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Self-efficacy, Psychosomatic Illness, and Psychopathology

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"The mind and the body cannot be meaningfully

separated in matters of health and illness."

-Shelley E. Taylor, 1996

Foreword

The impetus for this study was the dissertation proposal entitled *Physiological Reactivity to Mental Imagery as a Construct Relating to Somatization, Psychopathology, and Hypnotizability* by then-doctoral degree candidate in Clinical Psychology, Jeff Borckardt.

In the spring of 2001, Dr. Borckardt gave me the opportunity to contribute to his dissertation study as a lab assistant under the Psychology 489 *Supervised Research* rubric. Responsibilities included administering a questionnaire packet, setting up and running physiology and imagery task equipment, running a computer program designed to record physiological reactivity and recovery, attending lab meetings, and submitting a brief response essay discussing experiences in the lab. In addition, I was permitted to include a self-efficacy scale in the questionnaire packet.

To summarize, I was responsible for conceptualizing self-efficacy as a possible correlate of somatization and for reviewing the literature to find a self-efficacy scale; every other aspect of the actual experiment was a product of doctoral degree candidate Jared Younger and Dr. Borckardt's design and organization.

Upon completion of the study, Dr. Borckardt met with me on several occasions to guide me through data analysis and interpretation of the statistical results utilizing SPSS. Finally, I authored this paper in partial fulfillment of the degree requirements for a Bachelor of Arts in College Scholars at the University of Tennessee, Knoxville.

Special thanks to Dr. Jeff Borckardt, Dr. David Tandy, Dr. Rajan Mahadevan, Dr. Rachel Piferi, Dr. John Malone, and Dr. Warren Jones.

Contents

Introduction

The relationship between psychological and physical health is strongly evidenced. Psychosomatic illnesses, for example, are a class of health disturbances that stem solely from psychosocial variables; there is no known biological root to the problems although the illnesses are real (Taylor, 1999d). One psychosocial variable that contributes to health is self-efficacy. Self-efficacy is defined as "learned expectations that one is capable of carrying out a behavior or producing a desired outcome in a particular situation" (Feldman, 2001). According to Bandura (1977), these expectations stem from past experiences (personal and vicarious) and personal attributions of success to internal (skill) versus external (chance) causes. Verbal persuasion (other's assessments of one's abilities) and emotional arousal also contribute to self-efficacy beliefs (Bandura, 1986). In summary, self-efficacy reflects one's expectancies regarding control over future events, as opposed to attributions, which are one's beliefs about control over past events (Maddux, 1999).

Self-efficacy has been conceptualized from a variety of perspectives. For example, self-efficacy has been characterized as nothing more than one's generalized confidence that his or her behaviors will bring about outcomes (McClelland, 1985). Others, such as Bandura, hold that self-efficacy is a more distinctive, complicated construct. Bandura (1986) conceptualizes self-efficacy as a component of a broader personality theory called social cognitive theory. This model views the study of personality from a highly social perspective; it is

the study of one's social cognitions (beliefs and attitudes about people) combined with one's interpersonal behaviors. The theory holds two main tenets: 1) the most influential determinants of our behavior are cognitive mediators: beliefs about our environment and our behaviors and 2) social cognitions and social behaviors are learned through observation of others. Bandura is perhaps the most prolific writer on the construct, having engaged in over 20 years of self-efficacy research (Bandura, 1997). Yet, recently published literature suggests that self-efficacy is more of an internal characteristic, perhaps less influenced by social factors than was previously believed.

The study of efficacy evolved from 1950's research on competence, particularly in the workplace (Bowers, 1951). Over time, research shifted to include individuals' personal expectations of generalized competence. Albert Bandura's 1970's-1980's series of articles on self-efficacy (and related constructs) popularized the concept as a general characteristic integral to behavioral change (Bandura, Jeffery, & Gajdos, 1975; Bandura, Adams, Hardy, & Howells, 1980). More specifically, Bandura clearly expounded on the importance of perceptions of one's self-efficacy in the decision to initiate a behavior, the effort expended on the behavior, and persistence in the face of adversity. He theorized that self-*in*efficacy beliefs are needlessly limiting (Bandura, 1997). Mook (1996) likens generalized, pervasive self-inefficacy to learned helplessness schemas. He also summarizes Bandura's assertions regarding the relationship between self-efficacy and behavioral therapy: certain

forms of behavioral therapy (systematic desensitization, goal setting, and mental rehearsal) directly address self-inefficacy beliefs.

Much of contemporary self-efficacy research stems from Bandura's work, including the widely-used Self-Efficacy Scale (SES) (Sherer, Maddux, Mercadante, Prentice-Dunn, Jacobs, & Rogers, 1982). (See **Appendix A** for a partial list of other general self-efficacy scales and health-related self-efficacy scales.) Sherer and his colleagues intended to develop a measure of self-efficacy that was not situation, nor behavior-specific. Instead, it was designed to measure an individual's general expectancies of self-efficacy (Sherer & Adams, 1983). The scale breaks down into two sub-scales: general and social self-efficacy. In studies of validity, the general sub-scale has been shown to be more useful than the social sub-scale (Sherer, et al., 1982; Sherer, et al., 1983). General self-efficacy has been associated with personality factors such as internal control, social desirability, ego strength, interpersonal competency, self-esteem, being employed, quitting fewer jobs, being fired less, educational level, military rank (Sherer, et al., 1982), adjustment, assertiveness, and masculinity (Sherer, et al., 1983).

A shift in healthcare trends towards lifestyle management as preventative care set the stage for research on self-efficacy in terms of health behaviors (Maddux, 1999). Self-efficacy beliefs contribute significantly to whether a person practices positive or negative health behaviors (Taylor, 1999a).* For example, a study done by Rimm and Jerusalem (1999) showed that a strong sense of

* Other contributors, according to Taylor, include one's perceptions of the severity of the health threat, vulnerability to the threat, and efficacy, desirability, and convenience of prescribed treatment.

personal efficacy is related to better physical health. Also, evidence has shown that perceptions of self-efficacy play a role in coping with acute disorders and treatments, as well as chronic illnesses and the resulting long-term effects (Taylor, 1999b). Seligman (2000) also espouses the positive impact that efficacy can have on one's quality of life, specifically health. Some evidence exists in support of self-efficacy as a mediator between stressful events and physical well being (Marlow, 1998).

What about the effects of self-efficacy beliefs on psychosomatic illnesses? The acceptance of psychology as a component of all physical health issues (Engel, 1986) led to the development of scales such as the Symptom Checklist-90-Revised (SCL-90). It consists of 90 items that form nine subscale factors of psychopathology, including "somatization" (Derogatis & Lazarus, 1994). Recently, a symptom checklist was developed to address the interaction between psychological phenomena and somatic complaints. The Somatization of Emotional Conflict Scale (SECS; Borckardt, Younger, Adams, & Nash, 2000) allows a participant to attribute an affective component to the presence of somatic complaints, which standard symptom checklists do not do.

Currently, there is limited research on the relationship between general (trait-related) self-efficacy measures and somatization as measured by the SCL-90. However, there is a small body of literature evidencing a relationship between specific (state-related) measures of self-efficacy and SCL-90. In one study, self-efficacy scores specific to withstanding alcohol relapse increased, while SCL-90 scores decreased after a six-week coping skills training program in

chronic alcohol-dependent inpatients (Vogel, Eriksen, & Bjoernelv, 1997). In another study, Southeast Asian refugees living in the United States exhibited a negative relationship between self-efficacy in coping with stress, personal mastery (see Pearlin & Schooler, 1978), and the Somatization sub-scale of the SCL-90 (Yee, 1995). Finally, in research on mental health after a natural disaster (in this case, the volcanic eruption of Mt. St. Helens in 1980), general self-efficacy (see Coppel, 1981) was a predictor of mental distress, depression, and somatization one and three years after the disaster in victims of varying degrees of loss due to the disaster (Murphy, 1988). However, these three mental health outcomes were derived from the coding of interviews, and not the result of direct measurement by a scale such as the SCL-90.

The purpose of the present study was to examine the relationship between the Self-efficacy Scale (Sherer, et al., 1982) and somatization. As aforementioned, there is limited information on the role of general self-efficacy in somatization as measured by the SCL-90 . Also, prior to the present study, there was no research on the effects of self-efficacy on somatization as measured by the SECS. It was hypothesized that the General sub-scale of the Self-efficacy Scale would show a strong negative relationship with somatization. Also, it was hypothesized that the Social sub-scale would show either a slight negative correlation or no significant correlation at all with somatization. Due to the positive correlation between the Somatization sub-scale of the SCL-90 and the SECS (see **Materials**), it is further hypothesized that self-efficacy will relate similarly to the two measures of somatization.

I'd also mention HR & SRN conductance in Results - Hypotheses.

Methods: Participants

Participants were 70 undergraduate students enrolled in Introductory Psychology classes at the University of Tennessee at Knoxville. The sample was 88.6 % Caucasian, 5.7 % African-American, 2.9 % Asian, 1.4 % Hispanic, and 1.4 % Other. There were 34 males and 36 females with a mean age of 19.59 years. Participants volunteered in the study, and received extra credit for their involvement.

Methods: Materials

Self-efficacy Scale

Self-efficacy was assessed by the Self-efficacy Scale (SES; Sherer, et al., 1982). The SES consists of 23 items, which load into two sub-scales: General Self-efficacy (17 items) and Social Self-efficacy (6 items). Examples of items include "When I make plans, I am certain I can make them work" (general), "One of my problems is I cannot get down to work when I should" (reversed item, general), "It is difficult for me to make new friends" (reversed item, social), and "If I see someone I would like to meet, I go to that person instead of waiting for him or her to come to me" (social). Participants rated agreement with each item based on a 14-point Likert scale, ranging from "strongly agree" (1) to "strongly disagree" (14). In the present study, the SES demonstrated acceptable levels of internal-consistency reliability, with coefficient alpha measuring .86 and .66 for the General and Social self-efficacy sub-scales, respectively. Moreover,

acceptable construct validity was demonstrated with correlations ranging from .20 to .55 with the Internal-External (I-E) Control Scale, the Personal Control subscale of the I-E Scale, the Marlowe-Crowne Social Desirability Scale, the Ego Strength Scale, the Interpersonal Competency Scale, a Self-esteem Scale, certain sub-scales of the Minnesota Multi-phasic Personality Inventory (MMPI), the Rathus Assertiveness Schedule, and the Masculinity and Femininity scales of the Bem Sex-role Inventory (Sherer, et al., 1982; Sherer, et al., 1983). (See **Appendix B**.)

Symptom Checklist-90

Psychopathology was measured with the Symptom Checklist-90-Revised (SCL-90; Derogatis, et al., 1994). The SCL-90 consists of 90 items, which load into nine sub-scale factors, such as "depression," "anxiety," "hostility," and "somatization." Examples of symptoms include "headaches," "feeling that most people cannot be trusted," "crying easily," and "having urges to break or smash things." In addition, the items load into three summary factors: the Global Severity Index, Positive Symptom Total, and the Positive Symptom Distress Index. Participants rated how much each symptom "distressed or bothered" them in the preceding seven days. Rating was based on a 5-point Likert scale, ranging from "not at all" (0) to "extremely" (4). The SCL-90 has demonstrated acceptable levels of internal-consistency reliability (alpha ranging from .77 to .90), as well as test-retest reliability (coefficients ranging from .68 to .90) with a one-week and a ten-week lag between administrations (Derogatis, Rickels, &

Rock, 1976; Horowitz, et al., 1988). The SCL-90 has also demonstrated acceptable convergent-discriminant validity with correlations ranging from .40 to .92 with the Middlesex Hospital Questionnaire and the Clinical, Wiggins, and Tryon sub-scales of the MMPI (Derogatis, et al., 1976). (See **Appendix C**.)

Somatization of Emotional Conflict Scale

Somatization was also measured using the Somatization of Emotional Conflict Scale (Borckardt, et al., 2000). The SECS is comprised of 42 somatic complaints, with two male-specific and two female-specific items. Therefore, there are 40 possible symptoms for each participant. Some examples of the items include "headache," "vomiting," "muscle tension," "fatigue or weakness," and "numbness or tingling." Participants indicate the frequency of symptom occurrence, the severity (or intensity) of the symptom, and whether the symptom is related to an emotional state or states (anxiety, depression, and/or anger). Frequency and severity are rated separately on 5-point Likert scales (0-4). For frequency, the scales are anchored by "I have never had this problem" at zero, and "more than four times a month" at four. For severity, the scales are anchored by "never a problem at all" at zero" and "huge negative impact on my life" at four. Finally, participants indicate (by checking appropriate columns) if they have each symptom when they feel "stressed, anxious, frightened, or worried," "depressed, lonely, empty, or sad," and/or "angry, irritated, mad, or agitated." Acknowledgement of emotional contribution to symptomology (AEC) is the total number of check marks for all the symptoms on the list. (The total

possible is three per symptom, or 120 total.) The SECS demonstrated acceptable levels of internal-consistency reliability in this study (coefficient alpha = .88). Additionally, SECS frequency and severity scores correlate positively with the somatization sub-factor of the SCL-90, with coefficients ranging from .46 to .70 (Borckardt, *et al.*, 2000). (See **Appendix D**.)

Physiological Measurement

Skin conductance level (SCL) was measured by a Coulbourn Instruments Lab Linc V Skin Conductance Coupler (model V71-23). Bipolar placement was used with electrodes placed on the medial phalanx of the first and second fingers of each participant's non-dominant hand (Andreassi, 2000).

Heart rate (HR) was assessed with a Coulbourn Instruments Lab Linc V Tachometer (model V77-26). Sternal leads were utilized with a positive electrode lead placed over each participant's manubrium and a negative electrode place over the xyphoid process.

Blood pressure (BP) was measured with a Diametrics arm cuff digital blood pressure monitor, using a hospital grade Critikon Dinamap Vital Signs Monitor (model 1846 SX).

Methods: Procedure

Upon arrival to complete the study, participants read and signed an informed consent form. (See **Appendix E**.) Participants were then asked to complete the SES, SECS, and the SCL-90.

They were then taken individually to a small, sound-resistant room containing a comfortable chair and a TV/VCR. Participants were seated in the chair, and trained lab assistants (see **Appendix F**) attached physiological measurement leads for SCL, HR, and BP to the participants. (Prior to the participants' arrival, the leads were run through a small opening in the wall and were plugged into the physiological measurement equipment contained in the adjacent room, where the lab assistants monitored the equipment, recording physiological responses. A sound monitor was also set up between the experiment room and the recording room.) The assistants tested the BP cuff, and checked the SCL and EKG readings to ensure proper hook-up of all leads.

Next, participants were asked to relax for ten minutes while watching a video of underwater scenes and listening to relaxing music in order to establish a physiological baseline (Andreassi, 2000).

After ten minutes, an assistant returned to the experiment room to administer a cold-pressor task. Participants were asked to place their right hands in a circulating ice bath for 40 seconds (although they were permitted to remove their hands from the ice bath at any time if they felt too much discomfort). Physiological measures (SCL, HR, and BP) were recorded.

Participants were then given another ten-minute relaxation period, exactly the same as the first, in order to re-establish baseline. Physiological recovery was monitored and recorded during this time.

Then, participants were asked to imagine, as vividly as possible, placing their right hands into the ice bath as they did earlier in the experiment. As with

the actual cold-pressor task, physiological measures were recorded. At the completion of the imagery task, measurement leads were removed from the participants.

At the completion of the study, changes in physiology measures were computed. Lastly, the participants were thanked and debriefed.*

Results and Discussion

Table 1. SES Descriptive Statistics and Reliability Analysis

	N of Cases	N of Items	Mean	Standard Deviation	Alpha
General	70	17	162.21	29.22	.85
Social	70	6	56.77	12.16	.66

Table 1 summarizes descriptive statistics for the General and Social sub-scales of the Self-efficacy Scale. For both sub-scales, data from 70 participants were obtained. The means for the group were 162.21 (s.d. = 29.22) on the General sub-scale and 56.77 (s.d. = 12.16) on the Social sub-scale. ***Table 1*** also includes reliability analyses for the sub-scales, with alpha levels of .85 for the General sub-scale and .66 for the Social sub-scale. This compares favorably with the results of the scale's authors, Sherer, et al., (1982): .86 and .71, respectively.

* Results of imagery data will not be discussed within the scope of this paper. However, physiology data (as it relates to self-efficacy) will be briefly explored.

Table 2. SECS Descriptive Statistics and Reliability Analysis

	N of Cases	N of items	Mean	SD	Alpha
Frequency	60	38	28.18	16.09	.88
Severity	44	38	24.11	14.67	.88
Emotional Contribution	55	38	28.51	24.88	.87

Table 2 characterizes the data from the three factors of the Somatization of Emotional Conflict Scale: Frequency, Severity, and Emotional Contribution. Results were summarized from 60, 44, and 55 participants for the three respective factors. For reliability analyses, the four gender-specific items were removed from the 42-item scale, leaving a total of 38 items. Mean scores for the group were 28.18 for Frequency, 24.11 for Severity, and 28.51 for Emotional Contribution, with Emotional Contribution showing the greatest variability (s.d. = 24.88; Frequency s.d. = 16.09; Severity s.d. = 14.67). The relatively new scale evidenced acceptable levels of reliability for its three factors (alpha = .88 for Frequency, .88 for Severity, and .87 for Emotional Contribution). This is consistent with results from preliminary studies (alpha ranging from .84 to .87 across various studies; Borckardt, et al., 2000).

Table 3. **Regression Model for the ~~General~~ SES, the SECS, and the SCL-90**

	B	Beta	T	Significance	Adjusted R^2
(Constant)	66.127	---	2.743	.008	.409
General Self-Efficacy	-.294	-.225	-2.232	.029	
SECS	.721	.556	5.608	.000	

Table 3 shows the results of a regression model applied to the three scales. In this model, the General SES and the SECS are the independent variables and the SCL-90 (total pathology) is the dependent variable. The General SES and the SECS predict approximately 41 % of the variance in the SCL-90. Perhaps this surprising result is due in part to the role of self-efficacy in one' self-concept. More specifically, meta-analyses have suggested that generalized self-efficacy, self-esteem, locus of control, and emotional stability (or low neuroticism) are loaded into *one* factor, and are indicators of a *single* latent personality construct. Also, it has been asserted that emotional stability is the underlying construct of the four trait measures, which, collectively, have been coined "core self-evaluation" (Frye, 2001; Judge & Bono, 2001). Furthermore, low emotional stability (or neuroticism) is positively correlated with overall SCL-90 scores (Huang, 2001). Assuming this inextricable linkage between generalized self-efficacy and emotional stability, it is an easy step to understanding the role of self-efficacy in psychopathology.

Table 4. Correlations between the SES, the SECS, the Somatization Sub-scale of the SCL-90, and SCL-90 Total Pathology

	Freq. and Sev. Of Somatic Symptoms (SECS)	Emotional Contribution (SECS)	Freq. (SECS)	Sev. (SECS)	Somatization (SCL-90)	Total Pathology (SCL-90)
General Self-efficacy	-.225	-.161	-.242	-.189	-.188	-.361**
Social Self-efficacy	-.071	-.230	-.082	-.048	.080	-.095

**Correlation is significant at the .01 level (2-tailed).
*Correlation is significant at the .05 level (2-tailed).

So, somatization is not driving this relationship

Table 4 summarizes correlations between the SES sub-scales, the SECS, the SCL-90, and the Somatization sub-scale of the SCL-90. It was predicted that a negative relationship would be found between the SES and both measures of somatization (the SECS and the Somatization sub-scale of the SCL-90). The hypothesis was not supported by the data; neither the General nor the Social sub-scale was significantly correlated with any sub-scale of the SECS or the Somatization sub-scale. However, all correlations were in the expected direction (with one extremely weak exception: social self-efficacy and the Somatization sub-scale of the SCL-90; r = .080).

May be due to small N

Interestingly, general self-efficacy (but not social self-efficacy) was found to be significantly negatively correlated with total psychopathology as measured by the SCL-90 (r = -.361), which is consistent with the related literature.

Table 5. Correlations between the SES and the SCL-90 Sub-scales

	General Self-efficacy	Social Self-efficacy
Somatization	-.188	.080
Obsessive-Compulsive	-.289*	-.050
Interpersonal Sensitivity	-.378**	-.287*
Depression	-.405**	.059
Anxiety	-.299*	-.090
Hostility	-.240*	.029
Phobic Anxiety	-.389**	-.271*
Paranoid Ideation	-.304*	-.290*
Psychoticism	-.252	-.181

**Correlation is significant at the .01 level (2-tailed).
*Correlation is significant at the .05 level (2-tailed).

Table 5 summarizes the relationships between the sub-scales of the SES and the SCL-90. Multiple regression was not performed on these data due to excessive shared variance between independent variables (multicolinearity). In other words, there were unacceptably high levels of inter-relatedness of the SCL-90 sub-scales ($r=\sim.85$, $p<.01$).

General self-efficacy showed significant negative correlations with seven of the nine sub-scales: obsessive-compulsive ($r = -.289$, $p<.05$), interpersonal sensitivity (-.378, $p<.01$), depression (-.405, $p<.01$), anxiety (-.299, $p<.05$), hostility (-.240, $p<.05$), phobic anxiety (-.389, $p<.01$), and paranoid ideation (-.304, $p<.05$). The strong correlation between general self-efficacy and

depression supports a substantial body of current research (Martin, Flett, Hewitt, & Krames, 1996). Less is known about the interactions between self-efficacy and the other sub-factors. General self-efficacy was not significantly related to somatization (contrary to the hypothesis) or psychoticism.

Social self-efficacy was significantly related to three of the sub-scales: interpersonal sensitivity (-.287, $p<.05$), phobic anxiety (-.271, $p<.05$), and paranoid ideation (-.290, $p<.05$). Interestingly, it could be argued that of the nine sub-scales, these three psychopathologies are most closely tied to social interaction. In summary, the results support the existing position that the Social sub-scale, while note-worthy, exhibits fewer significant relationships with other constructs than the General sub-scale (Sherer, et al., 1982, 1983).

Table 6. Correlations between the SES and Heart Rate Reactivity

	Heart Rate Reactivity
General Self-efficacy	.097
Social Self-efficacy	-.409*

**Correlation is significant at the .01 level (2-tailed).
*Correlation is significant at the .05 level (2-tailed).

Table 6 Shows the relationship between scores for the SES sub-scales and heart rate reactivity, as defined by the proportion change in heart rate between baseline and the actual cold-pressor task (not the imagined task). General self-efficacy and reactivity showed a non-significant relationship. Surprisingly, social self-efficacy showed a significant negative correlation with heart rate reactivity on the cold-pressor task. This result was not predicted.

Moreover, current research on this subject is conflicting (for example, see Gerin, Litt, Deich, & Pickering, 1995, 1996). Therefore, further exploration is necessary to confirm this relationship.

Table 7. Correlations between the SES, Sex, Age, Sick Days, and Smoking

	Gender	Age	Freq. of Illness	# Cigarettes/Day
General Self-efficacy	.127	.199	-.274*	.099
Social Self-efficacy	-.115	.082	-.053	.361**

**Correlation is significant at the .01 level (2-tailed).
*Correlation is significant at the .05 level (2-tailed).

Table 7 shows correlations between the self-efficacy sub-scales, gender, age, frequency of physical illness (e.g., cold or flu symptoms) per year, and number of cigarettes per day. There were no significant relationships among self-efficacy, gender, and age. Yet, general self-efficacy was negatively related to frequency of illness (r = -.274). Although it has not been explicitly researched, self-efficacy is very closely related (at least in theory) to hardiness; at the heart of both constructs is personal perception of control (Maddux, 1999). Perhaps self-efficacy, like hardiness, mediates stress and common illnesses (Kobasa, 1979; Kobasa, Maddi, Puccetti, & Zola, 1985): highly self-efficacious may be less vulnerable to illness in times of stress than those with low self-efficacy.

Also, social self-efficacy was positively related to the number of cigarettes smoked per day (r = .361). This speaks to the salience of the social aspect of smoking. Perhaps the anxiolytic properties of smoking combined with the implicit

membership status of identifying one's self as a "smoker" accounts for the difference in social self-efficacy between smokers and non-smokers.

Conclusion

Arguably, the data presented in ***Table 3*** are the most interesting findings of the research; the SES and the SECS predict approximately 41 % of the variance for the SCL-90. Future research could explore the mechanism through which this relationship occurs. A good staring point could be performing statistical analyses of the ability of the General SES scores and each of the three sub-scales of the SECS scores to predict scores for each of the nine sub-scales of the SCL-90.

Furthermore, future research could examine which emotions an individual experiences while under distress, as measured by the SCL-90. Assuming general self-efficacy is an indicator of emotional stability, and taking into account the attribution of emotion in the SECS, it is reasonable to infer that the SCL-90 also is measuring, albeit unintentionally, a contribution of emotion in psychopathology.

Afterword

The construction and validation of task or behavior specific scales is integral to understanding the influence of self-efficacy on psychosomatic illness. By definition, self-efficacy is a trait—not a state—measuring beliefs about one's ability to carry out a task or perform a behavior. Undoubtedly, self-efficacy levels

change, depending on the task or behavior. To measure these beliefs *in general* is questionably close to measuring self-esteem or self-confidence. Yet, even self-esteem, while generally a stable personality construct, can be drastically changed-temporarily or permanently-by particular events (e.g., chronic illness) (Taylor, 1999b). The same is true for self-confidence. Furthermore, general self-efficacy measures were intended to be applied in situations in which the individual has little or no information about the situation (Sherer, et al., 1982). Thus, self-efficacy becomes a measure of one's perceived adaptability to new or unfamiliar experiences. Finally, the instant the requirements of the situation (in other words, which tasks or behaviors need to be performed) become known, one's self-efficacy could change drastically from a general measure. Thus, the general measure loses its applied value, and therefore, is non-predictive.

In summary, self-efficacy is a highly variable situation-dependent construct. There is no single set of behaviors that are universally representative of self-efficacy. We cannot accurately measure that which cannot be conclusively defined. To this extent, the study general self-efficacy is limited, though not useless, in its applied value. Self-efficacy measures specific to a task, behavior, or schema of behaviors will be more predictive of future behaviors, and thus, more informative. In addition, a measure that focuses on a highly salient component of one's self-identity (e.g., one's occupation) will be more informative than a general measure.

Appendix

A: General and Health-related Self-efficacy Measures

B: The Self-efficacy Scale

C: Symptom Check-list-90

D: The Somatization of Emotional Conflict Scale

E: Informed Consent

F: Imagery and Physiology Protocol

Appendix A:

General and Health-Related Self-efficacy Measures

Recently developed measures of general self-efficacy are: Generalised SES (Gillespie, Peltzer, & MacLachlan, 2000 citing R. Schwarzer, 1993), Estonian SES (Rimm & Jerusalem, 1999), and General SES (Leganger, Kraft, & Roysamb, 2000).

Health-related self-efficacy scales include: Child Birth Self-efficacy Inventory (Lowe, 1993), Headache SES (Martin, Holroyd, & Rokicki, 1993), Death SES (Robbins, 1994), Exercise SES (Mince, 1995), SES for Schizophrenic- Spectrum Disorders (Bender, 1995), Health Teaching SES (Cuzzi, Spitzer, Rutter, Chernack, & Rosenberg, 1997), Physical SES for the Elderly (Langan, 1997), Abstinence SES (Sherman, 1998), Osteoporosis (Horan, Kim, Gendler, Froman, & Patel, 1998), Breastfeeding SES (Dennis & Faux, 1999), Diabetes Specific SES (Edwards, 1999), Rheumatoid Arthritis SES (Nazaroff, 1999), Treatment Completement SES (L'Abbe, 1999), Condom Use SES (Barkley & Burns, 2000), HIV SES (Zamboni, Crawford, & Williams, 2000), ES (Everett, Price, Telliohann, & Durgin, 1996), Prostate Cancer Screening SES (Boehm, Coleman-Burns, Schlenk, & Funnell, 1996), Cancer SES (Beckham, Burker, Lytle, Feldman, & Costakis, 1997), Hospital Social Work SES (Holden, Parents Arthritis SES (Barlow, Shaw, & Wright, 2000), Sickle Cell SES (Edwards, Telfair, Cecil, & Lenoci, 2000), Smoking SES (Etter, Bergman, Humair, & Perneger, 2000), and Heart Failure SES (Perry, 2001).

Appendix B:

The Self-efficacy Scale

Please read each of the following statements and circle the number that best indicates your level of Disagreement or Agreement.

1. When I set important goals for myself, I rarely achieve them.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Strongly Disagree Strongly Agree

2. One of my problems is that I cannot get down to work when I should.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Strongly Disagree Strongly Agree

3. If I can't do a job the first time, I keep on trying until I can.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Strongly Disagree Strongly Agree

4.When I make plans, I am certain I can make them work.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Strongly Disagree Strongly Agree

5. I give up easily.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Strongly Disagree Strongly Agree

6. I avoid facing difficulties.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Strongly Disagree Strongly Agree

7. When I decide to do something, I go right to work on it.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Strongly Disagree Strongly Agree

8. When I have something unpleasant to do, I stick with it until I finish it.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Strongly Disagree Strongly Agree

9. If something looks too complicated, I will not even bother to try it.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Strongly Disagree Strongly Agree

10. When trying to learn something new, I soon give up if I am not initially successful.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Strongly Disagree Strongly Agree

11. When unexpected problems occur, I don't handle them well.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Strongly Disagree Strongly Agree

12. I avoid trying to learn new things when they look too difficult for me.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Strongly Disagree Strongly Agree

13. When I am trying to become friends with someone who seems uninterested at first, I don't give up easily.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Strongly Disagree Strongly Agree

14. I feel insecure about my ability to do things.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Strongly Disagree Strongly Agree

15. I am a self-reliant person.

1 2 3 4 5 6 7 8 9 10 11 12 13 14
Strongly Disagree Strongly Agree

16. I give up on things before completing them.
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Strongly Disagree Strongly Agree

17. I do not seem capable of dealing with most problems that come up in life.
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Strongly Disagree Strongly Agree

18. I have acquired my friends through my personal abilities at making friends.
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Strongly Disagree Strongly Agree

19. If I see someone I would like to meet, I go to that person instead of waiting for him or her to come to me.
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Strongly Disagree Strongly Agree

20. If I meet someone interesting who is hard to make friends with, I'll soon stop trying to make friends with that person.
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Strongly Disagree Strongly Agree

21. Failure just makes me try harder.
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Strongly Disagree Strongly Agree

22. I do not handle myself well in social situations.
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Strongly Disagree Strongly Agree

23. It is difficult for me to make new friends.
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Strongly Disagree Strongly Agree

Appendix C:

SS Number: _____ - ___ - _____.

SCL-90

Below is a list of problems people sometimes have. Please read each one carefully, and circle the number that best describes HOW MUCH THAT PROBLEM HAS DISTRESSED OR BOTHERED YOU DURING THE PAST 7 DAYS INCLUDING TODAY. Circle only one number for each problem and do not skip any items. If you change your mind, erase your first mark carefully.

0 = NOT AT ALL 1 = A LITTLE BIT 2 = MODERATELY 3 = QUITE A BIT 4 = EXTREMELY

HOW MUCH WERE YOU DISTRESSED BY:

1	0 1 2 3 4	Headaches
2	0 1 2 3 4	Nervousness or shakiness inside
3	0 1 2 3 4	Repeated unpleasant thoughts that won't leave your mind
4	0 1 2 3 4	Faintness or dizziness
5	0 1 2 3 4	Loss of sexual interest or pleasure
6	0 1 2 3 4	Feeling critical of others
7	0 1 2 3 4	The idea that someone else can control your thoughts
8	0 1 2 3 4	Feeling others are to blame for most of your troubles
9	0 1 2 3 4	Trouble remembering things
10	0 1 2 3 4	Worried about sloppiness or carelessness
11	0 1 2 3 4	Feeling easily annoyed or irritated
12	0 1 2 3 4	Pains in heart or chest
13	0 1 2 3 4	Feeling afraid in open spaces or on the streets
14	0 1 2 3 4	Feeling low in energy or slowed down
15	0 1 2 3 4	Thoughts of ending your life
16	0 1 2 3 4	Hearing voices that other people do not hear
17	0 1 2 3 4	Trembling
18	0 1 2 3 4	Feeling that most people cannot be trusted
19	0 1 2 3 4	Poor appetite
20	0 1 2 3 4	Crying easily
21	0 1 2 3 4	Feeling shy or uneasy with the opposite sex
22	0 1 2 3 4	Feelings of being trapped or caught
23	0 1 2 3 4	Suddenly scared for no reason
24	0 1 2 3 4	Temper outbursts that you could not control
25	0 1 2 3 4	Feeling afraid to go out of your house alone
26	0 1 2 3 4	Blaming yourself for things
27	0 1 2 3 4	Pains in lower back
28	0 1 2 3 4	Feeling blocked in getting things done
29	0 1 2 3 4	Feeling lonely
30	0 1 2 3 4	Feeling blue
31	0 1 2 3 4	Worrying too much about things
32	0 1 2 3 4	Feeling no interest in things
33	0 1 2 3 4	Feeling fearful
34	0 1 2 3 4	Your feelings being easily hurt
35	0 1 2 3 4	Other people being aware of your private thoughts
36	0 1 2 3 4	Feeling others do not understand you or are unsympathetic
37	0 1 2 3 4	Feeling that people are unfriendly or dislike you
38	0 1 2 3 4	Having to do things very slowly to insure correctness
39	0 1 2 3 4	Heart pounding or racing
40	0 1 2 3 4	Nausea or upset stomach
41	0 1 2 3 4	Feeling inferior to others
42	0 1 2 3 4	Soreness of your muscles

0 = NOT AT ALL 1 = A LITTLE BIT 2 = MODERATELY 3 = QUITE A BIT 4 = EXTREMELY

HOW MUCH WERE YOU DISTRESSED BY:

43	0 1 2 3 4	Feeling that you are watched or talked about by others
44	0 1 2 3 4	Trouble falling asleep
45	0 1 2 3 4	Having to check and double-check what you do
46	0 1 2 3 4	Difficulty making decisions
47	0 1 2 3 4	Feeling afraid to travel on buses, subways, or trains
48	0 1 2 3 4	Trouble getting your breath
49	0 1 2 3 4	Hot or cold spells
50	0 1 2 3 4	Having to avoid certain things, places, or activities because they frighten you
51	0 1 2 3 4	Your mind going blank
52	0 1 2 3 4	Numbness or tingling in parts of your body
53	0 1 2 3 4	A lump in your throat
54	0 1 2 3 4	Feeling hopeless about the future
55	0 1 2 3 4	Trouble concentrating
56	0 1 2 3 4	Feeling weak in parts of your body
57	0 1 2 3 4	Feeling tense or keyed up
58	0 1 2 3 4	Heavy feelings in your arms or legs
59	0 1 2 3 4	Thoughts of death or dying
60	0 1 2 3 4	Overeating
61	0 1 2 3 4	Feeling uneasy when people are watching or talking about you
62	0 1 2 3 4	Having thoughts that are not your own
63	0 1 2 3 4	Having urges to beat, injure, or harm someone
64	0 1 2 3 4	Awakening in the early morning
65	0 1 2 3 4	Having to repeat the same actions such as touching, counting, or washing
66	0 1 2 3 4	Sleep that is restless or disturbed
67	0 1 2 3 4	Having urges to break or smash things
68	0 1 2 3 4	Having ideas or beliefs that others do not share
69	0 1 2 3 4	Feeling very self-conscious with others
70	0 1 2 3 4	Feeling uneasy in crowds, such as shopping or at a movie
71	0 1 2 3 4	Feeling everything is an effort
72	0 1 2 3 4	Spells of terror or panic
73	0 1 2 3 4	Feeling uncomfortable about eating or drinking in public
74	0 1 2 3 4	Getting into frequent arguments
75	0 1 2 3 4	Feeling nervous when you are left alone
76	0 1 2 3 4	Others not giving you proper credit for your achievements
77	0 1 2 3 4	Feeling lonely even when you are with people
78	0 1 2 3 4	Feeling so restless you couldn't sit still
79	0 1 2 3 4	Feelings of worthlessness
80	0 1 2 3 4	The feeling that something bad is going to happen to you
81	0 1 2 3 4	Shouting or throwing things
82	0 1 2 3 4	Feeling afraid you will faint in public
83	0 1 2 3 4	Feeling that people will take advantage of you if you let them
84	0 1 2 3 4	Having thoughts about sex that bother you a lot
85	0 1 2 3 4	The idea you should be punished for your sins
86	0 1 2 3 4	Thoughts and images of a frightening nature
87	0 1 2 3 4	The idea that something serious is wrong with your body
88	0 1 2 3 4	Never feeling close to another person
89	0 1 2 3 4	Feelings of guilt
90	0 1 2 3 4	The idea that something is wrong with your mind

DO NOT PUT YOUR NAME ON THESE SHEETS! **Appendix D:** Last 4 digits of SS#_____

The Somatization of Emotional Conflict Scale

Sex (circle): Male Female **Age:**_____ **Height:**_____ **Weight:** _____ **Race:** _____

Do you smoke cigarettes? Yes No

If yes, how many cigarettes per day? _____

How often do you get sick with the cold, flu, or similar common illness? (circle the number of the most accurate response):

1 = less than once a year 2 = once or twice a year 3 = three or four times a year 4 = more than four times a year

Have you ever been diagnosed with the following (circle the appropriate response):

Chronic fatigue syndrome	Yes	No	Severe allergies	Yes	No
Irritable bowel syndrome	Yes	No	Fibromyalgia	Yes	No
Asthma	Yes	No	Conversion Disorder	Yes	No
Arthritis	Yes	No	Seizure Disorder	Yes	No
High blood pressure	Yes	No	Arteriosclerosis	Yes	No

Please list medications you are currently taking (including oral contraceptives):

_____ _____ _____ _____

_____ _____ _____ _____

On the next page, you will be presented with several common physical difficulties that people experience followed by three columns. Column A is concerned with how frequently you experience these difficulties. You are to circle a number to indicate how frequently you experience the difficulties. Column B is concerned with how much of an impact the difficulties have on your life. You are to circle a number to indicate the impact of the physical problems. Column C is concerned with what kinds of moods or emotions contribute to the physical difficulties. You are to place a check-mark in as many of the boxes as necessary to represent the emotional states that seem to **lead to** the physical problems. See the example below:

EXAMPLE:

	Column – A: How frequently do you have the following problems? (CIRCLE ONE)					Column - B: How much does this problem affect you? (CIRCLE ONE)					Column - C: I have these problems when I feel... (CHECK ALL THAT APPLY)		
	I have NEVER had this problem	Less than once a month	Once or twice a month	Three or four times a month	More than four times a month	Never a problem AT ALL!	Barely noticeable, not a problem	A minor problem, small discomfort	A problem, but can be dealt with	Huge negative impact on my life	Stressed, anxious frightened or worried	Depressed, lonely, empty or sad	Angry, irritated, mad or agitated
Migraine headache	0	1	2	(3)	4	0	1	2	(3)	4	X		X
Headache	0	1	2	3	(4)	0	1	(2)	3	4	X		
Nausea or upset stomach	0	1	(2)	3	4	0	1	2	3	(4)		X	
Numbness or tingling	(0)	1	2	3	4	(0)	1	2	3	4			

Please turn the page and proceed with the actual test items.

For EACH of the common difficulties below, circle ONE number in column A, circle ONE number in column B, and check **as many** boxes in column C that apply to you.

	Column – A: How frequently do you have the following problems? (CIRCLE ONE)					Column - B: How much does this problem affect you? (CIRCLE ONE)					Column - C: I have these problems when I feel... (CHECK ALL THAT APPLY)		
	I have NEVER had this problem	Less than once a month	Once or twice a month	Three or four times a month	More than four times a month	Never a problem AT ALL	Barely noticeable, not a problem	A minor problem, small discomfort	A problem, but can be dealt with	Huge negative impact on my life	Stressed, anxious frightened or worried	Depressed, lonely, empty or sad	Angry, irritated, mad or agitated
Migraine headache	0	1	2	3	4	0	1	2	3	4			
Headache	0	1	2	3	4	0	1	2	3	4			
Nausea or upset stomach	0	1	2	3	4	0	1	2	3	4			
Numbness or tingling	0	1	2	3	4	0	1	2	3	4			
Trouble breathing or short of breath	0	1	2	3	4	0	1	2	3	4			
Stomach aches or pains	0	1	2	3	4	0	1	2	3	4			
Shakiness or trembling	0	1	2	3	4	0	1	2	3	4			
Difficulty sleeping	0	1	2	3	4	0	1	2	3	4			
Vomiting	0	1	2	3	4	0	1	2	3	4			
Heart pounding or racing	0	1	2	3	4	0	1	2	3	4			
Diarrhea	0	1	2	3	4	0	1	2	3	4			
Blackouts or fainting	0	1	2	3	4	0	1	2	3	4			
Cramps	0	1	2	3	4	0	1	2	3	4			
Backaches	0	1	2	3	4	0	1	2	3	4			
Appetite problems	0	1	2	3	4	0	1	2	3	4			
Leg or foot pain	0	1	2	3	4	0	1	2	3	4			
Dizziness	0	1	2	3	4	0	1	2	3	4			
Fatigue or weakness	0	1	2	3	4	0	1	2	3	4			
Indigestion	0	1	2	3	4	0	1	2	3	4			
Impotence (males)	0	1	2	3	4	0	1	2	3	4			
Chest pain	0	1	2	3	4	0	1	2	3	4			
Blurred vision	0	1	2	3	4	0	1	2	3	4			
Nose bleeds	0	1	2	3	4	0	1	2	3	4			
Diffuse body aches and pains	0	1	2	3	4	0	1	2	3	4			
Constipation	0	1	2	3	4	0	1	2	3	4			
Hot or cold spells	0	1	2	3	4	0	1	2	3	4			
Skin rash	0	1	2	3	4	0	1	2	3	4			
Pain or aches in arms or hands	0	1	2	3	4	0	1	2	3	4			
Genital/Sexual Pain	0	1	2	3	4	0	1	2	3	4			
Cold sores or fever blisters	0	1	2	3	4	0	1	2	3	4			
Twitching of eyelid	0	1	2	3	4	0	1	2	3	4			
Premature ejaculation (males)	0	1	2	3	4	0	1	2	3	4			
Heartburn	0	1	2	3	4	0	1	2	3	4			
Ulcer	0	1	2	3	4	0	1	2	3	4			
Ringing in ears	0	1	2	3	4	0	1	2	3	4			
Dry or red eyes	0	1	2	3	4	0	1	2	3	4			
Absence of menstruation (females)	0	1	2			0	1	2	3	4			
Acne	0	1	2	3	4	0	1	2	3	4			
Muscle tension	0	1	2	3	4	0	1	2	3	4			
Severe PMS (females)	0	1	2			0	1	2	3	4			
Inability to achieve orgasm	0	1	2	3	4	0	1	2	3	4			
Excessive energy	0	1	2	3	4	0	1	2	3	4			

Appendix E

Informed Consent

Correlates of Autonomic Reactivity to Mental Imagery

Introduction

You are invited to participate in a research study. This study aims to better understand heart-rate, blood pressure and skin conductance reactions to mental imagery. Additionally, it aims to determine if patterns of physiological reactions to imagery are related to other personality factors.

This study will take about 60-75 minutes to complete. You will first fill-out a number of questionnaires that assess certain aspects of your personality. You will be hooked-up to instruments that measure your heart-rate, blood pressure and skin-conductance levels. You will then sit quietly for ten minutes in order to establish baseline physiological levels. Next, you will place your hand in a small container of cold water for about 40 seconds. You may experience mild discomfort when doing so, and you may remove your hand from the water at any time. You will be given a towel to dry your hand immediately after you remove it from the water. You will then sit quietly for another 10-minute baseline period. Finally, you will be asked to imagine as vividly as possible that you are placing your hand in the cold water once again.

Risks:	Minimal
Benefits:	Participants may learn more about psychological research methods.
Confidentiality:	Information in the study will be kept confidential. Data will be stored securely and will be made available only to persons conducting this study. No reference will be made in oral or written reports which could link participants to the study.
Compensation:	Documentation of participation will be provided to your course instructor who will give you extra credit for your participation.
Contact Information:	If you have any questions at any time about the study or the procedures, you may contact the researcher, Jeff Borckardt at 974-2161. If you have any questions about your rights as a participant, contact the Compliance Section of the Office of Research at 974-3466.
Participation:	Your participation in this study is voluntary; you may decline to participate without penalty. If you decide to participate, you may withdraw from the study at any time without penalty and without loss of benefits to which you are otherwise entitled. If you withdraw from the study before data collection is completed, your data will be destroyed.

Consent

I have read the above information and I agree to participate in this study. I affirm that I am at least 18 years of age.

Participant's Signature_____ Date_____

Appendix F

Imagery and Physiology Protocol

Before first subject arrives:

1) If any doors are locked (main, task, or recording room), go to the psychological clinic on the second floor and ask the receptionist for the key. Be sure to bring your ID and let them know you are working with Jeff.
2) Make sure that all doors are set to stay unlocked (button on the doorframe).
3) Turn on all equipment:
    a) Coulbourn tower (switch – left, behind unit)
    b) Computer (button – top right, front)
    c) Monitor (button – lower right, front)
    d) BP monitor (button – lower mid, front) USE BOTTOM MONITOR
    e) Audio monitor in recording room (switch to A)
    f) Audio monitor in task room (switch to A)
4) Double-click "Windaq Acquisition" icon
5) Cold-presser setup:
    a) Fill up tank to half-way
    b) Put one cup of ice in the tank (get this from 311B)
    c) Make sure pump is placed correctly
6) Make sure there is a stopwatch ready to go in both the task and recording rooms.

Before each subject:

1) Set-up Windaq file:
    a) Click "File"
    b) Click "Open"
    c) Set "Drive" to "G"
    d) Set "File name" to "Image000" (e.g., subject #1 = image001, #28 = image028)
    e) Click "OK"
    f) Set "File size" to "20,000"
    g) Click "OK"
2) Make sure baseline video is cued (Menu, selected zero return, hit forward)
3) Put collars (stickers) on 5 electrodes
4) Drain a little water and put some more ice in the tank.

When the subject arrives:

1) Have them fill out the consent form.
2) If the task room is occupied, have the subject fill out the questionnaire packet until the room is free.
3) When task room is free, have subject sit in the subject chair.
4) Instrument subject and explain physiological measurements:
    a) Attach blood pressure cuff to left arm right above elbow.
        - Have subject turn palm up
        - Make sure the cuff is snug
        - Tubes should be pointing away from subject
        - Tell subject that you will now take a test reading of the bp cuff
        - Take a test reading (green start button) to make sure cuff is reading correctly

b) Attach skin conductance electrodes to 1st and 2nd fingers of left hand.
- Clean medial section of both fingers with water and cotton swab
- Fill electrodes (2) with water-based gel
- Remove adhesive cover
- Stick on to medial section of both fingers (palm up)
- Secure with tape if necessary

c) Attach EKG electrodes
- Fill electrodes with saline-based gel
- Clean three electrode site with alcohol and cotton swab
- Attach lead electrodes (+/-) to bottom of each ribcage
- Attach ground (middle) electrode just above naval
- Secure with tape if necessary

5) In recording room, make sure EKG recording is noise-free (adjust electrodes if necessary)
6) Make sure that heart rate output is normal (not skipping around, value btw 40 – 150)
- If heart rate is not normal, turn the trigger adjust waveform (4th module from top) all the way clockwise and slowly turn counterclockwise until the readout stabilizes.

7) Return to task room and give instructions for baseline period . . .

NEXT, I'M GOING TO TURN ON A VIDEO TAPE THAT HAS RELAXING MUSIC AND SCENERY. WE NEED YOU TO SIT COMFORTABLY AND TO JUST RELAX FOR ABOUT TEN MINUTES. THIS WILL ALLOW US TO GET READINGS OF YOUR BASELINE PHYSIOLOGICAL REACTIVITY. THIS IS NECESSARY BECAUSE DIFFERENT PEOPLE HAVE DIFFERENT PHYSIOLOGICAL RESTING RATES, AND WE WANT TO KNOW WHAT YOURS ARE. OCCASIONALLY, YOU WILL FEEL THIS BLOOD PRESSURE CUFF INFLATE ON YOUR ARM THROUGHOUT THE EXPERIMENT. THERE IS NO NEED TO BE ALARMED WHEN THIS HAPPENS. YOU WILL FIND THAT YOU GET USED TO IT RATHER QUICKLY. SO JUST SIT COMFORTABLY AND RELAX...I'LL BE BACK IN ABOUT TEN MINUTES.

8) Start the baseline video and leave room – close door behind you.
9) Start recording by pressing F4 and start stopwatch at the same time (status should read RECORD).

Record baseline Skin Conductance Levels (SCL), Heart Rate (HR) and Blood Pressure (BP) over the ten minute baseline period.

Minute 0 –
Minute 1 –
Minute 2 – Start BP1 + Place Mark (Shift & Space) "base2"
Minute 3 –
Minute 4 – Start BP2 + "base 4"
Minute 5 –
Minute 6 – Start BP3 + "base 6"
Minute 7 –
Minute 8 – Start BP4 + "base 8"
Minute 9 –

10) Return to room at minute 10.
11) Stop video and *return to zero*.
12) Turn on pump.

12) Administer cold presser task . . .

IN A MOMENT I'M GOING TO HAVE YOU PLACE YOUR WHOLE RIGHT HAND INTO THIS COLD CIRCULATING WATER FOR ABOUT 40 SECONDS. YOU WILL FEEL THE BLOOD PRESSURE CUFF INFLATE WHEN YOU DO THIS. YOU MAY REMOVE YOUR HAND AT ANY POINT IF YOU EXPERIENCE TOO MUCH DISCOMFORT BUT BE CAREFUL WHEN REMOVING YOUR HAND NOT TO DISTURB THE BLOOD PRESSURE READING IF IT IS STILL BEING TAKEN. DO YOU HAVE ANY QUESTIONS?

13) Record the water temperature on the lab-form.

14) OK, LET'S GO AHEAD AND PLACE YOUR HAND IN THE WATER.

15) Wait until the hand is fully submerged and then say "GOOD" to indicate to the computer operator to begin recording BP. Start the timer at the same time. If the subject removes his/her hand before the end of 40 seconds, record the time on the lab-form. At 40 seconds, say, "YOU CAN TAKE OUT YOUR HAND NOW." Give them some paper towels and the linen towel to dry off.

In the recording room:

When you hear the word "GOOD," start three things simultaneously:

1) The blood pressure monitor (green start button)
2) Record marker (shift & space)
3) The stopwatch

Type "task 1" as the marker

When the blood pressure monitor has taken its reading, jot down the time it finished (in seconds)

16) Refer to the lab sheet and ask the discomfort question (#3). Record answer.
17) Turn off cold-presser pump.
18) Once the subject to dry and ready to continue . . .

OK, NOW WE WANT TO GET YOUR PHYSIOLOGY BACK TO RESTING LEVELS...SO, JUST SIT COMFORTABLY IN THE CHAIR AND I WILL PLAY THE VIDEO ONCE AGAIN. JUST RELAX AND WATCH THE VIDEO FOR ANOTHER 10 MINUTES AND I'LL BE BACK TO FINISH UP THE EXPERIMENT.

Record secondary-baseline Skin Conductance Levels (SCL), Heart Rate (HR) and Blood Pressure (BP) over the ten minute secondary-baseline period.

Minute 0 – mark "rec 0"
Minute 1 –
Minute 2 – Start BP1 + "rec 2"
Minute 3 –
Minute 4 – Start BP2 + "rec 4"
Minute 5 –
Minute 6 – Start BP3 + "rec 6"
Minute 7 –
Minute 8 – Start BP4 + "rec 8"
Minute 9 –

19) Return to the room at the 10-minute mark.

20) Ask questions 4 & 5 on the lab-form.
21) Administer imaginary cold-presser task . . .

OK, THIS NEXT TASK IS A LOT LIKE THE FIRST COLD WATER TASK EXCEPT THAT THIS TIME INSTEAD OF ACTUALLY PLACING YOUR HAND IN THE COLD WATER, YOU ARE GOING TO IMAGINE THAT YOU ARE DOING SO. WHEN I SAY SO, I WANT YOU TO IMAGINE **AS VIVIDLY AS POSSIBLE** THAT YOU ARE PLACING YOUR HAND IN THE ICY COLD WATER. I WANT YOU TO DO YOUR BEST TO VIVIDLY RELIVE THE EXPERIENCE USING YOUR IMAGINATION. JUST LIKE BEFORE, YOU WILL FEEL THE BLOOD PRESSURE CUFF INFLATE AS YOU IMAGINE YOU ARE PLACING YOUR HAND IN THE ICE BATH. YOU WILL BE ASKED TO VIVIDLY RE-EXPERIENCE THE ICE BATH FOR ABOUT 40 SECONDS. YOU CAN OF COURSE STOP THE TASK WHENEVER YOU WISH, BUT PLEASE LET ME KNOW IF YOU HAVE DONE SO. DO YOU HAVE ANY QUESTIONS?

OK, BEGIN IMAGINING THAT YOU ARE PLACING YOUR HAND IN THE FREEZING COLD CIRCULATING ICE BATH NOW.

Computer operator should begin recording at the word "NOW." Administrator should start the stopwatch. If the subject terminates the task before the end of 40 seconds, record the time on the lab-form. At 40 seconds . . .

22) Refer to the lab form and ask questions 7, 8, and 9.
23) Unhook the electrodes and give the subject cotton balls to clean up.
24) Answer and questions and thank the subject.
25) Have them fill out any questionnaires they did not complete before they started the task.
26) Fill out a consent form and give them the yellow copy.

After subject has left:

1) Return video tape to zero.
2) Clean electrodes with water and Q-tips in restroom.
3) Remove about a half-cup of water from the tank.
4) Make sure the subject number is on all sheets and paper-clip them together.
5) Close file by clicking, "File" and "Close"

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