longer than the non-preferred sexual stimulus. These viewing time results confirmed previous norm-reference patterns for heterosexual females

(Quinsey et al., 1993; Quinsey, Ketsetzis, Earls, & Karamanoukian, 1996; Wright & Adams, 1994).

Crosby (2008) also used the Affinity 2.0, this time to test for sexual attraction patterns of heterosexual college age males. He explains, "At test and retest administrations of the Affinity 2.0, slides of adult females (ADF) and adolescent females (JUF) were the clearly preferred visual stimuli of our sample. The participants' consistent preference for slides of nubile women suggests the presence of a characteristic pattern to normal heterosexual males viewing time response to the Affinity 2.0. At both test and retest, ADF slides were viewed longest" (Crosby, 2008).

A newer version of the Affinity, the Affinity 2.5, was also tested on a university sample (Hansen, 2011). This study was to establish the norm-reference samples of college age males and females. Hansen also tested the participants twice to establish temporal stability. She found similar norm-referenced patterns as previous research using earlier versions of Affinity (Boardman, 2009; Crosby, 2008; Harmon, 2006; Worsham, 2009). These findings support previous research on using viewing time to understand sexual attraction patterns (Gress, 2005; Gress, 2007; Harris, Rice, Quinsey, & Chaplin, 1996; Israel & Strassberg, 2009; Mokros, Dombert, Osterheider, Zappala, & Santtila, 2010; Quinsey et al., 1996; Rosenwasser, Adams, & Tansil, 1983).

Viewing time instruments are used in clinical settings to assess the possibility that a sex offender will reoffend. Research has found that "the strongest predictors of sexual recidivism were factors related to sexual deviance" (Hanson & Bussière, 1998). In sexual abuse against children "deviant sexual interest (e.g., in sex with children) is one of the strongest risk factors for reoffending" (Banse, Schmidt, & Clabour, 2010). In the 2009 Census (the most recent statistical

report) 67,032 cases of sexual abuse against children were reported (U.S. Census Bureau, 2011). The need to understand the sexual attraction patterns of persons who offend against children are overwhelming. The goal of keeping children safe from sex offenders is what drives further research into the assessment and treatment of sex offenders (Crooks, Rostill-Brooks, Beech, & Bickley, 2009).

Viewing time is used to assess sexual attraction by measuring the length of time a person views gender and age specific images (Israel & Strassberg, 2009). There are two current viewing time tools in use, the Abel Assessment for Sexual Interest (AASI) and the Affinity 2.5.

Available Instruments

Abel Assessment of Sexual Interest. The Abel Assessment of Sexual Interest (AASI) is a computer software viewing time measure. The AASI relies on a person's aesthetic response (viewing time) to measure their sexual interest. While images are being overtly rated by the test taker, a covert measure is taking place, measuring the amount of time the individual spends looking at each image. Those times are then summed to a constant, making the data ipsative (Cattell, 1944). The AASI uses images of fully clothed males and females of varying ages (Abel, Lawry, Karlstrom, Osborn, & Gillespie, 1994; Abel, Huffman, Warberg, & Holland, 1998; Abel et al., 2004; Tong, 2007).

Since the assessment is happening at the first stage of sexual arousal, the aesthetic response, and not the physiological stage, the test is less invasive than plethysmography, which measures genital tumescence. Other strengths of the AASI are its standardized administration procedure and the use of non-pornographic images (Smith & Fischer, 1999). Despite these strengths, however, there are concerns about how AASI controls and manages data (Fischer & Smith, 1999; Smith & Fischer, 1999; Sachsenmaier & Gress, 2009). Sachsenmaier and Gress

(2009) explain their concerns about the data being kept proprietary, "There could be no truly independent research, as all raw data are owned and controlled by Abel Screen Inc."

Other researchers have questioned the AASI method of trimming the data, which includes removing outliers according to methods that are held proprietary, and possibly compromising the raw data (Fischer, & Smith, 1999; Letourneau, 2002). Fischer and Smith (1999) and Smith and Fischer (1999) also question the use of the AASI with adolescents, explaining that the screening and predictive validity results of using the AASI with adolescents was no better than chance.

Affinity 2.5. The Affinity 2.5 is a computer software viewing time tool that also measures sexual attraction at the first stage of Singer's model by tracking sustained visual attention. The Affinity measures sexual attraction by measuring the length of time a person looks at images in different gender and age categories (Crosby, 2008; Gress, 2005; Harmon, 2006; Harris et al., 1996; Israel & Strassberg, 2009; Quinsey et al., 1996). In using the Affinity, like the AASI, the individual overtly rates images as they appear on the computer screen, while the time in microseconds (otherwise known as computer ticks) is covertly measuring how long the person spends looking at each image. The data from the Affinity 2.5 are reported in two ways: the raw data, and mean ranks. Mean ranks consist of assigning a rank to each of the 80 images, according to viewing time, which always sum to 3240 and makes the data ipsative. After the images are ranked, the ranks are averaged by differentiating gender and age categories. The mean rank generated for each category is the "score" for that category. Unlike the AASI, the Affinity 2.5 does make the raw data available. This makes it possible to conduct independent research on the data.

As mentioned earlier, data from the Affinity 2.0 and 2.5 have been used to establish reference group patterns (Boardman, 2009; Caswell, 2009; Crosby, 2008; Hansen, 2011; Harmon, 2006; Worsham, 2009). Establishing reference group patterns allows for research on deviations from expectation. Since it is irrational to assume that there is a "pedophile pattern," it is better to establish an empirically derived pattern of non-pedophiles and to allow myriad deviations therefrom.

Although reference group patterns have been established for the Affinity, the developers of the Affinity have decided not to integrate reference group scoring into the newest version of the instrument, Affinity 3.0 (Personal communication, David Glasgow, 2012). As for the AASI, no reference group procedures have ever been attempted. In order to move forward with a reference group scoring and logic, a new instrument was developed.

Ipsative versus reference group scoring. Both the AASI and the Affinity render ipsatized profiles. The data are ipsatized by always summing to a constant (Smith & Fischer, 1999). This means that an individual can only be compared to himself and not to another person. Ipsatized results, by nature, cannot be labeled "deviant" because there is no reference group with which to compare the outcomes. Unfortunately, often when viewing time data is reported, it is made to resemble norm-referenced data. This can mislead people to think that the data is compared against a norm-referenced group (Smith, 2010). When using ipsative data with viewing time measures, clinicians are only able to say how a person's sexual attraction to different gender and age groups varies within that one person. Unless the ipsatized profile has a standard against which to compare, one cannot draw conclusions about how deviant any individual profile may be.

Treatment

The prevention measures in place for pedophilia are serving to prevent *future* offenses, after the offender has already offended against a child and has been found guilty. Currently, no practices are in place to prevent the first sexual offense against a child. The next step for research in the field of preventing the first sexual offense against a child is screening.

Screening measures for deviant sexual attraction are a sensitive issue, and questions about civil rights come into play. The purpose of this study is to understand reference patterns of sexuality for the future goal of being able to screen people have viewing time patterns that deviate from the expected patterns. By doing this it allows the lines of communication to open up to discuss deviant sexual preference with those people who might be at risk for a first offense against a child. By screening for sexual attraction to children, persons with pedophilia may be prevented from becoming perpetrators of crimes against children.

There is a wide range of treatment for pedophiles who have offended against children. Offenders can face punishment in the form of incarceration, chemical castration and mandatory psychotherapy. The focus of psychotherapy for child sex offenders is not necessarily to change the person's sexual orientation, but to help the person lessen those desires and be able to control their impulses to act out (Hall & Hall, 2007). Hall and Hall (2007) have this to say about the use of psychotherapy with known pedophiles:

Psychotherapy is an important aspect of treatment, although debate exists concerning its overall effectiveness for long-term prevention. Psychotherapy can be individual, group based, or most commonly, a combination of the two. The general strategy toward psychotherapy with pedophiles is a cognitive behavioral approach (addressing their distortions and denial) combined with empathy training, sexual impulse control training,

relapse prevention, and biofeedback. Several studies have demonstrated that the best outcomes in preventing repeat offenses against children occur when pharmacological agents and psychotherapy are used together. (p. 466)

Increased understanding of pedophilia improves the chance of preventing a first offense, thus sparing children and pedophiles from future pain.

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Appendix B

Consent to be a Research Subject

Introduction

This research study is being conducted by Sierra Baird, Ph.D. student, and Lane Fischer, Ph.D., at Brigham Young University to examine the temporal stability of responses to the LOOK by adult males and females. You were selected to participate because you are over age 18 and have no history of pedophilia.

Procedures

You will be asked to complete the LOOK in a private room in the CPSE research lab (350 MCKB). The LOOK is a computer-administered measure of sexual interest. You will be asked to rank order different age/sex groups according to their sexual attractiveness to you. You will then be asked to rate a series of images of clothed models in everyday activities according to how sexually attractive or unattractive they are to you. No pornographic images are used in the LOOK. Following completion of the LOOK, you will be asked to fill out a brief questionnaire regarding some simple demographics, personal attitudes and sexual preference. You will return and complete the LOOK again in approximately 14 days. The procedure will take approximately 20 minutes to complete each time.

Risks/Discomforts

There are minimal risks for participation in this study. However, you may feel some discomfort about disclosing sexual interests or rating images of people. The possibility of a breach of confidentiality of potentially sensitive information regarding sexual preferences will be mediated by use of subject ID numbers, keeping this signed consent form unconnected to responses to the LOOK or the questionnaire, and limiting researcher access to consent forms and data connected to participants.

Benefits

There are no direct benefits to you. However, it is hoped that through your participation researchers will learn more about how people respond to such rating tasks and help us better understand human sexuality.

Confidentiality

All information provided will remain confidential. Your responses will be assigned a subject number that will be disconnected from your name. Your responses will be downloaded from LOOK to Excel and another statistical programs. The questionnaire will also be coded only by a subject number, transcribed into Excel and SPSS and separated from your name. After the research is completed, the questionnaires will be destroyed. Although the questionnaire will ask about your sexual preference, no information will be available to the university or the Honor Code Office.

Compensation

Participants may receive extra credit or clinical hours in their classes that offer such compensation. An alternative method of compensation may be provided at the discretion of your instructor, and often consists of reviewing a journal article or some other activity, which requires a time commitment similar to participating in the current study.

Participation

Participation in this research study is voluntary. You have the right to withdraw at anytime or refuse to participate entirely without jeopardy to your class status, grade or standing with the university.

Questions about the Research

If you have questions regarding this study, you may contact Sierra Baird at (801) 899-9665, sierra_baird@byu.edu or Lane Fischer at (801) 422-8293, lane_fischer@byu.edu.

Questions about your Rights as Research Participants

If you have questions you do not feel comfortable asking the researcher, you may contact BYU IRB Administrator, A-285 ASB, Brigham Young University, Provo, UT 84602, 801-422-1461, irb@byu.edu.

I have read, understood, and received a copy of the above consent and desire of my own free will to participate in this study.

Signature: _____

Date: _____

Appendix C

Demographics, Attitudes, and Sexual Interest Questionnaire

Subject # _____

Demographics

1. Age: _____
2. Ethnicity: _____
3. Year in School (mark the one that applies):

| | |
|---|------------------------------------|
| <input type="checkbox"/> Freshman | <input type="checkbox"/> Sophomore |
| <input type="checkbox"/> Junior | <input type="checkbox"/> Senior |
| <input type="checkbox"/> Graduate Student | |
4. Marital Status (mark the one that applies):

| | |
|-----------------------------------|----------------------------------|
| <input type="checkbox"/> Single | <input type="checkbox"/> Married |
| <input type="checkbox"/> Divorced | <input type="checkbox"/> Widowed |

Personal Attitudes

5. Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is true or false as it pertains to your personality.

- _____ I never hesitate to go out of my way to help someone in trouble.
- _____ I have never intensely disliked someone.
- _____ There have been times when I was quite jealous of the good fortune of others.
- _____ I would never think of letting someone else be punished for my wrongdoings.
- _____ I sometimes feel resentful when I don't get my way.
- _____ There have been times when I felt like rebelling against people in authority even though I knew they were right.
- _____ I am always courteous, even to people who are disagreeable.
- _____ When I don't know something, I don't at all mind admitting it.
- _____ I can remember "playing sick" to get out of something.
- _____ I am sometimes irritated by people who ask favors of me.

Sexual Interest

6. I would describe my sexual preference as (please mark only one):

- Exclusively heterosexual with no homosexual interest
- Predominantly heterosexual with incidentally homosexual interest
- Predominantly heterosexual with more than incidentally homosexual interest
- Equally heterosexual and homosexual interest
- Predominantly homosexual with more than incidentally heterosexual interest
- Predominantly homosexual with only incidentally heterosexual interest
- Exclusively homosexual with no heterosexual interest

Appendix D
LOOK Chi-Square Results for a Sample of Exclusively Heterosexual,
Nonpedophilic Males, for Dot Time, Rate Time, and Total Time

Table 4

Chi-Square Results for Dot Time: Males

| Participant No. | Chi Square | Participant No. | Chi Square |
|-----------------|---------------|-----------------|--------------|
| 25001 | 3.014164886 | 25042 | 3.896369743 |
| 25002 | 2.319256942 | 25044 | 1.828250798 |
| 25005 | 2.472571660 | 25045 | 4.239469519 |
| 25006 | 0.957543207 | 25047 | 2.068764411 |
| 25007 | 2.880798513 | 25052 | 4.364920564 |
| 25008 | 5.852034823 | 25053 | 4.592986423 |
| 25009 | 4.307253932 | 25054 | 1.819354495 |
| 25010 | 3.476601587 | 25055 | 12.925547861 |
| 25017 | 1.999202668 | 25056 | 1.158197914 |
| 25018 | 7.183270953 | 25057 | 0.914096647 |
| 25019 | 5.167494259 | 25058 | 5.649123562 |
| 25020 | 5.470665899 | 25059 | 6.041184843 |
| 25021 | 5.730871338 | 25061 | 2.752702186 |
| 25022 | 3.140538745 | 25062 | 2.684157743 |
| 25023 | 3.022743513 | 25063 | 2.709355597 |
| 25024 | 0.832618020 | 25066 | 2.998495579 |
| 25026 | 1.625106038 | 25067 | 2.161742833 |
| 25027 | 5.424931356 | 25068 | 0.787865708 |
| 25028 | 10.592476765 | 25070 | 6.372832277 |
| 25030 | 4.086433503 | 25071 | 3.027782443 |
| 25031 | 36.340938205* | 25073 | 1.457993583 |
| 25032 | 0.414987057 | 25074 | 5.129616195 |
| 25033 | 2.550540171 | 25075 | 4.531413099 |
| 25035 | 2.891169155 | 25076 | 4.886691988 |
| 25036 | 0.466249636 | 25077 | 2.208483717 |
| 25037 | 31.328859834* | 25078 | 4.316783424 |
| 25040 | 2.734285765 | 25079 | 5.180613202 |
| 25041 | 1.840295124 | 25080 | 0.709319645 |

*p > .05 significant critical value (22.3).

Table 5

Chi-Square Results for Rate Time: Males

| Participant No. | Chi Square | Participant No. | Chi Square |
|-----------------|---------------|-----------------|---------------|
| 25001 | 12.678880950 | 25042 | 11.728828530 |
| 25002 | 13.027551076 | 25044 | 18.077569566 |
| 25005 | 38.501381310* | 25045 | 35.572061526* |
| 25006 | 8.071628756 | 25047 | 14.597038907 |
| 25007 | 29.158711225* | 25052 | 16.663870406 |
| 25008 | 19.315787138 | 25053 | 93.593088495* |
| 25009 | 4.520415486 | 25054 | 8.998808706 |
| 25010 | 18.331082436 | 25055 | 12.333297182 |
| 25017 | 37.153752989* | 25056 | 15.067662008 |
| 25018 | 19.799651025 | 25057 | 6.972331665 |
| 25019 | 6.469566196 | 25058 | 13.291350746 |
| 25020 | 18.699850207 | 25059 | 10.295707399 |
| 25021 | 28.663275777* | 25061 | 46.356672190* |
| 25022 | 15.532056976 | 25062 | 15.114316150 |
| 25023 | 39.739096404* | 25063 | 13.883607174 |
| 25024 | 22.337470347* | 25066 | 33.608482073* |
| 25026 | 8.938355914 | 25067 | 31.921652263* |
| 25027 | 6.191179442 | 25068 | 12.008534576 |
| 25028 | 98.117386114* | 25070 | 19.993220071 |
| 25030 | 6.770835598 | 25071 | 25.038501766* |
| 25031 | 23.435244316* | 25073 | 6.814366330 |
| 25032 | 12.360254493 | 25074 | 45.357592189* |
| 25033 | 10.458321279 | 25075 | 21.554630444 |
| 25035 | 60.502411955* | 25076 | 27.338863800* |
| 25036 | 19.138876840 | 25077 | 11.749147281 |
| 25037 | 41.385882739* | 25078 | 30.574519849* |
| 25040 | 19.906640801 | 25079 | 7.661765513 |
| 25041 | 44.427699594* | 25080 | 19.042905949 |

*p >.05 significant critical value (22.3).

Table 6

Chi-Square Results for Total Time: Males

| Participant No. | Chi Square | Participant No. | Chi Square |
|-----------------|---------------|-----------------|--------------|
| 25001 | 4.456930319 | 25042 | 2.347362258 |
| 25002 | 3.988296106 | 25044 | 4.805903576 |
| 25005 | 10.388026053 | 25045 | 9.100795287 |
| 25006 | 1.917873579 | 25047 | 4.817800945 |
| 25007 | 9.247223695 | 25052 | 4.643489212 |
| 25008 | 4.390607230 | 25053 | 13.059150032 |
| 25009 | 2.772436204 | 25054 | 4.459780761 |
| 25010 | 6.929923249 | 25055 | 10.891805199 |
| 25017 | 5.734824742 | 25056 | 2.348530891 |
| 25018 | 7.475642241 | 25057 | 1.306367761 |
| 25019 | 1.691029974 | 25058 | 5.558881805 |
| 25020 | 9.509976403 | 25059 | 3.215023745 |
| 25021 | 8.099744966 | 25061 | 8.891329414 |
| 25022 | 5.706029404 | 25062 | 4.679067196 |
| 25023 | 4.526838527 | 25063 | 3.129019818 |
| 25024 | 6.274299709 | 25066 | 14.187981325 |
| 25026 | 2.189030095 | 25067 | 12.171371434 |
| 25027 | 3.587264532 | 25068 | 5.767796265 |
| 25028 | 12.187633370 | 25070 | 3.935563085 |
| 25030 | 1.858520652 | 25071 | 10.629458060 |
| 25031 | 14.078562959 | 25073 | 1.848343023 |
| 25032 | 3.324447320 | 25074 | 11.509821557 |
| 25033 | 3.083127707 | 25075 | 8.854973168 |
| 25035 | 18.053524334 | 25076 | 8.498959212 |
| 25036 | 4.123413748 | 25077 | 3.513195734 |
| 25037 | 30.011386474* | 25078 | 8.056737992 |
| 25040 | 6.683186572 | 25079 | 4.272133346 |
| 25041 | 16.101327361 | 25080 | 6.792166347 |

*p >.05 significant critical value (22.3).

Appendix E

LOOK Chi-Square Results for a Sample of Exclusively Heterosexual, Nonpedophilic Females, for Dot Time, Rate Time, and Total Time

Table 7

Chi-Square Results for Dot Time: Females

| Participant No. | Chi Square | Participant No. | Chi Square |
|-----------------|-------------|-----------------|--------------|
| 26003 | 2.183359631 | 26059 | 6.914541305 |
| 26004 | 2.653722754 | 26060 | 2.796768527 |
| 26005 | 1.439105894 | 26061 | 4.611380069 |
| 26006 | 4.916941071 | 26062 | 5.362053177 |
| 26010 | 2.119015998 | 26064 | 2.841609359 |
| 26011 | 1.887590941 | 26065 | 5.353168849 |
| 26013 | 1.664196688 | 26066 | 2.573824088 |
| 26016 | 3.189995667 | 26067 | 10.260162927 |
| 26017 | 1.348634929 | 26068 | 3.786319577 |
| 26018 | 0.713823412 | 26069 | 1.364806326 |
| 26019 | 3.833973309 | 26070 | 0.852825965 |
| 26027 | 2.525248013 | 26071 | 0.463350300 |
| 26028 | 8.345639923 | 26074 | 10.691273068 |
| 26029 | 1.023058955 | 26075 | 0.634940051 |
| 26030 | 7.746562549 | 26076 | 2.533769269 |
| 26031 | 6.586024515 | 26077 | 1.478044345 |
| 26032 | 0.389485001 | 26080 | 1.348192695 |
| 26034 | 1.048353474 | 26081 | 0.924913924 |
| 26035 | 2.726741071 | 26083 | 5.446641376 |
| 26036 | 2.065691079 | 26085 | 2.850505756 |
| 26038 | 0.852111575 | 26086 | 0.758661752 |
| 26040 | 2.982415843 | 26088 | 1.846509162 |
| 26041 | 3.763872675 | 26089 | 4.652585728 |
| 26042 | 3.123024523 | 26090 | 3.704300632 |
| 26043 | 1.934019879 | 26092 | 0.323786704 |

| Participant No. | Chi Square | Participant No. | Chi Square |
|-----------------|-------------|-----------------|-------------|
| 26044 | 2.156002188 | 26093 | 2.061195240 |
| 26045 | 7.984370987 | 26094 | 2.368770750 |
| 26046 | 4.586242409 | 26097 | 2.372311228 |
| 26047 | 1.364478060 | 26098 | 2.733268806 |
| 26048 | 0.824103409 | 26099 | 1.400991605 |
| 26049 | 0.419199242 | 26100 | 6.366297813 |
| 26051 | 1.196722022 | 26103 | 2.647765530 |
| 26052 | 2.355463583 | 26104 | 1.445958749 |
| 26053 | 2.546309908 | 26105 | 3.265792003 |
| 26054 | 1.877007237 | 26106 | 7.693267491 |
| 26056 | 3.638855691 | 26107 | 2.764519795 |
| 26057 | 0.705392991 | 26108 | 5.325365695 |
| 26058 | 2.218479894 | | |

*p >.05 significant critical value (22.3).

Table 8

Chi-Square Results for Rate Time: Females

| Participant No. | Chi Square | Participant No. | Chi Square |
|-----------------|---------------|-----------------|---------------|
| 26003 | 3.136259151 | 26059 | 17.727501341 |
| 26004 | 34.887924588* | 26060 | 20.067491079 |
| 26005 | 22.403923027* | 26061 | 24.384691157* |
| 26006 | 10.935847146 | 26062 | 26.620670592* |
| 26010 | 18.559236110 | 26064 | 15.173098332 |
| 26011 | 11.494375767 | 26065 | 21.603781841 |
| 26013 | 28.12559582* | 26066 | 5.137984502 |
| 26016 | 13.637373530 | 26067 | 12.300075068 |
| 26017 | 4.073399685 | 26068 | 22.947855481* |
| 26018 | 8.245942365 | 26069 | 8.668275642 |
| 26019 | 39.518099126* | 26070 | 12.543195366 |
| 26027 | 15.528196283 | 26071 | 28.766174934* |
| 26028 | 17.455284643 | 26074 | 20.173408377 |
| 26029 | 10.592944946 | 26075 | 13.605214775 |
| 26030 | 15.592572090 | 26076 | 30.36939717* |
| 26031 | 39.693148665* | 26077 | 31.350484142* |
| 26032 | 8.128663816 | 26080 | 7.673514763 |
| 26034 | 4.793188471 | 26081 | 4.252887899 |
| 26035 | 13.127265420 | 26083 | 14.715313036 |
| 26036 | 4.461652521 | 26085 | 44.327381187* |
| 26038 | 76.522866250* | 26086 | 10.064880084 |
| 26040 | 7.168222174 | 26088 | 27.005140423* |
| 26041 | 4.924688453 | 26089 | 7.534564567 |
| 26042 | 26.862213431* | 26090 | 36.754465653* |
| 26043 | 9.205028450 | 26092 | 12.993731872 |

| Participant No. | Chi Square | Participant No. | Chi Square |
|-----------------|---------------|-----------------|---------------|
| 26044 | 10.106842582 | 26093 | 25.933110167* |
| 26045 | 16.343933154 | 26094 | 16.823940558 |
| 26046 | 34.766619165* | 26097 | 14.041006748 |
| 26047 | 9.342852808 | 26098 | 13.119626413 |
| 26048 | 17.934224472 | 26099 | 4.940589474 |
| 26049 | 12.289726991 | 26100 | 15.129439541 |
| 26051 | 5.078121739 | 26103 | 23.636278078* |
| 26052 | 24.418743525* | 26104 | 14.169752735 |
| 26053 | 17.413923710 | 26105 | 8.693750771 |
| 26054 | 15.434913357 | 26106 | 5.769719646 |
| 26056 | 18.040046679 | 26107 | 10.014366667 |
| 26057 | 5.581946686 | 26108 | 19.242465827 |
| 26058 | 11.598343678 | | |

*p > .05 significant critical value (22.3).

Table 9

Chi-Square Results for Total Time: Females

| Participant No. | Chi Square | Participant No. | Chi Square |
|-----------------|--------------|-----------------|--------------|
| 26003 | 1.538668597 | 26059 | 5.030587503 |
| 26004 | 6.346193389 | 26060 | 7.981193070 |
| 26005 | 5.892007850 | 26061 | 11.363221495 |
| 26006 | 4.727992651 | 26062 | 9.326260769 |
| 26010 | 4.998928216 | 26064 | 7.535588205 |
| 26011 | 4.535116491 | 26065 | 8.156576321 |
| 26013 | 4.583583400 | 26066 | 2.053230459 |
| 26016 | 3.577327661 | 26067 | 6.793923337 |
| 26017 | 1.425063296 | 26068 | 2.002610929 |
| 26018 | 2.692117918 | 26069 | 2.535354123 |
| 26019 | 6.191638832 | 26070 | 1.959302582 |
| 26027 | 6.578582574 | 26071 | 8.153732327 |
| 26028 | 5.882678324 | 26074 | 6.382565917 |
| 26029 | 3.370680536 | 26075 | 3.927633119 |
| 26030 | 6.239590585 | 26076 | 7.211726483 |
| 26031 | 11.076090224 | 26077 | 7.709946277 |
| 26032 | 1.053587820 | 26080 | 2.564724607 |
| 26034 | 1.853308188 | 26081 | 1.100306511 |
| 26035 | 4.707729934 | 26083 | 4.163709673 |
| 26036 | 4.852793189 | 26085 | 16.240941922 |
| 26038 | 17.449115445 | 26086 | 2.104794909 |
| 26040 | 4.034371466 | 26088 | 4.204622045 |
| 26041 | 3.108343111 | 26089 | 3.446103690 |
| 26042 | 5.309453776 | 26090 | 11.148555253 |
| 26043 | 4.145306871 | 26092 | 3.946169898 |

| Participant No. | Chi Square | Participant No. | Chi Square |
|-----------------|-------------|-----------------|-------------|
| 26044 | 2.566477846 | 26093 | 7.283584463 |
| 26045 | 9.526103250 | 26094 | 3.879903696 |
| 26046 | 8.972493661 | 26097 | 3.765910775 |
| 26047 | 1.324358695 | 26098 | 4.878354379 |
| 26048 | 3.838420833 | 26099 | 1.777276246 |
| 26049 | 3.583120434 | 26100 | 5.532389819 |
| 26051 | 0.561682347 | 26103 | 9.615650107 |
| 26052 | 3.896613725 | 26104 | 3.602384714 |
| 26053 | 3.660115325 | 26105 | 2.244953689 |
| 26054 | 3.745217396 | 26106 | 3.856242825 |
| 26056 | 4.841982420 | 26107 | 2.846961694 |
| 26057 | 1.877193772 | 26108 | 6.248710220 |
| 26058 | 3.998679198 | | |

*p > .05 significant critical value (22.3).