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# Digit ratio and sexually dimorphic psychopathology

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# DIGIT RATIO AND SEXUALLY DIMORPHIC PSYCHOPATHOLOGY

A Thesis

by

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# DIMORPHIC PSYCHOPATHOLOGY

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ABSTRACT

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The 2D:4D ratio is a sexually dimorphic trait which is lower in males than in females. A low value of 2D:4D indicates a uterine environment high in testosterone and low in estrogen which is a characteristic of males. Smaller 2D:4D ratios have been associated with disorders that occur more frequently in males, such as autism and ADHD. In contrast, eating disorders and depression (disorders that occur more frequently in females) suggests larger 2D:4D ratios. The purpose of the study is to replicate and extend the findings of previous research concerning the relationship of masculinized and feminized digit ratio to the entities of psychopathology.

# DEDICATION

The completion of my master's degree would have been impossible without the huge support and love of God, my family and friends. Gracias a mis papás por darme siempre su apoyo, por sus consejos, su confianza y por sus enseñanzas de superación. Gracias a mis abuelos, mis tios y mis primas por su apoyo incondicional. You are the best! Thanks to my brothers who always find a way to put a smile on my face. To my friends: (in alphabetical order!) Adriana, Celeste, Celina, Claudia, Lorena, and Violeta who supported me in one way or another, thanks! You are the best friends someone could ask. You motivated me and helped me in infinite ways. Thank you for your love and patience! I love you all! ♥

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# CHAPTER I

## INTRODUCTION

The hand is a truly marvelous organ. The hand is the executor of the will of the mind. It is the instrument of action in man. We use it to explore, perceive and recognize surfaces, objects, and their properties. Our hands are extremely valuable and useful; they are our most valuable tool by grasping, transporting and manipulating objects we get to manage everyday tasks. But hands may also tell you things about people, just by looking at them.

The hand is supported by the arm and forearm bones which have a cantilever type function. The mobility of the shoulder restraint on the chest wall movements of the shoulder, elbow and wrist joints allow the hand to be positioned anywhere within two arcs limited only by the length of the supporting skeleton (Connolly, K., 1998).

The hand should not be considered in isolation because its function will depend on the integrity of more proximal structures. The functional capabilities of the hand are very wide-ranging, from the manipulative intricacies of microscopic surgery to the gross power demands of Olympic weight lifting. Normal hand function depends on three elements: intact sensation, pinch and grasp. Cortical influences are essential to the process, allowing delicate objects to be gripped lightly and heavy firm objects tightly. (Connolly, K. (1998).

## 2D:4D Digit Ratio

The 2D:4D ratio is a sexually dimorphic trait which is lower in men than in women, relative digit length is established as early as the 14th week, and the sex difference appears by two years and perhaps before birth. (Lutchmaya, Baron-Cohen, Raggatt, Knickermeyer, & Manning, 2004). 2D, refers to the "index finger" and the 4D refers to the "ring" finger. Therefore, the 2D:4D ratio is the comparison of the "index" finger to the "ring" finger. Testosterone appears to stimulate the prenatal growth of the 4th digit while estrogen promotes the growth of the 2nd digit. A low value of 2D:4D indicates a uterine environment high in testosterone and low in estrogen which is a characteristic of males. A high 2D:4D suggests low prenatal testosterone and high estrogen which is characteristic of females. Prenatal androgens are implicated in the development of behaviors showing sex differences, such that higher levels are associated with expression of more male-typical behavior across a variety of species (Cohen-Bendahan, Van deBeek, & Berenbaum, 2005). Direct measurements of prenatal androgens levels are typically unavailable to researchers studying the early hormonal influences on adult behavior. That is why an alternative strategy in research is to correlate behaviors of interest with a putative measure of perinatal androgen action, such as the ratio between the length of the 2D (the "index" finger) and the 4D (the "ring" finger) digit which is the 2D:4D ratio.

Smaller 2D:4D ratios have been associated with disorders that occur more frequently in males, such as autism, and attention-deficit/hyperactivity disorder (ADHD) (Manning, Baron-Cohen, Wheeewright, & Sanders, 2001). In addition, females with a more masculine 2D:4D ratio appear to express more male-typical characteristics, such as increased difficulties with social

cognition, prosocial ability, and peer relationships (Williams, Greenhalgh, & Manning, 2003). Recent research on eating disorders and depression suggest larger 2D:4D ratios which may be associated with an increased risk for disorders that occur more frequently in females (Martin, Manning, & Dowrick, 1999).

## Fetal Development

The hand and nails develop between 21 and 24 weeks of gestation (Malas, Dogan, Evcil, & Desdicioglu, 2006). Ultrasound has been used on several researches to detect intrauterine growth retardation in early stages of pregnancy, establish fetal weight or gestational age. The Homeobox genes Hox *a* and *b* control the differentiation of the urinogenital system, and may therefore indirectly influence the prenatal production of testicular androgen and the development of the digits (Lutchmaya, Baron-Cohen, Raggatt, Knickermeyer, & Manning, 2004).

There is indirect evidence that the sex difference in 2D:4D is casually related to relative concentrations of testosterone and estrogen. The ratio of the length of the digits is assumed to be correlated with fetal testosterone which has been reported to be associated with hyperactivity and poor social behavior, impulsivity and sensation seeking, and physical aggression (Rizwan, Manning, Brabin, 2007)

Manning (2001) found that children with autism had extremely long ring fingers compared to their index fingers. Children with Asperger syndrome also had a lower 2D:4D ratio, although this was less pronounced than in children with autism (2001). Baron-Cohen and

Hammer (1997) hypothesized that exposure to very high levels of testosterone in uterus may lead to magnification of normal male traits, such as problems with communication, and empathy. Extreme forms of these traits are often seen in individuals with autism.

Lutchmaya, Baron-Cohen, Raggatt, Knickermeyer, & Manning (2004) conducted a study with pregnant women in their second trimester, when there is an elevated risk of a fetus with a chromosomal abnormality. Fetal testosterone and fetal estradiol were obtained from amniocentesis. The sample consisted of 33 children, 18 male and 15 females. Results showed a significantly higher level of fetal testosterone in male children than in females. Moreover, the relationships between 2D:4D and fetal sex steroids were stronger in the right hand than the left hand. "Traits that differ between the sexes show a tendency for the male form of the trait to be more strongly expressed on the right side of the body." (Lutchmaya, Baron-Cohen, Raggatt, Knickermeyer, & Manning, 2004).

In a study made by Malas, Dogan, Evcil, & Desdicioglu (2006) 161 aborted human fetuses, aged between 10 and 40 weeks of gestation were analyzed. The fetuses were divided into groups according to their gestational stage. The length of their hands and fingers were measured. Between 9 to 40 weeks of gestation found a significant relationship between hand and digit lengths and gestational age throughout this period. On the contrary, this study failed to find any laterality differences in hand and digit parameters between sexes or sided either ($p>0.05$). When the sex differences in the $2^{nd}$ and $4^{th}$ digit lengths were investigated, it was found that in female fetuses the $2^{nd}$ digit was longer than the $4^{th}$ although the difference was not statistically significant.

Nicotine consumed during pregnancy increases testosterone levels. Maternal smoking during pregnancy has been reported to be associated with increased risk in offspring of autism, ADHD, antisocial behavior, and adult criminal outcomes (Rizwan, Manning, Brabin, 2007). The purpose of a study conducted by Rizwan, Manning, Brabin (2007) was to investigate the comparison between the 2D:4D ratio of children whose mother smoked during pregnancy with the 2D:4D of children whose mother did not smoked. The study confirmed that lower 2D:4D ratios occur in males and in their right hands, but found no association with child age. A significant association with maternal smoking during pregnancy and low mean right 2D:4D ratio in male offspring was identified. Associations between 2D:4D and behaviors related to fetal testosterone tend to be stronger for the right hand and this pattern was confirmed in this study.

## Differences between populations

It has been known for more than 100 years that masculine hands are different than feminine hands. Studies by Baker (1888) and George (1930) stated that Caucasian males tend to have their 4th digits longer than their 2nd digits, while Caucasian women tend to have their 2nd digits longer than their 4th.

More recent studies have shown differences in 2D:4D ratios among populations. A study conducted by Manning et al. (2000) gathered female and male 2D:4D data from nine populations: England, Spain, Poland, Hungary, Hungarian Gypsies, Germany, Jamaica, Zulu, Finland, and India. Results revealed high values of 2D:4D in the samples from Poland, Spain and England; intermediate values in ethnic Hungarians, Hungarian Gypsies, Germans, and

Indians; and low values in Zulus, Finns, and Jamaicans. These samples demonstrate that many females in Zulu, Finland and Jamaica have lower ratios compared to males in Poland, England, and Spain.

## Depression and 2D:4D Digit Ratio

Depression, including the full range of minor to major depressive disorders, is a common and disabling condition. Depression is the most common disorder, with approximately 50% of psychopathology in the medically ill, with the remainder made up of various anxiety disorders and mixed subsyndromal symptoms of anxiety and depression (as cited in Steptoe, A. 2007). It is common for people to feel some days sad, blue, or unhappy, but these are short periods we pass. Depression can be so extreme that is almost impossible for them to meet the essential requirements of their daily lives such as keeping a job, maintaining social contact, to eat or even to maintain an acceptable level of hygiene. Depression includes several symptoms like: sadness, loss of interest, poor appetite, sleep difficulty, loss of energy, pessimism or guilt, and suicidal ideation (Hallstrom, C., McClure, N. 2005). If any three of these symptoms are present at a clinically significant level, it means that the subject is possibly depressed.

The onset of anxiety disorders tend to coincide with puberty, a time of increase sex hormone production (Yonkers & Kidner, 2002). "Obsessive-compulsive disorder tends to coincide with puberty" (Pigott, 2003). In addition, anxiety symptoms appear sensitive to fluctuations in circulating hormone levels across reproductive life, including, across the menstrual cycle, pregnancy and the post partum period. Finally, previous findings of associations

between a feminine 2D:4D and anxious behavior in childhood, and between a feminine 2D:4D and neuroticism. Personally featured considered a dimensional pre-cursor to anxiety, suggests that adults with a more feminine digit ratio will also report greater levels of anxiety (Khan, Jacobson, Gardner, Prescott, & Kendler, 2005).

It is thought that women are more exposed to stress than men. Usually when women are sad it is common to refer to them as depressed, but when men are sad, they are referred to just being "sad". It is believed that women have more stressful situations. They deal with the house, the children, their partner, work, social relations and more often school. In contrast to this belief, a study conducted by Sherrill, J. T., Anderson, B., Frank, E., Reynolds, C.F., Ming Tu, X., Patterson, D., Ritenour, B.S., & Kupfer, D.J. (1997) had a patient group, conformed by subjects with unipolar depression and a control group, with no depression. The groups were compared males vs. females. As they hypothesized, females on the patient group showed more stressful events; but there was not a significant difference between males and females on the control group.

The highest rates of depression are seen among women on reproductive age (Stewart, D.E., Gucciardi, E., & Grace, S.L. 2004). A research made by Hammen, C. (2004), women were compared on their total life event stress in the past 12 months and they differed significantly. Results showed a S.D. = 5.19 on currently depressed women, a S.D. = 5.15 on past depressed women, and a S.D. =4.39 on never depressed; this showed that even when not depressed, women have high rates of stressful lives. Another study conducted by Stewart, D.E., Gucciardi, E., & Grace, S.L. (2004) showed that Canadian women have a higher percentage of depression than men, and only 43% of depressed women had consulted a health professional. In contrast to these researches results, a study by Bogner, H., & Gallo, J. (2004) showed that "there was no evidence

that symptoms of depression tend to be differentially reported at greater rates by women compared to men". It was a 13 year longitudinal study where adults answered surveys by the first time at college and they gave their permission to have followed up surveys. Bogner, H., & Gallo, J. (2004) used a model from educational testing to test differential symptoms functioning according to gender in the context of the nine symptom grouping that form the diagnostic criteria for major depression from DSM-IV.

## ADHD and 2D:4D Digit Ratio

Bruin, Verheim, Wiegman, & Ferdinand (2006) were interested in ADHD and anxiety and their relationship with 2D:4D ratio. In their study they hypothesized that males with anxiety disorders showed a high 2D:4D ratios; also that males with ADHD and oppositional defiant disorder (ODD), which occur more frequently in males than in females, would have lower 2D:4D ratios. The study consisted of 154 males, between the ages 6 to 14. All subjects received a diagnosis of Autism/Asperger syndrome, PDD-NOS, ADHD/ODD, or an anxiety disorder. Scans of both hands were obtained, in order to measure the finger lengths. Results indicated that males with autism/Asperger syndrome showed the most "male like" finger pattern, and males with anxiety disorder showed the most "female like" finger pattern. Concerning the right and left hand, males with autism/Asperger syndrome had lower ratio than males from the normal comparison group, which was in agreement with previous findings. For the right hand only, males with ADHD/ODD and males with PDD-NOS, showed the same pattern as males with autism/Asperger syndrome. They had lower ratios than males with anxiety disorders.

## Enuresis and 2D:4D Digit Ratio

Nocturnal enuresis is defined in the DSM-IV (1995) as "an involuntary voiding of urine during sleep, with a severity of at least twice a week, in children aged more than five years in the absence of congenital or acquired defects of the central nervous system". Epidemiological studies show that the prevalence of bedwetting reduces with age and appears to be independent of culture (Verhulst, Van Der Lee, Akkerhuis, Sanders-Woudstra, Timmer, & Donkhorts, 1985).

The prevalence estimated of enuresis is highly variable, with a rage of 3.8% (Chiozza, Bernardinelli, Caione, Del Gardo, Ferrara, & Giorgi (1998) to 24% (Hazza, & Tarawneh (2002). This range can be accounted by the inconsistency of methodology across surveys, particularly in the definition of nocturnal enuresis. Consequently the reported prevalence rates are treated with a degree of caution (Krantz, Jylkas, Ahlberg, & Wedel, 1994). Even recent epidemiological studies show inconsistency. A study by Chang, Chen, Tsai, & Chiu (2001) defines enuresis as: more than two wet nights/week. In contrast Chiozza, Bernardinelli, Caione, Del Gardo, Ferrara, & Giorgi (1998) define enuresis as: more than one wet night over a six month period.

Although, there is a common denominator, enuresis is approximately twice as common in males as in females (Bower, Moore, Shepherd, & Adams, 1996), (Hazza, & Tarawneh, 2002), Liu, Sun, Uchiyama, Li, & Okawa, 2000), (Tai, Chang, Chang, Chen, Chang, &Chou, 2007), (Kajiwara, Inoue, Kato, Usui, Kurihana, & Usui, 2006).

## Statement of Purpose

The primary hypothesis of the investigation was that there would be a positive relationship between masculinized digit ratios in females and prevalence of two disorders usually seen more frequently in males: enuresis and ADHD. The statistical hypotheses are as follows:

1. Female subjects reporting a history of diagnosis and/or treatment of ADHD will reveal smaller digit ratios than subjects reporting no history of ADHD.

2. Female subjects reporting a history of enuresis will reveal smaller digit ratios than subjects reporting no history of enuresis.

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# CHAPTER II

# METHOD

Students were recruited from introductory and advanced undergraduate courses in psychology. The sample on which this thesis is based consisted of 309 females whose mean age was 23.5 (standard deviation of 6.5) and standard error of the mean for this sample was 0.38. In all cases the subjects received extra credit points for participation.

## Questionnaire

The questions that were used to test the hypotheses of this study were embedded in a larger research project addressing multiple issues related to the experience of childhood sexual abuse. The primary independent variable is the 2D:4D Digit Ratio. The primary dependent variables are Depression, ADD or ADHD, and Enuresis. The questions for the dependent variables of this thesis were specifically:

17. Have you ever been diagnosed with Attention Deficit Disorder (ADD or ADHD)?

18. As a child, did you experience problems with bed-wetting?

## Procedure

Subjects were recruited by visiting their classes and reading a generic invitation to participate in a study involving the completion of a questionnaire that would address personal and sensitive issues. They were told that extra credit would be offered by the instructor and the details of the extra credit would be described by him or her. If interested, students were asked to sign on an appointment sheet which revealed the day, time, and room number to which they should report.

Five classrooms were used to administer the questionnaire. No more than eight subjects were schedule per room per time period in order to minimize the number of students in the room at one time. Subjects were asked to spread out so that no other subject could view the answers they provided. This part of the procedure ensured that subjects would perceive a maximum of privacy in completing the questionnaire. The person administering the questionnaire was a research assistant who was not involved in any research derived from the questionnaire.

As subjects appeared for questionnaire completion, they were handed an informed consent handout that they could keep for reference. At no time during the questionnaire was any form collected that had the student's name on it. Informed consent stated UTPA Institutional Review Board for the Protection of Human Subjects (IRB), and contact information was given if the student felt like they felt the need to discuss any portion of the questionnaire. They were asked to complete the questionnaire only if they felt the information in the consent form was acceptable. They were reminded to not provide their names anywhere on the questionnaire. During the completion of the questionnaire subjects were prompted twice to choose either continuation or termination of participation. Each questionnaire had a number on each page with

an index card revealing the same number. Subjects were asked to remove the index card and report to a different (designated) classroom where they would have their hands copied. Completed questionnaires were inserted into a box at the front of the room in which they completed them.

Subjects then reported to a second classroom in which they were asked to place their hands, palm side down on the glass face of an HP Officejet 6210 Printer after which a research assistant activated the copy function of the printer. When the copy was completed, subjects were told to place their name on a sign-up sheet (identifying their instructor) through which extra credit information would be provided.

To obtain the 2D:4D ratio, the fingers were measured using a plastic transparent metric ruler. The index and ring finger of both hands were measured from the first crease at the top of the palm to the fingertip in mm. Each finger was measure twice by different observers who were blinded from the measurement of the first observer. To determine measurement reliability, Pearson product-moment correlation coefficients were calculated on the first and second measurements of each digit. All correlation coefficients were sufficiently correlated to confirm the reliability of the digit measurements. The correlation coefficients and probability levels associated with each are presented here on table 1.

Table 1: Reliability of the Digit Measurements Including: Correlation Coefficients and Probability Levels.

| | Observer A | Observer B | Coefficient | P-Level |
|---|---|---|---|---|
| RD4 | 70.76 mm | 72.34 mm | +0.726 | <0.0000001 |
| RD2 | 66.85 mm | 66.47 mm | +0.859 | <0.0000001 |
| LD2 | 66.50 mm | 66.18 mm | +0.850 | <0.0000001 |
| LD4 | 70.68 mm | 72.31 mm | +0.649 | <0.0000001 |

## Data Analysis

Each hypothesis was tested by the performance of independent-t tests on means of digit ratios for females who are positive compared to females who are negative for the histories of ADHD and enuresis.

# CHAPTER III

# RESULTS

Independent-t tests revealed that neither of the two hypotheses were confirmed. The means and standard errors of digit ratios in women with and without histories of enuresis and ADHD are presented in Table 2. The corresponding t-test for each comparison is also presented in this table. Both comparisons failed to yield statistical significance.

Table 2: Digit Ratio Comparisons between Hispanic and White Females without histories of ADHD and Enuresis.

| | **RD4 A** | **RD2 A** | **RD2RD4** | **LD2 A** | **LD4 A** | **LD2LD4** |
|---|---|---|---|---|---|---|
| **Mean - H** | 70.74434 | 66.84142 | 0.94611 | 66.48867 | 70.66019 | 0.94183 |
| **Mean - W** | 72.66667 | 71.66667 | 0.98784 | 70.88889 | 71.77778 | 0.98877 |
| **t-value** | -1.27940 | -3.38325 | -2.50045 | -3.08995 | -0.79634 | -3.04906 |
| **df** | 316 | 316 | 316 | 316 | 316 | 316 |
| **p** | 0.201693 | 0.000806 | 0.012910 | 0.002180 | 0.426435 | 0.002490 |
| **Valid N - H** | 309 | 309 | 309 | 309 | 309 | 309 |
| **Valid N - W** | 9 | 9 | 9 | 9 | 9 | 9 |
| **Std.Dev. - H** | 4.399971 | 4.203906 | 0.049631 | 4.226236 | 4.144830 | 0.045694 |
| **Std.Dev. - W** | 5.873670 | 4.716991 | 0.037402 | 3.586239 | 4.352522 | 0.038661 |
| **F-ratio - Variances** | 1.782048 | 1.258995 | 1.760835 | 1.388766 | 1.102728 | 1.396930 |
| **p - Variances** | 0.159859 | 0.529098 | 0.391961 | 0.652404 | 0.722013 | 0.644949 |

In the absence of statistically significant differences, racial comparisons were made because it was observed that the digit ratios of the entire sample seemed quite "masculine" when compared to other studies in which Anglo (white) subjects dominated the samples. A comparison was therefore made between the 309 Hispanic females with the 9 White females and dramatic differences were seen in 2D lengths and digit ratios of both hands. Specifically, White females revealed 2D:4D ratios significantly closer to 1.0 (0.988) consistent with ratios seen in the White-dominated literature for females while Hispanic females revealed highly masculinized 2D:4D ratios as a whole (0.946). This difference was highly significant ($p = 0.01$) despite a very small representation of Whites in this sample. ($n = 9$). Interestingly, the ratio differences appeared to be related to significantly greater 2D lengths in White females compared to Hispanic females while 4D lengths did not reveal significant differences between the two groups. The means, standard errors of the means, and t-test comparisons for finger lengths and digit ratios are presented in Table 3.

Table 3: Digit Ratio Comparisons between Hispanic and White Females with histories of ADHD and Enuresis.

| ADHD | | Enuresis | |
|---|---|---|---|
| | **RD2RD4** | | **RD2RD4** |
| **Mean - NO** | 0.944773 | **Mean - NO** | 0.943704 |
| **Mean - YES** | 0.935479 | **Mean - YES** | 0.948040 |
| **t-value** | 0.450950 | **t-value** | -0.585992 |
| **df** | 277 | **df** | 275 |
| **p** | 0.652379 | **p** | 0.558362 |
| **Valid N - NO** | 273 | **Valid N - NO** | 219 |
| **Valid N - YES** | 6 | **Valid N - YES** | 58 |
| **Std.Dev. - NO** | 0.050127 | **Std.Dev. - NO** | 0.051256 |
| **Std.Dev. - YES** | 0.038248 | **Std.Dev. - YES** | 0.045410 |
| **F-ratio - Variances** | 1.717575 | **F-ratio - Variances** | 1.274039 |
| **p - Variances** | 0.572755 | **p - Variances** | 0.280070 |

## Discussion

The two primary hypotheses were not confirmed, i.e., there was no support for differences in female 2D:4D ratios based on reported histories of two disorders seen significantly more frequently in males, enuresis and ADHD. Unexpectedly, however, it was found that the entire sample of Hispanic females revealed relatively masculinized digit ratios and this could account for the fact that no differences were seen in subjects reporting histories of the male-dominated disorders. In other words, the total sample was so skewed toward masculinazation it would have been difficult to imagine that digit ratios in women reporting histories male-dominated disorders could have separated themselves in a statistically-significant way from a distribution that was already dramatically skewed in that direction already. On the other hand, it is interesting that reports of the male-dominated disorders weren't more frequent in the presence of a finding revealing that the total sample was so skewed in a masculinized direction.

Despite not confirming the original hypotheses of this study, the present findings are provocative and worthy of extension. Because of the overwhelmingly Hispanic representation of subjects in the present sample, the comparisons to the Whites in the study were limited by only 9 White subjects participating. It is recommended that this study be replicated with a larger white sample for comparison. Indeed the study would have to be performed at a different university where White comparison subjects would be more readily available than they are in the RioGrande Valley of south Texas.

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# APPENDIX A

# APPENDIX A

# INFORMED CONSENT FORM WITH IRB APPROVAL

Approved by
UTPA IRB
IRB#2009-103-11
(Expires: N/A)

## The University of Texas - Pan American

### Informed Consent Form

Study title: Attitudes about Personal Questions in a College Population

This research survey is being conducted by Dr. Fred Ernst who is a professor in the UTPA Psychology and Anthropology department. I am conducting a research study primarily about attitudes of people toward being asked personal questions for the purpose of research. If you agree to participate, the questionnaires should take 45-minutes or less to complete. After completing the questionnaires, you will be asked to deposit them in a box and proceed to a room where one photocopy will be made of each of your hands with using an HP printer/copier. These hand copies will be coded to match your questionnaires *without revealing your identity*. After finger length measurements have been made from the photocopies, they photocopies will be shredded and disposed of using UTPA institutional procedures for disposing of shredded materials.

I emphasize that you should not put your name anywhere on the questionnaire. If you agree with the terms of this consent form, you are agreeing to complete the questionnaire but you should be aware that you can change your mind at any time and elect not to participate. If you elect not to participate or if you prefer to terminate your participation after you have started, you can destroy the questionnaire yourself or you can turn it in incomplete.

If you complete the questionnaire or parts of it, return it to the receptacle (box) at the front or side of the room. Be sure to print your name clearly on the sign-in sheet when you are done so that your professor can record your extra credit points. HOWEVER, DO NOT PUT YOUR NAME ANYWHERE ON THE QUESTIONNAIRE ITSELF.

If you would prefer not to participate, simply return the blank survey. You must be at least 18 years old to participate. *If you are not 18 or older, please inform the researcher and do not complete the survey.*

Researcher contact information:

Name: Dr. Fred Ernst
Title: Professor
Dept: Psychology and Anthropology
The University of Texas-Pan American
Phone: 381-3323
Cell: 615-243-7783
Email: fernst@utpa.edu

If, at any time, you feel any need to speak with Dr. Ernst about anything related to having participated in this study, please feel free to call him on his cell phone at any time. The number is listed above.

This research has been reviewed by the Institutional Review Board for the Protection of Human Subjects (IRB). If you have any questions about your rights as a participant, or if you feel that your rights have been violated, please contact the IRB at 956-384-5004.

*Please keep this sheet for your reference.*

1 of 1

APPENDIX B

APPENDIX B

QUESTIONAIRRE

**THANK YOU VERY MUCH FOR ASSISTING OUR RESEARCH PROGRAM BY AGREEING TO COMPLETE THIS BRIEF QUESTIONNAIRE**

PLEASE REMEMBER THAT YOUR PARTICIPATION IS VOLUNTARY AND THAT YOU SHOULD FEEL FREE TO WITHDRAW FROM ANSWERING AT ANY TIME WITHOUT PENALTY. **DO NOT PUT YOUR NAME ANYWHERE ON THIS QUESTIONNAIRE!**

THIS DEMOGRAPHICS PAGE AND A COVER SHEET ARE PROVIDED TO KEEP YOUR ANSWERS PRIVATE. NO ONE ELSE WILL HAVE ACCESS TO THIS QUESTIONNAIRE EXCEPT THE PERSONS DOING THIS RESEARCH. THE INFORMATION YOU PROVIDE WILL BE PUT ONTO A COMPUTER DATABASE BY DR. ERNST OR A RESEARCH ASSISTANT AND THE QUESTIONNAIRES WILL BE IMMEDIATELY DESTROYED BY SHREDDING.

Please provide this information and answer the questions which follow ONLY IF YOU ARE COMFORTABLE DOING SO AND ONLY IF YOU WANT TO.

Please circle your preferred answer when given more than one option to choose from.

AGE_____ SEX _____ CLASS STANDING: *Freshman* *Sophomore* *Junior* *Senior*

RACE/ETHNICITY (Circle One): *Mexican-American* *European-American* *Asian-American*

*African-American* *Other Hispanic/Latino*_____ Other_____

State and Country of Birth _____ I am *right* *left* handed.

Are you Bi-Lingual? Yes No What is your "first language"? _____

What is your "second language"? _____

Age of your *mother* when you were born_____ Age of your *father* when you were born_____

Please circle the highest level of education attained by your mother.

*Some grade school* *Completed grade school* *Some high school* *Completed high school*

*High school + additional training* *Some college* *Completed college*

*Some graduate school* *Graduate degree* *Doctorate*

Please circle the highest level of education attained by your father.

*Some grade school* *Completed grade school* *Some high school* *Completed high school*
High *school + additional training* *Some college* *Completed college*

*Some graduate school* *Graduate degree* *Doctorate*

MARITAL STATUS_____ NUMBER OF CHILDREN_____

NUMBER OF OLDER SISTERS _____ NUMBER OF YOUNGER SISTERS _____

NUMBER OF OLDER BROTHERS _____ NUMBER OF YOUNGER BROTHERS _____

RELIGIOUS PREFERENCE_____

If you were a participant in a research project, how would you feel about being asked personal questions for research?

*Very Uncomfortable* *Uncomfortable* *Comfortable* *Very Comfortable*

How would you feel about answering questions about aspects of your sexual behavior?

*Very Uncomfortable* *Uncomfortable* *Comfortable* *Very Comfortable*

How would you feel about being asked if you have experienced sexual abuse as a child?
*Very Uncomfortable* *Uncomfortable* *Comfortable* *Very Comfortable*

How would you feel about answering questions concerning details of childhood sexual abuse without naming the person who did the abuse?
*Very Uncomfortable* *Uncomfortable* *Comfortable* *Very Comfortable*

Have you ever tried alcohol? *Yes* *No* If so, at what age did you begin using? _____

*In the past month*, how often have you had 5 alcoholic beverages (4 if you are female) in one night? _____

*In the past year*, how often have you had 5 alcoholic beverages (4 if you are female) in one night? _____

Other than alcohol, have you ever used other substances for recreational purposes? *Yes* *No*
If "Yes," at what age did you begin using? _____

********** PLEASE ANSWER THE FOLLOWING QUESTIONS ONLY **********
**IF YOU ARE COMFORTABLE DOING SO AND ONLY IF YOU ARE SURE YOU WANT TO.**

**(Select one of these options): I elect to continue _____ I prefer to not continue_____**

1. I believe that I was sexually abused before age 6. *Yes* *No*
2. I believe that I was sexually abused between ages 6 and 12. *Yes* *No*
3. I believe that I was sexually abused between ages 12 and 18. *Yes* *No*

4a. Were criminal authorities notified? *Yes* *No* 4b. Was legal action taken? *Yes* *No*

5. If "Yes" to any of # 1 through # 3, was the person a…? (Check as many as apply):

☐ *Stranger* ☐ *Friend or acquaintance* ☐ *Relative* ☐ *Parent or caregiver* ☐ *Step-parent*

6. If "Yes" to any of #1 through #3, how often did this occur?

☐ *Once* ☐ *Twice* ☐ *3 times* ☐ *4 times* ☐ *5 times* ☐ *More than 5 times*

7. If "Yes " to any of # 1 through # 3, please circle any of the following people you have **talked** to about these experiences.

*Family Doctor* *Psychologist* *Husband* *Parent* *Uncle/Aunt*

*Psychiatrist* *Social Worker* *Counselor* *Sibling* *Friend* *Teacher*

Other_____ (Please specify)

8. Which of these people did you talk to FIRST? _____

9. If "Yes" to any of #1 through #3, please estimate the **percentage** (0% to 100%) of "adjustment to" or "recovery from" the effects of the experience(s) you feel **at this time in your life**. _____%

10. I believe that I was *physically* abused as a child. *Yes* *or* *No*

If "Yes," how often? ☐ *Once* ☐ *Twice* ☐ *3 times* ☐ *4 times* ☐ *5 times* ☐ *More than 5 times*

11. How many caregivers did you have between the time you were born and age 17? _____

12. Did you ever see your caregivers hitting, throwing objects at each other, or using weapons against each other? *Yes* *No*

13. Did your mother ever experience mental or emotional problems? *Yes* *No*

drinking problems? *Yes* *No*

or was arrested for a crime? *Yes* *No*

14. Were you often left alone at home when an adult or responsible babysitter should have been there? *Yes* *No*

15. I was physically assaulted **after** the age of 17. *Yes* *No*

If "Yes," how often? ☐ *Once* ☐ *Twice* ☐ *3 times* ☐ *4 times* ☐ *5 times* ☐ *More than 5 times*

16. I was sexually assaulted **after** the age of 17. *Yes* *No*

If "Yes," how often? ☐ *Once* ☐ *Twice* ☐ *3 times* ☐ *4 times* ☐ *5 times* ☐ *More than 5 times*

**REMINDER: PLEASE ANSWER THE FOLLOWING QUESTIONS ONLY IF YOU ARE COMFORTABLE DOING SO AND ONLY IF YOU ARE SURE YOU WANT TO.**

**(Select one of these options): I elect to continue _____ I prefer to not continue_____**

**Please circle, check, or fill in the correct answer as it applies to you…**

17. Have you ever been diagnosed with Attention Deficit Disorder (ADD or ADHD)? *Yes* *No*

**If yes**, at what age? _____ **If yes**, are you currently taking medication for this? *Yes* *No*

18. As a child, did you experience problems with bed-wetting? *Yes* *No*

19. Are you currently taking prescriptive medication for depression? *Yes* *No*

If yes, which medication(s) are you taking?

_____

If yes, do you experience any adverse side effects from the medication? *Yes* *No*

If yes, what side effects do you experience?

_____

20. Have you had headaches for the past six months or more? *Yes* *No*

**If yes**, has a doctor diagnosed them as: *tension (muscle contraction) headaches?*

*or* *migraine (vascular) headaches)?*

*or* *both?*

*or* *other*

_____

21. If Yes, how long ago did your headaches begin? _____Weeks ago _____Months ago _____Years ago

22. If **y**ou have had headaches for the past six months or more, how do they affect your ability to function?

☐ *I have too few to cause me concern*

☐ *I have them frequently, but I can ignore them*

☐ *My headaches frequently interfere with my ability to function*

☐ *My headaches interfere with my ability to function on a daily basis*

23. If you have headaches, are most of your headaches? _____Mild _____Moderate _____Severe

24. Which statement best describes the frequency of your headaches? _____one each day _____more than one daily

_____one each week _____more than one weekly ____one per month _____ more than 4-5 per month

25. How many *days per year* do you miss school or work because of a headache? _____

26. I am taking medication for headaches… *rarely* *occasionally* *frequently* *daily*

The medication(s) I take for headache is/are_____

27. Are you currently in an intimate relationship? *Yes* *No*

28. If yes, how long have you been in your current relationship? _____

29. What is the longest period of time you have been in a continuous intimate relationship? _____

30. How easy or difficult do you find talking about sex to your partner or boyfriend/girlfriend?

***No** difficulty at all* *Difficult on **some** topics but not others* *Difficult on **most** topics* *Difficult on **all** topics*

31. How many consensual sexual partners have you had in your lifetime? _____

32. During your current or previous romantic relationships, how often have you "cheated" on your partner by having sex with another person?

*Never* *Once* *Occasionally* *Often*

33. Approximately **how many** X-rated videos or films have you viewed in the past year? _____

What percentage (%) were viewed…

[*alone*_____%] [*with a female*_____%] [with a *male*_____%] [with a *group*_____%]?

34.On average, how many **hours per week** do you spend visiting internet porn sites or viewing pornographic media on your computer? _____

What percentage (%) were viewed…

[*alone*_____%] [*with a female*_____%] [with a *male*_____%] [with a *group*_____%]?

35. Does it ever sexually arouse you to think about being raped ? *Yes* *No*

36. Does it ever sexually arouse you to think about raping someone ? *Yes* *No*

37. How would you describe your sexual orientation/preference?

*Exclusively Heterosexual* *Occasionally Bi-Sexual* *Regularly Bi-Sexual* *Exclusively Gay or Lesbian*

38. I consider myself exclusively homosexual (gay or lesbian) but occasionally I have sex with the opposite sex.

*Yes* *No* *Not Applicable, I do not consider myself exclusively homosexual*

39. I am exclusively heterosexual but I *have thought about* being with someone of the same sex.

*Never* *Occasionally* *Often* *Always*

40. If you indicated you were sexually abused as a child, how much do you believe your sexual orientation is related to the experience of having been sexually abused?

*0%  5%  10%  25%  50%  75%  100%*

41. How many times, on average, do you masturbate per month? _____

42. Which of these terms describes your **typical** ability to achieve orgasm by masturbation?

_____ I have never been able to achieve orgasm this way  _____ It is difficult for me to achieve orgasm

_____ It is easy for me to achieve orgasm  _____ Not Applicable, I do not masturbate

43. Which of these terms describes your **typical** ability to achieve orgasm with a partner?

_____ I have never been able to achieve orgasm this way  _____ It is difficult for me to achieve orgasm

_____ It is easy for me to achieve orgasm  _____ Not Applicable, I have not had sex with anyone

44. How would you rate the amount of your usual sexual desire?

*Very Low  Low  Average  High  Very High  Out of Control*

45. How much, if any, do you worry about your level of sexual desire?

*None  A Little  Average  A Lot*

46. How would you rate the amount of your usual sexual activity?

*Very Low  Low  Average  High  Very High  Out of Control*

47. How much, if any, do you worry about your level of sexual activity?

*None  A Little  Average  A Lot*

**Please continue to the next (last) page.**

*Please note that NONE of the activities described in the following questions are illegal or considered "abnormal" if performed alone or with another consenting adult…*

**Please indicate the frequency with which you have performed the following sexual activities:**

| | | | | |
|---|---|---|---|---|
| "Threesome": | *Never* | *Once* | *Occasionally* | *Often* |
| "Foursome": | *Never* | *Once* | *Occasionally* | *Often* |
| Group Sex (more than 4): | *Never* | *Once* | *Occasionally* | *Often* |
| Swinging: (trading sexual partners with one couple) | *Never* | *Once* | *Occasionally* | *Often* |
| Fetish: | *Never* | *Once* | *Occasionally* | *Often* |
| Bondage ("Receiver") | *Never* | *Once* | *Occasionally* | *Often* |
| Bondage ("Giver") | *Never* | *Once* | *Occasionally* | *Often* |
| (Non-Bondage) S & M: | | | | |
| S: | *Never* | *Once* | *Occasionally* | *Often* |
| M: | *Never* | *Once* | *Occasionally* | *Often* |
| Auto-Erotic Asphyxiation: (Strangling to enhance orgasm) | *Never* | *Once* | *Occasionally* | *Often* |
| Bestiality: (Sexual Contact with an animal) | *Never* | *Once* | *Occasionally* | *Often* |
| Sex involving urine: | *Never* | *Once* | *Occasionally* | *Often* |
| Sex involving feces: | *Never* | *Once* | *Occasionally* | *Often* |
| Cross-Dressing: | *Never* | *Once* | *Occasionally* | *Often* |
| Have you ever considered a sex-change? | *Yes* | *No* | | |

***A resource sheet about sexual abuse & assault and physical abuse & assault is available. If you would like one, please let the Proctor know.***

# BIOGRAPHICAL SKETCH

Miriam Sarahi Izaguirre education began in Reynosa, Mexico. Finishing high school, she started her bachelor degree in University of Texas Pan American. In May 2008 she earned a bachelor of arts in Psychology and a minor in Sociology and Spanish. In August 2010 she earned a Master of Arts in Experimental Psychology with an emphasis in Applied Behavior Analysis. Miriam may be contacted at: sarah1785@hotmail.com