

# DISCUSSIONS

Case Western Reserve University Undergraduate Research Journal

VOLUME 6, ISSUE II  
SPRING 2010

## FEATURING

The Association of  
**SELF-ESTEEM, DEPRESSION,  
STRESS, PERSONALITY,  
& ACADEMIC ACHIEVEMENT**

on Division-III Student-Athletes

*Andrea Wojtowicz*

Identification of a

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TRANSCRIPTION FACTOR**

in *Schistosoma mansoni*

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**THE ETIOLOGY OF NEURASTHENIA  
IN CHINESE-AMERICANS,**

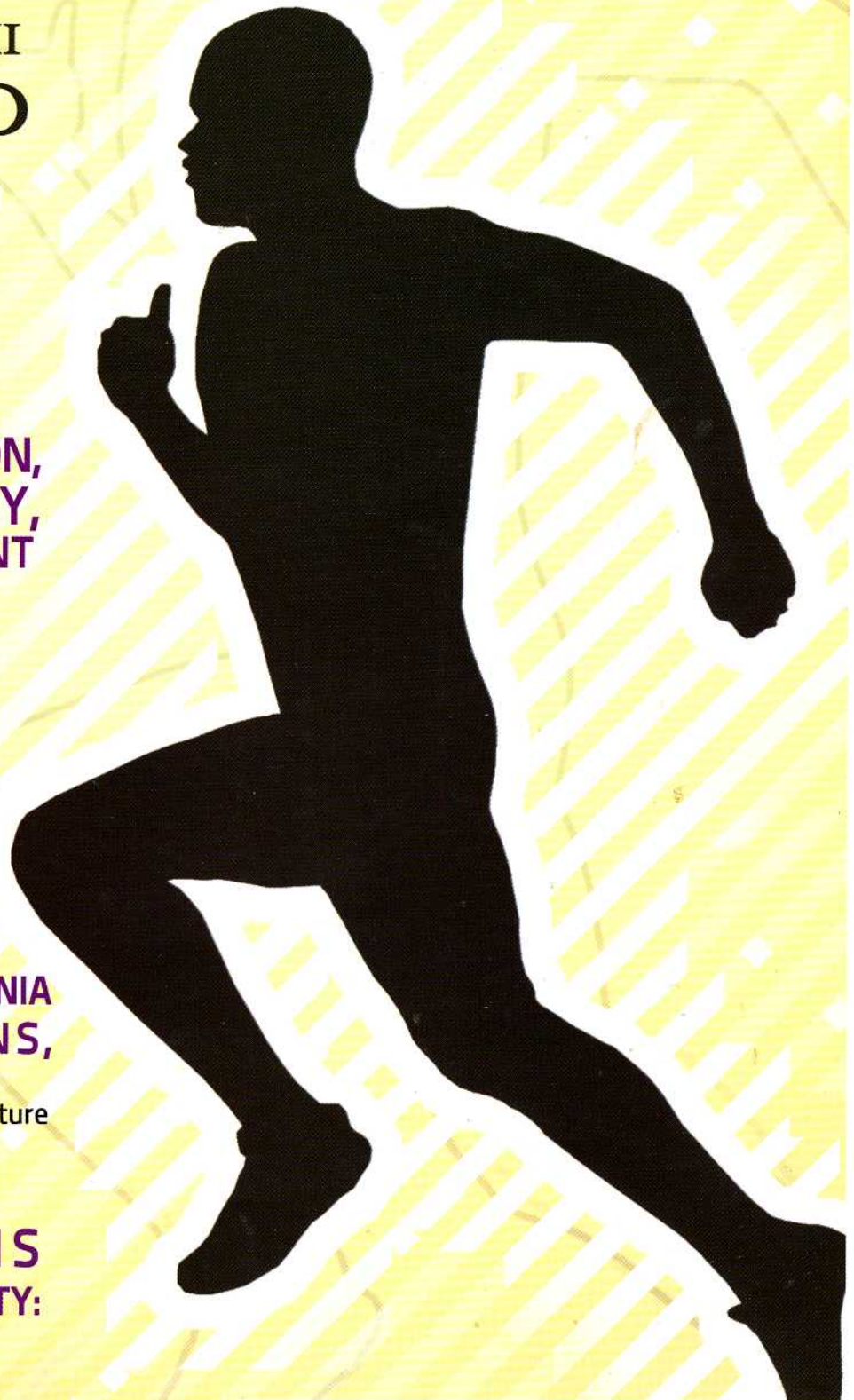
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**SYMBOLIC ORIGINS  
OF SOCIOECONOMIC DISPARITY:**

Women and Modern Iran

*Bob Amico*



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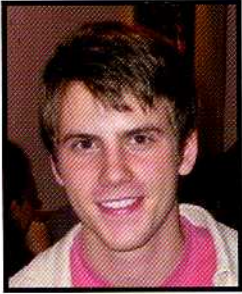
# DISCUSSIONS

Case Western Reserve University Undergraduate Research Journal

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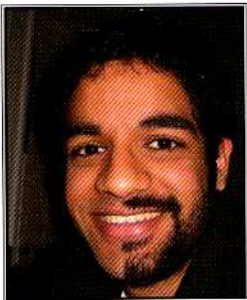
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# LETTER FROM THE EDITORS

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Dear Reader,

This semester we organized the creation of a Faculty Review Board spanning roughly twenty departments. The purpose of this panel is to generate another level of feedback on submitted articles and to provide a level of fact-checking which has not always been possible with our shifting reviewer population. Our ever-changing student reviewer base has historically been concentrated among the physical and life sciences; we are slowly recruiting members in additional fields, and in the mean time this Faculty Review Board will be exceptionally helpful. We should add that full author anonymity is maintained during this process of faculty review, and the journal ultimately remains peer reviewed and student run. We would like to send a special thanks to Professor Peter Haas for his feedback this semester, and we hope to continue expanding this board and strengthening our departmental ties in the semesters ahead.

This spring we have also been able to budget \$300 dollars towards the creation of an Editor's Choice Award. The format of this honorarium is still being revised for future semesters, but for now it will be evenly distributed among the published authors. Congratulations, authors, and thank you for publishing your work with us!

We are also pleased to see a large concentration of submissions in the areas of sociology, philosophy, psychology, women's studies and others. We hope the newly formed departmental ties in the Faculty Review Board will help us to better reach out into fields that have not previously been represented in this journal.

Finally, as the year ends we are once again looking to recruit new reviewers, copy editors, designers, and executive members. Are you interested in getting involved with *Discussions*? Please see the back pages of this journal for more information on how to join the staff.

Sincerely,

Sean Yeldell and Pyone Thi  
Editor-In-Chief and Managing Editor



### Andrea Wojtowicz

Andrea Wojtowicz is a senior Psychology major, childhood studies minor at Case Western Reserve University. She is a four year varsity letter winner in volleyball here at CWRU. She also serves as the president of the Case Association of Student Athletes. She plans to attend graduate school and pursue a degree in clinical psychology.

#### -Acknowledgments-

I would sincerely like to thank Dr. Amy Przeworski for all of her guidance and advisement on my research endeavors. I would also like to thank Professor Lisa Ramirez for helping me get my idea off the ground.

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## THE ASSOCIATION OF SELF-ESTEEM, DEPRESSION, STRESS, PERSONALITY, AND ACADEMIC ACHIEVEMENT ON DIVISION-III STUDENT ATHLETES

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### ABSTRACT

This study investigated the association of being a varsity athlete at Case Western Reserve University and academic performance. The sample included 74 undergraduate students. The study group consisted of 37 varsity athletes from the women's soccer, women's volleyball, and football teams. The control group was 37 psychology 101 students that used their participation in the study as required research credit. Each participant completed an online survey including demographics, self-assessment of academic abilities, an activities list including the number of hours spent in university sponsored activity per week, Rosenberg's self-esteem scale, Gadzella's student-life stress inventory, the Big Five Personality inventory, and the Beck Depression inventory. In the analyses of the Gadzella's, the Big Five Personality inventory, and GPA no significance was found between the athletes and non-athletes. Significant results were only found on Rosenberg's self-esteem scale, while the Beck Depression Inventory showed a trend toward significance.

### INTRODUCTION

The stress of curricular and extra-curricular work for college students across the country has become a topic of interest for researchers. Many college students experience unique events throughout their undergraduate careers, such as academic pressures, financial burdens, and the task of juggling important activities that may cause excessive stress. When the stress becomes excessive, it can affect the health and academic performance of the student (Campbell & Svenson, 1992). According to Misra and McKean (2000), effective time management lowered academic stress. The sample also showed higher reactions to stress in freshmen and sophomores than juniors and seniors. Juniors and seniors developed appropriate coping skills and time management skills that allow them to better control their stress (Misra & McKean, 2000).

Athletic departments across the nation are home to a diverse background of student-athletes that come from different geographical areas, socio-economic backgrounds, and ethnicities. Division III athletics consist of approximately 136,000 student-athletes at over 430 institutions (College Student Athlete, 2007). Unlike Division I and Division II, Division III athletes do not receive

financial aid on basis of athletic merit. They are working towards a valuable degree that will further their success in their careers. Being a student-athlete is a unique experience in one's college career. Many student-athletes value this experience. An athlete's daily activities requires time management, people skills, and the ability to cope with adversity which is parallel to any life structure that is stressful, challenging and important to one's identity (Denny & Steiner, 2009). Denny and Steiner (2009) conducted a study at Stanford University and University of Texas-Austin that evaluated happiness in elite collegiate athletes at the respective universities. The researchers found that self-esteem remains the significant indicator of happiness. If an athlete feels good about themselves overall, they will tend to feel good about the separate domains in their life (Denny & Steiner, 2009).

In a study conducted at eighteen Division IA universities, 90 % of the participants reported consistently positive responses to five different items in which they were asked to rate their college experience (Potuto & O'Hanlon, 2007). Over 95 % of the participants also believed that the skills and/or values learned through participation in intercollegiate athletics will help in getting the desired job or career (Potuto & O'Hanlon, 2007). Many of these athletes also answered that they strongly agree that they would have attended college even if they had not been athletes. It was very clear that the sample of the Division IA student-athletes were satisfied with their college experience and that they understood and accepted the trade-offs they made to participate in intercollegiate athletics. It was also pointed out that student-athletes that were obtaining full scholarship to play a sport tended to be less positive in their responses than those with no or partial scholarships (Potuto & O'Hanlon, 2007). This indicates that Division III athletes should overall be more satisfied with their experience because there is no financial incentive; perhaps they are purely playing because they love the game.

The time demand of a student-athlete across any division may affect one's academic realm. These time demands of athletic programs force athletes to sacrifice attention from academics (Aries, McCarthy, Salovey, & Banaji, 2004). This study concluded that the only type of extra-curricular group to which students committed on average more than ten hours per week were athletic teams and they considered themselves high-committed athletes (Aries et

al., 2004). In regard to academic achievement, the participants that considered themselves high-committed had lower verbal Scholastic Aptitude Test (SAT) scores and to a lesser degree lower math SAT scores than non-athletes at the time of entrance (Aries et al., 2004). These student-athletes showed no underperformance in terms of grades in comparison to those non-athletes with similar entrance scores. Other research has found no differences between the academic achievement of intercollegiate athletes and non-athletes when precollege differences were considered (Aries et al., 2004).

Killeya (2001) reported the same results stating that the SAT scores were unrelated to the first semester grade point average (GPA) for both male and female student-athletes but non-cognitive variables were better predictors for first semester grades (Killeya, 2001). These predictors included positive self-concept and trait anxiety related to adjustment and success of student-athletes. Particularly in minorities, participation in intercollegiate athletics is more likely to foster a sense of community. If a student-athlete is finding positive support and community within athletics and negative evaluation in academics, it is likely that the athlete will deemphasize the student role in favor of the athletic role (Killeya, 2001). The athlete role is clearly an important self-concept element for most, if not all, collegiate athletes.

It is possible that the attentional and physiological changes, including anxiety and self-concept, described may interfere with academics as well as sport performances. Such attentional and physiological changes can include muscle tension, increased distractibility, inability to attend to task-relevant cues, and fatigue (Petrie & Russell, 1995). Academic courses generally include in-class, timed examinations, situations that may be acutely stressful, and in the mind of athletes, parallel to competitive sport situations (Petrie & Russell, 1995). Athletes and non-athletes alike find these situations stressful and individuals with high levels of life stress may find these situations overwhelming or threatening. In the study conducted on Division IA football players, researchers found that academic variables were generally unrelated to semester GPA but it was the psychosocial variables that better predicted GPA for athletes who were not academically successful (Petrie & Russell, 1995). Higher levels of life stress and competitive trait anxiety were associated with lower GPAs.

There are few conclusions that surround Division III athletes. These athletes exemplify the meaning of the student-athlete. They put forth countless hours on and off the court to further enrich their collegiate experience. The current study seeks to examine whether Division III student athletes at Case Western Reserve University transfer stress from their respective sport into the classroom. Are differences in academic performance seen between student-athletes and non-athletes? In the case of Case Western Reserve University, many of the student-athletes are naturally more involved causing an increased level of stress that may increase the stress in the classroom. These students may also be capable of coping with stress better than the average student. Many athletes use sports as a release so they should show a decreased level of depression compared to the non-athletes. It is hypothesized that the student-athletes will show a negative difference in academic performance that can be traced due to the stress of their athletic demands and the limit of time they have to devote to their studies.

## METHODS

### *Participants*

Participants in this study included undergraduate students from Case Western Reserve University. The survey was administered to 74 students. The study group included 37 varsity athletes from women's volleyball, women's soccer, and football. The distribution of gender was 11 males and 26 females. The control group contained 37 psychology 101 students which included 26 females and 11 males. The varsity athletes were recruited through an email that described the study which included a link to the survey. The non-athletes were recruited through a study posting on the psychology 101 website to fulfill the research requirement.

### *Measures*

The data was collected through multiple measures in an online survey. The survey was published online using the software Snap, which securely allows one to publish a survey online. The survey began with self-reported facts which included gender, age, race/ethnicity, year of expected graduation, major(s), minor(s), number of credit hour carried that semester, and GPA of midterm performance. They were also asked to list the activities that they were involved in with an approximate number of hours per week

that they put into the activity. The next part included a self-assessment of academic abilities. Students rated their skill levels in writing, analytic ability, foreign languages, science, mathematics, and computers on a 5 point scale (1 = weak, 3 = average, and 5 = outstanding).

Students also rated their self-esteem on Rosenberg's 10-item scale. The items were rated on a 5 point Likert scale (1 = completely disagree, 5 = completely agree) (Rosenberg, 1965). The participants are asked to reflect on their current feelings when answering the ten items.

B.M. Gadzella's student-life stress inventory, which was created in 1991, was used to assess the student's perceived academic stress and reaction to stress (Gadzella, 1998).

The inventory included 51 items arranged on a Likert response format (1 = never true to 5 = always true) that assessed the student's five categories of academic stressors which include frustration, conflict, pressures, change and self-imposed as well as four categories describing reactions to stressors. Previous studies (Gadzella, 1994; Gadzella & Guthrie, 1993; Gadzella & Baloglu, 2001) showed the student life stress inventory was a fairly reliable inventory measuring stressors and reactions to stressors.

The Beck Depression Inventory was also used as a measure in the study. The Beck Depression Inventory, also known as the BDI was developed in 1961 to measure the behavior manifestations of depression (Beck, Ward, Mendelson, Mock, and Erbaugh, 1961). The inventory is a 21 question measure based on a 4 choice response ranging in intensity. An example of the responses is (0) I do not feel sad, (1) I feel sad, (2) I am sad all of the time and I can't snap out of it, and (3) I am so sad or unhappy that I can't stand it. The higher total score indicates more severe depressive symptoms. The BDI has been reported to have relatively high test/re-test reliability parallel with patient's clinical state. Beck reports reliability figures to be above .90 and the validity to fall between .65 and .67 when comparing results of the BDI to psychiatric ratings of patients (1961).

The Big Five Inventory is a self-report inventory that assesses the big five personality dimensions. The multidimensional personality inventory is 44 items long and was created in 1991 (John, Donahue, and Kentle, 1991). The instrument provides a mean score for each of the five per-

	Varsity Athletes (N=37)	Non-Athletes (N=37)
<b>Participant Characteristics</b>	<b>Mean (SD)</b>	<b>Mean (SD)</b>
Number of Credit Hours	15.97 (1.95)	16.14 (3.77)
Self-report midterm GPA	3.48 (.37)	3.41 (.62)
Rosenberg's Self-Esteem Scale	24.35 (4.18)	21.03 (5.85)
Beck Depression Inventory	5.81 (4.61)	8.34 (6.47)
Self-reported Academic Abilities	3.51 (.39)	3.39 (.49)
Hours of Activity Per Week	8.61 (6.81)	4.22 (6.92)
Hours of Sleep Per Night	4.90 (3.21)	5.56 (2.62)

**Table 1:** Statistical Means of Participant Characteristics

sonality traits, extraversion, agreeableness, conscientiousness, neuroticism, and openness. The reliability of the scale ranges from .75 to .87.

The survey concluded with brief questions assessing time management, feelings toward social life and involvement, as well as asking for a detailed layout of daily schedule.

*Procedure*

The Institutional Review Board of Case Western Reserve University approved the study for research. The varsity athletes were recruited by an email sent out to their respective team by the head coach. If the athlete was interested in participating, they simply followed the link attached on the email to reach the survey. The survey was open from October 5, 2009 to November 2, 2009. The non-athletes were recruited through the study posting site for psychology 101 students. The psychology 101 students who completed the survey via the link through the subject pool website were granted 1 experimental credit.

*Data Analysis Plan*

To analyze the data collected from the surveys, the mean was taken for all of the demographics. The frequencies of year of graduation and the questions assessing time management, feelings toward social life, involvement, academic requirements, and schedule were taken for both athletes and non-athletes. Chi squares were also used to analyze the differences among the groups in time management and feelings toward social life, involvement, academic requirements, and schedule. A MANOVA was computed for both the Big Five Inventory subsets as well as the subsets of the Gadzella instrument. An ANOVA

completed for the Beck Depression Inventory total and the Rosenberg self-esteem total as well as the self-reported academic abilities.

**RESULTS**

The study group consisted of 32.4% were freshmen, 24.3% were sophomores, 27.0% were juniors, and 16.2% were seniors. The grade level of the control participants was 45.7% were freshmen, 20.0% were sophomores, 17.1% were juniors and 17.1% were seniors with the data not provided in two cases of non-athletes. The mean course load for varsity athletes was 15.97 credit hours and the average for the non-athletes was 16.14 credit hours,  $F(1,72)=.95$ ,  $p<.01$ .

To analyze that data collected from the surveys, means and standard deviations are calculated for the age, number of credit hours, and self-report GPA (see table 1). The mean scores and the standard deviations of the self-assessment of academic abilities, Rosenberg's self-esteem scale, Gadzella's student-life stress inventory, and the Beck Depression Inventory were also calculated and shown in Table 1.

The frequencies of year of graduation and the questions assessing time management, feelings toward social life, involvement, academic requirements, and schedule were taken for both athletes and non-athletes. These values are shown in Table 2 (Page 8). GPA and the number of hours the students spent in university sponsored activity were analyzed by using one-way ANOVA. An analysis of variance proved GPA to have no significance,  $F(1,48)=.251$ ,



p=.62. There was a slight difference in the mean of the reported GPAs among the sample. Athletes reported a slightly higher GPA (M=3.48, SD=.37) than did the non-athletes (M=3.41, SD=.62). As expected, athletes (M=8.61, SD=6.81) showed significant more hours in activity than non-athletes (M=4.22, SD=6.92). An analysis of variance showed that there was significance in hours spent in university sponsored activity,  $F(1, 62) = 6.53, p=.013$ .

The Beck Depression Inventory, the Rosenberg self-esteem scale, and the self-reported academic abilities were analyzed by a one-way ANOVA. An analysis of variance showed that the effect of the Beck Depression Inventory was on a trend towards significance,  $F(1, 72) = 3.86, p<.05$ . The mean for athletes was lower (M=5.81, SD=4.61) than for non-athletes (M=8.38, SD=6.47). Both scores fell within the not depressed range of 0-9. The analysis of variance of Rosenberg's self-esteem scale was significant,  $F(1, 72) = 7.92, p<.01$ . The mean score showed that athletes' self-esteem was higher (M=24.35, SD=4.18) than the non-athletes' self-esteem (M=21.03, SD=5.85). Both

athletes (M=3.51, SD=.39) and non-athletes (M=3.40, SD=.49) reported their feelings toward their academic abilities similarly. The analysis of variance was not significant,  $F(1, 72) = 1.39, p=.24$ .

A MANOVA was used to analyze the Big Five Inventory and Gadzella's student-life inventory among athletes and non-athletes. The analysis for the Big Five Inventory comparing athletes to non-athletes indicated no significant differences among the groups,  $F(5,68) = 2.04, p=.08$ . The MANOVA comparing the sums of Gadzella's student-life inventory among athletes and non-athletes also indicated no significant differences,  $F(2, 72) = 1.75, p=.18$ .

Multiple chi-square tests of independence were performed to examine the relation between being an athlete and questions regarding feelings toward social life, time to complete work, time to sleep, meeting academic requirements, schedule, and involvement. The relation between being an athlete and feeling that one had enough time to complete work was not significant,  $\chi^2(1, N=69) = 1.17, p=.28$ . The relationship between having enough time for a social life

	Athletes (N = 37)	Non-Athletes (N = 37)
<b>Year of Graduation</b>		
2013	16.2	17.1 <sup>a</sup>
2012	27.0	17.1 <sup>a</sup>
2011	24.3	20.0 <sup>a</sup>
2010	32.4	45.7 <sup>a</sup>
<b>Do you feel like you have enough time to complete your work?</b>		
Yes	57.1 <sup>a</sup>	44.1 <sup>b</sup>
No	42.9 <sup>a</sup>	55.9 <sup>b</sup>
<b>Do you feel you have enough time for a social life?</b>		
Yes	57.1 <sup>a</sup>	58.8 <sup>b</sup>
No	42.9 <sup>a</sup>	41.2 <sup>b</sup>
<b>Do you Have enough time to sleep?</b>		
Yes	54.3 <sup>a</sup>	45.5 <sup>c</sup>
No	45.7 <sup>a</sup>	54.5 <sup>c</sup>
<b>Do you feel you are struggling to meet academic requirements?</b>		
Yes	38.2 <sup>b</sup>	47.1 <sup>b</sup>
No	61.8 <sup>b</sup>	52.9 <sup>b</sup>
<b>Do you feel that you are overwhelmed by your schedule?</b>		
Yes	42.4 <sup>c</sup>	52.9 <sup>b</sup>
No	57.6 <sup>c</sup>	47.1 <sup>b</sup>
<b>Do you wish you were more involved with other campus activities?</b>		
Yes	44.1 <sup>b</sup>	61.8 <sup>b</sup>
No	55.9 <sup>b</sup>	38.2 <sup>b</sup>

**Table 2:** Frequency Distribution Comparison of Athletes and Non-Athletes

<sup>a</sup> Valid percent reported due to 2 missing cases reported

<sup>b</sup> Valid percent reported due to 3 missing cases reported

<sup>c</sup> Valid percent reported due to 4 missing cases reported

and being an athlete also showed no significance,  $X^2(1, N=69) = .02, p=.89$ . No significance was found between the relationship of having enough time to sleep and being a student-athlete,  $X^2(1, N=68) = .53, p=.47$ . The relationship between being an athlete and feeling that one is struggling to meet academic requirements also showed no significance,  $X^2(1, N=68) = .54, p=.46$ . No significance was found between the relationship in being an athlete and feeling that one is overwhelmed by their schedule,  $X^2(1, N=67) = .74, p=.39$ . The relationship between being an athlete and wishing one was more involved was not significant,  $X^2(1, N=68) = 2.13, p=.15$ .

## DISCUSSION

As stated earlier, this study attempted to observe the differences between athletes and non-athletes in their academic performance, stress, personality, and depression. The hypothesis stated that the added stress would show a negative difference in GPA as well as increased levels of stress, and increased thoughts of depression.

The results showed no significant finding when comparing athletes to non-athletes on personality, GPA, and stress. The results did show a trend toward significance in the BDI whereas significant differences were seen between groups in Rosenberg's self-esteem scale.

The analysis reports that like athletes in Division I and II, the athletes at Case Western Reserve University reported a time commitment of over ten hours per week in university sponsored activities, mainly athletics. In other studies on Division III student-athletes, student-athletes generally do not rate athletics as a negative predictor of GPA because there is nothing binding them to continue their experience. As part of the NCAA Division III institutions, Case Western Reserve University is not allowed to give partial or full scholarships to its athletes. Therefore, these students continue to participate because of their love for the game. Student-athletes at Case Western Reserve University did not report any differences in time commitments. Both groups believed that they had enough time to complete their work required for class.

At this point in ones athletic career, athletes have mastered balancing their academic and athletic careers. Athletes at Case Western Reserve University may have better mastered time management and they define athletics as a sense

of belonging. Athletes take pride in their sport and the institution they represent. Although there were no significant findings between GPA, stress, and personality, there may be multiple reasons as to why an athlete and non-athlete would vary in these results. GPA can tie back to the time management skills that athletes have learned to adapt to over the many years of participating in athletics. Many athletes may use their respective sport as an outlet for the daily stress of academics at Case. The physical activity may also contribute to the lowered rates of stress reported by the students. There may be certain personality types that continue athletics at the collegiate level.

The significant differences among groups on Rosenberg's self-esteem scale could possibly indicate multiple things. Student athletes that are involved in athletics may develop a sense of pride in the athletic community leading to a feeling of belonging. Self-esteem may also be higher in athletes because athletes competing at the collegiate level are talented and skilled in their respective sport.

There are a few aspects of the study that could have been changed to make for better results. A larger sample of varsity athletes participating in different seasons would have increased the variation in the study group. Many of the fall seasons are considered shorter than those in the winter and spring. A broader range in my control group would have also been beneficial for a better comparison in age and major than the psychology 101 students. The sample collected did not accurately depict the gender ratio present at Case. Although self-reports can be accurate measures, choosing measures that are less subjective could have also validate the data.

Student-athletes are an under researched population, especially Division III women athletes. These findings indicate that more research needs to be done to further look at personality affects as well as other psychological aspects. This study proves to be a broad look into the predictors of student-athletes success off the court. Division III athletes may also be less likely to rate athletics as a negative factor to their success because it is an activity that they enjoy and take great pride in. This means that students are more likely to rate an unfavorable event, like a bad grade, more stressful than athletics. Division III student-athletes at highly selective universities, such as Case Western Reserve University, are a unique population that may soon begin to see an overwhelming interest in research.

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# IDENTIFICATION OF A HEAT SHOCK TRANSCRIPTION FACTOR IN *SCHISTOSOMA MANSONI*

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## ABSTRACT

Schistosomiasis, a disease caused by the parasite worm, *Schistosoma mansoni*, affects over 200 million people and ranks second only to malaria in terms of its impact on quality of life. Little is known about the specific regulators of gene transcription in *S. mansoni* or about many of the biological pathways in which they participate. In this study, we identified a schistosome gene that encodes for a transcriptional activator. We designed fusion proteins consisting of the yeast Gal4p DNA binding domain (DBD) and a putative schistosome transcriptional activator and asked whether these fusion proteins could drive expression of several reporter genes in a modified yeast one-hybrid system. The genes coding for the putative transcriptional activators were found through predicted protein homology BLAST comparison between confirmed activator-coding genes in yeast and uncharacterized genes in *S. mansoni*. We describe in this paper the cloning and analysis of a schistosome homolog to the yeast gene HSF1, a gene involved in activating heat shock response genes. The identification of this schistosome transcriptional activator will provide a strong foundation from which we can build a better understanding of the biological pathways involved in gene activation, expression, and development in response to stress.

## INTRODUCTION

Schistosomiasis is a debilitating disease affecting over 200 million people worldwide. However, as a neglected tropical disease, it has received little attention from the global scientific community (Chitsulo et al., 2004). *Schistosoma mansoni* is a species of parasitic worms responsible for schistosomiasis and is endemic in many developing countries with poor water treatment systems (Steinmann, et al., 2006). The parasitic schistosome has a complex life cycle with many developmental stages, two of which involve infection of a host and all of which are distinctly different from one another (see Figure 1). For the mammalian hosts, cercariae are the infective agents. Once a swimming cercaria contacts a mammalian host, it passes through the skin, losing its tail, while its head transforms into a schistosomulum. The schistosomula develop into adult worms, which mate and produce eggs in the liver. These eggs are then excreted from the host into freshwater, where they hatch, yielding miracidia, which then find and infect a molluscan host,

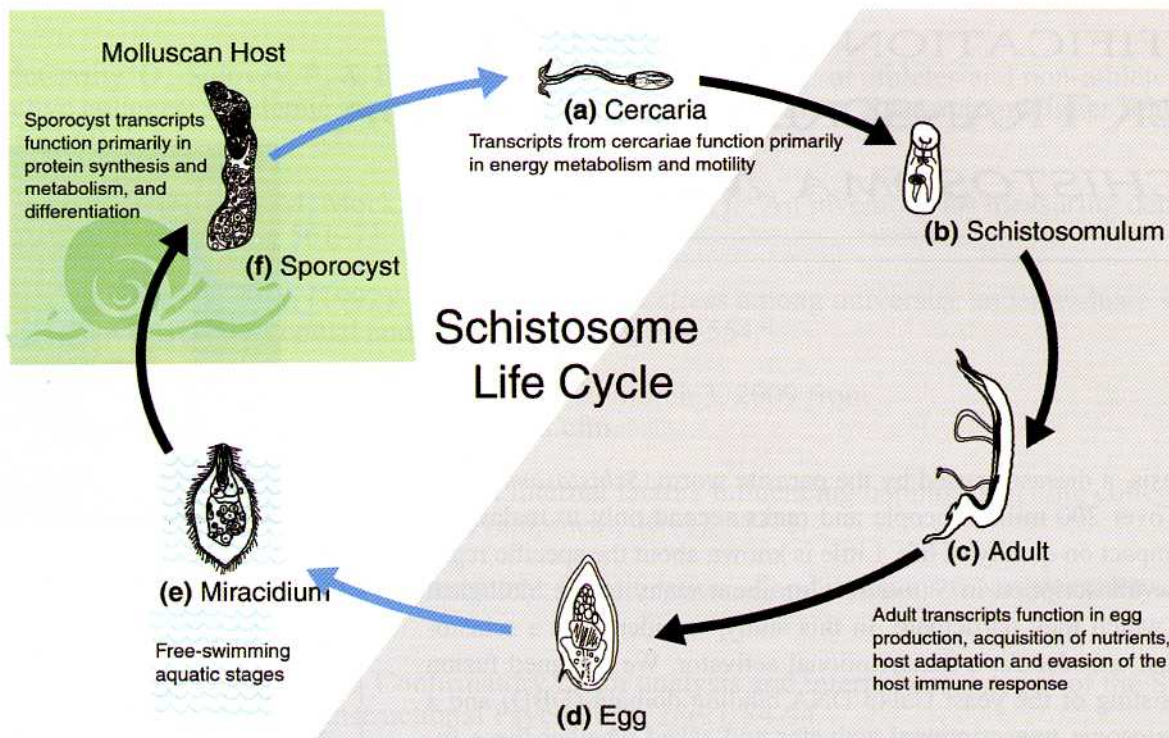


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## -Acknowledgments-

My thanks go to Dr. Emmitt Jolly for his wonderful guidance and support and for offering me the opportunity to do great research. I also thank all of the members of the Jolly Lab for providing assistance, as well as the Howard Hughes Medical Institute for funding much of this ongoing project.



**Figure 1:** Life cycle of the Schistosome parasite, which includes six different stages adapted to different environments. Free-swimming cercariae (a) infect mammalian hosts, after which the tail is lost and the head transforms into the schistosomulum (b). When further adaptation to the host is complete, the schistosomula become adult worms (c), which mate in the liver to produce eggs (d). After shedding through the feces into freshwater, the eggs hatch and release miracidia (e), which infect molluscan hosts and transform into sporocysts (f), mass producers of cercariae (taken from Jolly, et al., 2007).

transforming into sporocysts, mass producers of cercariae (Jolly et al., 2007). The focus of this study is to attempt to uncover information about the genetics of the complex parasite *S. mansoni* to expand the possibility of drug development. This is an opportune time for such an investigation, as there is concern for schistosome worms resistant to the one current drug, praziquantel, (Doenhoff, et al., 2007).

To begin the process of uncovering biological pathways associated with the stress response in the schistosome, this study attempts to identify genes that code for transcriptional activators in schistosomes. Transcriptional activators belong to a class of proteins that cause transcription of specific genes under a specific set of conditions. In order to drive gene expression, the activator must be present in the nucleus and able to access the genome. If post-translational modification or protein-protein interaction is required to satisfy this condition, the activator cannot function. To

address this problem, the sequence of the gene coding for the potential schistosome activator can be cloned with a well-characterized DNA binding domain (DBD), such as that encoded by the separable DNA binding domain of the yeast gene GAL4, which will produce a fusion protein consisting of the Gal4p-DBD and putative transcriptional activator protein (Titz et al., 2006). The yeast Gal4p-DBD will bind to known promoter sites that regulate transcription of reporter genes. The ability of the putative activator/Gal4p-DBD complex to induce reporter gene expression will permit us to determine whether the putative transcription factor is a positive regulator of gene expression.

## MATERIALS AND METHODS

### Candidate Gene Selection

Genes were first selected from a *Saccharomyces cerevisiae* transcriptional activator screen by Uetz et al. and Ito

et al. and used sequence information in a protein BLAST query hosted by GeneDB against the *Schistosoma mansoni* genome. After choosing a schistosome gene that had significant homology with a yeast transcriptional activator, we proceeded to design oligonucleotides to amplify the gene from schistosome RNA.

#### *Oligonucleotide Design*

Two sets of oligonucleotides were designed in this study. One of these sets was for use with standard TA vector cloning and the other was for use with a newer InFusion cloning technique. Each set of these oligonucleotides consisted of forward and reverse primers, which contained 30 base pairs of homology with the respective ends of the schistosome gene (the forward primer contained the sequence of the first 30 base pairs and the reverse primer contained the reverse complement of the last 30 base pairs).

The first set contained the addition of two different restriction endonuclease cut sites for Nde I and EcoR I, respectively, for the forward and reverse primers in order to facilitate cloning into the final plasmid vector, pGBKT7 (Clontech). These two restriction endonuclease cut sites were chosen by comparing available cut sites in the pGBKT7 multiple cloning site (MCS), which is directly downstream of the GAL4 DBD gene, with the gene sequence and using a restriction endonuclease cut site search tool (New England Biolabs). Both Nde I and EcoR I had potential cut sites in the pGBKT7 MCS and did not exist in the gene.

While the other set of oligonucleotide primers also contained the first and last 30 base pair homology to the schistosome gene, they did not contain the same cut sites. Instead, they contained a 15 base pair sequence homologous to the respective side of the Sma I cut site of the pGBKT7 MCS at the 5' end, as well as a Sma I cut site after the 15 base pair homologous region to allow the subsequent isolation of the gene and the verification of successful cloning into pGBKT7.

#### *RT-PCR*

cDNA of the schistosome gene was generated using SuperScript One-Step RT-PCR (Invitrogen) with both sets of forward and reverse oligonucleotide primers and 14 ng of schistosome RNA as the template strand in a MultiGene Gradient Thermal Cycler (Labnet). For reverse transcrip-

tion, the samples were placed in the thermal cycler at 45°C for 30 minutes, followed by a 95°C denaturing period of 2 minutes and polymerase chain reaction (PCR) amplification of the cDNA, which consisted of 25 cycles of denaturing at 94°C for 30 seconds, annealing at 50.4°C for 30 seconds, and extension at 72°C for 2½ minutes. A final extension at 72°C was programmed for 10 minutes after PCR.

To verify the presence of the schistosome gene, the RT-PCR product was run on a 0.8% agarose gel and visualized with a Fotodyne FOTO/Eclipse and FOTO/Analyst transilluminator system.

#### *Cloning*

Using the InFusion Liquid PCR Cloning Kit (Clontech), the PCR product amplified by the InFusion-specific primers was cloned into the prepared pGBKT7 at the Sma I cut site. The pGBKT7 vector was prepared using a standard digest protocol from New England Biolabs with the Sma I restriction endonuclease, followed by gel purification with Nucleospin Extract II (Macherey-Nagel).

#### *Bacteria Transformation*

To complete the InFusion cloning, the InFusion product was immediately transformed into FusionBlue competent *E. coli* bacteria (Clontech) according to the standard Clontech bacteria transformation protocol. After the final 37°C shaker incubation period, 30µL of cells were diluted with super optimal with catabolite repression medium (SOC), and the remaining cells were centrifuged and resuspended in a smaller volume of SOC (70µL less) to achieve an approximate total volume of 200µL. Both the diluted and normal cell concentration samples were plated on 37°C Luria-Bertani (LB)/kana-mycin plates to select only the cells that were transformed with pGBKT7. The cells were allowed to grow overnight in a 37°C incubator, after which eight colonies were picked and grown in liquid LB/kanamycin medium in the 37°C shaker overnight.

Using the PureYield Miniprep System (Promega), plasmid DNA was extracted from the cells. A portion of these extracts were digested with Sma I and run on a gel to verify the presence of the gene in the extracted plasmid. The samples that yielded a band at the location corresponding to the size of the gene were subsequently used to transform yeast.

### *Yeast Transformation*

First, four 10mL samples of yeast strain AH109 (Clontech) were grown from a frozen stock in yeast extract peptone dextrose (YEPD) medium in a 30°C roller overnight, after which the optical absorbance (at 600nm) of the samples were verified to be between 0.6 and 1.0 (OD600 = 0.6-1.0).

In order to transform the yeast cells, a variation of the protocol presented in Guthrie and Fink (1991) was used with the positive control, negative control, and experimental plasmids, which are, respectively, pGBKT7 cloned with a complete GAL4 gene downstream of the constitutive promoter PADH1, pGBKT7 alone, and 3 $\mu$ L (600ng DNA) from a sample of extracted pGBKT7 (cloned with the schistosome gene) that showed a band of the gene size in the previous gel verification.

After the transformation, the three yeast samples were first plated on synthetic dextrose complete medium (SDC) lacking the essential amino acid tryptophan (SDC-Trp) to screen for those cells carried each plasmid. Single colonies were chosen from each of the samples and streaked for single colonies on a separate SDC-Trp plate to further verify transformation. For each sample, three single colonies were chosen from the new streak plate to make an SDC-Trp master patch plate, from which all subsequent samples would be obtained.

### *Gene Expression Assay and Screening*

LacZ, HIS3, ADE2 in the yeast were the three main genes targeted for activation in this experiment. Either an assay or simple screening was performed to verify the successful expression of these genes.

For the LacZ gene expression assay, a new SDC-Trp plate was supplemented with 100 $\mu$ L alpha-galactosidase, and samples from each of the patches on the SDC-Trp master patch plates were transferred to the alpha-galactosidase plate to verify LacZ expression. Blue color indicates successful LacZ expression, while white color indicates no LacZ expression.

Verification of HIS3 and ADE2 expression involved a simple streaking from the master patch plates to SDC plates missing histidine (SDC-His) or adenine (SDC-Ade), re-

spectively. In order to observe relative activation strength, these plates were separated into three compartments, with each compartment containing singles streaks for the positive control, negative control, or experimental sample.

## RESULTS

### *Selection and Amplification*

The schistosome gene, Smp\_068270.5 was chosen as the focus of this study because of its high degree of homology to a known yeast transcriptional activator. Comparing the protein sequence produced by the HSF1 yeast gene with that produced by the Smp\_068270.5 schistosome gene using BLAST yielded a probability of  $5.8 \times 10^{-18}$  of dissimilarity between the two genes, meaning the two genes are likely to be homologous.

Oligonucleotide primers designed to amplify the Smp\_068270.5 gene with the addition of a 15 base pair region of homology to the respective sides of the Sma I cut site in the pGBKT7 vector, as well as the addition of a Sma I cut site, were used for the RT-PCR reaction, the product of which was run on a gel and found to contain DNA fragments of 2000 base pairs as can be seen in Figure 2. Lanes 3 and 4 show the 2000 base pair fragment with darker bands further along the gel, which are the excess primers used in the RT-PCR reaction. No DNA fragment product was amplified in lanes 1 and 2, in which different oligonucleotide primers were used to prepare the gene for standard TA vector cloning.

### *Restriction Endonuclease Digest and Cloning*

In order to clone the schistosome gene (amplified by the InFusion-specific primers) into the pGBKT7 vector, a restriction endonuclease digest with Sma I as well as a verification gel of the digest was necessary. Figure 3 shows that pGBKT7 digested with Sma I (rightmost lane) ran further on the gel compared to the uncut pGBKT7 (middle lane) by a difference of between 1000 and 2000 base pairs. The brighter band of the digested pGBKT7 resulted from a greater sample size of 0.75 $\mu$ g of vector compared to the 0.1 $\mu$ g of uncut pGBKT7.

Combining the RT-PCR product prepared for the InFusion reaction, the gel purified pGBKT7 vector, and InFusion enzyme and buffer yielded a partially cloned



**Figure 2:** 0.8% agarose gel of the RT-PCR product. Lanes 1 and 2 are duplicate samples of schistosome RNA amplified with primers for TA cloning and lanes 3 and 4 are duplicate samples of the RNA amplified with primers for InFusion cloning. Lane 9 is the 1 kb ladder molecular marker.



**Figure 3:** 0.8% agarose gel of the pGBKT7 plasmid. The middle lane is uncut pGBKT7 and rightmost lane is pGBKT7 cut with Sma I. The leftmost lane is 1 kb ladder molecular marker.



gene to be completely cloned via a bacteria transformation. After transforming, growing, and picking bacteria colonies, a miniprep was performed, the product of which was digested with Sma I and run on a gel along with undigested vector extract (Figure 4). Out of the eight different samples of extracted and digested pGBKT7 cloned with Smp\_068270.5, samples 1, 4, 6, and 8 show a DNA fragment at about 2000 base pairs and 7000 base pairs, while the other samples show a DNA fragment only at 7000 base pairs. Again, the undigested samples of pGBKT7 alone as well as the undigested samples 6, 7, and 8 traveled less on the gel than the digested samples. Between the undigested samples 6, 7, and 8, sample 7 traveled less than samples 6, and 8, which both traveled about the same distance of 8000 base pairs.

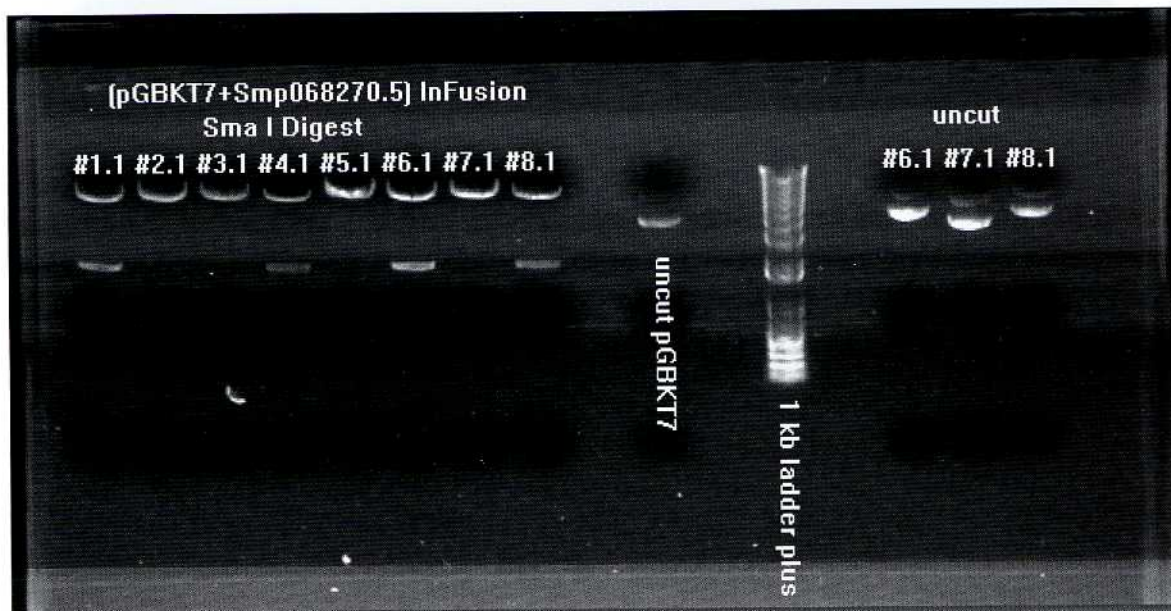
Yeast cells of strain AH109 were transformed with sample 6 from the bacteria miniprep with other samples transformed with positive control vector pGBKT7 cloned with the complete GAL4 gene and negative control vector pGBKT7 alone and plated on SDC-Trp, SDC-Trp+x-alpha-galactosidase, SDC-His, and SDC-Ade (Figure 5, 6, 7, pages 18, 19). As expected, the positive control transformant grew on all plates and exhibited blue color in the LacZ assay, while the negative control transformant grew only on SDC-Trp and remained a white color in the LacZ

assay. The experimental transformant showed growth in all plates and exhibited blue color in the LacZ assay.

## DISCUSSION

Smp\_068270.5 was chosen as the gene of interest in this study by looking at its homology to a yeast gene confirmed to function as a heat shock transcriptional activator. Yeast was used as a starting point for the reason that many yeast genes have been thoroughly investigated and characterized. If one such gene has homology with a completely different species such as *S. mansoni*, there may be significance in the conservation of the sequence and, therefore, a possibility that the functions of the two genes may be similar. Yeast HSF1 is an example of such a case, especially considering that heat shock factor not only acts when an organism encounters a heat shock but also acts under other types of stress, during which cellular proteins fold incorrectly and the integrity of the cytoskeleton degrades (Shamovsky et al., 2008).

For designing the two sets of oligonucleotide primers to amplify Smp\_068270.5, in addition to verifying that the correct sequences were used in the correct orientation for the homologous regions, one more consideration was



**Figure 4:** 0.8% agarose gel of the Sma I restriction endonuclease digest of vector pGBKT7 containing the heat shock gene Smp\_068270.5. Lanes 1-8 represent digest samples of vector (with gene) extracted from eight different bacterial colonies. Gene product was detected in samples 1, 4, 6, and 8. Lane 10 is uncut vector alone, lane 12 is a 1 kb ladder molecular marker, and lanes 13-16 are uncut vector (with gene) samples 6-8.

required when inserting the restriction endonuclease cut sites into the primers. After the cloning of the gene into pGBKT7, the reading frame of the gene must match the reading frame of the vector in order to obtain a working protein from the gene sequence. One or two arbitrary nucleotide bases were added immediately following the restriction cut site sequence, if adjustment was necessary, to allow the start codon (ATG) to be read in the correct frame.

Out of the two sets of oligonucleotide primers used for RT-PCR, only the second set designed for the InFusion reaction yielded a gel that showed a DNA fragment at about the size of 2000 base pairs. The first set only showed light bands toward the bottom of the gel, indicating that the target PCR product could be formed. Since all samples were amplified in the same machine under the same conditions, certain temperatures and cycle lengths may have been incompatible between the two different primers in terms of obtaining a PCR product. As both samples for the InFusion cloning yielded clean PCR products, the samples could be immediately used without purification to perform the InFusion cloning.

In order for the InFusion cloning reaction to work correctly, the pGBKT7 vector needed to be digested by Sma I, and the RT-PCR product needed to be amplified by oligonucleotide primers containing the cut site for the same restriction endonuclease and homologous sequences to the regions immediately surrounding the Sma I cut site in the pGBKT7 MCS. All of these conditions must be met in order for the InFusion 3' to 5' exonuclease to be able to create sticky ends on the linearized (non-circular) vector and the gene insert.

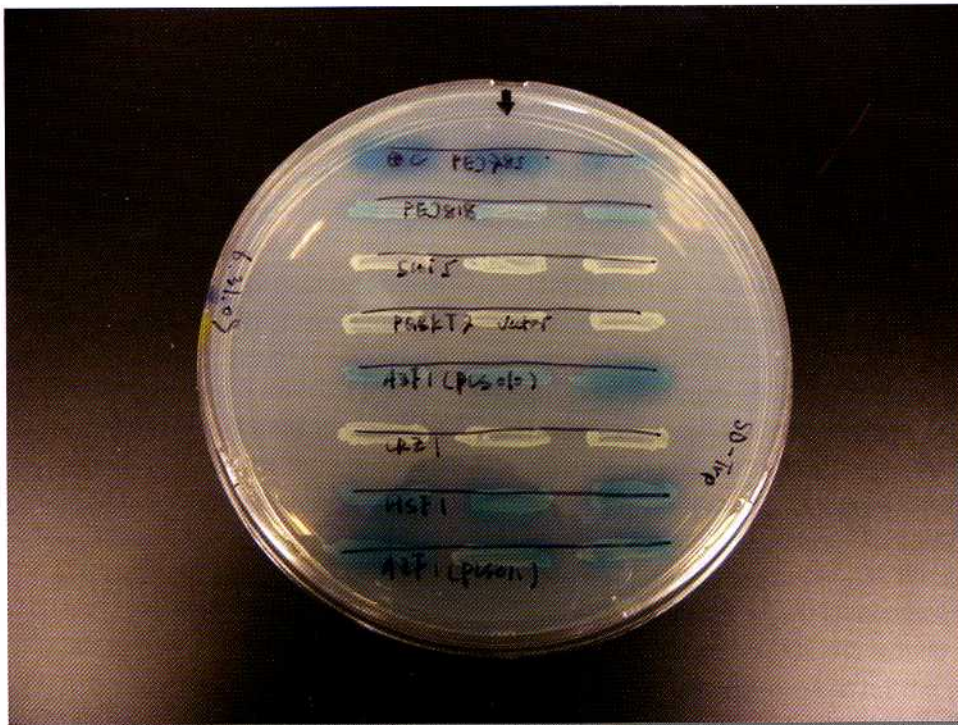
Following the InFusion cloning, bacteria transformation, and plasmid extraction, a digest with the appropriate restriction endonuclease, Sma I, was necessary to verify that the gene was successfully cloned into the Sma I site of the pGBKT7 MCS. Since the MCS is immediately downstream of the GAL4 gene, given that the inserted gene is in the correct orientation and correct reading frame, a fusion protein of the Gal4p DBD and putative transcriptional activator will be produced when this plasmid is transformed into the AH109 yeast strain.

AH109 is specifically designed with many Gal4p binding elements (genomic promoters) that are upstream of the reporter genes LacZ, HIS3, and ADE2, and it is also deficient in that without either the presence of histidine and adenine in the medium or a transcriptional activator to drive expression of the HIS3 and ADE2 genes, it cannot survive. When the Gal4p DBD portion of a fusion protein consisting of the DBD and a transcriptional activator binds to its binding element, expression of the genes downstream of the promoters will occur.

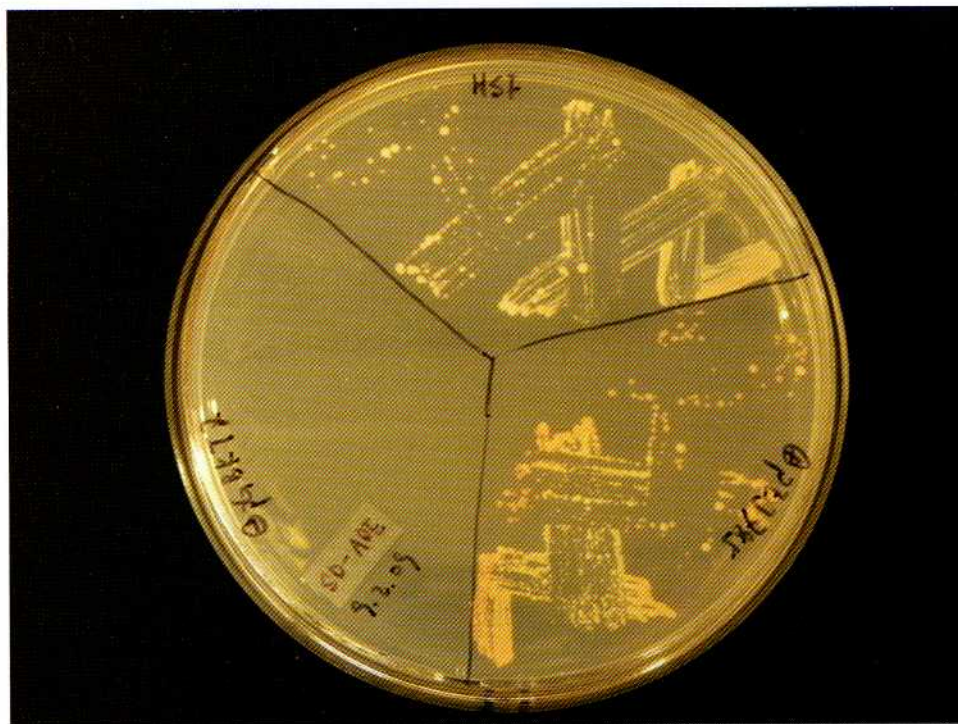
Plating the transformed yeast on specific media missing tryptophan, histidine, or adenine ensures that only those cells that received the expressing the correct genes can survive. A successful transformation with the pGBKT7 vector should allow the cells to grow in SDC-Trp plates, since pGBKT7 contains a TRP synthesis gene with its own promoter.

In the assay and screens, growth for all three transformants was observed on SDC-Trp plates, indicating the transformation was successful. In the LacZ assay, both the positive control and experimental exhibited blue color while the negative control did not (Figure 5a, page 18), indicating activation of the LacZ reporter gene. In the histidine and adenine screen, both the positive control and experimental produced viable single colonies while the negative control did not, indicating the successful activation of both HIS3 and ADE2 reporter genes by the positive control and experimental. There was also comparable growth between the two transformants in both the histidine and adenine screen. Comparable growth of the experimental to the positive control in the adenine screen indicates that the schistosome codes for a strong activator, as the ADE2 reporter gene is the most stringent in terms of the strength of activation required for adequate growth.

All gene expression testing showed a positive result for the experimental transformant, especially for the stringent ADE2 reporter gene, indicating that the schistosome gene Smp\_068270.5 has strong transcriptional activator activity. Now that the activator activity has been confirmed, the activator must be further characterized by identification of its DNA binding requirements and genomic DNA binding targets in schistosome, as well as verification of its protein sequence by mass spectroscopy.



**Figure 5:** LacZ assay with alpha-galactosidase on SDC-Trp media. The positive control is pEJ785 (complete yeast GAL4) in the first row and the negative control is pGBKT7 (DBD) alone in the fourth row. Smp\_068270.5 shows a positive result and is labeled HSF1 in the seventh row.



**Figure 6:** Growth of transformed yeast on SDC-Ade media. Clockwise from top, Smp\_068270.5 (HSF1) followed by the positive and negative controls. Again, the schistosome gene shows comparable growth with the positive control.

## CONCLUSIONS

The successful expression of LacZ, histidine, and adenine reporters by the schistosome homolog to yeast HSF1 shows exciting possibilities for the future of schistosome genetics: first, a previously unknown schistosome transcriptional activator was identified; and second, this activator showed functionality in a heterologous yeast system. In other words, not only can this activator function in schistosomes but also in yeast, given the correct conditions. Therefore, such expression in the yeast system

is not only limited to this specific activator but includes other schistosome activators as well. The techniques used in this study can be applied to other schistosome genes, from identification of a putative transcriptional activator candidate, to the determination of whether expression can be driven. Once such an activator is determined, the sites in the schistosome genome to which it binds could be identified, uncovering pathway information, which can be used in drug development for schistosomiasis.



**Figure 7:** Growth of transformed yeast on SDC-His media. Clockwise from top, Smp\_068270.5 (HSF1), followed by the negative and positive controls. The schistosome gene shows comparable growth with the positive control.

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# THE ETIOLOGY OF NEURASTHENIA IN CHINESE-AMERICANS, ITS EFFECT ON HELP-SEEKING BEHAVIORS, AND PATHS FOR A MORE CULTURALLY COMPETENT FUTURE

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## INTRODUCTION

Depression can significantly impair overall functioning and the global prevalence of this debilitating disease is increasing every year (Suang & Tohen, 2002); by 2020, depression will be second only to heart disease in accounting for the world's disease burden (WHO, 2009). Depression is associated with the one of the highest rates of mortality and disability out of all chronic health conditions (WHO, 2009). However, there is a cultural group that seems to be immune to the growing prevalence of depression: the Chinese. On the whole, the Chinese have a much lower depression rate when compared to other populations. According to the Chinese American Psychiatric Epidemiological Study (CAPES), Chinese immigrants and their second generation descendents in the United States have a 12-month depression rate that is a third of the national average (Takeuchi, 1998). These findings suggest that Chinese-Americans are inherently a happy and stable population which has somehow been able to avoid depression's debilitating symptoms, as outlined by the Diagnostic and Statistical Manual (DSM). However it is important to note that the DSM, which delineates the criteria by which depression is diagnosed, is used primarily by a Western psychiatric circle. The DSM symptoms of depression, while an effective means for diagnosis in the United States for mainstream American citizens, are not universal. Just because the Chinese do not satisfy all the criteria for depression as defined by the DSM, does not mean that they do not suffer from obstacles similar to those caused by depression. Chinese Americans are not exempt from the global pattern of escalating prevalence of depression; it is because of the mistranslation of Chinese depression symptoms into the language of Western biomedical systems and the differences between Chinese and Western modes of appropriate behavior that the CAPES study identified so few Chinese Americans with depression.

The CAPES study was well structured and researchers intended to use it to learn more about the "health and well being" of the considerable Asian population in America, which will triple by 2025 (Takeuchi, 1998, p. 1407). The study was conducted in English, Mandarin, or Cantonese on a randomly selected 18-65 year old member of each of the 1,747 Los Angeles based Chinese-American households that qualified for the study. The diagnostic instrument used was the DSM III-R, and the interviewees were screened for major depression episodes and dysthymia, a chronic but less severe form of major depression. The results for the major depression episodes were striking; the



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## **-Acknowledgments-**

I am very grateful to Professor Anderson-Fye for her support, sound guidance, and for teaching me that anthropology is about "going with the flow." I thank Professor Charlotte Ikels for answering my numerous questions and for pointing me in the right direction. I would also like to thank Professor Christine Mueri for sparking my interests in mental health.

Mental Disorder		Rate in Chinese- American Adults (CAPES)	Rate in National Sample of Adults (NCS)
Major Depressive Episode	Lifetime	6.9%	17.1%
	12-month	3.4%	10.3%

**Figure 1:** Showing the disparities between Lifetime and 12-month major depressive episode rates between Chinese-Americans and the national American population according to the CAPES and NCS surveys.

lifetime rate was 6.9%, and the 12 month prevalence rate was 3.4% (see Figure 1). These results were in unusual contrast when compared to the results of the National Comorbidity survey, which assessed the overall United States lifetime major depressive episode rate at 17.1% and the 12 month prevalence rate at 10.3% (Takeuchi, 1998). The study implies that the Chinese population in America is a secure and a content population which is nominally affected by the obstacles presented by immigration.

#### THE CHINESE CONTEXT

In contrast to the Chinese population's apparent immunity to immigration stress, Chinese adages regarding leaving their homeland reveal their wary attitudes towards immigration. "An tu chung chien" advises one to "dwell contentedly on one's native soil, unwilling to be moved from [one's] native place," and "Lo yen kwei ken" recommends that people should return to their homeland, just as "the leaves fall and return to the root" (Chu, 1972, p. 319). Obviously the Chinese greatly value their native culture and these proverbs imply that immigration is unwise. This outlook on leaving one's native soil conflicts with the CAPES data, which suggest that immigration difficulties have little effect on the Chinese-American population. Psychiatric disorders occur more often among immigrant populations because of the change in culture. The strain that results from this change is proportional to the literal and figurative distance between the cultures (Yeh, 1972). Because there is such a large difference between many of the social constructs in China and the United States, the migration from China to the United States is exceptionally difficult. This shift in environment leads to "confusion of value orientations, difficulty in communication, psychological isolation, and increased uncertainty concerning the self and its relation to others" (Yeh, 1972). The stress caused by these conflicts between self and society manifests into psychiatric disorders like depression.

Although immigration to a radically different environment and culture is widely acknowledged as a distressing process, the CAPES results still resonate with popular perceptions of the Chinese in America. It is common knowledge that immigration is destabilizing, but still the stereotype of the unemotional Chinese persists. In a study conducted in the United States, Chinese-American students were asked to identify traits they associated with their Chinese-American peers. Among the characteristics deemed "more Chinese than American" were cautious, distant, serious, reserved, formal, and stable (Yeh & Chu, 1974, p. 209). These traits reflect unfeeling behavior, devoid of both highs and lows emotionally. It seems rational that a population that considers itself distant and stable would not be affected by an emotional disease such as depression. In accordance with the Chinese-Americans' perceptions of themselves, when non-Chinese Americans were asked to identify traits aligning with Chinese-Americans' social style, they listed traits such as stoic and uncompassionate (Oyserman & Sakamoto, 1997). If both emic and etic perspectives of the Chinese-American culture see the Chinese population as aloof and removed from emotional matters even if they have gone through the stressful process of immigration, it seems plausible that this population, socially or biologically, is immune to emotional disorders like depression. However, these perceptions of the Chinese American community are superficial. The behavior and values of the Chinese population does not serve to confirm the results of the CAPES study because behaviors have different meanings in different cultural contexts. Just because an individual does not exhibit the key emotive characteristics of depression as defined by the DSM-IV, does not mean that they are indifferent or unresponsive to distressing situations. Expressing a 'depressed mood' or 'low self-esteem' to society or even a psychiatrist is not universally appropriate. It is risky to extrapolate stereotypes or popular perceptions to rationalize mental health phenomena.

Similarly, extrapolating 'depression' from 'suicide' is not universal; while suicide may be a good indicator of a depressed individual in the West, suicides do not always correlate with instances of depression in China. However, suicide in China does suggest intolerable pressure or extreme dissatisfaction with one's life (Hsieh & Spence, 1981). The current suicide rate in China is 23.2 out of every 100,000 individuals (Phillips & Zhang, 2002), which is 7 more individuals per 100,000 people than the global average, and 12 more individuals than the United States average (WHO, 2009). This markedly high suicide rate in China is inconsistent with the image of the stable, unemotional Chinese population living in the United States, which reinforces the fact that Western perception of a concept, like suicide, does not universally connote the same circumstance, like the DSM diagnosable depression. China's suicide prevalence seems like a contradiction: the Chinese are not depressed but they are still committing the radical act of suicide. This apparent paradox is explained because the Chinese, when suffering from similar circumstances that lead the mainstream American population into depression, undergo a different illness experience. For the Chinese, it is not emotional disorders like depression, but somatic illnesses that were more frequently associated with suicide (Lin, Kleinman, & Lin, 1981, p. 247)

A somatic illness is a primarily physiological illness experience. Neurasthenia is a somatic illness characterized by "bodily weakness, fatigue, tiredness, headaches, dizziness, and a range of gastrointestinal and other complaints" (Kleinman, 1986, p 22). Neurasthenia was originally made popular by American neurologist George Beard in 1868, and he had coined it the "American Disease" (Kleinman, 1986, p16). Ironically, a century later, Neurasthenia is essentially nonexistent in the United States, but accounts for nearly a third of all 'psychiatric' diagnoses at Hunan Medical College in China. However, it is important to note that the physicians at Hunan Medical College and their patients may disagree about categorizing Neurasthenia as a psychiatric disorder. The etiology of Neurasthenia can be described in purely physiological terms. Neurasthenia in China is called "Shen jing shuai ruo" and several aspects of its nosology are described in its name. Shen is "spirit", and jing are the channels through which the vital energy, qi, runs. Shen jing, when together, means nervous system. Shuai means "degenerate" and ruo means "weak", so that shen jing shuai ruo is a condition of nervous weakness and inability to to transmit qi throughout the body (Lee, 1994, p. 153-154). The lack and imbalance of qi causes

a disharmony of vital organs and generates the trademark symptoms of Neurasthenia (Parker, Gladstone, & Chee, 2001).

## SOCIAL AND POLITICAL ETIOLOGY OF NEURASTHENIA

Depression is the most widely diagnosed mental illness in the West, Neurasthenia is the most widely diagnosed mental illness in China. Even though Neurasthenia was once the "American Sickness" (Kleinman, 1986), it has waned in Western biomedical systems and flourished in the Chinese mental health services. Depression, on the other hand, made up only 1% of the diagnoses in prominent Chinese mental hospitals (Kleinman, 1986). The reason neurasthenia in China was able to avoid a fate similar to being banished to the appendix of the DSM-IV, as it did in the West, has to do with the political and social context of the illness.

The first mention of a depression-like illness in Chinese medical literature was in the early 7th century when a "prolonged crying syndrome" (Kleinman, 1986, p43) was described. It depicted an illness during which a person's crying was so intense that qi becomes deficient in the body, which aligns easily with the modern concept of neurasthenia. Through its name, the prolonged crying syndrome seems to focus on emotional aspects of the illness but the Cultural Revolution shifted the values of Chinese psychiatry. The Cultural Revolution transformed the diagnoses of mental illnesses, as psychiatry is the "reflection of objective reality, the concrete conditions of social life" (Kleinman, 1986, p 30). Neurasthenia was introduced to China when Chinese psychiatry was still in its beginning stages (Ming-Yuan, 1989). Unfortunately, the progress of Chinese psychiatry was immobilized when the Cultural Revolution, an era of social and political upheaval, occurred (Kleinman, 1986). The government's closed door policy kept Chinese psychiatry secluded from innovation in the field from overseas. Mao Zhedong declared that psychology was "90 per cent useless and that the remaining 10 per cent was distorted and bourgeois phony science" (Kleinman, 1986, p 859). Depression had been branded "wrong political thinking" because in the context of China's "aroused political energy", depression connoted suspicious "disaffiliation and alienation" (Kleinman & Kleinman, 1985, p. 440). With this disapproval of psychology, it is logical that depression was not widely diagnosed in China during the Cultural Revolution. The legacy of Mao's sentiment continues today when few



individuals are diagnosed with depression. These conditions of psychiatry's seclusion and repression allowed for the condition of neurasthenia to thrive in a "uniquely Chinese psychiatry that combined biomedicine with indigenous approaches" (Kleinman, 1986, p. 34).

There were few Western biomedical physicians during the Cultural Revolution, and because the handful that did practice Western biomedicine were primarily engaged in combating infectious diseases; illnesses characterized by abnormal behavior, like neurasthenia, were left up to those practicing traditional Chinese medicine. Neurasthenia was corresponded with kidney or heart weakness, and the inability of the nerves to transmit qi. Likewise, the Cultural Revolution is seen as depriving the entire social foundation of qi (Ware & Kleinman, 1992). Chinese neurasthenics often attributed their condition to being victimized by oppression during the Cultural Revolution, or by being disillusioned after their dedication to the revolutionary ideals (Ware & Kleinman, 1992). Dizziness, a symptom of neurasthenia, symbolized estrangement from the body, social constructs, and politics. Neurasthenia was a way to "[justify] withdrawal from stressful situations" and avoid "being sent down to the countryside" (Ware & Kleinman, 1992, p. 556) without the implications of depression.

Political prejudices against depression and psychiatric disorders in general coalesced with the paradigms of Chinese stigma. The Chinese have often been characterized as "experts at keeping harmony with their environment" (Yeh & Chu, 1974, p. 200). This discernment is not an accident, but rather a result of structured training from childhood emphasizing compliance with the socially acceptable standards. A Chinese child is "trained to control emotions that are considered adverse and disruptive to harmonious social interaction", and punishment of boisterous behavior is a salient characteristic of Chinese teaching techniques which accounts for "the learning of self-control and emotional restraint at an early age" (Tseng & Wu, 1985, p. 10). While excessive displays of emotions are strictly discouraged, these rules do not mean that the Chinese disallow all expression. Sickness is accepted and physical ailments are addressed. If a child conveys stomach pain, he or she "will be given warm soup to eat and tenderly cared for, while a child who expresses fear will probably be scolded" (Hsu, 1985, p. 105). The interactions between Chinese children and their elders reflect priorities and expected behaviors for a Chinese individual not just in childhood, but also when the individual assumes full adult roles in his or her interactions with society.

Behaviors taught during a young age carry into adulthood and the teachings of Confucius are heavily emphasized when first learning the modes of socially appropriate behavior. Confucian thought, which teaches methods for maintaining harmony with society, has "never ceased in its influence on Chinese society" (Tseng & Wu, 1985, p.10). This continuing line of philosophy accounts for the reservation and emphasis on conformity in the Chinese code of conduct by advocating "inhibition and avoidance of emotional expression" (Lin, 1981, p. 102). Confucian traditions shape values and expected behaviors of the Chinese in society and also affect related social experiences like managing mental illness symptoms. The Chinese are trained "not to respond to hazardous stimuli with excessive emotions" (Lin, 1981, p. 102), which exhibiting symptoms of depression will violate. Thus, the Confucian philosophical tradition "legitimizes suppression as a psychoculturally adaptive coping mechanism" (Lin, 1981, p. 102), and demonstrates why emotional symptoms of an illness may be deemphasized and the somatic symptoms amplified. Neurasthenia is an opportune illness when considering these social expectations because the patient reacts to stressful situations in a suitable, physical way. Symptoms like joylessness would be stifled and manifested into bodily complaints such as fatigue. A Chinese individual has laudable character if they are "sober-minded" and "reasonable" (Weizhen, 1985, p. 54), but looked down upon if they were "sad;" sadness could potentially pose a burden on friends and family. Somatized ailments do not affect disposition and do not impede harmony or the projection of admirable character.

In Chinese culture, posing a burden on others is deeply frowned upon, and one's actions not only influence the individual's image, but the image of the family. The Chinese concept of collective responsibility has deeply ingrained influence on an individual's behavior, as the family's appearance is inseparable from each member of the family. An individual's conduct represents "the collective qualities of the family, including the faults or virtues of the ancestors" (Hsu, 1985, p. 99). This means that any display of mental illness is a consequence of a family member having done something immoral. Illnesses are expected to affect the body, but if the illness has undesirable emotional effects such as gloominess or antisocial behaviors, the family is held responsible. This may be because physical ailments are clearly linked to biology, but psychological ailments can be attributed to factors in the environment. These standards may lead to repression of expressive be-

haviors because they would encumber family members with the duty of concealment and also suggest the family member had erred morally, causing the negative display of emotion. The dedication to "harmonious relationships in Asian cultural values" (Abe-Kim, Takeuchi, Hwang, 2002, p 1186) further underlines the reasons that somatization is present in Chinese medical systems.

The values enforced by the political background of psychiatric stigma and the emphasis on Confucian harmony within society and family taught during childhood carry overseas. These principles are ingrained deep within the Chinese immigrant population; these values do not dissolve into mainstream American standards. When asked to rate statements such as "I would be embarrassed if my friends knew I was getting professional help for an emotional problem" (Fogel & Ford, 2005, p. 472), Asian Americans had greater stigma beliefs than non-Asian Americans in all categories that were analyzed: friends, family, and employers. This reinforces the concept that Asians in America have retained their convictions on appropriate interpersonal behaviors, and that stigma is still influenced by traditional Asian values. When Chinese-American children were presented two pictures: one depicting a group of children who were similarly dressed, and the other depicting a group of children who had varied clothing, 93% of the children wanted to join the group with uniform clothing. This was in marked contrast to the Chinese-American children's non-Chinese American peers, out of whom only 41% chose to join the group of children with uniform clothing (Wilson, 1974). This demonstrates how deviating from a uniform, cohesive unit is discouraged in the population of Chinese-American children from a very early age, just like in China. These studies show that the social reasons for Neurasthenia's prevalence as a diagnosis in China also apply to the Chinese-American population because Chinese Americans have similar attitudes towards the Confucian code of conduct and towards stigma regarding mental health.

#### CHINESE PERSPECTIVES ON PURELY PSYCHOLOGICAL ILLNESSES

Just as the reasons behind the continued success of Neurasthenia in China resonate within Chinese Americans, so too do the norms of physician-patient behavior. Beyond stigma paradigms, the Chinese culture has established certain behaviors that are appropriate during patient doctor interactions. The Chinese population clearly presents physical

symptoms to physicians because the physicians are able to diagnose these patients with neurasthenia based on the described symptoms. However, because of stigma, different illness experiences, or appropriate modes of doctor-patient behavior, emotional symptoms are not as widely reported. "Amplifying somatic distress and silencing affectivity... may simply reflect the norms and values of the health care system" (Lee, 1997, p 116). While this may suggest that the Chinese patients are manipulating the physicians by presenting what they believe is more urgent, it also may mean that the physicians are expecting physical symptoms to construct their diagnosis. Somatization was sparked by of the social and political background in Chinese culture, but it proliferates because it is advantageous in a clinical setting. Somatization is not an intentional rejection of emotional symptoms, but a "culturally determined idiomatic cognitive style that is an initial negotiative tactic" (Parker, et al., 2001, p 862). This reminds us that although illness is not an enjoyable experience, there are benefits to being ill, such as exemption from work and other stressful situations. Accentuating somatic ailments is a "locally appropriate strategy of engaging physicians' concern" (Lee, 1997, p. 116). To get more substantial treatment, higher priority symptoms may be emphasized. The Chinese are not ignorant of purely mental disorders, but "patients report somatic symptoms to professionals because they are what professionals think are important" (Ying, 1990, p. 394). It is not within the Chinese doctor-patient interaction archetype to discuss feelings and expect attention or desired treatment. Emotional symptoms are underreported to physicians "in response to perceived situational demands" (Cheung & Snowden, 1990, p. 285).

Although the Chinese are not unaware of psychological symptoms, and it is possible that many of them cater their symptoms to what they believe will yield the best treatment, it is evident that physiological symptoms accompany psychological ones in the Chinese mental health paradigm. Because of the concept of organs relating to disposition in traditional Chinese medicine, when a patient is experiencing psychological ailments and knows that his problems are emotional, his or her "attention is thereby channeled to preoccupation with the alleged physiological function of the related bodily organ" (Lin, 1981, p. 102). It is reasonable that much of the attention to bodily organs in Chinese mental healthcare is not a denial of psychiatric illness or a patient's manipulation of the physician, but a belief of actual issues with the associated organ. The organ may actually be functioning abnormally because of lack of

or accumulation of qi, or the discomfort in the organ may be because of the patient's ideas. Regardless of what the truth is, all neurasthenic patients believed that "their problems were primarily physical" (Kleinman & Kleinman, 1985, p. 439). The Chinese ideas of somatization should not be dismissed because it is those concepts that create the illness, and therefore the shape the illness experience.

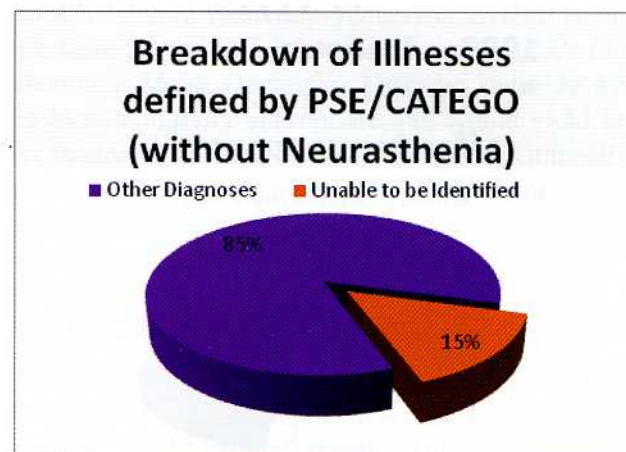
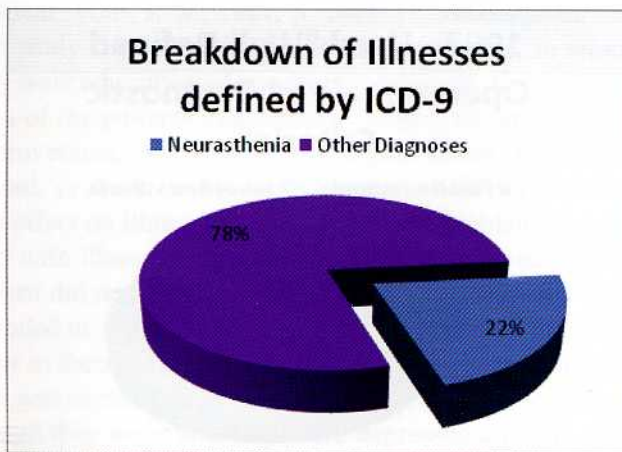
### IS NEURASTHENIA REDUNDANT?

The value of catering to patient's expectations versus abiding by strict diagnostic criteria was investigated when two psychiatrists had independently diagnosed forty patients with Neurasthenia. The symptoms were then systematically analyzed using different diagnostic criteria. When using the ICD-9, 22.2% of the patients were diagnosed with Neurasthenia, and other diagnoses ranged from anxiety to depressive neurosis (Ming-Yuan, 1989). No patient was left without a diagnosis (see Figure 2). This suggests that Neurasthenia may be over diagnosed by Chinese psychiatrists who are using the ICD criteria loosely. They may be catering to the patient's expectations, or their diagnosis may be informed by their experience and norms in Chinese psychiatry. However, Neurasthenia was not an option when using the PSE/CATEGO diagnostic tools. When using the PSE/CATEGO system, the percentage of patients diagnosed under other treatments increased, as the patients diagnosed with Neurasthenia were spread among other categories, but no diagnosis was made for 15% of the patients (see Figure 2). The study therefore lends a conclusion besides the main one the researchers highlighted. While the academics who conducted the research emphasized the overdiagnosis of neurasthenia, their study also showed neurasthenia's integrity as a recognized diagnosis. This means that neurasthenia, as a formal category, has its flaws. It may be diagnosed too often by Chinese psychiatrists, because of cultural norms. Also, Neurasthenia may encompass symptoms from other illnesses, and that there are cases that are interchangeable between Neurasthenia and mental illnesses. However, the study also validates Neurasthenia as a category because it accounts for 15% of the illnesses that were not able to be diagnosed when Neurasthenia was not an option. In a widely cited study in 1982, Kleinman reclassified 87% of Chinese Neurasthenic patients as cases of Major Depression according to the DSM III, even though the patients "suppressed most of the affective symptoms" (Kleinman & Kleinman, 1985, p. 436). This suggests that Neurasthenia is a result of poor diagnostic criteria and ill-defined on-

tology, and that diagnoses are too easily influenced by the patients' expectations (see Figure 3, page 28). This report was delved into again 15 years later with the same 1,747 interviews conducted in Chinese-American households in Los Angeles. In this study, out of the Neurasthenic patients identified by ICD-10 criteria, 56% of them experienced "pure Neurasthenia" that did not overlap with any lifetime DMS-III category. The researchers found that only 27.7% of those with Neurasthenia had symptoms that overlapped with Major Depression (see Figure 3). This is in contrast to Kleinman's initial theory, and implies two thoughts. First, the results of the studies may differ because Chinese psychiatrists have acknowledged overuse of Neurasthenia in the past, and the system of the 1997 study used "well-defined operationalized diagnostic criteria and structured interviews" (Zhang, Takeuchi, & Lin, 1997, p. 254). Secondly, it signifies that even when strict categorization is used, "pure Neurasthenia" was still the most prevalent disorder among the Chinese-American population. This challenges the theory that Neurasthenia is a "masked" form of depression and that Neurasthenia is just a façade to be ignored.

A similar, more qualitative study conducted in 1994 found that 54% of their Neurasthenic patients could be reclassified under "somatoform disorders" in the DSM-III-R, but found that the category did not "capture Neurasthenic patients' variegated symptom profile" (Lee, 1994, p. 164). In addition, they found that Neurasthenia had similar symptoms to Depression, but differed from depression in the patient's primary complaint. This demonstrates that if coerced to, Neurasthenia can be reclassified under other labels. However, these labels are not nearly as effective as having the diagnoses Neurasthenia available because "somatoform disorder" only provides a snippet view of the patient's whole illness experience. If depression is applied on a Neurasthenic patient, treatment will address the primary complaints of depression, even though it is the somatic complaints that are important to the patient.

Studies on the overlap of Neurasthenia with DSM disorders concede that there is substantial overlap between Neurasthenia and symptoms of other disorders, and that it is likely that Chinese psychiatrists have over diagnosed depression in the past. However, they also suggest that Neurasthenia on its own is a legitimate category; it is different from other disorders in its primary complaint and psychiatrists undermining somatic symptoms to insist upon psychological ones would distance their patient.



**Figure 2:** Comparison of the different diagnostic systems used on 40 patients that were independently diagnosed with Neurasthenia by two separate Chinese physicians. The results using ICD-9, which includes Neurasthenia as a possible diagnosis, and using PSE/CATEGO, which does not include Neurasthenia, are shown.

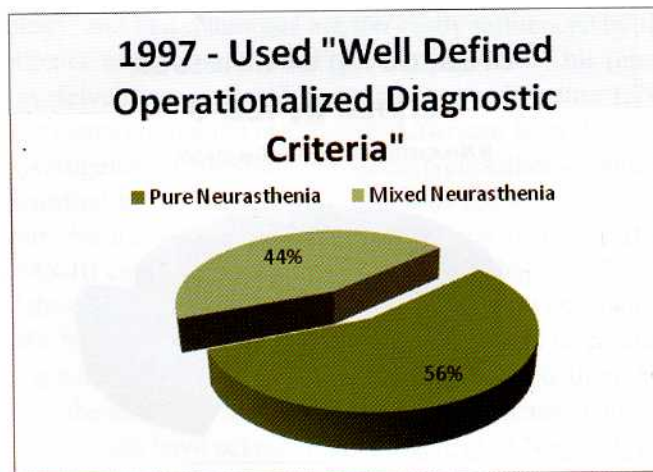
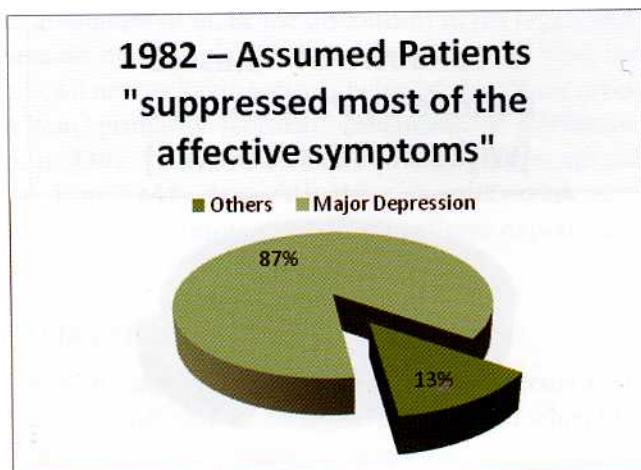
### CHINESE-AMERICAN HELP-SEEKING BEHAVIORS

The Chinese' attention to physical symptoms, in conjunction with stigma, affect which, if any, resources they utilize to aid them in dealing with mental health issues. The Chinese culture's close-knit family results in them using family members for support first. Emotional disturbance is not associated with disease in Chinese culture, and therefore the Chinese do not see the need to visit professionals if there is no disease (Parker, et al., 2001). To illustrate this, a vignette of the story of Mrs. Wu, an immigrant who has a stressful lifestyle and purely psychological symptoms which meet the DSM depression criteria, was presented to Chinese Americans. Out of the 30% who described her as having neurasthenia, three-quarters suggested she get professional help. Out of those who believed she had a psychological problem, over two-thirds advised her to solve the problem within her family or by comforting herself. While this may be an effective method of treatment within an extensive support system, Chinese-American immigrants do not necessarily have this family network in the United States. This demonstrates the importance of allowing the Chinese population their own illness experience. If the clinician recognizes the Chinese-American's symptoms as a legitimate way of coping with stress, he or she should present interventions in a way that fits the patient's somatic explanatory model, because this is "pivotal in the client's willingness to accept the diagnosis, to remain in treatment, to adhere to the prescribed intervention, and finally, to recover" (Ying, 1990, p. 394). If a Chinese-American is neurasthenic, and their illness model is en-

dorsed, he or she is likely to seek and uphold professional help. If the Western concept of depression is imposed on the same individual, with all the contexts and connotations associated with it in the Chinese culture, they are likely not to use resources they could benefit from.

The Chinese are underutilizing medical services available to them, and often do not commit to long-term treatment which may be required to properly address their psychosomatic illnesses. It is well documented that Asian-Americans use less mental health services (Cheung & Snowden, 1990). Half of all Asian Americans who do gather the resources and momentum to visit the vastly unfamiliar setting of Western mental healthcare end up leaving after a single session (Sue, 1997). This demonstrates the incongruity of Chinese and American norms when tackling health issues, and stresses that cultural competency needs to be addressed.

The vast difference between the style of those practicing traditional Chinese medicine and Western practitioners presents another barrier to healthcare utilization by Chinese-Americans. The Chinese-American population is used to behaving differently and expecting different behaviors from medical environments compared to what the Western clinical setting entails. Within the Chinese community, mental health advice generally aligns with the patient's ideal solution, patients are able to give gifts to the medical authority, and this practitioner is allowed to form personal relationships with the patient (Sue, 1997). With



**Figure 3:** Comparison of 1982 and 1997 studies on Reclassification of Neurasthenia, in which the prior eliminated Neurasthenia as a possibility, and the other acknowledged both DSM illnesses and Neurasthenia as viable.

mental health professionals outside the Chinese community, treatment is often a prescription that differs from the patient's expected or preferred resolution, a gift exchange system is embarrassing for the professional, and the professional can only form neutral, technical relationships with the patient (Sue, 1997). These differences can be an obstacle to a Chinese-American individual's comfort within a clinical setting. A change in mode of conduct can be destabilizing and confusing; Chinese-Americans "do not share the values of Western mental health providers" (Ying, 1990, p 395). When the professional's advice does not agree with the patient's judgment, it is likely that the patient will terminate follow-ups or seek advice elsewhere. The formality of mainstream American doctor-patient relationships can make the Chinese-American patient feel ignored and dehumanized, especially if the patient is used to exchanging gifts with the medical authority. With these differences in mind, the Asian American underutilization of mental health resources is understandable.

#### WHAT WESTERN HEALTHCARE PROFESSIONALS CAN DO

The Chinese-American population would benefit from less stigma towards psychiatric services so that they start treatment earlier and recover from mental illnesses through continued efforts from a healthcare provider. In a study conducted on Chinese-Americans' perceptions of others' stigma beliefs, the Chinese-Americans were found to hold strong stigma beliefs and intense fear of rejection based on their mental illnesses even though few actually experi-

enced a negative response in connection with their mental illnesses. While about two-thirds of those questioned in the study agreed that others characterized them as "untrustworthy" and "dangerous", only 11% believed they may have actually been treated differently on the basis of their mental illness by healthcare professionals. To address this, healthcare professionals need to emphasize that the actual attitudes of those who interact with the mentally ill are not as intolerant of the mentally ill as the Chinese-American population believes. Mental health specialists need to paint a better picture of what happens when an individual is diagnosed with a mental illness, and how others view those who have mental illnesses.

Besides stigma, there are other obstacles that a Chinese-American must tackle within the Western healthcare setting, like the insular attitudes of some physicians. Categorizing a neurasthenic individual with depression is largely ineffective and an ethnocentric practice. Although it is the role of Western psychiatrists to diagnose the patient, the patient must be made comfortable with the diagnosis. If a patient is simply assessed and prescribed medication without explanation, it is an imposition of Western labeling. The categorization of patients into different illness roles has significant repercussions in the clinical setting because a patient's illness experience is an important part of recovery. If a Chinese-American individual is suffering from Neurasthenia, psychiatric counseling will not help to fully address their somatic complaints. Even if the root of the disease is psychiatric, "when physiological functions are disturbed, the logical methods of treatment become physi-

ological" (Lin, K-M, 1981, p. 102). This is demonstrated in a study conducted on Neurasthenic patients, in which they were administered antidepressant drugs. Even though 87% of the patients experienced "slight" to "substantial" improvement, very few saw improvement in family, school, or work problems (Kleinman, 1986). This "limited effect on illness behavior and social problems associated with illness" (Kleinman, 1986, p440) is because the patient did not feel his or her neurasthenic ailments were attended to. Out of the 87% of patients who saw improvement in their condition, only 11% said their initial condition was depression at their follow-up appointment, even though they were told they were depressed and that their medication was an anti-depressant (Kleinman, 1986). This study reveals the crucial role a patient's perception of their own illness plays in their recuperation. The diagnosis and treatment must be made clear; physician transparency is essential to a patient's full recovery, especially when the patient is in an alien mode of healthcare.

A step towards accommodating the population of Chinese-Americans, which is rising in magnitude, visibility, and influence on mainstream American culture, would be to include Neurasthenia in the DSM V. However, Western psychiatrists are reluctant to include Neurasthenia because they feel it is not well documented enough and that it may distract psychiatrists from making the correct diagnosis:

"The recent position of American psychiatrists might be epitomized by the DSM-IV Options Book, the forerunner of the DSM-IV. This states that "the availability of this diagnosis may lead clinicians to use it as a waste basket category, resulting in their overlooking other mental disorders [e.g., Major Depressive Disorder] and nonpsychiatric medical conditions [e.g., anemia]... Because of the lack of empirical research supporting Neurasthenia, it is unlikely that this disorder will be included as a separate category in the official classification." (Lee, 1994, p. 155)

This demonstrates how Neurasthenia is regarded as a "lesser" disorder that is not up to the standards of Western psychiatry. The large Neurasthenic population that has been diagnosed and successfully treated by educated Chinese physicians does not seem to yield evidence that is dependable enough for Western psychiatrists. As for the claim that Neurasthenia will become a "waste basket category", this is unlikely because of the contrast of Western doctor-patient interactions with the Chinese model: there is no cultural context leading to overdiagnosis of Neur-

asthenia among Western psychiatrists. Even if Neurasthenia were used to diagnose illnesses that didn't fit under anemia or Major Depressive Disorder, not only would it be more culturally appropriate, but would yield far better treatment than a DSM diagnosis that is lumped under the broad "somatoform disorder" category, or worse, "not otherwise specified."

## CONCLUSION AND IMPLICATIONS

The CAPES data found a very low prevalence rate among the Chinese-American population in Los Angeles when compared to the national average. This rate is not a misrepresentation and is not inaccurate; the Chinese-American population is less depressed than the mainstream American population when their illnesses are assessed according to the DSM III-R. This implies that despite Chinese attitudes towards leaving their homeland, and despite the stresses and obstacles associated with immersing oneself in a drastically different culture and environment, the Chinese do not yield to the anxiety and do not become ill. Although the emic and etic stereotypes of the stoic and unflappable Chinese-American agree with this misconception, suicide rates in China reveal that the Chinese are considerably affected when struggling through stressful experiences. However, the repression of psychiatry during China's political upheaval, Confucian traditions emphasizing inhibition, conformity and maintaining face, and the importance of filial relations dissuading posing a burden on family, all intensified the stigma towards expression of psychological distress. The shame associated with mental illnesses caused patients to amplify their somatic symptoms because it is what physicians were seeking, and because their attentions were directed towards the physical ailments. Neurasthenia is important in Chinese culture because it leads to Chinese-Americans getting treatment sooner from a medical system that is foreign to them. If practitioners in the Western biomedical system scoff at the patient's explanatory model of Neurasthenia, it only adds to the mountain of barriers against the Chinese-American using Western mental healthcare.

It is unfortunate that although Neurasthenia is a very real illness for Chinese and Chinese-American patients, many Western psychiatrists do not believe its validity. Some psychiatrists have the opinion that neurasthenia "stands in the way of psychiatric progress" (Kleinman, 1986, p. 21). It is clear that those who have this opinion are not inspired by interactions with those suffering the somatic

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consequences of distressed lives. A patient's genuine belief that he or she is suffering from fatigue, dizziness, and other bodily complaints because strain has weakened their channels for distributing qi is enough to debunk neurasthenia as an impediment to psychiatry's progress. Even if the patient's explanation for his or her illness is a culture-bound belief, it does not undermine the symptoms the patient is experiencing. Perhaps to some psychiatrists, neurasthenia is "a meaningless concept" (Kleinman, 1986,

p. 21), but to Chinese and Chinese-American patients, neurasthenia has the profound meaning of being a culturally appropriate outlet for symptoms relating to stress. Just because the Chinese-Americans aren't depressed, their somatic symptoms should not be dismissed because the depression itself is a background-specific syndrome and should not be imposed on those unfamiliar with the DSM's culture.

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# SYMBOLIC ORIGINS OF SOCIOECONOMIC DISPARITY: WOMEN AND MODERN IRAN

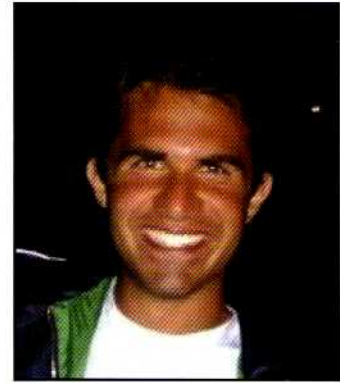
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## ABSTRACT

The perpetuation of socioeconomic gender disparities within present-day Iran is typically explained by citing lingering conflicts from the 1979 Iranian Revolution. Historical evidence and argument provides a generally acceptable corroboration for such a belief but inadequately addresses the roots of this conflict and the essence of its perpetuation. This paper readdresses the problem by evaluating it with a philosophical paradigm of mutual recognition, which readdresses the events prior to, of, and following the Iranian Revolution, enabling scholars to understand gender disparities in a new light that is compatible with and supportive of existing perspectives yet insightful on its own merits. Reanalysis of the conflict within the parameters of this new paradigm allows scholars to understand Iranian conflicts in the context of a larger sexual-symbolic conflict which plays out unconsciously and cyclically, habituated as a result of objectifying legal changes that Khomeini instated and sustained for one generation. The sexual-symbolic conflict, which originally reflected confusion about the roles of Iranian women in a modernizing society, now represents the sexual oppression of women achieved through imperious and corrupt interpretations of a woman's symbolic role within Islamic culture. Habituated repetition of this conflict helps to clarify why such disparities remain difficult to address within Iranian culture. Existing statistical, historical and philosophical literature further corroborates this paper's suggestion that Iranian socioeconomic disparities between men and women are strongly linked to the sexual-symbolic conflicts which this paper identifies.

## INTRODUCTION

An interpretative theory of mutual recognition is a paradigm which proposes a basis for and then grants insight into human experience while simultaneously surpassing perceived epistemic limitations without sacrifice of scholarly objectivity. Particularly useful to the historian and the sociologist, one can use such a theory to reveal and understand the symbolic aspects of historical or sociological phenomena. Scholars of conflict especially benefit from such theories, as they capably grant nuanced, subjective insight into the causes of and nature of conflict that other forms of analysis cannot produce. A reconstitution of such a theory followed by an application of that theory to a complex conflict, such as the 1979 Iranian Revolution and its long-term



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## -Acknowledgments-

This paper was written thanks to the efforts of three other individuals. Their considerable contributions warrant recognition. First, I would like to thank Dr. Cheryl Toman for the insightful and diversifying instruction I received while enrolled in her class, Women in Developing Countries. Next, I must express appreciation for the persuasive and motivational skills of my friend Tulsii Roy, who encouraged me to enroll in Dr. Toman's class. Finally, I credit my mentor and adviser, Dr. Jerry Piven of the Philosophy department, as being an invaluable asset and friend who has contributed immensely to my maturation as a philosopher.

impacts on women, will sequentially reveal both the opportunity for newfound intellectual insight these theories offer as well as provide novel insight into the experience of womanhood and femininity within Iran during and following the era of Khomeini. Analysis of the causes of, history of, and participants in the Iranian Revolution reveals that lingering discrepancies within sociological standards from the Iranian Revolution between women in "modernized" countries and women in present-day Iran can be explained by the sustained sexual-symbolic conflict playing out as a function of the Iranian conflict cycle, enslaving and disempowering women by inflicting the symbolic qualities of sexual object and child bearer upon them. This symbolic image continues to perpetuate itself throughout Iranian culture in subtle and insidious ways, preventing closure of the socioeconomic disparity gap between men and women in Iran.

## APPROACH

The philosophical strategy that leads to these new insights does not require that existing paradigms be supplanted. Perhaps the greatest virtue of a theory of mutual recognition is that the paradigm can be constructed to be compatibly enabling; in other words, it supports and reinforces existing paradigms instead of overthrowing them. The establishment of the theory of mutual recognition is premised on the observations of Paul Ricoeur within *Fallible Man*, especially rooted within his extended account of freedom. Arguing that the conflicts between the finite dimension of human experience (location in time and space, progress through life) and the infinite dimension of human experience (the capacity to grasp universals and categories) are the basis upon which a person develops their identity, Ricoeur is able to advance the proposition that all people have a different finite dimension. This is the basis of identity. As it can only be understood by comparison with other human beings, and given that such comparisons occur without regulation, Ricoeur is able to argue in favor of human freedom. This freedom to communicate is a crucial feature of the theory of mutual recognition because it prompts Ricoeur to conclude that humanity is by definition united with the imperative, inalienable purpose of understanding one another. "Man is this plural and collective unity," he writes, "...[which is] to be understood through each other." (Ricoeur, *Fallible Man* 138) In essence, humans are mutually interlocked with all other humans; understood through each person's recognition of

another. By default, human beings recognize each other as human beings.

This theory at first glance appears incapable of serving scholars of violence or conflict. If indeed humans are free on the basis of difference and conflicts arise out of different categories of humans evidently opposed to recognition of one another, it appears to suggest that the theory of recognition is without use in this environment; there is no account of what Ricoeur describes as bad will. Ricoeur anticipates such reactions, and they consequently motivate a philosophical transition to exploring fault in place of fallibility. To achieve such a transition, Ricoeur deconstructs original sin and mythology. Ricoeur adopts a definition of myth consistent with his theory of mutual recognition: "a traditional narration... which has the purpose of providing grounds for the ritual actions of men today, and... [establishes] all the forms of action and thought by which a man understands himself..." (Ricoeur, *The Symbolism of Evil* 5) What is especially critical for understanding the link between human capacity for bad will and symbol while remaining consistent within Ricoeur's philosophical framework is viewing that mythological narration, especially myths of evil, as what Ricoeur entitles a language of confession. What is being confessed? The exact notion that one wishes to understand: fault. Ricoeur soon apprehends this point, concluding that "...myth makes the experience of fault the center of a whole, the center of a world: the world of fault." (Ricoeur, *The Symbolism of Evil* 162-163)

Earlier, it was established that this specific theory of recognition was specifically interpretative. An interpretative paradigm offers scholars the advantages of comparison and conjecture; when combined with the previously defined theory, interpretation enables one to incisively differentiate between thought and thinker. This is particularly important within religious cultures such as Iran, which will soon be analyzed under the rigors of this framework. It is crucial to understand that comparison, in this case, does not refer to a critique of Islam against another religion or against its own supposed merits and flaws but instead denotes a deconstruction of applied Islamic thought (especially as such thought impacts women) in the symbolic context provided by Ricoeur's theory. Within *Religious Worlds*, William Paden provides us with a four-point scheme for evaluating a religious totality, describing how a religious reality is comprised of "mythic language ... ritual times ... engaging of gods ... and the distinction

between pure and profane behavior.” (Paden, *Religious Worlds: The Comparative Study of Religion* 7-8) The purpose of the interpretative comparison, in this case, is to determine the extent to which religion creates the symbolized world of fault that Ricoeur describes, as this will comment most incisively on the conflict. Paden elsewhere describes how religion construes the world by assigning value and meaning “...in terms of mythic language and prototypes.” (Paden, *Interpreting the Sacred: Ways of Viewing Religion* 70) This point will likewise guide interpretation by being repeatedly demonstrated to adequately depict schemes of mutual recognition prescribed by authorities within Iran. Specifically, readers will observe a demonstrated absence of recognition directed towards women created by a set of symbolic properties that are inflicted upon them. Following an analysis of the history of Iran, which likewise echoes with remnants of Persian mythology, these properties prove very difficult to overcome because of how deeply they are inculcated into the fabric of Iranian culture.

## BACKGROUND

The historical background for Khomeini’s rise to power is likewise crucial for understanding both the sociological and symbolic aspects of his rule and its impact on women, because the cycle of conflict between the secular and religious orthodoxy began well before Khomeini’s rule. Further mythologizing the conflict, the events that led to the Iranian Revolution were, in many ways, a macrocosm of Khomeini’s personal conflict with political nemesis Reza Pahlavi, the ruling Shah who preceded Khomeini. Khomeini, a cleric and a lifelong proponent of religious orthodoxy, first implicitly takes issue with Reza Pahlavi during the rise to power of his father, Reza Khan Mirpanj, who earned the title of Sar-dar Sepah (grand marshal of the army) following a successful coup d’etat in 1921. (Hoveyda 5) Pahlavi’s father advocated western modernization for Iran, an idea which infuriated clergymen like Khomeini around the country. Pahlavi’s father received the title of Shahinshah (King of Kings) in 1925. What would soon be known as the “White Revolution” had just begun in Iran, ensuring prolonged conflict between the secularists and the orthodox for decades and decades to come.

Khomeini was urged, like many other clergymen of the era, to resist any temptation to react to the perceived threat of modernization. Still angry, Khomeini bid his time and awaited a chance to strike out at the changes and ideas

that offended him so deeply. He prepared for battle relentlessly and pursued his goals through acquisition of religious titles and credentials. By the early 1930s, Khomeini was entitled *hojat-ol-Islam* (a middle rank cleric) and by forty years of age, Khomeini had established a reputation for himself as a stern and unyielding religious figure. (Hoveyda 12-13) Pahlavi likewise continued his advancement, and was named Shah in 1941. An unassertive leader, Pahlavi was criticized heavily during the period following his ascent both for his “White Revolution” and for his political weakness. Under the first five years of Pahlavi’s rule, Iran was occupied by Allied forces. In an attempt to calm his society, Pahlavi begrudgingly enacted policies that would improve the relationships with religious leaders. Unfortunately for Pahlavi, the only religious authority that remained within Iran was Ayatollah Boroujerdi - a religious leader who would become a mentor for Pahlavi’s future nemesis.

Khomeini progressed as a religious personality, although this progress was not denoted in title. When Boroujerdi passed away, Khomeini was not selected as his successor, in spite of his dutiful efforts sustained for many years. Though frustrating for the future Ayatollah, Khomeini ultimately benefited as a lack of government attention allowed his ambition and zealotry to remain unchecked. By this point in time, 1961, Khomeini’s renown as a teacher of theology was quite considerable - and his presence was so refined and intense that the entourages he would gather entitled him Ayatollah out of respect. In the wake of his failure, Khomeini withdrew into over a year of long, intense meditation, emerging in 1963 to vigorously lead riots meticulously planned to incense clergymen so much that they would want to break entirely from the Iranian government. Warning that “Islam [was] in danger,” Khomeini intensified the conflict between clergy and government. (Moin 87-90) For this, Khomeini was arrested and exiled by order of the Shah. Consequently, Khomeini’s name became distinctly and permanently political. Likewise, the conflict between the secularists and religious orthodoxy was established as a major feature of Iranian politics and history.

The Shah’s image deteriorated between 1965 and 1975 as Pahlavi was seized by bouts of narcissism which grew in frequency and intensity as time progressed. By 1970, Pahlavi’s sense of grandiosity had been further inflated by Iranian success in the oil market. Pahlavi remained psychologically overinvested in his White Revolution plan

and further extended it to position Iran as one of five technological world superpowers. Narcissistic delusions were expressed through Pahlavi's exaltation of monarchy and hero-worship of his father, who Pahlavi often saw himself as or becoming like. Pahlavi's speech frequently included mythological reference. In his narcissism, Pahlavi often compared himself, his actions, and the progress of Iran to the triumphs of figures from Persian myths. (Hoveyda 23-26) Corruption surged within Pahlavi's royal family and the upper echelons of his government as his already tenuous grip on reality and the state of affairs within his country loosened further. By 1977, U.S. President Jimmy Carter perceived Pahlavi to be a liability and desired an overhaul of the Iranian government.

Khomeini returned to Iran as a conquering hero on February 1, 1979, following the Shah's permanent departure from his country motivated by his implicit admission of political failure only a few weeks prior. Khomeini was now viewed by many as a messianic figure who would restore spirituality to Iran and a leader who could bring freedom and justice into the country with him. (Moin 199) Upon his arrival, Khomeini delivered an emphatic speech wherein he expressed satisfaction with the nation's attainment of unity of purpose. Sternly, Khomeini here invoked the first of many symbolic images to appear during his rule: "Let us not lose [unity of purpose] by permitting demons ... to create dissension in our ranks." (Khomeini 253)

## DISCUSSION

Khomeini's proclamation reminded his attendees that Islamic faith is not derived from interpretation. This is a critical feature of Islam as virtually all worshipers practice with this critical concept in mind. As Bouhdiba reminds his readers within *Sexuality in Islam*, "The Quran is the divine word, kalāmu Allah, the universal logos, pure idea." Departure from the text's traditions constitutes direct defiance of God in the eyes of other practitioners. "... the ideal behavior ... conforms to the sacred Word." Understanding Islam requires that one understand how its internal function is a manifestation of orthodoxy. Regression towards prevailing cultural rules is therefore a consequence of typical Islamic operation, and is not limited to special variants of fundamentalist Islam. (Bouhdiba 1) To grasp what Khomeini is suggesting, one must necessarily reason symbolically and understand how and why Pahlavi may justifiably be viewed as a demonic disruptor of cultural unity. This is unambiguously an exercise in creating

a totality of fault, and it distinctly satisfies the four necessary conditions established by Paden, which justifies describing Khomeini's world as a religious one. This totality of fault would soon be inflicted upon the women of Iran. Khomeini's proclamation therefore represents an end for cultural recognition of Iranian women and the beginning of an objectifying rule that would perpetuate socioeconomic disparity for decades.

These cultural rules impose many regulations upon worshipers, but perhaps no life is more influenced than the life of a woman. And indeed, Khomeini's revolution sought ought and often achieved maximum adherence to the holy Word. For example, women of Khomeini's era experienced marked changes in legal rights with regards to marriage. Addressing women within days of becoming the supreme leader of Iran, Khomeini himself describes the necessary conditions for justifying divorce. "A woman can stipulate that if her future husband turns out to be of corrupt moral character, or if he mistreats her, she would possess the right to execute a divorce." He continues: "Similarly, [Islam has granted the right to divorce] to women, on condition that parties stipulate at the time of marriage." (Khomeini 264) Perhaps most insidious of all, Khomeini describes the loss of rights to these women in a deceitful way, as though he were proposing a generous, altruistic expansion of rights. In reality, these rights are inaccessible without prescience or before suffering at least one bout of abuse.

Khomeini reversed many of the Iranian social reforms enacted by Shah Pahlavi. For example, Khomeini prohibited women from becoming judges. Opportunities for women to find other work were likewise drastically reduced. He imposed laws which prohibited married women from attending universities while simultaneously reducing the minimum age for marriage eligibility to thirteen. Mandatory observance of the dress code was likewise strictly enforced. Leila Badawi reminds us that "the relationship between Muslim society and Muslim law ... is complex and subtle." Muslim laws adapt to best endorse the atmosphere of the immediate culture or society in which they are used. The Quran guides legal theory, but does not express or define it directly in the same way it rigidly defines Islamic practice, faith, and ritual. (Holm and Bowker 108-110) Definitions and rules are created on the basis of cultural conditions and desires. It is therefore unsurprising that Khomeini's religiously orthodox and totalitarian administration endorsed and enforced each of these extreme changes. What is surprising is that Khomeini's legal phi-

losophy existed openly in direct defiance of a fundamental tenet of Islam: that all men and women are equal before God. Even this outright blasphemy in a religious society was met with virtually no resistance, suggesting that Khomeini was successful in his efforts to restrict women to lives of sexual service and childbearing.

Khomeini's life came to an end in 1989. He was succeeded by Ali Khamenehi, whose rule is described by Mehdi Moslem as "modest in significance at best." (Moslem 88) The absence of a charismatic and forceful figure like Khomeini from Iran's supreme office changed the political dynamic of the country, and arguably for the better. A future leader, President Rafsanjani, capably minimized the impact and influence of extremism within Iran during the nineties. Rafsanjani earned great internal acclaim for his success with "economic liberalization" policies and achievement of relative balance of power across the major factions of Iran within political offices. (Moslem 142-143) By the turn of the millennium, factional struggles were reduced to "power struggle[s] among competing ideological blocs" - not ideal, but certainly preferable compared to another Iranian Revolution. Unfortunately, these political and economic improvements have yet to make a broad impact upon the gender inequities of Iran. In the course of twenty years - one generation - we still observe that certain categories of gender inequities in Iran are surprisingly unresponsive to the political and economic environment. The presence of this generation gap implies that the default mode of recognition, mutual recognition, has been replaced with a different default perspective of what and who a woman is.

It isn't easy to detect this problem. At first glance, statistics appear to be a pleasant surprise. Joni Seager's *Penguin Atlas Of Women In The World*, a recent and comprehensive statistical survey of women's rights, appears to suggest considerable improvement for Iran within the last twenty years. Particularly impressive are Iran's achievements in education: twenty years ago, Ayatollah Khomeini strongly discouraged schooling for women. Presently, 95% of women attend primary school. More surprising and commendable is that roughly half of all Iranian university students are women. Not only does this suggest balance within the educational system, but it also depicts a strong educational infrastructure ranging from primary school through (at least) undergrad. (Seager) Although overall literacy is not ideal, recall that Khomeini vowed to radicalize Iranian schools with what he deemed proper Islamic

traditions less than thirty years ago. All of this education leads to work that is adequate, but not especially lucrative: about 35% of women in Iran are employed, and they earn roughly 80% of the salary a man in the same position earns. (Seager) In this regard, we can see that educational, and to a lesser extent, professional concerns of women are very responsive to economic success and neutralization of extremism.

## CONCLUSIONS

The historical review of Iranian politics, legal practice, and sociology presented within this paper enable one to conclude that Iran is a continuous participant in its own two-faction civil war which rages on within a symbolic dimension, even when guns are silent. Orthodoxy and secularism have been locked into battle for nearly one hundred years of Iran's recent history, expressing themselves through the conflicts of leaders (Khomeini versus Pahlavi) and the power struggles of post-revolutionary factions (guardians versus progressives). Political and economic instability exacerbate this problem considerably. Even a ruling party that adopts beneficial, well-planned, and favorable policy may be overthrown by an unforeseen economic calamity. As a country, Iran struggles to remain internally stable, economically solvent, and politically consistent. Even though Iran has managed national conflicts admirably within the past five years, ideological discrepancies on the local level continue to pose a threat. Some Iranians resist additional attempts at "white revolutions" while other Iranians support unrelenting modernization. Sustained symbolic conflict has obscured Iranian cultural identity.

Women of Iran are in a unique position because they unwillingly mediate this symbolic conflict. Islamic faith at its core explicitly and literally describes men and women as equal before God. Women are easily understood to be at the foundation of Islam: primarily in a mythological or religious sense, but to only a lesser extent based upon the societal improvements Seager's data reflects. Marriages, as well as sexuality within marriage, are considered noble pursuits within Islam. "The best way of realizing the harmony intended by God," explains Bouhdiba, "is for a man to assume his full masculinity and for a woman to assume her full femininity." (Bouhdiba 30) Legally speaking, sex is condemned within Islam when it occurs out of marriage. A yet more noble pursuit within Islam is motherhood. Mothers, especially mythological mothers identified in primary texts like the Quran, are the subject of immense

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reverence. Obviously, this particular type of reverence is reserved for women exclusively. Even the word Allah is grammatically understood to be simultaneously masculine and feminine to suggest deific transcendence. By making either sex inferior, the glory of such transcendence would be lost. By Badawi's account, no primary Islamic text identifies any sex as inferior.

These descriptors could reasonably be seen as the defining essence of womanhood within the Islamic totality, especially during Khomeini's Revolution. Indeed, women are understood symbolically as lovers and mothers by conventional Islam. Tragically, while these symbols are designed to exalt women, Islamic laws were subverted such that the symbols appear to be implemented only to objectify women. The equality and symmetry between sexes advocated by the Quran is unquestionably overlooked in favor of a simpler approach which habituates the recognition of women as sexual objects.

Statistics support this thesis. Motherhood statistics report a low value of 2.1 childbirths per mother. Contraceptive usage nears 75% in Iran, which is innocuous in its own right... until one considers that Iran has neither signed nor ratified the CEDAW bill, imposes restrictions on how women move and dress, refuses to report or collect rape statistics, and describes honor killings as a "regular occurrence". Taken into consideration alongside the fact that Iran reports one of the lowest average ages for marriage - between 20 and 23 years old - it becomes empirically obvious that freedoms or purposes outside of what are understood to be a woman's symbolic purposes are almost entirely illusory. (Seager) Iran's increased success in educating and employing women effectively casts a smoke-screen over an insidiously abusive and theologically empowered patriarchal tyranny which continuously improves its capacity to systematically rob women of their rights. This tyranny is not a component of any one regime, revolution, or dictatorship, but is instead a byproduct of perpetuated conflicts in Iran which force, among other things, characteristics of Islamic culture to fight to survive. Each

battle won strengthens the grasp these abusive cultures have on society. And as Khomeini proved to Iran as he returned in 1979, no defeat is necessarily permanent. Unfortunately for these women, a change in government will probably never imply a change in attitude or perspective.

Describing the net effect of these statistics as a trivialization of the feminine, Bouhdiba observes that the derealization of female status within Islamic cultures constructs for women a "double role as objects of pleasure and of producers of children." (Bouhdiba 214) Within his speeches and legal policy, scholars can easily observe Khomeini's willingness and eagerness to implement laws in such a way that they force women to be trapped in the symbols ascribed to them. The damage done by this corruption has already been computed by Seager and many other sociologists; it goes without saying, but the costs to women are immense and nearly defy imagination.

Although Paul Ricoeur claims that the symbol gives rise to thought, the symbolic dimensions of feminine conflicts in Iran offer a fascinating counterexample. In many ways it can be observed that the symbolic essences of femininity have been repeatedly used against the women of Iran, particularly since Khomeini's revolution. The symbol is effectively implemented opposite as to how it might naturally be employed; now existing instead to promote the disintegration of mutual recognition. Loss of mutual recognition implies a very specific sort of dehumanization and loss of freedom, one which renders woman into an object which exists for primary functions of sex and childbirth and one which is so sufficiently objectified that the woman loses her identity and is thoughtlessly ascribed a purpose. For feminine conflicts within Iran to achieve genuine resolution, women will need to safeguard and empower their capacity for mutual recognition as part of a larger project of reclaiming their symbolic essence from a society which wields it like a weapon against them. Within the religious totality produced by Iran's endless conflicts, rising to this challenge may take generations of struggle.

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- 3) No previous editing experience required, and all majors are welcome
- 4) You can get involved as a reviewer, copy editor, member of the advertising or design teams, or any combination of the four

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# THANKS TO:



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# *Media Board*



Media Board is a student group comprised of representatives from each of Case's student media organizations. It promotes responsible forums of student expression in the various media.

Member organizations include The Athenian (Humor Magazine), Case Reserve Review (Literary Magazine), Discussions (Undergraduate Research Journal), Engineering & Science Review, Film Society, Ignite TV, The Observer, Retrospect (Yearbook), and WRUW 91.1 FM.

Since these groups are all student run, they always welcome new members! Any interested students should check out the Media Board website for more information at

<http://studentaffairs.case.edu/groups/mediaboard/>.

Any media oriented student group interested in becoming a member of Media Board is welcome to apply for membership and should contact the Media Board Chairman at [mediaboard-chairman@case.edu](mailto:mediaboard-chairman@case.edu).

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