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An Investigation of a Process Constraint Treatment Analogue for Verbalizers and Visualizers

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AN INVESTIGATION OF A PROCESS CONSTRAINT TREATMENT ANALOGUE FOR VERBALIZERS AND VISUALIZERS

by

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Abstract

Based on the self-generated attitude change model, a process constraint treatment analogue was investigated. Differential treatment effects were explored for people that are verbalizers and visualizers. It was predicted that people who participated in the process constraint condition would benefit more if they were verbalizers than visualizers. It was also predicted that there would be no difference in effects for people in the control condition. To test these predictions, people with a fear of speaking in public were asked to speak in front of a small group. The effects of the treatment conditions were assessed using self-report, behavioral, and physiological measures of fear. Results supported the predictions on the behavioral and physiological measures, but only in part on the self-report measures. Implications of these results are discussed as well as directions for future research.

What is Self-Generated Attitude Change?

Traditionally, changes in attitude have been conceptualized as a response to outside information (i.e., from the environment). A new focus of attitude change has questioned the assumption that changes in attitude usually results from external sources or from the environment. It is entirely possible that these changes arise from a reassessment of one's attitudes regardless of the addition of new facts (Tesser, 1978). The process for this self-generated change in attitude would be simply thinking about an object.

The idea of self-generated attitude change stems from (a) the relationship between beliefs and attitudes and (b) the effects of thought on beliefs or beliefs. A belief can be looked at as an impression or an idea about an object. An attitude can be thought of as an appraisal of a particular object or feelings connected with the object. An operational definition of attitudes "involves asking the person to assign the object of thought to a position on some dimension of judgement...dimensions can be thought of as evaluations" (McGuire 1985, p. 239). Tesser (1978) felt that a person's attitude is partially determined by their beliefs. Therefore, changes in one's beliefs would result in a change of attitude.

Basically, the process that links beliefs and attitudes is thought. The way in which people think about their beliefs and ideas can change their attitudes. Tesser (1978) stated "thought does not involve a passive view of a static object but, rather, a dynamic process which alters the salient cognitive representation of that object" (p. 330). Thought tends to make beliefs evaluatively consistent. If thought will cause a person's beliefs to be more congruent, then this process would affect one's feelings about an object. This change in affect is a polarization of feelings (i.e., favorable attitudes become more favorable, and unfavorable attitudes become more unfavorable).

Thus, increased thought should generally change beliefs to be more consistent. With additional thought, feelings that are initially positive should become more positive and feelings that are initially negative should become more negative. In a study by Sadler and Tesser (1973), the effects of thought on affect were examined. Subjects were exposed to a "likeable" or "dislikeable" person (p. 101). Their attitude or impression toward this person became more extreme if they were given time to think rather than being distracted. The strengthening of their initial feelings occurred for both positive and negative feelings. Assuming that beliefs about an object can affect attitudes because of

introspective examination, it follows that feelings will become more polarized or extreme the longer a person reflects about an object. Tesser and Conlee (1975) found that the longer a person thought about an object or issue in the absence of any external information, the more polarized their feelings became toward the object.

How Thought Effects Beliefs

Given that thought causes polarization of one's evaluation or affect, knowing how it occurs becomes important. Different hypotheses have been suggested to explain the manner in which thought influences beliefs. One explanation is the "generation" hypothesis which dictates that a person can add new beliefs to be congruous with the existing beliefs (Sadler & Tesser, 1973, p. 101). In the Sadler and Tesser study, subjects given time to think about their partner (whether the partner was likable or not) tended to list more attitude consistent beliefs than did those subjects that were not given a chance to reflect on their attitudes.

Further evidence for the generation hypothesis was demonstrated in the Tesser and Cowan study (1975) on impression formation. They set up conditions in which it would be difficult or easy to generate new beliefs. Their reasoning was that it would be more difficult to generate

new consistent beliefs given many initial trait adjectives than given few trait adjectives. Thus, a greater amount of polarization of feelings was expected with few initial trait adjectives that with many initial trait adjectives. The results of this study showed that given time to think about a person, polarization was much higher when there were few initial trait adjectives compared with many initial trait adjectives. Overall, there seems to be much evidence that points toward the generation hypothesis.

The "reinterpretation" hypothesis is another explanation of the process by which thought alters beliefs and, in turn, alters affect (Tesser & Cowan, 1977, p. 217). Tesser and Cowan created treatment conditions that contained ambiguous trait adjectives. An ambiguous trait adjective was one in which there could be a wide range of meanings. While musing over different alternatives, ambiguous trait adjectives can be reinterpreted to be more consistent with other trait adjectives. The results of this study showed that ambiguous adjectives were judged more positively when in a positive set of descriptions and were judged more negatively when in a negative set of descriptions. Thus, when given an ambiguous situation people may reinterpret their beliefs, thereby polarizing their feelings.

An additional possibility suggested by Tesser (1978) is a blocking process in which inconsistent beliefs are

suppressed. More specifically, an individual may discount or discard any information that does not seem congruous with their particular line of reasoning. Stated another way, a rejection of inconsistent beliefs can result in a set of beliefs that are evaluatively consistent.

However, the thought process of each individual is idiosyncratic. Thus there could be many other processes possible. In general, thinking about an issue, idea or object can result in a group of beliefs which are evaluatively consistent.

Under What Conditions Does Polarization Occur?

Thought has now been linked to altering people's beliefs which in turn can polarize attitudes or affect. However, most of the aforementioned studies were performed in the absence of any external information, in a vacuum of sorts. Without any external information, there remains little chance of people testing the validity of their beliefs.

If the object of people's thought is present, people can realistically assess their beliefs. Moreover, people would probably adapt their beliefs to reflect the object. Having the object present serves as a "reality constraint" because the chances of misrepresentation are reduced (Tesser, 1976, p.184). Placing a reality constraint on

people restricts the extent to which beliefs can be generated, reinterpreted, or discounted. In contrast, the absence of an object would allow people to polarize their affect because there would not be any evidence in which to check the validity of their beliefs.

Tesser (1976) looked at the effects of reality constraints on attitudes about paintings. Subjects were asked how they felt about various paintings two times. In between these evaluations, some subjects were instructed to perform a distraction task to decrease the amount of thought that could be done. Other subjects were asked to think about a painting without it being displayed. A third group was asked to think about a painting while it was displayed.

The results for the female subjects showed the most amount of polarization occurring in the condition in which the object was absent. The condition with the painting present produced less polarization than the condition in which it was absent. The least amount of polarization was in the condition in which subjects performed a distraction task. Thus, the results were consistent with the idea that reality constraints tends to reduce affect by limiting the consistency of the beliefs. That is, thought causes beliefs to be more consistent and subsequently cause attitudes to be more extreme. Alternatively, by constraining thought, beliefs become somewhat ambivalent. The result is reduced

attitude extremity or attitude polarization.

In addition to reality constraints "process constraints" have been found to reduce polarization of feelings (Tesser, 1978, p. 326). Reality constraints originate from obvious evidence about the object or external information. Process constraints, on the other hand, originate from internal information (i.e., standards and rules). A process constraint requires people to examine the origins of their beliefs. The idea underlying process constraints is that people attempt to be rational. When people are asked to explicitly state the origins of their beliefs, they might discover there are inconsistencies. If while looking at the derivations of their beliefs people find some irrational beliefs, they would probably adjust their beliefs to be more rational. As a result, these beliefs become more inconsistent or ambivalent. Some of the intensity of the affect associated with the beliefs is reduced. (i.e., a decrease in polarization occurs).

Clinical Applications

How does the idea of attitude change relate to clinical problems? Consider, for example, phobias. Some of the criterion for social phobias the Diagnostic and Statistical Manual III-R includes are: exposure to the specific phobic stimulus provokes immediate anxiety, phobic situation is

avoided or endured with intense anxiety, and the person recognizes that the fear is excessive or unreasonable (1987). Also, there is a persistent fear of one or more situations in which a person is exposed to possible scrutiny by others and fears s/he may do something or act in a way that will be humiliating or embarrassing.

In some ways, a phobia is like an attitude. When experiences are unpleasant or negative, people will probably attempt to avoid the whole situation or object. Without any more exposure to the stimulus, people will not have any reality checks to assess the rationality of their beliefs. In other words, the more people think about the negative aspects of an experience the fearful they may become. People's beliefs will become increasingly consistent yet irrational and their feelings become polarized (i.e., extremely negative). In sum, the development of phobias can be thought of in terms of self generated attitude change. That is, in the absence of contact with the object and with increased thought, phobic reactions can emerge.

Hypothesizing about the development of phobias in terms of self-generated attitude change has implications for intervention. Process constraints could be utilized by simply asking a person about the origin of the phobia and the rationale behind it. In this way, a person might

realize that the basis of his fear is not thoroughly logical or rational. These beliefs will be discredited, thereby reducing the exaggerated affect associated with it (i.e., reducing the polarized negative feelings). In many studies, process constraints have been examined for use in ameliorating phobias.

Constrained Thought vs. Unconstrained Thought

One of the original experiments that studied process constraints was done by Tesser, Leone, and Clary (1978). Their study concentrated on women with a fear of public speaking. The subjects were given one of three treatment conditions: a condition that utilized process constraints, one that had an affective focus, or a control condition.

In the process constraint condition, the experimenter asked the subject to concentrate on why she felt uncomfortable about speaking in public. For example, "why do you feel this way...in what way are these beliefs logically related to your emotions, past experiences..." (p. 269). In the affective focus condition, women were asked what emotions they felt when speaking in public. For example, "... we're not concerned with why you feel this way, but how you feel..." (p, 270). In the control condition, subjects were asked to perform a task in which they indicated anxiety levels on particular topics.

After a five minute relaxation exercise, the participants were asked to speak to the other subjects twice about a particular topic. After each speech, three measures were taken: a self report measure, a behavioral measure and a physiological response. On the self report, subjects were asked questions about their emotions, their performance, and pleasantness of the experience. They were also asked of how they usually felt after a performance compared to the present and their opinion of the effectiveness of the treatment. The behavioral measure was very similar to the self report taken. The only difference was that the audience (the other subjects) filled out the measure in response to the speaker's (the subject's) affect. The physiological measure was a palmar sweat test. Sweat from the subjects' index finger on their dominant hand was measured just before and just after the talk.

The self-reports revealed the anxiety level in the process condition to be the lowest of any conditions. The control condition was next, and the affective condition produced the most anxiety. Using the physiological responses, arousal for the subjects in the process condition was the lowest. The control condition was not much higher, but the affective condition was again very high. The behavioral component showed no variability between the conditions, probably due to the inconsistency of audience

judgement.

These results confirm much of the hypothesized effects of process constraints. Searching for the origins of people's thought tended to reduce their fear of public speaking. Essentially, through examination and constriction of their irrational beliefs, the subjects' associated affect was "depolarized." In contrast, the anxiety levels of the affective condition was closely aligned with the self generated attitude change model. Focusing on the affect tended to increase the subjects feeling of fear instead of reducing the anxiety. In part, this polarization occurred by not allowing a more corrective cognitive experience. Much like the results of Tesser (1976) subjects affect was "depolarized" when thinking about the reality of their beliefs.

The results of this study have been replicated in other studies (Leone, 1984; Leone & Baldwin, 1983; Leone, Minor, & Baltimore, 1983). Combinations of constrained thought have been utilized (i.e., process and reality constraints together). The combination of process and reality constraints seemed to increase approach behavior to the feared stimulus and increase self efficacy. Also, the longer people thought with reality and process constraints about the feared stimulus the more strongly they believed they would be able to cope with their fears in the future.

The results of these studies were found with different fears, different dependent variables, and different settings. For example, both fear of speaking in front of a group and fear of snakes have been tested. Also, several dependent variables such as behavioral approach (Lang & Lozovik, 1963), self-efficacy, and physiological arousal have been utilized. In addition, different studies have utilized different experimenters and different locations.

Assimilating all these results, it seems that constrained thought and unconstrained thought can be seen to be a linear process. Thinking in a manner that restricts exaggerated beliefs decreases anxiety. Thinking in a manner that allows exaggerated thought to become more consistent and extreme can increase anxiety. In sum, constrained thought is associated with the reduction of anxiety, and unconstrained thought can be associated with an increase in anxiety.

Individual Differences

Thus far, studies have also shown that placing constraints on people's thought processes decreases the extent to which people can make their beliefs consistent (Leone et al., 1983; Tesser et al., 1978). Consequently, constraints reduce people's polarized feelings. Given that thought is the key to polarized feelings, the concept of

individual styles of thought becomes important.

Individual differences in cognitive style could affect the efficacy of treatment outcomes. The ultimate goal for clinical and research purposes is to match individual styles to appropriate treatments for the most effective results possible. "Aptitude-treatment interaction is directed toward identifying client variables that predict differential treatment responsiveness...the most research on client type by treatment interactions have been conducted with the anxiety disorders" (Dance & Neufeld, 1988 p. 192-194). Several individual difference variables have been examined. Dance and Neufeld cite over twenty studies completed that investigate various individual differences that can affect treatment outcomes. In addition, Carrol and Maxwell (1979) review many individual differences within cognitive abilities.

Verbal and Visual Cognitive Styles

One variable that has been studied is verbal and visual styles of thinking. Generally, it is assumed that people have a style or preference that dominates their way of thinking. Katz points out that "due to one's learning history one acquires a preference to use imagery regardless of task type...a predisposition or bias regardless of signs regarding the appropriateness of that symbolic system" (1983, p. 56). Thus, regardless of the particular

situation, people will tend to utilize either a verbalizing or visualizing cognitive style. Additionally, Zenhausen stated "some people always think in images and either cannot think without them...or do so with difficulty. Other people have either no visual imagery at all when they think, or...it is merely an accompaniment to their thinking (1978, p. 381).

Richardson defined a verbal cognitive style as a "preference for linguistic encoding (labeling or naming) for reading the instructions on how to do something rather than someone demonstrating the task... experience of inner speech..." (1983, p.12). Richardson defined a preference for visualizing as "...a preference for visual encoding (i.e., the spatial layout and physical features) and attention to the sensory properties of the stimulus (i.e., color)...experience of inner pictures."

MacInnis and Price differentiate cognitive styles of processing on a continuum (1987, p. 425). For verbal styles, they included factors such as verbal retrieving, cognitive responding and verbal encoding. For visual styles they include factors such as sensory representations of ideas and feeling. More specifically, MacInnnis and Price consider verbalizers to utilize symbolic and language-like processing for counter-arguments, attributions, and compositional choice strategies. Alternatively, they

consider visualizers to utilize daydreams, fantasies, and visual problem solving.

Similarly, Pavio and Harshman (1987, pp. 78-79) describe verbal cognitive styles as "abilities" (i.e., fluency and easy of expression, reading ability) and "attitudes" (i.e., correctness of verbal expression). Alternatively, they describe visual cognitive styles as "habits" (i.e, dreams, daydreams, and use of images to solve problems). To summarize, we can conceptualize verbalizers as people who utilize verbal representations for encoding, might be more likely to engage in compositional problem solving techniques, and express themselves verbally. We can conceptualize visualizers as people who utilize sensory representations for encoding, might be more likely to engage in visual problem solving techniques, and have daydreams.

Verbalizing and visualizing cognitive styles have been researched with differential treatment effects for anxious or phobic individuals. Studies have found that people with verbalizing cognitive styles gain more from verbally oriented treatments than people with visualizing cognitive styles. That is, treatments such as covert reinforcement and instructional training which ask people to imagine things verbally, or to ask people to rely on speech as stimuli are better for "verbalizers" (Delaney, 1978; Tondo &

Cautela, 1974; and Vallis & Butcher, 1986). Other clinical studies have found that people with visualizing cognitive styles gain more from visually oriented treatments than people with verbalizing cognitive styles. That is, treatments such as systematic desensitization, the use of fantasies and covert modeling which ask people to visually imagine things or to ask people to rely on visual stimuli are better for "visualizers" (Dyckman & Cowan, 1978; Gold, Jarvinen, & Teague, 1982; Vallis & Butcher, 1986; Wisocki, 1973). Basically, treatments that were based on verbal representations were more effective on verbalizers than on visualizers. Similarly, treatments that were based on visual representations were more effective on visualizers than on verbalizers.

The treatments that were derived from the self-generated attitude change model can be applied to the verbalizing and visualizing concepts. That is, the treatments of process constraints would seem to interact with verbalizing and visualizing cognitive styles. Looking closely at the process constraint treatment analogue, it would be predicted that verbalizers would benefit from this type of intervention. With process constraints, people are asked to explain out loud where they think their beliefs originate. Thus, the content of the process constraint treatment utilizes verbal expression of people's beliefs.

Therefore, people with verbalizing cognitive styles would seem to benefit highly from a process constrained treatment. In contrast, people with visualizing cognitive styles would not seem to benefit highly from a process constrained treatment because they utilize visual representations.

For this study, fear of speaking in front of a group was investigated. Two main hypothesis were tested. First, it was predicted that people who participate in a process constraint treatment analogue would benefit more if they were verbalizers than visualizers. Second it was hypothesized that there would be no difference in effects for people in the control condition. Taking these two hypothesis into account, it was expected that there would be an interaction between treatment effects and cognitive styles.

Method

Participants

Undergraduates at the University of North Florida were recruited for an experiment concerning "people's fears and thoughts." Volunteers received extra credit for participation. The participants selected had previously indicated a strong fear of public speaking. There were 58 participants included in this experiment (60 participated, but only 58 completed the experiment). The participants were randomly assigned to conditions with the restriction that there were an equal number of verbalizer participants and visualizer participants in each condition.

Procedure

Assessment of Fear and Cognitive Styles

Geer Survey Schedule. In an initial screening, participants were administered an abbreviated version of the Geer Fear Survey Schedule-II (Geer, 1965). The survey is a 20-item self-report measure. Participants were asked to rate on a 7-point scale their fear of situations or objects. Participants who reported a strong fear of public speaking (i.e., a rating of 5, 6, or 7) were chosen for this study.

Verbalizer-Visualizer Questionnaire. Participants were also given at an initial screening Richardson's Verbalizer-Visualizer Questionnaire (1977). The Verbalizer-Visualizer Questionnaire (VVQ) is a 15-item, true-false, self-report

measure. The VVQ measures verbalizing-visualizing thinking styles in individuals. Participants were asked to indicate if particular activities (e.g., my thinking often consists of mental pictures or images, I can easily think of synonyms for words) are characteristic of them. Their responses were summed across all 15 items. Participants chosen for the study were classified as a verbalizer or visualizer by a median split of the full range of scores.

Administration of Treatments Analogues

Participants were seen individually for one session. An experimenter briefly described the procedure and rationale of the experiment. The participants were told that the experiment was designed to assess new types of treatments for people that have a fear of public speaking. The experimenter then administered either the process constraint treatment analogue or the control condition.

Process constraint condition. In the process constraint condition, participants were asked to verbalize for five minutes the reasons for their beliefs about speaking before a group. These instructions were similar to the instructions given in the Tesser et al. (1978) study. For example, participants were asked, "Tell me how you feel emotionally and physically when you are about to give a speech...most importantly, tell me why you feel this way...in terms of past experiences try to concentrate on why

you believe as you do." The experimenter focused the participants verbalizations on the derivations of their beliefs by using probes (e.g., tell me why you think that).

Control condition. In the control condition, participants were asked to fill out a questionnaire for five minutes. The 100-item questionnaire contained different issues, objects, and situations. The participants were asked to rate on a scale of 1-10 (10 indicating no anxiety and 1 indicating extreme anxiety) how much anxiety they believed the average person would experience for these issues. If the participants finished before the allotted five minutes was over, they were asked to review their answers.

At the end of either treatment condition, participants underwent a relaxation procedure. The experimenter first gave an introduction about the benefits of physical relaxation. The experimenter then demonstrated three times the deep breathing exercise. Finally, the subjects participated in the exercise for 3 minutes. By having both groups undergo the relaxation exercise, any differences in fear should be attributed to changes in beliefs rather than the treatment per se.

Dependent Variables

After the relaxation procedure, the participants were asked to speak for three minutes to a small group on a

preselected innocuous topic (e.g., plans for the summer). The group consisted of three assistants (not including the experimenter). The range in the ages of the assistants was equivalent to the range in ages of the participants. The assistants were also dressed in the same manner as the participants (i.e., casually). One half the participants spoke to a group consisting of two females and one male assistant. The other half of the participants spoke to a group consisting of one female and two male assistants. All the assistants were blind to the treatment condition.

Self-Generated Responses. Immediately following the speech, the participants generated four measures of fear. The questionnaire included three scales designed to assess the participants' feelings and perceptions about their speech. The first scale (measure of fear) asked participants to indicate how much fear they experienced while giving the speech. Ratings were made on a 100-point scale with 5-point increments marked and anchored with the following labels: no fear, slight fear, moderate fear, strong fear, and terror. The second scale (measure of behavior) asked participants to rate how well they thought they were able to give their speech. The ratings were made on a series of 7-point semantic-differential type scales (i.e., good/bad, valuable/worthless, pleasant/unpleasant, positive/negative, nice/awful). The third scale (measure

of beliefs) asked subjects how they might cope with seven situations involving a speech (e.g., giving an oral report in front of a 90-person class, being asked to give a "formal" toast at an acquaintance's wedding, presenting a project to supervisors at work, giving an eulogy at someone's funeral, being asked to speak in class without prior notice, defending ideas in front of a club, giving a presentation to a civic group). Participants were asked to rate how well they thought they would cope with each of these situations on a 100-point scale with 5-point increments with anchors of : unable to cope, barely able to cope, able to cope pretty well, and completely able to cope.

The fourth scale (physiological measure of fear) was measured during the speech using a method described by McNair, Droppleman, and Pillard (1967). Palmar sweat was measured from the index finger of the participants' nondominant hand. A chemically treated paper was wrapped around their index finger.

Palmar sweat stains the chemically treated papers. The depth of the stain is an index of the participants' arousal (i.e., darker papers indicate higher levels of arousal). To score the arousal levels, the palmar sweat papers were sorted into five categories form lightest to darkest. There was an equal number of palmar sweat papers per category.

Each category was assigned a score of 1-5 corresponding from the least arousal to the most arousal.

Rater-Generated Responses. Immediately following the speech, the three assistants generated three measures of fear on the participants. The assistants were trained to focus to on the participants' non-verbal activity (i.e., eye contact, posture, facial movements, para-verbal, and body movements). After the speech, the assistants rated the participants' observable fear and performance during the speech using the three scales described under the self reported fear. Appropriate word changes reflected the fact that the group was rating the participants and not themselves. Responses were averaged over each of the three members of the group for each participant.

Post-experimental interview

After completion of the dependent variables, the rationale of the experiment was explained to the participants. They were given the opportunity to ask and have answered any questions concerning the experiment. Participants were asked not to discuss the experiment with other potential subjects, and then dismissed.

Results

This experiment utilized a 2 x 2 design. The independent variables were treatment condition (analogue versus control) and cognitive style (verbalizing versus visualizing). Each participant generated four dependent measures: extra-laboratory beliefs, self-reported fear, physiological arousal, and self-assessed behavior. Another set of dependent measures was obtained from the raters' assessments of the participants' fear, behavior, and extra-laboratory expectations. All the dependent measures were assessed immediately following the speech with the exception of the palmar sweat measure which was assessed during the speech. All measures were separately analyzed utilizing a 2 x 2 ANOVA. Significant interaction effects were further analyzed by simple main effects analyses.

Subjects-Generated Responses

Beliefs. For the measure of participants' beliefs about their ability to cope in extra-laboratory situations, the interaction between treatment analogue and cognitive style was not significant, F (1, 57) < 1.00. The means were, in part, ordered as predicted. In the treatment condition, subjects had higher expectations about their ability to cope if they were verbalizers (M= 53.22) than if they were visualizers (M= 48.31). Contrary to predictions, subjects in the control condition also had higher

expectations about their ability to cope if they were verbalizers (M= 45.90) than if they were visualizers (M= 40.51). The difference in the treatment means and the control means were approximately the same.

Fear. For the self-report measure of fear, the interaction between treatment analogue and cognitive style was not significant, F (1, 57) < 1.00. However, the means were again ordered as predicted. In the treatment condition, subjects reported less fear during the speech if they were verbalizers (M= 39.28) than if they were visualizers (M= 47.88). In the control condition, subjects reported less fear during the speech, if they were verbalizers (M= 49.73) than if they were visualizers (M= 53.18). The difference in the treatment means was greater than the control means.

Palmar Sweat. For the physiological measure of arousal, two judges rated the palmar sweat papers. The two judges scores were averaged, because the inter-rater reliability was adequate (r= .97). For this measure, the interaction between treatment analogue and cognitive style was significant, F (1, 57) = 7.95, p, < .01. In the treatment condition, subjects were less aroused during the speech if they were verbalizers (M=2.75) than if they were visualizers (M =3.67). This difference is only marginally significant, F (1, 57) = 3.41, p < .07. In the control

condition, subjects palmar sweat measure indicated they were less nervous if they were visualizers (M= 2.04) than verbalizers (3.13), F (1, 57) = 4.84, p < .05.

Behavior. For the self-assessment measure of performance, the interaction between treatment analogue and cognitive style was not significant, F (1, 57) < 1.0. However, the means were, in part, ordered as predicted. In the treatment condition, subjects assessed their performance to be better if they were verbalizers (M= 22.71) than if they were visualizers (M= 21.78). Contrary to expectations, subjects in the control condition also assessed their performance to be better if they were verbalizers (M= 21.63) than if they were visualizers (M= 20.64). The difference in the treatment means and the control means were approximately the same.

Rater-Generated Responses

For each rater-generated response, the three raters' evaluations were combined so that there was one dependent measure for each participant. For each measure, inter-rater reliability was determined by coefficient alpha. To obtain an overall measure of extra-laboratory beliefs for each subject, the seven items in the measure were combined within raters, summed across raters, and then divided by seven (α = .76). The measure of fear observed by the raters was obtained by combining each raters score into one overall

score (α = .83). To obtain an overall behavioral measure, the five items' scores for each rater were combined and then each of the raters' scores was added together (α =.70).

Beliefs. For the raters' expectations that subjects would be able to cope with extra-laboratory situations, there was a significant interaction between treatment analogue and cognitive style, F (1,57) =5.21, $p < .05$. In the treatment condition, raters expected more effective coping from verbalizers (M= 206.33) than from visualizers (M= 156.24), F (1,57) = 6.62, $p < .05$. In the control condition, there was no significant difference in the raters' expectations of verbalizers (M= 184.09) and visualizers (M= 198.05), F (1, 57) < 1.00.

Fear. For the raters' evaluation of the participants' fear, there was a significant interaction between treatment analogue and cognitive style, F (1, 57) = 5.67, $p < .05$. In the treatment condition, raters judged the subjects' fear to be lower if they were verbalizers (M= 92.21) than if they were visualizers (M= 152.50), F (1, 57) = 7.40, $p < .01$. In the control condition, there was no significant difference in the raters' evaluation of fear in verbalizers (M=120.05) and visualizers (M= 104.27), F (1, 57) < 1.00.

Behavior. For the raters' evaluations of the subjects' performance, the interaction between treatment analogue and cognitive style only approached conventional levels of

significance, F (1, 57) = 2.65, $p < .11$. The means, however, were ordered as predicted. In the treatment condition, raters evaluated the subjects' performance as better if they were verbalizers (M= 78.64) than visualizers (M=66.35), F (1, 57) = 5.01, $p < .05$. In the control condition, there was no significant difference in the raters' evaluation of verbalizers (M= 70.05) and visualizers (M=70.64), F (1, 57) < 1.00.

Discussion

For this study, two main hypothesis were tested. First, it was hypothesized that participants would benefit more from treatment if they were verbalizers than visualizers. Second, it was hypothesized that there would be no differences in effects for participants in the control condition. Taken together, it was expected that there would be an interaction between treatment effects and cognitive styles.

For the subject-generated responses, the means were, in part, ordered as predicted but did not approach significance (although the physiological measure was statistically significant). That is, the verbalizers in the treatment condition indicated they had higher expectations about their ability to cope in extra-laboratory situations and assessed their performance to be better than visualizers in the treatment condition. Additionally, verbalizers in the treatment condition reported less fear (from the results of the physiological measure) and were less nervous during the speech than visualizers in the treatment condition. However, there were also differences between the verbalizers and visualizers in the control group.

For the rater-generated responses, the means were ordered as predicted and achieved statistical significance. That is, raters believed that verbalizers in the treatment

condition would be able to cope better in extra-laboratory situations, looked less fearful, and performed better than visualizers in the treatment condition. For the both the subject-generated responses and the rater-generated responses, there were no significant differences in verbalizers and visualizers in the control condition.

Alternative Hypothesis

There are many plausible explanations for the discrepancy between the subjects-generated responses and the rater-generated responses. One explanation for this discrepancy concerns the perspectives of the subjects and the raters. For purposes of reference, the subjects had a very limited perspective on the evaluation of their performance. That is, the only comparative analysis they could utilize for this situation was their past performances in other situations. On the other hand, the raters had a broader perspective on the subjects' performances. That is, the raters saw many participants speak, perhaps creating a more realistic comparison reference of subjects' performances. Thus, it might be considered that the subjects were "untrained" for their evaluations.

Another explanation for the discrepancy between the subject-generated responses and the rater-generated responses concerns the reliability of the measures. For any

one score (i.e., the subject's report or one rater's report), there is a certain amount of error involved. According to the true score model, aggregation of evaluations would reduce the amount of error involved. If so, the summed raters' responses would be more reliable than the subjects' single responses. Thus, it might be considered that the rater-generated responses would be a better index of the treatment effects than the subject-generated responses.

Finally, another explanation for the discrepancy between the subjects-generated responses and the rater-generated responses, is the sample size. With more participants, differences in the subjects-generated responses would perhaps become statistically significant instead of just approaching significance. More participants would add power to the analysis. Thus, given that the subjects-generated responses tended to be less reliable assessments than the raters-generated responses, adding more subjects might increase the reliability of these responses.

Theoretical Comparisons

There are many apparent similarities between treatment analogues from self-generated attitude change and treatments from other psychological frameworks. The perspective that seems to be most similar to the self-generated attitude

change model is cognitive restructuring. In general, cognitive restructuring approaches origins of phobias from the angle that peoples' affect and behavior are based on the way people cognitively structure their world (Corey, 1986). Social anxieties are described as "exaggerated fear of being the focus of attention and devaluation by another person or persons" (Beck, 1985 p. 150). Nichols (1974) described some characteristics of social anxiety such as the perception and expectation of disapproving or critical regard by others and a tendency to perceive and respond to criticism from others which is nonexistent.

Similarly, self-generated attitude change approaches origins of phobias from the angle that with increased thought, people's beliefs become increasingly consistent and their feelings become polarized. Social anxieties are described as negative, polarized attitudes that result from irrational beliefs. Tesser et. al. stated "that specific content of people's belief systems differ across persons in spite of the fact that the derivative process is illogical; i.e., there are any number of ways to be wrong" (1978, p. 273).

There seems to be many procedural similarities as well as differences in treatments derived from the cognitive restructuring model and the self-generated attitude change model. In cognitive restructuring, three basic strategies

or questions are utilized to help people change their beliefs: (1) "What's the evidence?" (2) "What's another way of looking at the situation?" and (3) "So what if it happens?" (Beck, 1985 pp. 201-209).

There are many forms of cognitive restructuring. In rational emotive therapy (RET), for example, Ellis suggests that people ask themselves "why would it emerge as terrible as that...would it really seem so awful if..." (Ellis, 1975 p. 154). In one way, this procedure is similar to constrained thought or process constraints in that both approaches seem to explore peoples' beliefs. With process constraints, however, people are just asked to think about the derivations of their beliefs rather than with the inclusion of the "so what if it happens" step. Also, people are asked to think about how these beliefs are logically related to their feelings and arrive at their own conclusions rather than think in a prescribed step. For example, with process constraints, there is not a "disputing" or "awfulizing" component which is deemed as essential in RET (Corey, 1986 p. 220). With process constraints, it would be asked why do you think that? With RET, it might be asked why is it terrible and horrible if life is not the way you want it to be?

Another difference between RET and process constraints is the structure of the interventions. "RET is highly

directive, confrontive...and highly didactic" (Corey, 1986 p. 228). Thus, RET seems to place much control with the therapist. In contrast, process constraints seem to place much more control with the individual. Therefore, the subtle nature of the interventions are different.

Another form of cognitive restructuring is the self-instructional intervention (Meichenbaum, 1977). Like process constraints, Meichenbaum's cognitive restructuring is somewhat self-focused. People are taught to modify the negative beliefs or internal dialogue they have within themselves. Similarly, with process constraints people are asked to explore their beliefs. Also, both treatments focused on verbalizations of beliefs.

However, Meichenbaum (1977) suggests rehearsing new dialogues in which the therapist says the dialogue and the individual just repeats it and then imagines it. The individual's coping statements are monitored by the therapist throughout the rehearsal and any mistakes are corrected by the therapist. Thus, the intervention tends to be somewhat directive. With self-generated attitude change, a change in beliefs decreases fear through the subjects' focusing on the derivations of their beliefs. The mediating process is increased thought by the subjects about their own beliefs. Thus, the structure of the interventions are different. That is, self-instructional interventions are

much more didactic than process constraint interventions.

Another technique that is similar to process constraints is objective countering. Objective countering states that "the client's beliefs can be changed if the therapist helps accumulate more logic against a thought than the client has in support of it; when the logical evidence tips the scales the beliefs will shift" (McMullin, 1986 p. 41). With objective countering, the individual is asked to write down all the logical reasons for the rejections of these beliefs. Like process constraints, the identification of beliefs is paramount. However, instead of just guiding an individual to understanding the logical origins of their beliefs as in process constraints, objective countering prescribes how it should be done (e.g., examining each belief in terms of the principles of inductive and deductive logic). Thus, the structure and actual implementation of objective countering is much more directive than the structure and implementation of treatment analogues derived from self-generated attitude change.

Overall, it appears that there is theoretical agreement between self-generated attitude change and cognitive restructuring approaches. For example, examination of peoples' beliefs are important. There is also agreement that affect is dependent on beliefs and that pathological behavior and affect is the result of illogical beliefs.

However, there are many conceptual and procedural differences between self-generated attitude change and cognitive restructuring One general difference is the amount of directiveness in the interventions. There are also differences in how the change in beliefs occurs. Thus, there seems to be many researchable similarities and differences between the self generated attitude change and cognitive restructuring approaches. Some of the speculative comparisons between self-generated attitude change model and cognitive restructuring might warrant future investigations. For instance, a comparison of process constraints, RET, self-instructional training, and objective countering might highlight the comparative effectiveness of each strategy. Additional research might define the precise similarities and differences between the processes of self-generated attitude change and other treatments.

Directions for Future Research

Thus far, in the self-generated attitude change research, the combination of reality and process constraints have been investigated (Leone, 1984; Leone & Baldwin, 1983; Leone et. al., 1983). Further exploration is needed to establish whether one treatment analogue alone (process or reality constraint), or the combination of both would be the most effective in ameliorating fears. Such research is currently underway (Leone & Groble, 1989).

Another useful study would be a comparison of the interaction process and reality constraints with verbalizing-visualizing cognitive styles. Such a study might compare process and reality constraints and evaluate which one is most effective for verbalizers and visualizers. It would be predicted that for verbalizers, process constraints would be more effective than reality constraints. This prediction has a strong basis in that verbalizers did indeed benefit more than visualizers from the process constraint treatment analogue in this study. Similarly, it might be predicted that for visualizers, reality constraints might be more effective. This prediction assumes that with reality constraints, people could check the reality of their distorted visual representations. Because reality constraints utilize the visual representation of their fear, people who typically use visual cognitive styles should benefit from this type of intervention.

Before any exact conclusions can be made about cognitive styles, this individual difference variable has to be researched further (e.g., what exact processes are verbalizers and visualizers utilizing?). Research has indicated that verbalizing and visualizing cognitive styles may be very flexible depending upon the context of the treatment (Akins, Hollandsworth, Alcorn, 1983; Akins,

Hollandsworth, & O'Connell, 1982; Stevens & Pfost, 1987) or the context of the fear (Lang, Melamed, & Hart, 1970, Weerts & Lang, 1978). Obviously, the area of cognitive style research needs methodological improvement (e.g., extensive refinement of diagnostic evaluations of cognitive styles). Before methodological improvement can be completed effectively, the theoretical construct of cognitive styles needs to be clearly described.

Another issue is the participant population, In the present and previous studies, college participants have been included. Some, but perhaps not all, of these participants could be considered part of the clinical population. Given additional resources, research could be conducted with phobic people that have dehabilitating symptoms. Perhaps, utilizing a population that is in extreme distress instead of a population that is in some distress might yield varied results.

In sum, issues to be explored include comparisons of self-generated attitude change treatment analogues to treatments from other psychological frameworks and comparisons of the different treatment analogues within the self-generated attitude change model. Additionally, the verbal and visual cognitive styles ought to be studied with the process and reality constraints to ascertain interaction effects. Finally, this study ought to be replicated with

various populations. In conclusion, by matching different cognitive styles with different self-generated attitude change treatment analogues, an efficient individualized treatment package might one day be possible.

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Vita

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