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Falsification of the LOOK

Rodrigo Andres Veas

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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July 2015

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## ABSTRACT

### Falsification of the LOOK

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Doctor of Philosophy

The LOOK is a viewing time measure that seeks to assess sexual interest patterns and is currently in development at Brigham Young University. This instrument is intended to aid current efforts to prevent child sexual abuse by identifying deviant sexual interests. A recently presented study on a similar viewing time measure has raised concerns regarding individuals' ability to falsify sexual interest patterns on average. This study seeks to extend this falsification research to the LOOK in order to assess if falsification of this measure is possible by means of speed or pretense. Participants were exclusively heterosexual non-pedophilic males and females. Sexual interest patterns for 151 females and 150 males were used. These individuals were distributed into either a control group or one of four possible falsification conditions for each gender. The study used Fischer's Chi-square scoring procedure to examine the significance of differences between the averaged patterns of sexual interest obtained from falsification groups and average expected interest patterns of control groups. Results of this study found that 4 of 8 falsification groups were able to significantly falsify sexual interest patterns on average. It appears that, on average, everyone in the pretense groups were capable of falsifying results. Men and women were able to emulate response patterns of the opposite gender regardless of whether given information about the basic mechanism of visual response time instruments. It is concluded that while the LOOK seems to possess a degree of sensitivity toward falsification efforts, improvements are still needed in order to increase its ability to detect test-taker's efforts to falsify results on average.

Keywords: LOOK, falsification, sexual interest, viewing time, chi-square

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I would like to also thank my fellow students involved in the LOOK team for their help, support, and work. Knowing that I had a professional and dependable team to back me up through the hours of work and data collection was a great source of relief. I would like to specifically thank Sierra and Cameron Baird for the constant and timely support in updating and providing technical support for the LOOK throughout the entire data collection process.

Lastly, I cannot adequately express the profound gratitude I feel for my family and friends. Words cannot sufficiently convey how grateful I am to my mother and father for all of the sacrifices that they have made on my behalf. Many of my close friends have supported me through this process. I would like to specially thank Heather Hogue, who has provided countless hours of editing and support throughout this project. I would also like to thank Nathan Jeffs for the hours he spent helping me organize and check data, and my internship site supervisors and peers who took time to help me think critically and refine my ability to explain my methodologies and findings.

## TABLE OF CONTENTS

ABSTRACT.....	ii
ACKNOWLEDGMENTS .....	iii
TABLE OF CONTENTS.....	iv
LIST OF TABLES.....	v
LIST OF FIGURES .....	vi
DESCRIPTION OF DISSERTATION STRUCTURE .....	vii
Introduction.....	1
Current Study.....	9
Research Questions.....	10
Method.....	10
Participants.....	11
Procedures.....	11
Measures .....	14
LOOK .....	14
The Demographics, Attitudes, and Sexual Interest Questionnaire .....	16
Data Analysis.....	17
Standard Chi-square procedure.....	17
Fischer’s Chi-square scoring procedure.....	18
Results.....	20
Discussion.....	28
Study Limitations.....	33
Future Directions .....	34
References.....	37
APPENDIX A: Literature Review.....	44
Incidence.....	44
Prevalence.....	44
Risk Factor for Victims.....	45
Prevention .....	46
Identifying Perpetrators .....	47
Sexual Interest Assessment as a Measurement of Deviance .....	49
Penile plethysmography .....	49
Viewing time measures .....	51
References.....	56
APPENDIX B: Demographics, Attitudes, and Sexual Interest Questionnaire.....	65

## LIST OF TABLES

Table 1: <i>Participant Demographics Information</i> .....	21
Table 2: <i>LOOK Completion Times in Minutes</i> .....	22

## LIST OF FIGURES

<i>Figure 1.</i> Proportion of means for expected female sexual interest patterns in Affinity 2.5.....	8
<i>Figure 2.</i> Proportion of means for expected male sexual interest patterns in Affinity 2.5.....	8
<i>Figure 3.</i> Proportion of means for expected male and female patterns .....	23
<i>Figure 4.</i> Proportion of means for obtained male sexual interest patterns in speed conditions .....	24
<i>Figure 5.</i> Proportion of means for obtained male sexual interest patterns in pretense conditions .....	25
<i>Figure 6.</i> Proportion of means for obtained female sexual interest patterns in speed conditions .....	26
<i>Figure 7.</i> Proportion of means for obtained female sexual interest patterns in pretense conditions .....	27

## DESCRIPTION OF DISSERTATION STRUCTURE

This dissertation, *Falsification of the LOOK*, is written in a hybrid format. This format focuses on the combination of traditional requirements for dissertation writing along with the preparation of a manuscript that summarizes and organizes this dissertation in a manner consistent with what is required for publication in peer-reviewed scientific journals.

The initial sections of this document, which are numerated using Roman numerals, are required for university submission. The main body of this dissertation, which is numerated in Arabic numerals, follows organization and style appropriate for submission to most peer-reviewed psychology journals.

The extended review of literature can be found under Appendix A. This document includes two reference lists, one after the main body of the dissertation and the other after Appendix A. The first is specific to the citations used in the body of the journal-ready article while the second is specific to the referenced cited in the literature review found in Appendix A.



## Introduction

Sexual abuse of minors has been linked to various deleterious psychological outcomes throughout a wide body of research (Dinwiddie et al., 2000; Levitan, Rector, Sheldon, & Goering, 2003; Messman-Moore & Long, 2000; Roosa, Reinholtz & Angelini, 1999; Widom, 1999). These studies have linked childhood sexual abuse to anxiety and mood disorders, post-traumatic stress disorder, self-destructive or high-risk behaviors, substance abuse, and potentially revictimization. These studies also note a large amount of interpersonal difficulties that, while not necessarily rising to diagnostic levels, can severely impact quality of life. Some of these include feelings of disenfranchisement, poor self-esteem, and difficulties with trust and intimacy (Browne & Finkelhor, 1986). Overall, research of child sexual abuse (CSA) places it as a regrettably common problem. Because of the seriousness of CSA, both private and governmental agencies have instituted a wide range of prevention efforts. These efforts can generally be grouped into three different areas.

At the most broad level, CSA prevention efforts take the form of various programs that promote education and large scale legislative reforms. These efforts seek to educate the general population and potential victims to reduce first offences. These programs educate children, parents, and agencies to help them better understand, recognize, and be more willing to report CSA. These first tier measures are backed by research indicating that CSA prevention education programs are associated with reduced incidence rates (Gibson & Leitenberg, 2000).

At the most narrow level, CSA prevention takes the form of rehabilitative and other treatment programs aimed at known offenders in order to reduce recidivism. These prevention efforts are highly studied. The depth of research into this area is bolstered by the findings

indicating that 30% to 40% of CSA offenders are likely to recidivate within 20 years of their last offense (Hanson, Morton, & Harris, 2003).

One area of research that is less commonly addressed is the identification of individuals currently at-risk of engaging CSA behaviors. Like broad-level prevention efforts mentioned above, this level of prevention focuses on reducing first offenses. Research of at-risk individuals addresses potential perpetrators rather than placing the responsibility for incidence reduction on potential victims or the community at large. Unfortunately, identifying these at-risk individuals can be a difficult task due to methodological, social, and ethical factors.

The wealth of research on recidivism prevention presents two main findings regarding the factors that play into repeat offenses for known CSA perpetrators, namely, antisocial attitudes, and deviant sexual interest (Hanson & Bussiere, 1998; Hanson & Morton-Bourgon, 2005; Hanson, Steffy, & Gauthier, 1993; Whitaker et al., 2008). It is clear that there is a very important difference between individuals who have been found guilty of committing CSA-related crimes and those who are simply at risk of doing so. While at-risk individuals are not the same as known offenders, it stands to reason that these two groups are likely to have some overlap in the characteristics related to CSA behaviors. Ultimately, while not all at-risk individuals may go on to become offenders, all known offenders were at some point in the at-risk category. Additionally, while first offenses may be different from repeat offenses in some ways, both behaviors share an inherent disregard for social and legal norms regarding sexual behavior and enough deviant sexual interest to see children at least as masturbatory objects. It follows that the task of identifying at-risk individuals can be linked to the assessment of both antisocial attitudes and deviant sexual interest.

Looking at the large body of assessments and measures developed in forensic settings to identify individuals at risk of criminal or antisocial acts mainly supports a set of features which seem to create a relatively clear profile (e.g., Bonta, 1996; Champion, 1994; Gendreau, Little, & Goggin, 1996; Gottfredson & Tonry, 1987). This set of features is sometimes referred to as the “criminal lifestyle” and involves a varied set of factors, including demographic facts, behavioral history, and beliefs regarding criminality (Gendreau, Little, & Goggin, 1996). While the depth of research and information found in this field of study seems promising, assessing risk of future CSA behaviors from an individual’s risk of criminality alone is insufficient. Although it is true that perpetrators of CSA can often be found to be involved in other criminal acts, it is rare for criminals of nonsexual crimes to recidivate with sexual crimes (Bonta & Hanson, 1995; Hanson, Scott, & Steffy, 1995). Additionally, despite criminality being a common factor in recidivism, some of this same research shows that CSA perpetrators may often not score at clinically significant levels on these instruments (Bonta & Hanson, 1995). Because of this fact, being able to adequately assess deviant sexual interest becomes pivotal to the assessment of risk for CSA.

Deviant sexual interest has been researched and shown to be one of the strongest predictors for CSA recidivism and, given the similarities that can be expected to exist between known perpetrators and at-risk individuals, deviant sexual interest could be reasonably expected to also be an important factor in identifying at-risk individuals. Currently, sexual interest is measured in a variety of ways including, but not limited to, clinical interviews, surveys/self-report, polygraph tests, genital plethysmography, and also viewing time measures.

Sexual deviance assessment is complicated due to various social and legal factors that may cause individuals to feel pressured to minimize or simply deny deviant sexual interest. Among the factors are fear of incarceration, mandated treatment, involuntary commitment,

inclusion in a sex offender registry, employment difficulties, marital problems, and exclusion or discrimination by family, friends, and society. These factors most directly affect measures and methods reliant on self-report given their commonly subjective nature. Additionally, even when an individual is being honest, the information provided in clinical interviews has to be subjectively interpreted by whoever is charged with making these determinations. However, even the best-trained and most well intentioned professionals are subject to bias, misunderstanding, and error. The seriousness of the previously mentioned repercussions underlines the importance of objective measures of sexual interest that are valid and reliable.

One of the most used methods of obtaining objective information regarding sexual interest is genital plethysmography. Plethysmographs assess changes in sexual arousal through directly measuring variations in genital volume, blood flow, lubrication, or other physiological signs of sexual arousal. The information obtained from these instruments has historically been used in various stages of treatment of individuals who commit sexual crimes and has been found to accurately detect deviant sexual interests in offenders with histories of these behaviors (Barbaree & Marshall, 1989; Barker & Howell, 1992; Freund & Watson, 1991; Quinsey, 1984, 1986).

Despite its effectiveness, there are also potential psychometric and ethical issues inherent in plethysmography. The most glaring methodological issue found in this instrument is the mismatch between the nature of the data obtained and the interpretation and use of this data. More simply stated, there is a substantial issue stemming from the inadequacy of using measurements of intrapsychic variation to compare an individual's sexual interest patterns to those of the population. This intrapsychic, or ipsative, information can only be expected to give us information regarding how an individual's personal preference in one area compares to their

personal preference in other areas. An individual becoming more physically aroused when looking at pornographic images or listening to explicit narratives of adult heterosexual intercourse compared to when they are exposed to explicit pedophilic material only tells us that they enjoy one of these two things more than they enjoy the other. These data do not tell us if their sexual interests are in any way different than would be expected in the population. Using ipsative data to make normative claims has been criticized by various authors (Clemans, 1966; Closs, 1996; Cornwell & Dunlap, 1994; Fischer & Smith, 1999; Glasgow & Fischer, 2006a; Glasgow & Fischer, 2006b). This methodological error causes various issues, particularly with scale and outliers. Not having actual normative data makes it theoretically impossible to make any claim of deviance because it is unable to account for what exactly the obtained data are deviating from.

In addition to the problem of how data are used there are also issues surrounding confounding factors that can affect plethysmograph results. Physiological arousal can be affected unintentionally or purposefully by medication use, mood, and individual variations in the sexual response cycle. The testing environment itself can be considered uncomfortable due to its invasiveness and may affect results. Research has shown that intentional use of falsification strategies on the part of test-taker diminishes the plethysmograph's ability to reliably measure arousal patterns (Konopasky & Konopasky, 2000).

Alongside these methodological issues are the ethical dilemmas introduced when judging the appropriateness of using explicit visual or auditory materials, which may be considered personally or morally offensive, and, depending on local legislature, could be argued to be illegal. There are also issues of personal boundaries given the delicate physical placement of the measurement device. Lastly, all of these ethical dilemmas are compounded when discussing the

limits of what is appropriate in the assessment of juvenile offenders or individuals who are only at-risk and not convicted for or suspected of CSA offenses.

One alternative to genital plethysmography is the use of instruments relying on viewing time measurements. These instruments do not gather data from physiological sexual responses, but rather, they use methodologies based on research into sexual interest and its effect on cognitive processes. This line of research began in the latter half of the 20<sup>th</sup> century with experiments designed to study the link between sexual interest and its effect on image viewing time patterns (Quinsey, Ketsetzis, Earls, & Karamanoukian, 1996; Rosenzweig, 1942; Ware, Brown, Amoroso, Pilkey, & Pruesse, 1972; Wright & Adams, 1994; Zamansky, 1956). This line of research was eventually extended specifically to CSA research. Researchers found significant differences when comparing viewing time for CSA offenders and non-offenders who were shown nude images of models of varying genders and ages (Harris, Rice, Quinsey, & Chaplin, 1996). As an extension to this vein of research visual response time assessments of sexual interest began to be developed. These include currently commercially available measures such as the *Abel Assessment for Sexual Interest* and the *Affinity* series of tests. These instruments use surreptitious measures of viewing times as a way to ascertain patterns of sexual interest. While the images used in both measures depict clothed individuals in a non-sexual context, the test-takers are primed to think of them in a sexual context by being asked to rate their sexual interest in the individual depicted in each image.

Viewing time measurements of sexual attraction improve on some of the previously stated ethical dilemmas associated with genital plethysmography. Specifically, these tests are much less invasive, can be carried out without the need of explicit narratives or images, and use procedures which are much less likely to lead to excessive discomfort or distress for test-takers.

While it is impossible to guarantee that a test-taker will not experience any discomfort when using these assessments, the use of these assessments with juvenile and at-risk individuals seems much less objectionable.

Despite these improvements over some of the plethysmograph's ethical problems, neither of these currently commercially available visual response time measures appears to address the statistical issue of using ipsative data to make normative claims. For example, scores produced by these measures may show that an individual's pattern of sexual attraction toward children may be considerably lower than their attraction to adults from the ipsative point of view; however, their attraction to children may actually be statistically significantly above the expected pattern if their scores were normalized and compared to the expected pattern of attraction of heterosexual non-pedophilic adults. False negatives and false positives can have severe effects on the lives of children and adults wrongly imprecated.

A second matter of concern with at least one of the currently available viewing time measures of sexual interest is individual's ability to falsify results, particularly when provided with information regarding the assessment's surreptitious time measurements. Recent results presented by Fischer et al. at the 2012 conference of the Association for the Treatment of Sexual Abusers suggested that their sample of college students were able to accurately imitate expected response patterns of non-pedophilic adults of the opposite gender through pretense on the Affinity 2.5. This same study also found that speed of responding was not an efficient way to falsify results. In sum, the average sexual interest patterns produced by individuals in a gender's speed groups and the opposite gender's pretense groups were found not to be significantly different from the average expected pattern of that gender (see Figure 1 and Figure 2). Speed

group patterns were too close to the expected pattern to falsify while the pretense group patterns were too close to be distinguished from the expected pattern of the opposite gender.

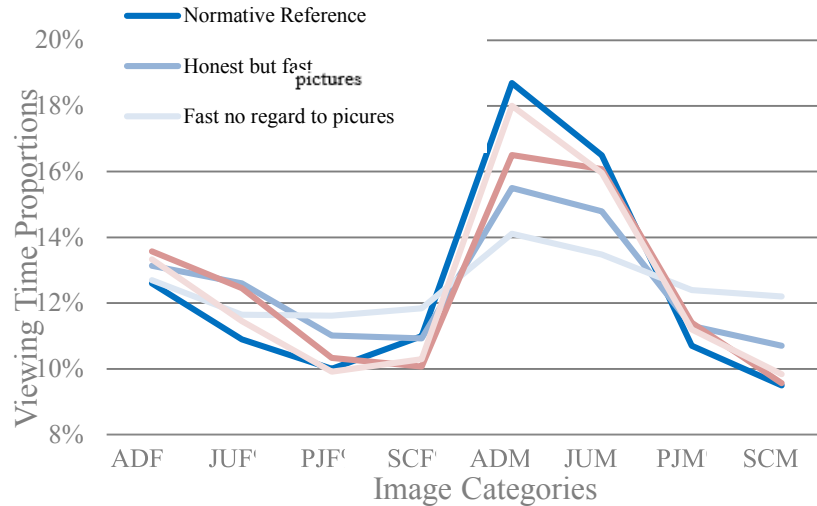


Figure 1. Proportion of means for expected female sexual interest patterns in Affinity 2.5. Comparison of viewing time proportion means for Affinity 2.5 patterns obtained from female speed groups and male pretense groups with these expected patterns. ADF = Adult Female; JUF = Juvenile Female; PJF = Pre-juvenile Female; SCF = Small Child Female; ADM = Adult Male; JUM = Juvenile Male; PJM = Pre-juvenile Male; SCM = Small Child Male.

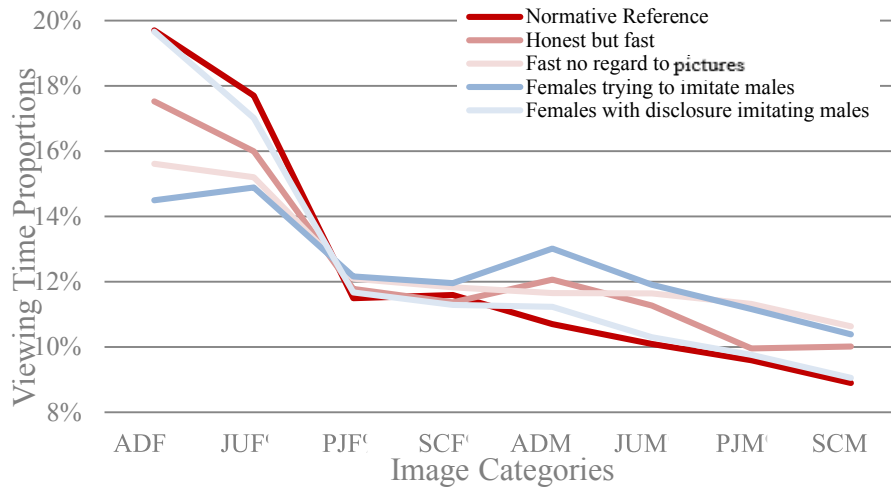


Figure 2. Proportion of means for expected male sexual interest patterns in Affinity 2.5. Comparison of viewing time proportion means for Affinity 2.5 patterns obtained from male speed groups and female pretense groups with these expected patterns. ADF = Adult Female; JUF = Juvenile Female; PJF = Pre-juvenile Female; SCF = Small Child Female; ADM = Adult Male; JUM = Juvenile Male; PJM = Pre-juvenile Male; SCM = Small Child Male.



Alongside these results on the potential falsification of average sexual interest profiles, Fischer et al. (2012) also discussed how to address the issue of appropriately norm-referencing through a variation on traditional Chi-square goodness-of-fit scoring procedures and the creation of expected average sexual interest patterns. This was done through the use of a fair constant multiplier to make a linear transformation of scores to reduce the effect of variations in total viewing time. Fischer recommended the average total viewing time as the fair constant multiplier.

The LOOK is a visual response time measure of sexual interest currently under development at Brigham Young University by Sierra and Cameron Baird. It seeks to improve some of the current issues found in sexual interest deviance testing. As a viewing time instrument, it intrinsically avoids issues surrounding the invasiveness and moral complexities related to the use of explicit content found in genital plethysmography. It also tries to improve on the sensitivity and scoring of currently commercially available viewing time measures by using Fischer's Chi-square procedure, normative sampling of expected sexual interest patterns, and integrating recent research regarding sexual interest and its impact on cognitive processing.

### **Current Study**

Visual response time measures of sexual interest have the potential to advance the study of at-risk individuals and, through this research, help prevent CSA. These measures could potentially avoid some of the current methodological and ethical issues found in current instruments that make it difficult to study this population. This study replicated the Affinity 2.5 falsification study carried out by Fischer et al. (2012) in order to assess falsification of results on the LOOK. While the nature of the instrument in itself addresses some dilemmas observed in current instruments, this study particularly addressed the concerns raised by this previous

falsification study on the Affinity 2.5. This study used Fischer's Chi-square procedure to analyze how the falsification groups fared when compared to the control group data obtained from exclusively heterosexual, non-pedophilic, males and females who went through the standard administration of the LOOK.

The falsification groups attempted to alter results by means of speed and pretense. These conditions were each additionally divided into two subgroups. While both speed groups were asked to test the limits of quick responding on results, one group was additionally asked to disregard the images during their attempts at quick responding. The pretense groups were both asked to respond to the instrument as if they were of the opposite gender. These groups varied in that one group was additionally informed that people tend to look at images they find appealing for longer.

### **Research Questions**

1. On average, can the observed patterns obtained from the speed groups be differentiated from the expected patterns obtained from the control group of their own gender?
2. On average, can the observed patterns obtained from the pretense groups be differentiated from the expected patterns obtained from the control group of the opposite gender?

### **Method**

The following is a description of participant characteristics, research procedures, and data analysis used in this study.

## **Participants**

Data for this study were collected at Brigham Young University (BYU) in Provo, Utah between April 3, 2014 and April 2, 2015. Participants were recruited using the Sona Systems online recruitment website sponsored by the BYU Psychology Department. This recruitment process allows professors at BYU to offer extra credit to students who use this program to sign up for research participation. All students who were recruited through this process were given extra credit in their referring class as delineated by their course instructor.

Due to the nature of the research questions, participants had to be at least 18 years of age and have no history of pedophilic behavior to sign up to participate in this study. These inclusion criteria were clearly listed on the recruitment page. Additionally, only the data obtained from individuals who identified as exclusively heterosexual in the demographic questionnaire were used as the scope of this particular study only tested against expected sexual interest patterns of heterosexual non-pedophilic adults.

## **Procedures**

This study was approved by BYU's Institutional Review Board (IRB) and followed appropriate ethical guidelines regarding informed consent and protection of each individual's personal information. In order to protect the privacy and confidentiality of participants, data were never linked to identifying information.

Upon arriving to participate in the study, all individuals were assigned to a control group or falsification group and given the associated consent document to read. After reading this document, participants were allowed to ask any questions they had regarding the information provided in the consent form. They were then given the option to agree to participate or leave at any time without questions or penalties. Those who chose to continue were then assigned an

identification number within the research database. This number was used to link demographic information, consent forms, and assessment data. A waiver was obtained through the Internal Review Board in order for individuals to consent verbally rather than sign the consent form in order to avoid the creation of any document that linking participant's names to their research identification number. Upon request, participants were allowed to take blank consent forms to keep. These included contact information for the primary researcher and dissertation chair in case they had future concerns or questions about the study. All data collection materials were stored in a dedicated locked file inside of a locked office or in an encrypted password-protected database.

After completing the initial process, participants were taken to a private assessment room designated for the purpose of this study. Once there, participants were given an iPad mini that was locked into the LOOK application, oriented regarding the use of the LOOK, and reminded of the additional instructions they were previously given in the consent form for their research condition.

As mentioned above, participants were assigned to one of five research situations. These included one control group and four falsification groups. Each group received different instructions for the purpose of this study. Specific instructions were as follows:

- Falsification Group 1 (Speed Group 1): The LOOK purports to measure sexual interests. We are examining variations in its effectiveness across several conditions. In this study, we are testing the effect of rapid responding on the results of the test. Please respond as you would normally to the tasks presented to you, but do so as rapidly or quickly as possible. Do you have any questions?

- Falsification Group 2 (Speed Group 2): The LOOK purports to measure sexual interests. We are examining variations in its effectiveness across several conditions. In this study, we are testing the limits of rapid responding and its effect on the results of the test. Please focus on responding as quickly as possible the tasks presented to you without regard to the image presented. Do you have any questions?
- Falsification Group 3 (Pretense Group 1): The LOOK purports to measure sexual interests. We are examining variations in its effectiveness across several conditions. In this study, we are testing the effect of pretense on the results of the test. Please respond to the tasks presented to you as though you were of the opposite gender. In other words, if you are a female, please respond to the tasks pretending to be a male, or as you believe a male would respond. If you are a male, please respond to the tasks pretending to be a female, or as you believe a female would respond. Do you have any questions?
- Falsification Group 4 (Pretense Group 2): The LOOK purports to measure sexual interests. We are examining variations in its effectiveness across several conditions. In this study, we are testing the effect of pretense on the results of the test. Please respond to the tasks presented to you as though you were of the opposite gender. In other words, if you are a female, please respond to the tasks pretending to be a male, or as you believe a male would respond. If you are a male, please respond to the tasks pretending to be a female, or as you believe a female would respond.

I am going to give you privileged information about how the test actually works.

As you complete the tasks of the test and rate the images in terms of their sexual attractiveness, the computer will be timing how long it takes you to do these activities.

We have previously established the typical pattern of time that it takes people to do these

activities. In general, females take longer to rate images of adult and juvenile males than other images. Conversely, males generally take longer to rate images of adult and juvenile females than other images. Do you have any questions?

- Control Group: The LOOK purports to measure sexual interests. We are examining variations in its effectiveness across several conditions. In this study, we are collecting data regarding what the expected response pattern is under the standard administration of the test. Please respond as you would normally to the tasks presented to you. Do you have any questions?

After being reminded of these instructions, participants were then asked to complete the LOOK administration and fill out the front and back of the demographic questionnaire. They were instructed to return to the research assistant's table once they were finished and asked to place their demographics questionnaire inside a manila envelope. They were then left alone to complete their LOOK administration and demographics questionnaire. Once participants returned and placed their demographics sheets in the envelope, they were told they were free to leave and their research participation was verified on the online recruitment page.

### Measures

**LOOK.** The LOOK is a visual response time assessment made to assess sexual interest patterns. This instrument is currently released as an iOS application compatible with Apple iPad products. This study used solely iPad Minis through their touchpad interface. None of the administrations for this study used a keyboard, mouse, or any other alternative interface. On average, an administration of the LOOK can be expected to be completed in under 10 minutes.

The LOOK begins by asking participants to rank order its 14 categories from most to least sexually appealing. These 14 categories of images are: Elderly Female (ELF), Mature

Adult Female (MAF), Adult Female (ADF), Juvenile Female (JUF), Pre-juvenile Female (PJF), Small Child Female (SCF), and Infant Female (INF) for images depicting women and Elderly Male (ELM), Mature Adult Male (MAM), Adult Male (ADM), Juvenile Male (JUM), Pre-juvenile Male (PJM), Small Child Male (SCM), and Infant Male (INM) for images depicting men. The LOOK then proceeds to present the participant with 154 images, 11 for each of the 14 categories. The first 14 images presented contain one picture from each group and are used to introduce the test-taker with the assessment and its procedures. Data for these first 14 images are not used in the creation of the participant's sexual interest pattern. After these first 14 images the rest of the 140 images, 10 per category, are presented in random order.

During the presentation of images, the LOOK asks individuals to find a small dot that is randomly generated on the image in one of the four quadrants of the screen. Asking participants to find this randomly generated dot is done in an effort to increase the cognitive load associated with the rating task. Increasing the cognitive load in a visual-response-time measure has been found to be useful in increasing instrument sensitivity and improving discrimination of viewing time measures (Mokros, Dombert, Osterheider, Zappalà, & Santtila, 2010; Santtila et al., 2009; Wright & Adams, 1994).

Once the participant has found the dot and touched it on the screen, he or she is asked to rate the sexual attractiveness of the individual presented on the image before they can move on to the next image. The assessment discreetly measures viewing times during this process. These viewing times are then used to create a sexual interest pattern for that individual. Once the participant has completed this process for each of the 140 images she or he is taken to a final screen where they are thanked and their data is securely uploaded to a protected server. Data are stored locally on the iPad mini until successfully uploaded to the server.

Development of the LOOK incorporated various features to increase the quality of the instrument over currently available visual response time measures. Various considerations were involved in the choosing images in order to supply a varied and minimally biased pool of models depicted in each of the categories used. Among these considerations were age, gender, race, body type, hair color, facial expression, and body position. While images were varied regarding most categories, test developers excluded images that contained overtly sexual content, suggestive facial expressions, or body positions. All individuals depicted were fully clothed. The images chosen were required to depict the majority of the body. Furthermore, all pictures were digitally enhanced to equalize saturation, brightness, and color balance. Darkened edges were added in order to help focus the viewer to the center of the image where the model is located. These requirements and enhancements serve to reduce the effects of the images' technical features focus the participant primarily on the actual model presented.

Lastly, after each administration of the LOOK is completed and the data are securely uploaded and stored, qualified test administrators are provided access to each participant's raw data. Though it was not used in this study, test administrators will eventually also receive information regarding how each test-taker fared when compared to pre-established sexual interest patterns expected for their population.

**The Demographics, Attitudes, and Sexual Interest Questionnaire (DASIQ).** A demographic survey was used in conjunction with the administration of the LOOK in order to obtain additional information relevant to this study that is not normally collected by LOOK. The DASIQ (Appendix B) was used for this purpose and consists of three main sections.

The first section of the DASIQ asks participants to disclose their age, ethnicity, academic year, and marital status. The second section assesses participant's tendency to respond in a



socially desirable manner. This is done by administering an abbreviated version of the Marlowe-Crowne Social Desirability Scale (sometimes referred to as the Strahan-Gerbasi Scale) in order to save time while only experiencing a mild drop in reliability from the original instrument (Strahan & Gerbasi, 1972). The Strahan-Gerbasi Scale is composed of 10 of the original 33 items found in the original Marlowe-Crowne Social Desirability Scale. The third section of the DASIQ obtains participant's self-report regarding their sexual orientation as rated on a scale adapted from the Kinsey Heterosexual-Homosexual Scale (Kinsey, Pomeroy, & Martin, 1998).

The DASIQ was used by Fischer et al. (2012) in the falsification study for the Affinity 2.5 and was previously used by these researchers in other studies assessing various psychometric features of this instrument (Boardman, 2009; Crosby, 2007; Hansen, 2011; Harmon, 2006; Worsham, 2009). This instrument was chosen due to its satisfactory use in previous studies on visual response time instruments and its inclusion of required demographic data for this study.

### **Data Analysis**

This study used a modified Chi-square goodness-of-fit test to statistically compare the overall obtained patterns gathered in the falsification groups against the average expected sexual attraction patterns found in the control groups. The same modified Chi-square procedure was used for all additional comparisons discussed in the Results section.

**Standard Chi-square procedure.** The standard Chi-square goodness-of-fit approach analyzes the chance that the differences found between two patterns is statistically significant. The Chi-square procedure first obtains an absolute value of the differences between data points by squaring these. Then it divides this absolute difference by the expected data point to create a standardized ratio. These ratios are summed and result in a number that can be compared to Chi-square distributions for various degrees of freedom given selected  $p$ -values. If we refer to

the obtained value for each instance as  $O_i$  and the expected value for each instance as  $E_i$  the equation to obtain the Chi-square ( $\chi^2$ ) value for any given degree of freedom ( $df$ ) is as follows:

$$\chi^2_{(df)} = \sum_{i=1}^j \frac{(O_i - E_i)^2}{E_i} \quad (1)$$

If the Chi-square value obtained from this equation is equal to or greater than the significant Chi-square value obtained from a Chi-square distribution table for the appropriate  $p$ -value and degrees of freedom, then the null hypothesis is rejected. For the Chi-square goodness-of-fit test, the null hypothesis could generally be summed up to be that the data are consistent with the expected distribution. Chi-square values that are lower than the values obtained from the distribution table suggest that differences seen between the obtained pattern and expected pattern are not significantly different at the set  $p$ -value given the degrees of freedom of those variables.

**Fischer's Chi-square scoring procedure.** One issue seen in previous research of visual response time instruments is that “subjects that complete the assessment rapidly tend to generate spuriously low Chi-square values. Conversely, subjects that complete the assessment slowly, tend to generate spuriously high Chi-square values” (Boardman, 2009). In order to address this issue, previous research into similar visual response time instruments of sexual attraction has often used Fischer's Chi-square scoring procedure to ameliorate the effect of test-takers assessment completion speed (Boardman, 2009; Hansen, 2011; Stephenson, 2014; Worsham, 2009).

Fischer's Chi-square scoring procedure addresses this concern by using the standard Chi-square procedure but converting expected and obtained data into proportions and then multiplying these proportions by a fair constant multiplier. The fair constant multiplier used in

this study was set to the average total viewing time of each gender's control group. This value is meant to take all the expected and obtained values and linearly transform them in order to reduce the distortion created by different individual's test-taking speeds. This is particularly important for this study as two of the falsification groups in each gender directly try to distort obtained values through speed. The fair constant multiplier is also important in transforming the category percentages back into values that can be appropriately compared against the Chi-square significance value obtained from the expected distribution table. Using the fair constant multiplier is important because simply transforming the obtained and expected values into percentages distorts proportions as these become ipsative, adding up to one rather than varying freely.

Fischer's Chi-square scoring procedure adapts the Chi-square formula to the following equation:

$$\chi^2_{(df)} = n * \sum_{i=1}^j \frac{(P_i - \pi_i)^2}{\pi_i} \quad (2)$$

In this equation  $n$  represents the fair constant multiplier,  $P_i$  represents the obtained proportion of viewing time for each instance, and  $\pi_i$  represents the expected proportion of viewing time for each instance. This calculation procedure was used in all pattern comparisons in this study.

The average obtained patterns from the two groups in each gender that were attempting to falsify results through speed were analyzed using Fischer's Chi-square procedure to explore if their efforts were successful in making their response patterns appear significantly different from the average expected pattern for heterosexual non-pedophilic adults of their gender. Strong goodness-of-fit between the average observed pattern and the average expected pattern would

indicate that speed does not diminish the LOOK's ability to assess the participants' sexual interests on average.

The two groups in the pretense condition for each gender were similarly compared against the average expected patterns obtained from control groups; however, in these cases each group was compared to the expected pattern of the opposite gender to measure if they had been successful, on average, in using pretense as a means to significantly approximate their obtained patterns to the expected patterns of the opposite gender. Strong goodness-of-fit in these cases would suggest that participants were able to use pretense to diminish the LOOK's ability to accurately assess their actual sexual interest patterns on average. Particularly, the patterns created by one gender using pretense (and the additional information regarding the LOOK's mechanics in the case of the second pretense group of each gender) would appear to be able to accurately imitate the expected response patterns of the other gender.

### **Results**

A total of 189 males and 185 females met inclusion criteria and used the online recruitment system to register for this study. Sexual orientation as self-reported on the DASIQ reduced the data used to that of 301 participants who identified as exclusively heterosexual. These 301 individuals constituted 80.48% of total individuals who signed up to participate in this study. In order to help ensure the appropriateness of the statistical analysis used in this study, we attempted to recruit a minimum of 30 participants for each of the two control groups and eight falsification groups.

Of the individuals whose data were used in this study, 151 identified as female and 150 identified as male. Female participants' ages ranged from 18 to 46, with a mean of 20.21. Male

participants' ages ranged from 18 to 32, with a mean of 22.04. Additional participant demographics are found on Table 1.

Table 1

*Participant Demographic Information*

	<u>Number</u>	<u>Percentage</u>
<b>Total Participants</b>	301	100.0
Male	150	49.8
Female	151	50.2
<b>Ethnicity</b>		
Caucasian	265	88.0
Hispanic	15	5.0
Asian	12	4.0
Biracial	3	1.0
Native American	3	1.0
African American	2	0.7
Pacific Islander	1	0.3
<b>School Year</b>		
Freshman	95	31.6
Sophomore	79	26.2
Junior	68	22.6
Senior	57	18.9
Graduate student	2	0.7
<b>Marital Status*</b>		
Single	260	86.4
Married	40	13.3
Divorced	1	0.3

\* No participants reported their marital status as widowed.

Moreover, it was found that on average women seem to complete LOOK administrations assessment about 30 seconds quicker than men do across all corresponding groups (see Table 2). The total viewing time averages for each gender were used as the fair constant multiplier when comparing against the expected sexual interest pattern for that gender. These average total viewing times were 368.15 seconds for males and 334.41 seconds for females.

Table 2

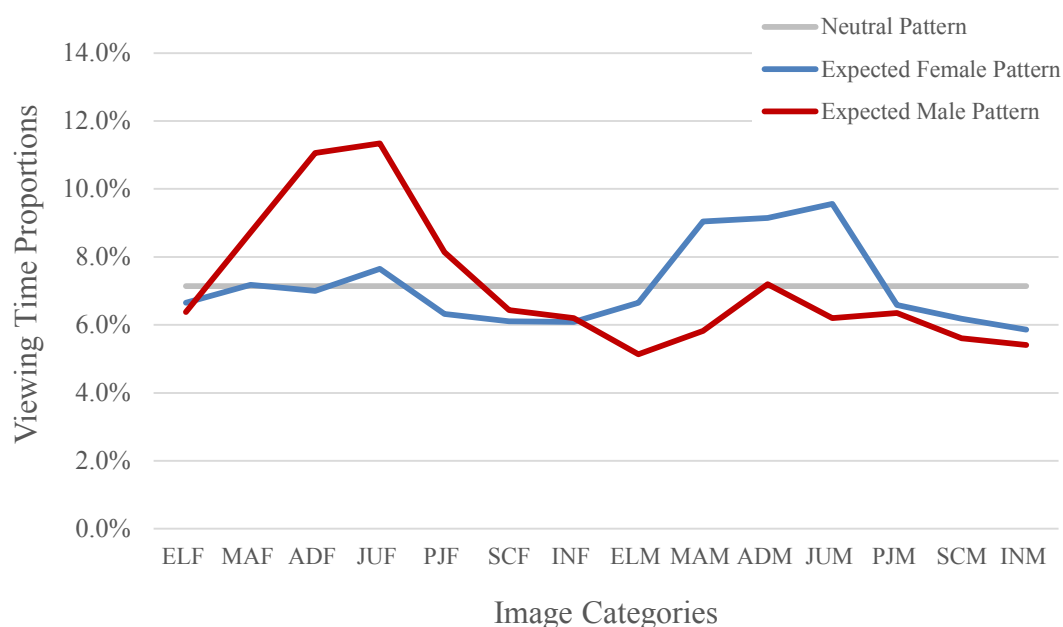
*LOOK Completion Times in Minutes*

<u>Group</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>
Male Control	4:17	11:40	6:08
Male Speed 1	3:04	10:06	4:55
Male Speed 2	2:18	6:05	4:18
Male Pretense 1	4:02	11:19	6:12
Male Pretense 2	4:00	9:00	5:57
Female Control	3:47	11:02	5:34
Female Speed 1	2:36	7:30	4:17
Female Speed 2	2:23	5:37	3:54
Female Pretense 1	3:43	9:24	5:41
Female Pretense 2	3:26	7:46	5:21

The Strahan-Gerbasi (1972) social desirability scale was completed by each participant. The average score of participants was 4.46 ( $SD = 1.9$ ). Normative data on the Strahan-Gerbasi scale for a comparable population indicated an average score of 4.6 ( $SD = 2.1$ ). There was no significant difference between average social desirability scores of this study's participants when compared to the normative data,  $t(373) = -1.43$ ,  $p > 0.05$ . These results suggested that participants in this study would not be expected to unduly distort responses due to social desirability effects.

All participants were assigned to one of ten possible groups for the study. These groups consisted of one control group and four falsification groups (two per falsification condition) for each gender. Average expected sexual interest patterns were established using the control groups and can be seen in Figure 3. These average expected sexual interest patterns were then

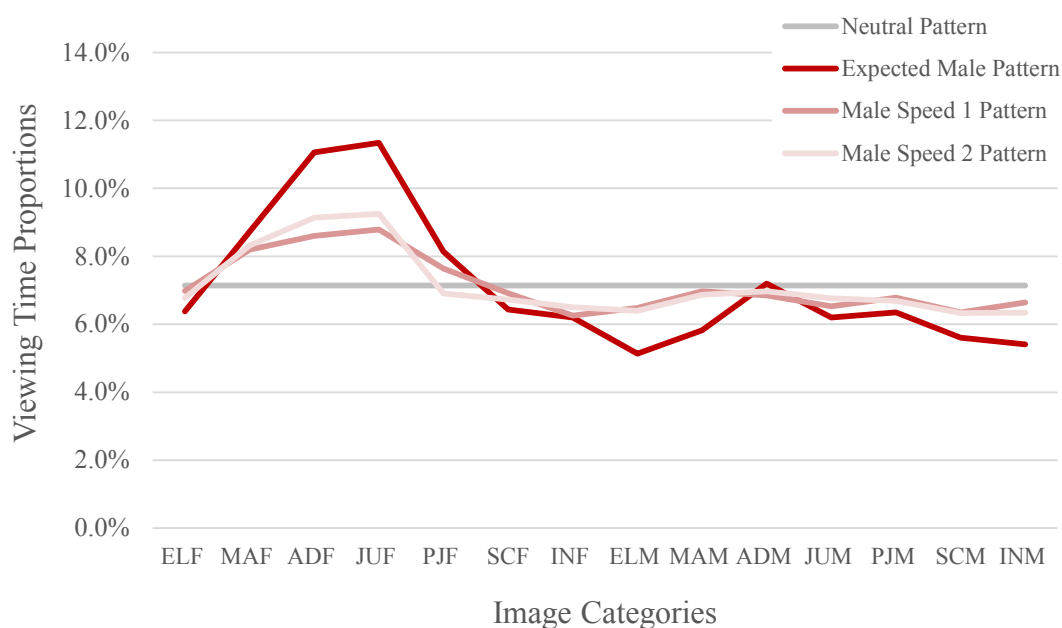
compared to a neutral pattern where all viewing times were equally distributed using Fischer's Chi-square scoring procedure. For males, the differences between the control group pattern and neutral pattern were significant  $\chi^2(13) = 188.66, p < 0.05$  for males. For females, it was found that the average expected pattern was not significantly different from the neutral pattern,  $\chi^2(13) = 9.35, p > 0.05$ . Additionally, it was found that in men 78.1% of individual patterns were found to be significantly different from the neutral line while 21.9% were not considered significantly different. In women 46.9% of individual patterns were significantly different from the neutral pattern while 53.1% were not.



*Figure 3.* Proportion of means for expected male and female patterns. Comparison of viewing time proportion means for LOOK patterns obtained from male and female control groups with neutral pattern. 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 Male; SCM = Small Child Male; INM = Infant Male.

Average patterns obtained from the falsification conditions were then compared against the average expected patterns seen in Figure 3 using Fischer's Chi-square scoring procedure.

The obtained average sexual interest patterns from the two male speed groups were compared to the male's average expected sexual interest pattern and are shown in Figure 4. The two male pretense groups were compared to the average female expected sexual interest pattern and are shown in Figure 5. The average sexual interest patterns found in the two female speed groups were compared to the average female expected sexual interest pattern and are shown in Figure 6. The average sexual interest patterns found in the two female pretense groups were compared to the average male expected sexual interest pattern and are shown in Figure 7.

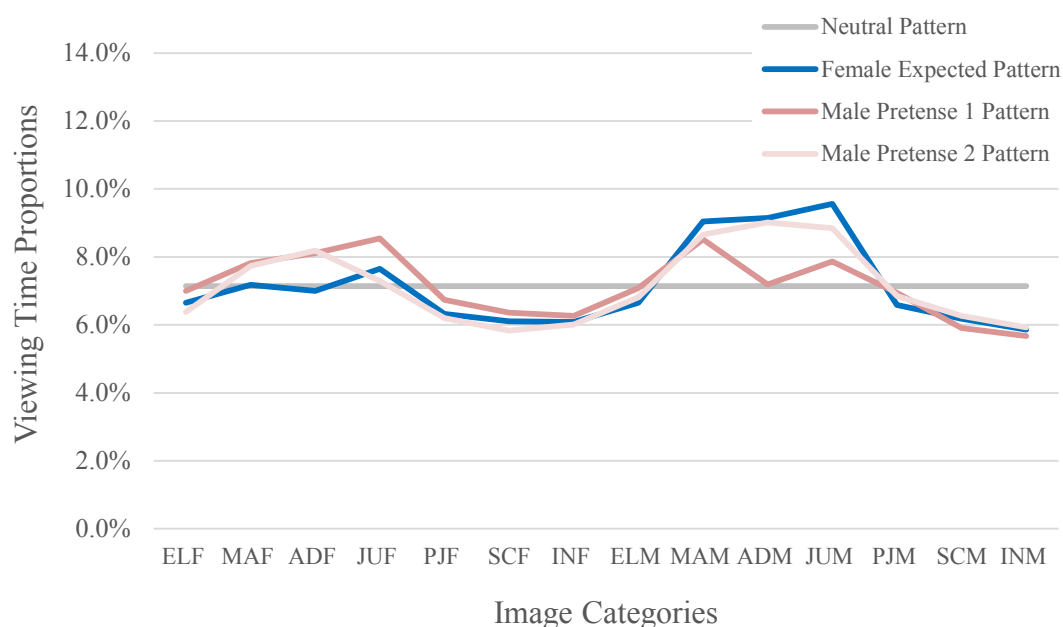


*Figure 4.* Proportion of means for obtained male sexual interest patterns in speed conditions. Comparison of viewing time proportion means for LOOK patterns obtained from male control group with these falsification patterns. ELF = Elderly Female; MAF = Mature Adult Female; ADF = Adult Female; JUF = 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 Male; SCM = Small Child Male; INM = Infant Male.

Fischer's Chi-square results obtained when comparing the average pattern of either male speed group and the average expected male sexual interest pattern were not significant,  $\chi^2(13) = 8.47, p > 0.05$  for Male Speed Group 1 and  $\chi^2(13) = 7.23, p > 0.05$  for Male Speed Group 2.



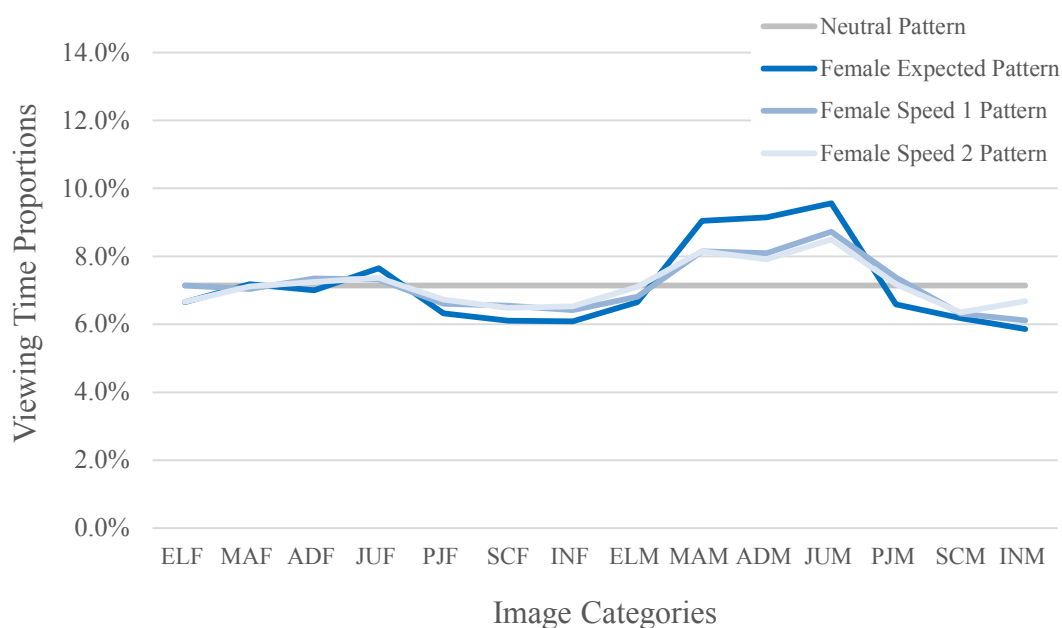
Males who were using quick responding to attempt to falsify results were unable to produce attraction patterns that were significantly different from the expected pattern. It appears that, overall, when men attempt to go through the measure as quickly as possible, they are not able to reduce their viewing times sufficiently to fail to meet the expected sexual interest patterns obtained from the control group. When individual patterns were analyzed separately, only 19.4% of men in Speed Group 1 and 22.6% of men in Speed Group 2 were able to produce response patterns that were significantly different from the average expected male response pattern.



*Figure 5.* Proportion of means for obtained male sexual interest patterns in pretense conditions. Comparison of viewing time proportion means for LOOK patterns obtained from female control group with these falsification patterns. 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 Male; SCM = Small Child Male; INM = Infant Male.

Comparing the responses of both male pretense groups and the average expected female pattern did not show significance differences between groups:  $\chi^2(13) = 4.07, p > 0.05$  for

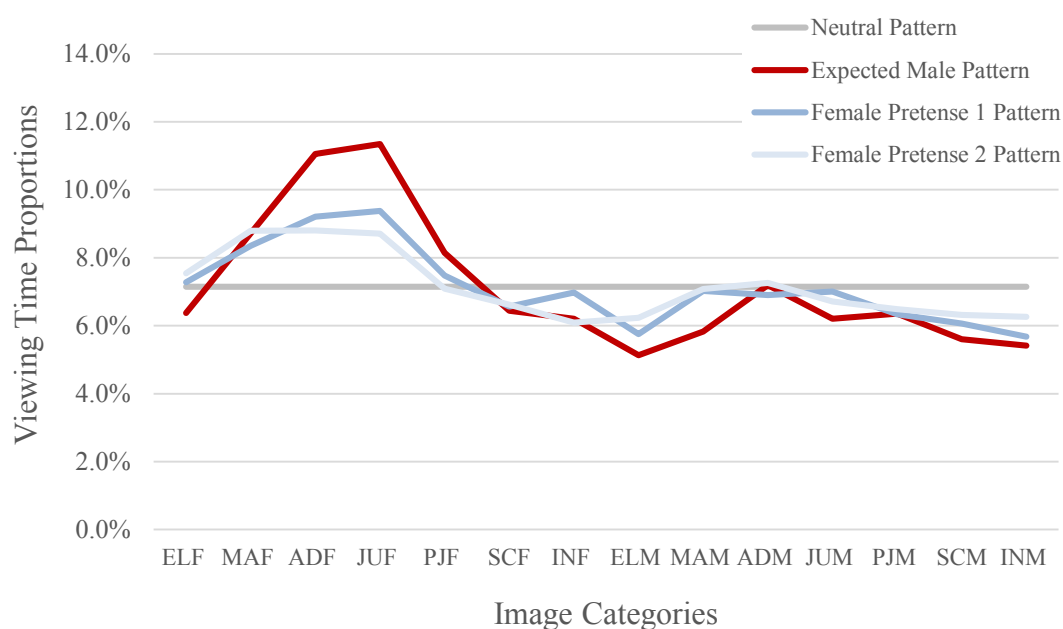
Pretense Group 1 and  $\chi^2(13) = 1.26, p > 0.05$  for Pretense Group 2. When analyzing individual response patterns, it was found that 58.1% of men in Pretense Group 1 and 73.1% of men in Pretense Group 2 were able to produce response patterns that were not significantly different from the average expected female patterns. Males who were asked to use pretense were able to emulate the expected female pattern on average. Their ability to falsify through pretense appeared to be bolstered when they were given additional information regarding the fact that individuals tend to look at images they find attractive for a longer period of time.



*Figure 6.* Proportion of means for obtained female sexual interest patterns in speed conditions. Comparison of viewing time proportion means for LOOK patterns obtained from female control group with these falsification patterns. 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 Male; SCM = Small Child Male; INM = Infant Male.

Fischer's Chi-square results obtained when comparing the average patterns obtained from both female speed groups and the average expected female sexual interest pattern were not found to be significant,  $\chi^2(13) = 1.77, p > 0.05$  for Female Speed Group 1 and  $\chi^2(13) = 2.27, p > 0.05$

for Female Speed Group 2. Women who were using quick responding to attempt to falsify results produced attraction patterns that were not significantly different from the expected pattern on average. Individually, only one woman (3.3%) in Speed Group 1 and none of the women (0.0%) in Speed Group 2 were found to be able to produce response patterns that significantly differed from the average expected pattern for females when using quick responding as a means to falsify results.



*Figure 7.* Proportion of means for obtained female sexual interest patterns in pretense conditions. Comparison of viewing time proportion means for LOOK patterns obtained from male control group with these falsification patterns. 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 Male; SCM = Small Child Male; INM = Infant Male.

The differences between both female pretense group average patterns and the average expected male pattern were not significant,  $\chi^2(13) = 5.29, p > 0.05$  for Female Pretense Group 1 and  $\chi^2(13) = 8.12, p > 0.05$  for Female Pretense Group 2. Females who used pretense in their responding to attempt to falsify results produced attraction patterns that were not significantly

different from the male expected pattern. Overall, it appears that, despite whether they were given hints regarding the surreptitious time measurements, women were able to use pretense to as a way to falsify results. When individually analyzed, 64.5% of women in Pretense Group 1 and 56.0% of women in Pretense Group 2 were able to produce patterns that were not significantly different from the average expected pattern in the male control group.

### **Discussion**

Falsification efforts appeared to be effective in four of the eight falsification groups. Data suggested that on average, using quick responding was not an effective way for participants to dissimulate their average sexual attraction pattern regardless of whether they paid attention to the images. Across all speed groups, only 14 individuals (11.3% of participants in these groups) were able to produce sexual interest patterns that were significantly different from the average expected pattern for their gender.

Data suggested that, despite the efforts to slow administration times down with the dot-finding task, LOOK administrations were still fast, with control group total viewing times taking an average of 6.13 and 5.56 minutes for men and women respectively. On average, males were able to cut total viewing times by about 20% and 28% for Speed Group 1 and Speed Group 2. Similarly, women were able to cut down average total viewing times by 23% and 30% for Speed Groups 1 and 2 respectively. Despite participants' ability to lower total viewing times through quick responding, Fischer's Chi-square procedure seemed to effectively equalize total viewing times and diminish the ability to effectively falsify results through speed on both the individual and group level.

While results indicated that the LOOK showed sensitivity against the use of speed to falsify results, average falsification patterns were found to effectively emulate average response

patterns of the opposite gender in all pretense groups. Across all pretense groups it was found that 71 individuals (62.8% of participants in these groups) were able to produce sexual interest patterns that significantly emulated the average expected pattern of the opposite gender. It was also interesting to note that having the additional information regarding the surreptitious time measurements appeared to bolster men's individual falsification efforts between the two pretense groups from 58.1% to 73.1% but not women's individual efforts, which actually decreased from 64.5% to 56.0% between the first and second pretense group.

This difference between the speed and pretense conditions brings up various interesting questions regarding the effect of administration speed and the scoring procedure on falsification results. Is it possible that while the use of Fischer's Chi-square procedure helps increase sensitivity toward falsification efforts by speed, it inadvertently lowers sensitivity to falsification efforts through pretense? In Pretense Group 1 women took 7% less time to complete LOOK administrations when compared to the men's control group. Women's Pretense Group 2 administrations similarly took 12% less time. Men's results were comparable except that on average they took longer than the women's control group (by 11% and 7% more time respectively for Pretense Groups 1 and 2). If these differences in total administration times represent true differences between groups, then systematically reducing the effect of total viewing times through the fair constant multiplier may unintentionally make the pretense groups appear more similar to the control group of the opposite gender. Further research may reveal alternative or additional scoring techniques designed to increase sensitivity to falsification efforts through pretense.

Another interesting finding was how these results matched what was presented by Fischer et al. (2012) on the results of their falsification study of the Affinity 2.5. The Affinity 2.5 study

also found that, on average, participants of both genders were able to falsify results through pretense but not speed. Results of this study suggested that the LOOK seems equally sensitive to falsification efforts. This similarity could be considered surprising given the differences seen between the LOOK and the Affinity 2.5. Among these differences there are considerable variations in measurement interface and category structures that would normally be expected to result divergent outcomes for both studies.

Research shows that, in tapping or clicking tasks, touchscreens are generally faster to use than a mouse or stylus (Cockburn, Ahlstrom, & Gutwin, 2012). This supports the finding that Affinity 2.5 viewing times obtained from Fischer et al. (2012) were proportionately slower than LOOK viewing times obtained from this study: 2.51 seconds per image on the LOOK against 2.89 seconds per image on the Affinity 2.5 on average. These variations in viewing times would add up to about a one-minute difference between total viewing times if the Affinity had as many images as the LOOK. This difference is important given previously mentioned research indicating how strongly results of viewing time measures are affected by total viewing time. Another difference between the instruments worth considering is that the Affinity 2.5 uses eight categories of images (adult, juvenile, pre-juvenile, and small child for each gender) while the LOOK uses 14 categories (see Methods section). This difference leads to changes in how viewing times are distributed among categories. Overall, the LOOK would be expected to have smaller proportions of time in each category and, therefore, provide increased sensitivity to variations in sexual interest between categories. These variations in total viewing time and category structure between instruments could reasonably be expected to lead to differences affecting the instruments' sensitivity to falsification efforts. Nonetheless, falsification results in both studies were consistent in that falsification was achieved through pretense and not speed.

This finding could possibly be attributed to the properties of Fischer's Chi-square procedure (which were briefly discussed above) or to the theoretical underpinnings shared by both instruments.

The LOOK was designed using the theoretical foundations shared by all viewing-time measures of sexual interest; namely, that viewing-time is indicative of sexual interest when an individual is primed to view images in this context. This foundation itself sits on various other assumptions regarding the nature of sexual interest. It may be important to consider whether there is anything inherent about these theoretical bases that makes visual response time instruments vulnerable to falsification through pretense.

One of these considerations might be highlighted by a secondary analysis carried out during this study in which individuals in the control groups were independently compared to the average expected patterns of their gender. Results showed that 21.9% of the men and 15.6% of women in the control groups produced sexual interest patterns that were significantly different from the average expected patterns of their genders. If it is assumed that the LOOK is reliably and validly measuring accurate sexual interest patterns, these results may suggest a few different conclusions. Is it possible that, despite having a group of people who all identify as exclusively heterosexual, sexual interest patterns still vary broadly if one were to analyze the population closely enough? The sexual interest categories we use may be too broad and the instruments too sensitive to variations within these categories. It stands to reason that the less tightly defined that the expected patterns are, the easier it is for someone to use pretense to respond in a manner that is close enough to the expected pattern.

Another theoretical base that is important to consider and may affect falsification through pretense involves the assumption that sexual response time measures can distinguish sexual

interest from aesthetic preference. Singer (1984) theorized that sexual arousal could be divided into three stages. The first involved an aesthetic determination of appeal. The second involved what he termed the approach, where an individual behaves in a manner that elicits physical closeness and increased attention from and toward a potential mate. The last stage according to Singer is the genital response stage that refers to the autonomic response that the body uses to prepare for intercourse. In addition to describing sexual arousal, this theory also accounted for the fact that an individual is not always sexually attracted to other every other individual they find aesthetically pleasing. To complete the arousal response would necessitate that an individual additionally go beyond a simple aesthetic appraisal and move through stages two and three.

Theoretically, visual response time measures can be understood to rely most heavily on Singer's second stage which suggests that, while an individual may find various images in the assessment to be aesthetically pleasing, they would be expected to pay additional attention to and spend more time on images they additionally find sexually attractive when primed to think of the images in this manner through the rating task. However since moving onto the second stage of sexual arousal theoretically necessitates the determination of aesthetic preference made in stage one, at least some portion of the viewing time measured by the LOOK is spent measuring solely aesthetic preference. Participants in the pretense groups of this study would not need to be sexually interested in an image to spend longer on it, but may have simply spent additional time to consider images they felt might be aesthetically pleasing to the opposite gender. To at least a partial extent, the pretense task in itself would be responsible for individuals showing a pattern of longer viewing times on images they believed the opposite gender would find attractive. This is regardless of whether they were given the information that the instrument is surreptitiously



measuring viewing times. Given that both the LOOK and Affinity 2.5 rely on similar theoretical underpinnings and that very similar instructions were used in the pretense conditions of both falsification studies, results for the pretense condition may have been similarly affected in both studies.

### **Study Limitations**

There are limitations in this study that are worth discussing. First, there is a nontrivial issue surrounding the generalizability of results. This can be largely affected by participant demographics. While it could be argued that this study's participant demographics may have been affected by the conservative nature of the university where it was conducted, data obtained from the Strahan-Gerbasi scale suggested that these individuals were not different from the normative population in regards to susceptibility to altering responses based on social desirability. However, the facts that the great majority of participants were Caucasian and all participants were students of the same large, private, religious university are not negligible. Additionally, given the scope of the study, only data from exclusively heterosexual, non-pedophilic adults were used. While these results may hold some weight when analyzing this particular group, they do not necessarily provide any information extendable to individuals who do not match demographic features. Furthermore, previous research has suggested there may be sampling bias surrounding regarding individuals who volunteer for research involving issues of sexuality (Plaud, Gaither, Hegstead, Rowan, & Devitt, 1999; Strassberg & Lowe, 1995; Suschinsky, Lalumière, & Chivers, 2009; Wolchik, Braver, & Jensen, 1985).

Lastly, at the time of this study, research into the reliability and validity of the LOOK was still being conducted. This study is based on the assumptions that the LOOK is a reliable and valid instrument. This is particularly important given the finding that the female average

pattern obtained through the control group in this study was not significantly different from the neutral pattern. If the LOOK is found to be unreliable or invalid, the results of this study can be argued to simply be caused by the inherent problems caused by theoretical and methodological flaws of the instrument.

### **Future Directions**

Given the limitations mentioned above regarding sample size and demographics, further research into expected group patterns of differing demographic groups should be established. These may not only include research into the expected patterns of different demographic groups (age, ethnicity, socioeconomic status, sexual orientation, known offenders, etc.), but also research to establish the existence and viability of possible validity profiles to be used as an additional information source when interpreting results. These validity profiles may provide useful information regarding how closely obtained results matched established falsification profiles. Given the statistical properties of the Chi-square goodness-of-fit test, stronger expected patterns created from larger samples may improve the LOOK's sensitivity. This is especially important in order to address results in this study, which found that about a fifth of men and a sixth of women who responded to the measure using the standard administration still produced patterns that were significantly different from the expected pattern for their gender. Does this imply that a better expected pattern should be created or that there are some exclusively heterosexual individuals whose sexual interest pattern is essentially different from other individuals who identify as exclusively heterosexual? Research into expected patterns and sexual orientation categories may be important to answer these questions.

It may also be useful to research response patterns produced by individuals asked to rate the images on the LOOK by how aesthetically pleasing they find these. Understanding this may

provide tools to help isolate how much of the measurement of sexual interest is confounded by time spent making determinations of the aesthetic attributes of the images. Establishing a clearer distinction between aesthetic preference and sexual interest may prove useful in discerning falsification attempts made by individuals who are not actually sexually attracted to a group but understand that group's aesthetic preferences.

Further research into Fischer's Chi-square may prove beneficial in establishing its uses and limitations as a statistical procedure to evaluate the significance of differences between obtained and expected patterns. In particular, research into optimizing the fair constant multiplier may provide simple and powerful scoring modifications that may increase the instrument's sensitivity.

The LOOK varied from other visual response time measures in its addition of the dot-finding task along with the rating task and surreptitious time measurement found in similar measures of sexual interest. This was done in an attempt to increase the instrument's validity and improve on its sensitivity to sexual interest patterns. Following this logic, it may prove beneficial to research the effect of adding other features to help improve instrument sensitivity. Given current advances in technology, it may be possible to include the collection of physiological arousal patterns to the data obtained from the LOOK. The iPad and other current handheld devices now possess sensors and cameras that could allow for the measurement of both surreptitious viewing time and physiological responses such as heart rate and pupil dilation. In the same way that the LOOK attempts to integrate the dot-finding task to increase instrument sensitivity, it could further integrate other changes in methodology to include the measurement of physiological responses. These additional data points could help increase the instrument's sensitivity to falsification efforts and warrant research.

Lastly, in order for the LOOK to be used as a screening instrument to identify at risk individuals, it must be studied and shown to be efficient in using expected patterns to discriminate between individual results. This study focused on falsification efforts of groups on average with some investigation into participant's individual falsification efforts. While this study may provide useful information regarding the instrument's sensitivity to falsification efforts in general, it only provides a small sample of data regarding the LOOK's ability to detect individuals' efforts to alter results. This may be the next logical step in research regarding the use of the LOOK as a screening instrument for the at-risk population.

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## APPENDIX A:

### **Literature Review**

Sexual abuse affects children in multiple ways throughout their lives and is linked with various harmful psychological outcomes including depression, post-traumatic stress disorder, anxiety, and revictimization as adults (Dinwiddie et al., 2000; Levitan et al., 2003; Messman-Moore & Long, 2000; Roosa, Reinholtz, & Angelini, 1999; Widom, 1999). Due to the severity of these outcomes, child sexual abuse prevention efforts are of great importance. In this study, I seek to add to the current accuracy of the LOOK, a sexual interest deviance measure used in child sexual abuse prevention, by testing its sensitivity to efforts made to falsify results.

### **Incidence**

The number of new cases of Child Sexual Abuse (CSA) reported each year seems to have decreased by about 19% since the 1990s. Despite this positive decline in child abuse cases, CSA remains a serious problem and constituted 24% of all officially reported child abuse cases between 2005 and 2006, affecting an estimated 135,300 children in the United States during that 12 month period—about 1.8 children of every 1,000 (U.S. Department of Health and Human Services, 2010). Other research estimates this rate to be as high as 82 of every 1,000 children, including non-reported cases (Finkelhor, Ormrod, Turner, & Hamby, 2005). While incidence rates have varied from year to year, CSA is estimated to have historically increased by about one hundred thousand new cases on average every year since the 1990s (U.S. Department of Health and Human Services, 1996; U.S. Department of Health and Human Services, 2010).

### **Prevalence**

The total number of CSA cases at any given time is generally calculated through retrospective accounts obtained from adults. These numbers can vary broadly for various

reasons: how sexual abuse is defined (including both what behaviors are included and what age difference is sufficient), sampling bias, population studied, modality of investigation (anything from self-report surveys to structured interviews done by professional staff), and issues surrounding shame or feeling unsafe in disclosing abuse history. Because of these issues, prevalence studies vary broadly in their results, from 16% to 50% in women and 4% to 14% in men (e.g., Arreola, Neilands, Pollack, Paul, & Catania, 2005; Arroyo, Simpson, & Aragon, 1997; Back et al., 2003; Briere & Elliot, 2003; Kenny & McEachem, 2000; Lodico, Gruber, & DiClemente, 1996; Nelson, Higginson, & Grant-Worley, 1994; Robin, Chester, Rasmussen, Jaranson, & Goldman, 1997; Romero, Wyatt, Loeb, Carmona, & Solis, 1999; Vogeltanz et al., 1999; Wyatt, Loeb, Solis, Carmona, & Romero, 1999). A 1997 integrative review of studies on CSA prevalence in North America by Gorey and Leslie found that after adjusting for response rates and definitions, on average, CSA had not varied significantly over the previous three decades. Gorey and Leslie estimated CSA prevalence rates to be 16.8% for women and 7.9% for males.

### **Risk Factors for Victims**

While girls are at 2.5 to 3 times higher risk than boys, boys still constitute 22% to 29% of CSA victims (Fergusson, Lynskey, & Horwood, 1996; Finkelhor, 1993; Sobsey, Randall, & Parrila, 1997; U.S. Department of Health and Human Services, 1998). Additionally, as children get older they become more at risk (Finkelhor, 1993; U.S. Department of Health and Human Services, 1998). In their 1998 study, the U.S. Department of Health and Human Services broke risk down by age: children 0 to 3 years of age accounted for 10.2% of CSA victims, children 4 to 7 years old accounted for 28.4% of CSA victims, children ages 8 to 11 years old accounted for 25.5% of victims and children 12 and older accounted for about one third (35.9%) of victims.

Physical disabilities, especially blindness, deafness, and mental retardation also contribute to risk (Westcott & Jones, 1999). Another significant risk factor is family constellation, specifically, the absence of one or both parents, presence of a stepfather, and parental impairments such as maternal mental illness, alcoholism, serious relationship problems between parents, substance abuse, and deficient parenting style (Fergusson et al., 1996; Finkelhor, 1993; Finkelhor, Hamby, Turner, & Ormond, 2010; Mullen, Martin, Anderson, Romans, & Herbison., 1993; Nelson et al., 2002).

### **Prevention**

In order to recognize the importance of being able to accurately identify individuals at-risk of perpetrating CSA, it is imperative to understand the role prediction plays in prevention. CSA prevention can occur at multiple levels or tiers of intervention. On the most basic level, tier one interventions are focused on the general population and promote education and legislature to prevent CSA and discourage potential perpetrators. These efforts are backed by recent research indicating that CSA prevention education programs are associated with reduced incidence of CSA (Gibson & Leitenberg, 2000). The second tier of prevention strategies consists of interventions focused on identifying individuals who have not committed CSA but are currently at risk of offending. Tier two efforts also focus on reducing first offenses, but they do so by addressing potential perpetrators instead of potential victims or the community at large. Lastly, we have the third tier of prevention, which is focused on diminishing and preventing known offenders from falling back into CSA behaviors. Recidivism deterrence is probably the most studied area of CSA prevention due to the fact that 30% to 40% of current CSA offenders are likely to recidivate within 20 years of their last offense (Hanson, Morton, & Harris, 2003).

While each tier of intervention has associated risks and benefits, they all combine to reduce the

perpetration of CSA. However, while tiers one and three are currently well-studied, tier two prevention is the least developed area of prevention due to potential social, political, and logistical difficulties.

### **Identifying Perpetrators**

Recidivism is linked to two factors in current meta-analyses, sexual interest deviance, and antisocial attitudes (Hanson & Bussiere, 1998; Hanson & Morton-Bourgon, 2005; Hanson, Steffy, & Gauthier, 1993; Whitaker et al., 2008). While it is impossible to conclusively identify at-risk individuals before they commit acts of abuse, it would stand to reason that risk factors for first-time offenders would somewhat overlap with proven risk predictors for repeat offenders. Even during a first offense, the act of CSA inherently shows a disregard for social norms regarding illegal sexual behaviors and implies enough sexual interest in children to see them at least as masturbatory objects.

The task of detecting individuals at risk for perpetrating CSA then becomes two-fold: the assessment of criminality in individuals and the assessment of deviant sexual interest. This approach is further strengthened when one considers that many perpetrators of CSA also engage in nonsexual criminal activity (Broadhurst & Maller, 1992; Hanson, Scott, & Steffy, 1995).

Regarding antisocial behavior, there are various profiling instruments that have been developed in forensic research to identify the risk an individual has of being involved in criminal or antisocial activities (e.g., Bonta, 1996; Champion, 1994; Gendreau, Little, & Goggin, 1996; Gottfredson & Tonry, 1987). In particular, Gendreau, Little, and Goggin (1996) identify common factors of what is referred to as a *criminal lifestyle*, i.e. youth, unemployment, social ties with other criminals, drug or alcohol abuse and antisocial beliefs regarding crime. These factors can be assessed in various ways. Nevertheless, despite antisocial behavior being one of

the two factors linked to CSA recidivism and the abundance of research done to pinpoint individuals who are likely to commit crime due to their antisocial attitudes and lifestyle, assessing CSA risk from antisocial behavior or criminal attitudes alone is insufficient. First of all, while it is true that many perpetrators of CSA also commit nonsexual crime, it is rare for nonsexual criminals to recidivate with CSA or any other sort of sexual crime (Bonta & Hanson, 1995; Hanson et al., 1995). Additionally, notwithstanding criminality being a common factor in CSA recidivism, there are still many CSA perpetrators do not score high in assessments designed to rate the risk of criminal recidivism (Bonta & Hanson, 1995).

Since the propensity to antisocial or criminal behavior is not sufficient to predict CSA recidivism, much less first-time offenses in at-risk populations, it is necessary to focus on the other common factor for CSA recidivism, namely, deviant sexual interests. However, screening for deviant sexual interest in situations where there is no established history can prove to be a complicated task. These complications are increased because many offenders will deny having persistent deviant sexual interest or behaviors in order to avoid criminal and social repercussions for their actions (Kennedy & Grubin, 1992; Langevin, 1988). If known perpetrators are likely to deny deviant sexual interests despite having been convicted for perpetrating CSA, it seems even less likely that at-risk individuals who have no historical evidence of CSA behaviors would readily claim persistent deviant sexual interests. Since deviant sexual interests in at-risk individuals are difficult to ascertain due to lack historical evidence and reduced chances of self-disclosure, it is critical to develop other ways of identifying deviant sexual interest patterns to promote tier two prevention.



## **Sexual Interest Assessment as a Measurement of Deviance**

There are multiple studies that conclude that assessing sexual deviance is not only an important predictor of CSA behavior but also the strongest predictor of recidivism (Hanson & Bussiere, 1998; Hanson & Morton-Bourgon, 2005; Whitaker et al., 2008). Because of this, reliable and valid measurement of deviant sexual interest becomes crucial to CSA prevention efforts. As previously stated, self-report is not a reliable strategy of assessing CSA offender risk. The legal and social repercussions for both CSA offenders and at-risk individuals are too steep. Admitting to sexually deviant interests or behaviors can lead to incarceration, involuntary commitment, inclusion in a sex offender registry system, employment difficulties, marital problems, and shunning or discrimination by those around the individual. Because of the seriousness of these repercussions it is important that sexual interest patterns be measured accurately and the data be interpreted and protected properly.

**Penile plethysmography.** One of the first efforts at objectively measuring sexual interest patterns was the development of the penile plethysmography. Penile plethysmography is a method where changes in sexual arousal are measured through variations in penile volume or circumference. Indirect measurements of arousal are made by identifying displaced air volume in a cylinder or calculating fluctuations in diameter as measured through a cuff. These measurements are then used in various ways: to establish patterns of sexual attraction, develop recommendations for clinical or disciplinary treatments, and measure the success of these treatments (Barker & Howell, 1992). Penile plethysmography shows deviant sexual interest in offenders with the most deviant sexual histories (Barbaree & Marshall, 1989; Freund & Watson, 1991; Quinsey, 1984, 1986). Conversely, penile plethysmography also carries potential flaws and weaknesses.

First, penile plethysmography uses ipsative measurements to make comparisons between individuals' scores. Ipsative measurement does not allow for comparison between people; it only detects changes within the individual. Each time an individual is assessed through penile plethysmography, measurements have to be calibrated according to that particular individual's basal arousal. Because of this, penile plethysmography cannot be standardized. This point is often misinterpreted. Using ipsative scoring to make normative claims has been criticized by various authors (Clemans, 1966; Closs, 1996; Cornwell & Dunlap, 1994; Fischer & Smith, 1999; Glasgow & Fischer, 2006a; Glasgow & Fischer, 2006b). Not being able to normalize scores causes various issues, particularly with scale and outliers. At best, not having a normalized score makes it extremely difficult, if not impossible, to make the claim of deviance—it raises the question of what the scores are deviating from.

Aside from these issues regarding the interpretation of the data, the measurements themselves can also be easily manipulated. An internet search asking how to cheat the penile plethysmograph will pull up resources that explain ways to alter plethysmography results. The test can be most easily cheated by suppressing erections altogether. This is often referred to as “flat-lining.” This can be achieved by inducing anxiety or masturbating before the test. Flat-lining on the penile plethysmograph can be further affected by any medication use or by the testing environment itself, which is uncomfortable by its very nature. Konopasky and Konopasky (2000) noted that the selection of PPG stimuli and faking on the part of the test-taker diminishes the penile plethysmograph's ability to measure true arousal patterns and, therefore, limits its ability to predict criminal behavior.

There are also ethical and legal concerns regarding the intrusiveness of plethysmography and the graphic nature of the stimuli shown, especially when used on juvenile sex offenders or

when the images used could be categorized as child pornography, possession of which is illegal in many countries.

**Viewing time measures.** Viewing time measurements are based on the idea that viewing time correlates with interest, particularly, that sexual interest can be determined when the viewer is primed to think of the images in a sexual framework. This reasoning was originally theorized by Saul Rosenzweig, in 1942. Rosenzweig was a classmate of B.F. Skinner and was also interested in the stimulus-response aspects of behaviorism. In his experiment, Rosenzweig showed his clients several photographs, some explicitly sexual and some non-sexual in order to see if sexual arousal followed a stimulus-response pattern. He gathered 20 in-patient schizophrenic clients, ten of whom were interested in sexual behavior and ten who were not. Those patients who were interested in sexual behavior looked at the sexually explicit images longer and those who were not had shorter viewing times.

Fourteen years later, in 1956, a similar experiment was designed by Harold Zamansky in order to study homosexuality in males. He gathered 20 homosexual and 20 heterosexual paranoid schizophrenic patients and showed them three sets of photographs: male, female, and neutral images. After measuring viewing times for patients, Zamansky was able to differentiate between the heterosexual and homosexual groups based on their viewing times. Zamansky's results build on Rosenzweig's research by suggesting not just a connection between viewing time and sexual interest, but a strong enough connection to distinguish sexual orientation.

In 1972 a group of scientists built on this idea by showing various photographs to college students and measuring how their viewing times correlated with the explicitness of the images (Ware et al., 1972). The images ranged in both explicitness and type of sexual activity shown.

A significant positive correlation was shown between viewing time and sexual explicitness of the images.

Building on the ideas that viewing time correlates with sexual interest and can possibly determine sexual orientation, Wright and Adams (1994) gathered both heterosexual and homosexual males and females and studied their viewing times to images from Playboy, Playgirl, and sexually neutral photographs. This study, similarly to those above, also found significant differences between groups. This further sustains the idea that sexual interest is connected to viewing time of sexually primed images. Similar results were found by another study that showed slides of nudes to heterosexual males and females (Quinsey et al., 1996). Participants were found to look significantly longer at images that followed their self-reported attraction patterns. Furthermore, participants looked significantly less at those images that they did not find sexually attractive according to their reported sexual attraction preferences.

Harris et al. extended this line of reasoning to CSA offenders in 1996. They measured viewing times for 26 CSA offenders and 25 non-offenders while they showed them nude images of people of varying ages and gender. There were significant differences between viewing times for each group, indicating a deviant interest pattern for the CSA offenders.

Based on research findings correlating sexual interest with viewing time measures, Abel (1996) developed the Abel Assessment for Sexual Interest (AASI). This test is divided into two portions, the first gathers information about client's sexual history including orientation, behaviors, legal history, and impulsivity surrounding sex. The second part of the test is series of photographs of clothed individuals varying in age and gender. Clients are asked to rate each slide according to how sexually arousing they find the images to be while the system discreetly records their viewing times to each stimuli. The main data sources are the discreet viewing time

measurements that are sent back to the AASI's headquarters. There the data are reviewed, scored, and the results are then sent back to the clinician.

Another similar instrument used to measure deviant sexual interest is the *Affinity*. It begins by asking the test-taker to rank simple prototype line drawings of different groups of people (small child, pre-adolescent child, adolescent, and adult—both male and female for each category) and requires the individual to rate the sexual attractiveness of images of clothed individuals of varying age and gender. During this second phase, the *Affinity* discreetly records viewing time for each image. This data is then interpreted in an ipsative manner similarly to the AASI.

There are various benefits to using viewing time measurements of sexual attraction over penile plethysmography. Viewing time measurements do not have to be modified to work with male or female clients, they can obtain data without the use of pornographic images, they are easier to administer and are much less intrusive. Moreover, these qualities not only make viewing time measures easier to use with adult offenders, they also make them more amenable to being used to assess juvenile sex offenders.

On the other hand, viewing time measurements also have weaknesses. First, there is the issue of the statistical adequacy of using ipsative scores to try to establish deviance. Ipsative scores do not give a standardized score that can be compared to others people's scores. These scores only indicate the strength of each individual's sexual interest in one group in relation to that same individual's strength of sexual interests in the other groups. Because ipsative scoring does not render a sexual interest score that can be compared with others, it cannot claim that a person's core is deviant from the population (Fischer & Smith, 1999; Smith & Fischer, 1999). For example, a test-taker's scores regarding their attraction to small children may seem low in

comparison to their attraction to adults from the ipsative point of view, while if their scores were to be standardized and compared to the expected population pattern, their attraction to children may actually be significantly deviant.

The other main issue presented by viewing time measurements is dissimulation of results. As is the case with penile plethysmography, although less readily found, there are internet sites and forums (e.g., InnocentDads.com) that discuss how viewing time measurements work and show people how to prepare for them in order to avoid showing deviant patterns. The potential of falsifying results with access to even cursory amounts of information regarding discreet viewing time measurements is highlighted by a study presented by Fischer et al. (2012) at the annual conference of the Association for the Treatment of Sexual Abusers. In this study researchers collected data from four groups consisting of 60 participants more (at least 30 male and 30 female) who were instructed to use either speed or pretense to falsify their results on the Affinity 2.5. The first group was instructed to respond honestly but go through the rating of images as fast as possible. The second group was also instructed to respond as quickly as possible, however, they were additionally told to ignore the pictures. The third group was instructed to respond as if they were a non-pedophilic heterosexual member of the opposite sex. The last group was given the same instructions and additionally told that they were being timed as they rated images and that heterosexual individuals generally take longer to rate images of the opposite sex. Chi-square goodness-of-fit was used to compare observed to expected response patterns. Results suggested that regardless of speed participants in groups one and two tended to look at images of the opposite gender longer than other images, following the expected pattern for their gender on average. Conversely, participants in groups three and four were able to accurately imitate expected patterns of the opposite gender on average. These results suggest

that while individuals may not be able to use speed to render data meaningless, they may be able to falsify results through pretense. Despite the efforts often made by test manufacturers and administrators to keep assessment details concealed, it is not uncommon for some of these details to become known to the public. Finding that, given only general details regarding the mechanics of the Affinity 2.5, participants were able to imitate expected response patterns of the opposite gender brings into question if test-takers could use pretense to avoid the detection of sexually deviant interests altogether.

Professionals have an ethical responsibility to help in investigating and preventing CSA. Our assessment process should involve various and meticulous procedures including clinical interviews, reviewing personal and criminal history, verifying information, and proper implementation and interpretation of assessments with attention to their limits and potential biases. Furthermore, it is important to evaluate the efficacy of our instruments beyond the initial and crucial steps of measuring reliability and validity. Falsification of results can pose a serious problem, especially considering the ease of access to information that may compromise the integrity of our findings. This study hopes to investigate test-takers ability to falsify or tamper with results in the LOOK. The LOOK is a viewing time sexual deviance assessment instrument currently in development that hopes to improve on current measures and provide normalized data in order to help prevent CSA.

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## APPENDIX B:

**Demographics, Attitudes, and Sexual Interest Questionnaire****Demographics:**

Age: \_\_\_\_\_

Ethnicity: \_\_\_\_\_

Year in School:

- Freshman       Sophomore       Junior       Senior       Graduate Student

Marital Status:

- Single       Married       Divorced       Widowed

**Personal Attitudes:**

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.

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

**Sexual Interest:**

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