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Stress-related growth : can field independence be a mediator?

Marianna I. Baykina
San Jose State University

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STRESS-RELATED GROWTH: CAN FIELD INDEPENDENCE BE A MEDIATOR?

A Thesis

Presented to

the Faculty of the Department of Psychology

San Jose State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

by

Marianna I. Baykina

August, 2000

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APPROVED FOR THE DEPARTMENT OF PSYCHOLOGY

Robert Cooper

(Dr. Robert Cooper, Professor and Chair)

Glenn M. Callaghan

(Dr. Glenn M. Callaghan, Assistant Professor)

Naomi Wagner

(Dr. Naomi Wagner, Instructor)

APPROVED FOR THE UNIVERSITY

Joseph J. Pesal

ABSTRACT

STRESS-RELATED GROWTH: CAN FIELD INDEPENDENCE BE A MEDIATOR?

By Marianna I. Baykina

This thesis assessed the relationship between positive outcomes of negative life events and cognitive styles expressed in terms of field dependence/independence (FD/I). Positive outcomes of negative life events were assessed with the Stress-Related Growth Scale (SRGS). FD/I was measured with the Group Embedded Figures Test (GEFT). The first hypothesis in this study was that FI persons would demonstrate stress-related growth mainly in the self-enhancement area. The second hypothesis was that FD individuals would demonstrate stress-related growth mainly in the social skills area. One hundred forty-two college students, currently attending SJSU, participated in the study. Correlational analysis performed on the scores received on the SRGS and GEFT did not support the hypotheses.

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Stress-Related Growth: Can Field Independence Be a Mediator?

In the introduction, we discuss a phenomenon of stress-related growth, cognitive complexity, and the notion of field dependence/independence. We review research that can be considered in support of the view that field independence is correlated with an ability to form representational structures. Then we discuss the possibility of a relationship between field independence and stress-related growth. The hypotheses of the study are presented in the end of the section.

Stress-Related Growth

Lazarus and Folkman (1984) define stress as an interaction with the environment that is considered by individuals as costing resources and threatening their well-being. Most of the stress and coping research has been devoted to unfavorable outcomes and factors that diminish the stress reverberations (Cohen, 1988). However, Gerald Caplan (1964), who developed a preventive approach to community mental health, underscored that negative life events could bring about the potential for personal growth. The cornerstone assumption of the modern crisis theory (Caplan, 1964) is that a crisis brings a system into a state of disequilibrium, and that opportunities for growth are represented together with opportunities for deterioration on the way to acquiring a new equilibrium state.

The last two decades witnessed a growth in research exploring the possibility of finding benefits from negative life experiences. Taylor's (1983) model of cognitive adaptation emphasizes the adaptive value of positively reinterpreting stressful experiences. The implication is that such positive reinterpretation serves not only for coping with the

The implication is that such positive reinterpretation serves not only for coping with the event that had been reinterpreted, but also for “future references” for newly occurring stresses. Antonovsky (1987), who coined the term “sense of coherence,” considers stress-related positive outcomes to be common experiences. Sense of coherence refers to a set of traits that help individuals to function adequately under stress and includes the ability to assess stressors as comprehensible. Janoff-Bulman (1992) offers a theoretical framework that involves an assumptive world that is shattered by a trauma and rebuilt later on. Tedeschi and Calhoun (1998) view personal growth as an inevitable outcome of overcoming adversity. Tennen and Affleck (1999) argue that finding benefits in adversity constitutes an adaptive phenomenon in search of conceptualization.

Growth in the aftermath of adversity has been reported to occur in different populations: bereaved, people with chronic illnesses, victims of sexual assault or abuse, and so forth (for a review, see Tedeschi, Park, & Calhoun, 1998; Cohen, Hettler, & Pane, 1998). Antonovsky (1987) gained his insightful observations from the studies of holocaust survivors.

The literature on growth as an outcome of negative life events usually considers both trauma and stress. Different authors used different terms for the phenomenon of interest. Yalom and Lieberman (1991) considered “positive psychological changes”; McMillen, Zuravin, and Rideout (1995) and Tennen, Affleck, Urrows, Higgins, and Mendola (1992) – “perceived benefits” and “construing benefits” respectively; O’Leary and Ickovics (1995) named it “thriving”; Park, Cohen, and Murch (1996) used the term

“stress-related growth.” Tedeschi, Park, and Calhoun (1998) suggested the term “posttraumatic growth” maintaining that this term clarifies “that persons experiencing this phenomenon have developed beyond their previous level of adaptation, psychological functioning, or life awareness, that is, they have grown” (p. 3). These authors also underscore that the influence of this phenomenon on people’s lives is too profound to consider it just a coping mechanism.

Tedeschi and Calhoun (1995) distinguish the following changes in a personal functioning that indicate posttraumatic growth: (a) changes in perception of self, (b) changes in interpersonal relationships, (c) changes in philosophy of life. The authors stress that all three of these manifestations may not appear in the same person.

Tedeschi, Park, and Calhoun (1998), reviewing the reported evidence of posttraumatic growth, state that the majority of studies were not designed to find such evidence and the results were not anticipated. Growth manifested in the perception of self can concern labels that people apply to themselves, self-reliance, and awareness of their vulnerability. Growth in the interpersonal relationships domain includes the ability for self-disclosure and emotional expressiveness as self-directed part of communications and compassion and giving to others as the outer world directed communications. Tedeschi et al. categorize the positive posttraumatic changes concerning philosophy of life into four groups: priorities and appreciation of life, existential themes and sense of meaning, spiritual development, and wisdom.

However, to date very few studies were designed to assess perceived benefits from negative life events, and most of their data were qualitative. The 50-item Stress-Related Growth Scale (SRGS; Park, Cohen, & Murch, 1996) appears to be the first quantitative measure of the concept under discussion. Its items touch upon three major types of stress-related positive outcomes: (a) enhanced social resources, (b) enhanced personal resources, and (c) improved coping skills. The SRGS was created for two major purposes: (1) to assess stress-related growth and (2) to gain knowledge about determinants of stress-related growth (Park et al., 1996). The 21-item Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996) was published six months later. Both measures assess growth in the aftermath of negative life events, but the PTGI refers to events that are stressful to the extreme.

In the proposed study we plan to use SRGS for two reasons. First, empirical research on PTG relies on self-reports measures, a fact that Shedler, Mayman, and Manis (1993) criticize on the grounds that reporting participants can be in “defensive denial.” In contrast, Park et al.’s (1996) studies utilizing SRGS validated self-report measures by obtaining reports from respondents’ significant others. Second, the term PTG emphasizes that events of interest are highly stressful, whereas the proposed study will be conducted on the sample from the college student population, in which occurrence of highly stressful events can approximate the general population.

Cognitive complexity and PTG

In search for understanding the links between PTG and personality characteristics, different authors named different factors. Personality dimensions that have received the most consideration are dispositional optimism/pessimism, cognitive complexity, self-complexity, and dispositional hope (for a review, see Tennen & Affleck, 1998). Several experts in the field believe that dimensions of cognitive and self-complexity hold considerable promise (Linville, 1987; McCann & Pearlman, 1990; Morgan & Janoff-Bulman, 1994; Schaefer & Moos, 1992; Tennen & Affleck, 1998, 1999). High self-complexity means a considerable number of identities used to organize self-schemas, and ability to view oneself from multiple perspectives enables an individual to create new self-representations after a trauma.

Cognitive abilities were considered in a related area of research on stress and trauma, namely on resilience. Harvey (1996) distinguished between “recovery” from trauma and resilience in a following way: Resilience manifests itself when trauma does not affect certain aspects of self, whereas recovery means change from undesired to desired outcome. Rutter (1987) and Garmezy (1985) in their research on resilience in children considered cognitive abilities to be crucial as allowing for a richer repertoire of strategies applicable in a situation.

Cognitive abilities that allow for better restructuring of encountered situations and that account for greater cognitive and self-complexity can be understood as strong abilities to form representational structures. Such an approach is consistent with a view on cognitive development proposed by Annette Karmiloff-Smith (1992). According to her

theory, cognitive development is constituted by representational redescription that occur in every domain of human functioning. The mind has modular organization, but the process of representational redescription is domain general and modules are not encapsulated, the quality that allows for an informational exchange between the modules. Important in this theory is also the point that representational redescriptions happen not because of occurring disequilibriums, but because of the mastery of the representations of the previous level.

Karmiloff-Smith's (1996) theory of cognitive development is consistent with Riegel's (1979) dialectical psychology and with the dialectical constructivist approach to clients and to psychotherapy proposed by Greenberg and Pascual-Leone (1995). Riegel argues that neither social or living systems, nor human beings require a state of disequilibrium for further development, which occurs because of the dialectical processes inherent to the above mentioned systems and people. The dialectical constructivist approach, being an approach of experiential psychotherapy, utilizes an assumption that human beings are aware, experiencing organisms who function holistically to organize their experiences into coherent forms (Greenberg & Van Balen, 1998). People are viewed as discovering meaning in their unique and subjective experience, which constitutes an essential part of their humanity. People simultaneously discover and create themselves anew each moment (Greenberg, Rice, & Elliott, 1993). The approach considers the self as always being in a constructive process of becoming, involving a dialectical process of symbolizing and constructing experience from internal complexity (Greenberg & Elliott,

1997; Greenberg & Pascual-Leone, 1995, 1997). The dialectical view of human beings also accounts for change occurring within the self when a researcher accepts the stance of Maturana and Varela (1987), whose work on visual systems led them to claim that brain is a closed system.

Consider together the mentioned above promises of cognitive and self-complexity to account, at least in part, for stress-related growth, the cognitive development understood in terms of development and restructuring of representations, and the dialectical constructivist approach. The question of a measurable factor, responsible for the differences in individual abilities to form representations, seems to be the next logical step.

Field Dependence/Independence

In our opinion, the domain-general ability to form representational structures can be assessed by the performance on the Embedded Figures Test (EFT). The stimuli for this test consist of eight simple geometrical figures and 12 complex patterns. Each of the complex patterns contains one simple figure. A research participant is required to look at a simple geometrical figure and then to identify this figure in a complex pattern under the condition that the simple figure and the pattern cannot be seen at the same time. In order to perform successfully on this test, the participant has to form a mental image, or representation, of the simple figure, to hold it in memory, and to disembed this figure from the misleading context in the complex figure. The EFT was initially designed and continues to be used for assessment of field independence.

The notion of field dependence/independence (FD/I) was first introduced by Herman Witkin after his laboratory studies that are now classic (e.g., Witkin & Asch, 1948). The researchers were investigating the importance of visual cues in perceiving the vertical direction of space. The strategy utilized the conflict between visual and gravitational cues. In the Rod-and-Frame Test (RFT), for example, the conflict was created by showing a rod in a tilted square frame in a dark room. The research participants had to adjust the rod to the vertical position. The RFT was one of the tests developed for measuring a person's manner of conflict resolution, and the term field dependence was first used to describe the effects of the tilted visual fields used in these tests (Goodenough, 1986). The finding was that individuals differ to a large extent in degree of FD with a strong consistency across many tests of orientation perception (Witkin, Lewis, Hertzman, Machover, Meissner, & Wapner, 1954).

The notion of FD/I was used in subsequent research in clinical psychology, developmental psychology, psychology of perception, educational psychology (Johnson & Rosano, 1993; Pascual-Leone, 1989). Personality correlates of FD involving social-interpersonal behavior played especially important role in the development of the theory of FD/I.

Another important early discovery was the finding that FI in upright perception is related to ability in locating embedded figures (Witkin et al., 1954). Research participants must disembed the rod from the surrounding frame in the RFT, and they must similarly disembed the simple figure from the complex pattern in the Embedded Figures Test

(EFT). By 1962, field independence had been redefined as the capacity to overcome, or analyze, an embedding context in perceptual functioning (Witkin, Dyk, Goodenough, & Karp, 1962).

The issue of interpretation FI/D as a cognitive style or as ability has been a controversial one. Arguments in support of the ability interpretation include the following ones: (a) performance on the tests of FD/I reflects an individual's capacity to locate the true vertical (RFT) or a simple figure embedded in a complex one (EFT), (b) measures of FD/I are correlated with other ability tests, (c) learning and achievement research has consistently shown that FI individuals do better in these areas (Davis, 1991). Researchers studying second language acquisition usually consider FD/I as a cognitive style (e.g., Johnson & Rosano, 1993).

Regardless of interpretation, researchers agree that FD/I is a mode of processing that applies across contents and domains and is especially salient in the situations characterized by ambiguity or cognitive conflict (Jamieson, 1992). In such situations, FD participants tend to rely on external referents and sources of information, whereas FI participants tend to demonstrate autonomy from external sources of information. Greater autonomy as a personality characteristic is associated with cognitive restructuring ability in perceptual and cognitive tasks (Witkin & Goodenough, 1977).

The issue of which factor best accounts for FI has not been clearly resolved. Juan Pascual-Leone (1989) proposed an organismic process model as a frame for explaining the relationship between developmental processes and FD/I. Within this model, the gestaltist

perceptual and the attentional operators are considered as important in the disembedding processes.

Field Independence as a Measure of the Ability to Form Representational Structures

The results of the number of studies can be considered in support of the view that field independence can be regarded as a measure of the ability to form representational structures. The notions of field dependence/independence and cognitive styles are used interchangeably.

Cognitive style conceptualized within the FD/FI paradigm was found to stabilize in age between 8 and 24 years (Witkin et al., 1954). The study conducted by Steele (1989) addressed the question whether gifted children experience earlier stabilization of cognitive style. The hypothesis of interest was that gifted children become field-independent early, at age 6, and that FI is a better predictor of academic success than IQ. Field dependence/independence was measured by the Preschool Embedded Figures Test (PEFT, Coates, 1975, as cited in Steele, 1989). This test's principal factor is loaded on a perceptual analytical ability similar to that of the Children's Embedded Figures Test (CEFT, Witkin & Goodenough, 1977) used with older children.

Participants were gifted and not-selected-as-gifted children. To be selected as gifted for this study a child had to score 125 and higher on the Stanford-Binet IQ test. A series of ANOVAs were conducted on all set of scores to determine the differences between the gifted children and not-selected-as-gifted children. FI children in the total sample were significantly older chronologically and had higher IQ. These differences were

salient in both the gifted and not-selected-as-gifted groups. The conclusion was that the cognitive style of gifted children was different from the cognitive style of not-selected-as-gifted peers. Another conclusion was that gifted children process information more efficiently and more rapidly than their chronological peers.

The study on allocation of mental-attentional capacity (Baillargeon, Pascual-Leone, & Roncandin, 1998) addresses the relationship between cognitive development and cognitive style, but from a different point of view than the study by Steel (1989). Within the organismic process model (Pascual-Leone, 1989) one of the questions is the following one: Do FD individuals allocate their mental-attentional resources less efficiently than FI do, or are their mental-attentional resources more limited than that of FI's?

The researchers hypothesized that FI/FD is a performance rather than a competence variable and FD individuals differ not on mental-attentional capacity, but on the existence of executive schemes of utilizing current resources. FD/FI was measured by the CEFT. Mental-attentional capacity was measured by a performance on the Figural Intersection Task (FIT, Pascual-Leone & Ijaz, 1989, as cited in Baillargeon et al., 1998). The FIT was developed for assessment of mental-attentional capacity as a form of intellectual development. The FIT presents a participant with tasks below, equal to, or above the child's mental power and, because of the discrepancy, requires application of different attentional strategies. Mental power within this framework is defined as the power of the participant's allocatable mental-attentional capacity. One of the hypotheses

was that a FD child performs better than a FI one on tasks mental demands on which exceed the participant's mental power, whereas a FI child performs better than a FD one in case of the task being equal to the participant's mental power.

Participants were children age 9-13 with 70% of the sample being identified as gifted. To distinguish group differences in mental-attentional capacity from differences in mental processing strategies the study utilized multigroup latent structure analysis. Results showed that a FD participant had better odds of success than a FI one when the task's mental demand was above the child's mental power. When the task's mental demand was below or equal to the child's mental power, a FI child performed better than a FD one.

Thus, in a situation like the FIT field dependence is value neutral. However, comparison of performance of nongifted versus gifted children clearly showed an advantage of the gifted children regardless of whether the item's mental demand was above, below, or equal to the child's mental power. Since nongifted children were more than five times more likely to be FD than gifted and did not perform as well in misleading situations on FIT as FD children, the authors came to a conclusion that FD/I appears as unipolar and value directional.

Two studies explored the relationship between the ability to overcome embeddedness in visual context and in musical context. Ellis and McCoy (1990) investigated the connection between the cognitive style and ability to identify musical form. Music educators believe that it is important to develop skills of musical form discernment. Field-independent subjects take an analytical approach to information

processing, which accounts for their ability to overcome embeddedness in visual context. The authors of the study hypothesized that field-independent subjects would show an advantage over field-dependent subjects in musical form discernment.

Participants were nonmusic majors enrolled in a college introductory music course and tested prior to instruction. The authors conducted a correlational study on two sets of scores. The first set of scores was obtained from the results on the EFT. The second set of scores was obtained on the author-designed Musical Form Test (MFT). On this test the subjects had to match each of the 12 musical pieces with one out of six musical form descriptions. Consistent with the hypothesis, field-independent participants scored significantly higher than field-dependent participants on the MFT.

Ellis (1995) investigated the link between FI and the ability to discern music texture. The hypothesis was that FI individuals are better able to discriminate among musical textures than FD ones. Music texture refers to different levels of complexity of interplay of themes within one piece. FI/FD was assessed by the EFT. Music texture discrimination was assessed by the author-developed Texture Discrimination Test (TDT). Participants were non-music majors who participated in a short lesson on music texture prior to taking the TDT. The correlational analyses were conducted on the two sets of scores. Consistent with the hypothesis, FI participants identified homophonic (medium complexity) and polyphonic (maximum complexity) textures significantly better than FD participants. There was no significant difference between FI and FD participants in identifying monophonic (minimum complexity) pieces.

The findings from these two studies show the connection between representations formed in different domains, music and geometry. Also, results of these studies show that for a given individual a cognitive style can be stable across different domains. Especially interesting is the fact that the initial processing of stimuli comes from different perceptual systems. This piece of knowledge adds to understanding why a cognitive style can account for pervasive personality characteristics.

Leventhal and Sisco (1996) conducted a study to assert an hypothesized link between the cognitive style in terms of field dependence/independence and two social-behavioral characteristics, locus of control and self-monitoring. People with an internal locus of control tend to attribute events in their lives to their own behaviors, whereas people with an external locus of control perceive life events to be beyond their control. Self-monitoring refers to situationally-based behaviors in social situations (high self-monitors) and dispositionally-based behaviors (low self-monitors).

The correlational analysis was conducted on two measures of field dependence/independence (EFT and Witkin Rod and Frame Test), a measure of locus of control (Adult Novicki-Strickland Internal-External Locus of Control Scale), and a measure of self-monitoring (Snyder Self-Monitoring Scale). Consistent with the hypothesis, FI participants tended to have an internal locus of control and score as low self-monitors.

The authors (Leventhal & Sisco, 1996) suggested that the EFT is a better measure of the construct of field dependence/independence than the Witkin Rod and Frame Test.

They also brought up the argument that the Rotter's Locus of Control Scale, employed by most past studies, could be a less valid measure of the construct of locus of control in that it is too global and participants can show a social desirability bias.

The findings from this study bring evidence that field independent people can be better able to separate a stimulus from the context not only in visual perceptual field, but also in a social situation.

The study conducted by Tourrette (1989) explored whether guiding FD participants toward analytical processing of written text can result in better comprehension and target word recall. Text comprehension and retention require an ability to organize processed information. A reader organizes new information according to the reader's prior knowledge. When this knowledge takes the form of abstract structures that can be applied to different texts, such structures, or organizing frames, are called schemas. Previous research (Spiro & Tirre, 1980, as cited in Tourrette, 1989) found that ability to dissociate a schema from a text significantly affected number of words recalled and was significantly correlated with a cognitive style as measured by field dependence/independence. Field-independent participants tended to extract a schema from a text better and to recall a greater number of words than field-dependent participants.

Participants were 7th graders from Poitiers schools. All participants took the EFT. The median of their EFT scores was used to divide them into FD and FI groups. Both groups were subdivided into two subgroups. One FD and one FI group received instructions that primed them to search for a schema in a text prior to reading. The rest of

the participants did not receive such instructions. The correlational analysis was conducted on the EFT scores and number of words recalled. Results showed that both FI and FD participants benefited from the instructions, but the margin between FI and FD remained stable. Thus, FI participants demonstrated better capacity to form organizational structures than FD participants regardless of priming.

Two studies demonstrated the relationship between FI and formation of representational structures within the language domain. The hypothesis in the study of Johnson and Rosano (1993) was that field independence is negatively correlated with metaphor fluency and communicative proficiency for English as a second language (ESL) learners. Metaphor fluency referred to ability to interpret ambiguous statements like “My sister was a butterfly”. Communicative proficiency was measured by an index of pragmatic competence from the Language Assessment Scale (De Avila & Duncan, 1983, as cited in Johnson & Rosano, 1993). The block designs test from the WAIS-R (Wechsler, 1981) was used as an index of both analytical ability and field dependence/independence.

Three groups of participants were used in the study: one group of English native speakers and two groups of ESL learners who differed by the level of English proficiency. Field-dependent participants scored higher on communicative proficiency. Field-independent participants scored higher on metaphor interpretations for all three groups.

In the second study that investigated the relationship between cognitive styles and ESL proficiency (Jamieson, 1992), the hypothesis of interest was that field independence

(FI) is positively correlated with performance on selected linguistic tasks for those studying second language. FI was measured by the EFT, and English proficiency was measured by the Test of English as a Foreign Language (TOEFL). TOEFL measures different aspects of language proficiency necessary for an education at an American university.

Participants were students from an American university who came from foreign countries. Since language improvement was an issue, the TOEFL was administered twice – at the beginning and at the end of the semester. FI was moderately positively correlated with high scores on all language measures.

Since FD individuals are considered to be socially oriented, prone to communication, and, therefore, more motivated to improve their language skills, this finding is important in terms of adding evidence that FI people do better than FD on different language tasks regardless of motivation.

Results of the reviewed studies show consistent individual differences between FD and FI participants, both children and adults. Ability to overcome embeddedness within a complex visual stimuli by creating a representational structure of a simple geometrical figure is correlated with the abilities to create representational structures in the language, music, and social domains. This ability seems to be critical for academic success. The study of Tourrette (1989) demonstrated that FD individuals can improve their schema formation by being primed in desired direction.

FD/I and Stress-Related Growth

Our study focused on the link between the cognitive styles in terms of FD/I and stress-related growth. FI individuals tend to have better cognitive restructuring skills, have more abstract, impersonal orientation, and function with a greater degree of personal autonomy than FD ones (Witkin & Goodenough, 1977). Therefore, we hypothesized the FI individuals to show growth in the self-enhancement area as an expression of SRG. FD people rely on others to a greater degree than FI and are more socially oriented. Therefore, we can expect the FD individuals to show social skills enhancement as an expression of SRG.

The study tested two hypotheses: 1) participants who are high on FI will utilize more inside-directed (self-related) strategies when overcoming consequences of stressful/negative events as listed in SRGS (i.e., items related to the “Theory of Mind” and “Self-Complexity”); 2) participants who are high on FD will utilize more outside-directed (others-related) strategies when coping with stress (i.e., items related to the “Social Relations”, “Support from Others”, and “Religion”).

Method

Participants

One hundred fifty students who were attending General Psychology or Discovering Business classes at San Jose State University participated in the study. All students of the General Psychology class received credit toward their research participation requirement. The data from eight participants were not used in the analyses because their responses

were either uncodable or demonstrated failure to understand the task on the GEFT. The data from one hundred forty-two students (89 women and 53 men, age range 18-47, mean age 20.10) were used in the analyses.

Materials

The Group Embedded Figures Test (GEFT) and 50-item Stress-Related Growth Scale (SRGS) were used in this study.

Design and Procedure

Testing occurred in six groups. All testing occurred during the daytime in classrooms at SJSU. Each participant was tested in a single session. Participants were first administered the 50-item SRGS with no time limitation. After all participants in the group filled in and submitted the SRGS, the group was administered GEFT according to the manual (Witkin, Oltman, Raskin, & Karp, 1971). This procedure involves explanation of the task with untimed practice items, a first timed section administered for practice, and a second and third timed sections which are scored. Each section consists of nine items. A short break is taken between the sections.

Scoring

On the GEFT a participant received a score of 1 for each correct response and a score of 0 for each incorrect response. Since the whole scored part of the test contains 18 items, the maximum score on this test is 18.

On the SRGS each item can be answered "0 - not at all," "1 - somewhat," or "2 - a great deal." Since the whole scale contains 50 items, the maximum score is 100. The 50

items were subdivided according to the type of stress-related growth they addressed, namely self-enhancement, relationship with others, philosophy of life. The type of stress-related growth each item assessed was determined by consensus between the authors. Disagreements were resolved by discussion. All 50 items and their assignment to the type of stress-related growth they addressed are presented in Appendix B.

Results

In this section, we first present descriptive measures of scores obtained on both tests. Then we present results of a Varimax rotation factor analysis of the SRGS. We conclude with the overall correlation between the scores obtained on SRGS and GEFT.

The overall mean and standard deviation on the GEFT were 12.54 and 4.48, respectively. The scores ranged from a minimum of 1 to a maximum of 18. Men ($M = 13.64$, $SD = 3.49$) scored statistically significantly higher than women ($M = 11.89$, $SD = 4.88$), $t(140) = 2.29$, $p < .05$.

On the SRGS the mean and standard deviation were 53.04 and 20.51, respectively. The scores ranged from a minimum of 1 to a maximum of 95. Women ($M = 56.80$, $SD = 18.67$) scored statistically significantly higher than men ($M = 46.72$, $SD = 22.03$), $t(140) = -2.91$, $p < .01$.

In order to evaluate the consistency of performance on the GEFT and the consistency of responses to the items of the SRGS for each participant, an alpha coefficient was calculated for each test. The resultant coefficients were .88 and .94 for the GEFT and for the SRGS, respectively.

The 7,100 stress-related growth ratings were first subjected to a principal components factor analysis using an unstipulated number of factors defined by eigenvalues greater than 1.00. Initially 14 factors were extracted that accounted for 69% of the variance in ratings.

Orthogonal rotation was performed with first four factors with eigenvalues greater than 2.00 which cumulatively accounted for 41% of variance. The first factor accounted for 27.2% of variance, the second factor accounted for 5.3% of variance, the third factor accounted for 4.5% of variance, and the fourth factor accounted for 4.1% of variance.

The three a priori categories of items appeared to be highly correlated with each other (see Table 1). However, the correlation of these three category scores with the four factors with eigenvalues greater than 2.00 obtained through the exploratory factor analysis revealed a correspondence between the a priori and empirical subscales (see Table 2).

None of the correlations between the performance on the GEFT and a priori factors, as well as between the scores on the GEFT and empirically obtained four factors was statistically significant (see Table 3). As a final evaluation of the relationship between the performance on the GEFT and responses to the items of the SRGS a Pearson product-moment correlation coefficient was calculated on the overall scores obtained on the GEFT and the SRGS. It showed an absence of statistically significant correlation between performance of the GEFT and responses to the items of the SRGS, $r = -.124$, $p > .05$.

Table 1

Correlation Among A Priori Categories of Items

	<u>Self-Enhancement</u>	<u>Relationship with Others</u>
Relationship with Others	.70**	
Life Philosophy	.82**	.75**

Note: $N = 142$.

** $p < .01$.

Table 2

Correlation Between the A Priori and Empirical Subscales

<u>Empirical Subscale</u>	<u>A Priori Subscale</u>		
	Self-Enhancement	Relationship with Others	Life Philosophy
Factor Score 1	.47**	.82**	.34**
Factor Score 2	.37**	.39**	.73**
Factor Score 3	.68**	.27**	.34**
Factor Score 4	.32**	.25**	.35**

Note: $N = 142$.

** $p < .01$.

Table 3

Correlation Between the Scores on the GEFT and Factors

	<u>GEFT Total Score</u>
<u>Empirical Subscale</u>	
Factor Score 1	.01
Factor Score 2	-.12
Factor Score 3	-.05
Factor Score 4	-.06
<u>A Priori Subscale</u>	
Self-Enhancement	-.01
Relationship with Others	-.01
Life Philosophy	-.12

Note: N = 142.

Discussion

In this section, we evaluate the results with regard to our original hypotheses and qualify them according to the specificity of the sample of participants of our study. Considerations which can be taken into account for next steps in the same direction are discussed.

Our study did not find experimental support for the hypotheses that FI participants would show stress-related growth primarily in self-enhancement area and FD participants would demonstrate growth primarily in the relationship with others. None of the correlations between the GEFT and the total score and sub-scores on the SRGS was significant.

The measurement characteristics of both the GEFT and SRGS appear to be good. First, the Cronbach alpha for both scores were high. Second, the a priori and empirical subscales of the SRGS correlated in patterns that lend support to the conceptual distinction in the two hypotheses.

However, despite the support for these conceptual distinctions, the subscales are highly correlated with one another. Since the first hypothesis predicts a positive correlation of the self-enhancement subscale with the GEFT score, and the second hypothesis predicts a negative correlation of the social relations subscale with the GEFT score, both hypotheses could not be supported.

Given the limitations imposed by the intercorrelations of the subscales, a conclusion that our underlying conceptualization is fallacious would be premature. The

SRGS was developed at the University of Delaware, using their students as participants. The ethnic groups constituting the student bodies there and at SJSU differ significantly. Even more importantly, the values of those ethnic groups differ. The majority of students at SJSU belong to Asian and Latino ethnic groups, who place great value on interrelationship and would consider improvement of social skills to be a necessary part of personal growth. However, those students live in the United States and it would be unrealistic to think that they have not been partially imbued with the traditional American value of self-enhancement. This means that interrelationship between the factors can be explained by the social desirability bias.

Another important consideration is possible low validity of SRGS. One of the methodological weaknesses that this measure possesses is absence of the reversed items in this scale. Absence of reversed items can lead to a “yeah-response” bias (Rosenthal & Rosnow, 1991), which can also account for a tendency of some of our respondents to answer positively on many items. If this bias is a reliable individual difference, it would account for the high reliability and high correlations among the subscales. Redesigning the scale with reversed items would eliminate this problem.

The number of initially extracted factors with eigenvalues greater than 1.00 also provide an indirect evidence that the underlying assumption of the SRGS that it assesses a few specific areas of growth possesses low validity. Those fourteen factors account for 69% of the variance. Only the first factor extracted accounts for a large portion of the

variance. The other 13 account for slowly diminishing portions of variance. This supports the possibility of the substantial limitation of the validity of the measure.

If another study can be conducted based on the same conceptualization as presented, two changes would be useful. One is improving the SRGS. First, as just discussed, reversed items should be incorporated in the scale. Second, a methodology can take advantage of the strategy when a respondent is forced into limited choices. For example, respondents can be offered to choose the one most important positive impact that a stressful event had exerted on them. The other change would be to find another measure to tap the same construct as the GEFT. Minimally, the individual version of the embedded figures test could be used.

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Appendix A

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San José State
UNIVERSITY

Office of the Academic
Vice President

Associate Vice President
Graduate Studies and Research

One Washington Square
San Jose, CA 95192-0025

Voice: (408) 924-2480

Fax: (408) 924-2477

E-mail: gsr@www.sjsu.edu
<http://www.sjsu.edu>

TO: Marianna Baykina
360 DelMedio Ave., #4
Mountain View, CA 94040

FROM: Nabil Ibrahim.
AVP, Graduate Studies & Research

DATE: September 10, 1999

The Human Subjects-Institutional Review Board has approved
your request to use human subjects in the study entitled:

"Stress Related Growth: Can Field Independence
be a Mediator?"

This approval is contingent upon the subjects participating in
your research project being appropriately protected from risk.
This includes the protection of the anonymity of the subjects'
identity when they participate in your research project, and
with regard to any and all data that may be collected from the
subjects. The Board's approval includes continued monitoring
of your research by the Board to assure that the subjects are
being adequately and properly protected from such risks. If at
any time a subject becomes injured or complains of injury, you
must notify Nabil Ibrahim, Ph.D., immediately. Injury includes
but is not limited to bodily harm, psychological trauma and
release of potentially damaging personal information.

Please also be advised that all subjects need to be fully
informed and aware that their participation in your research
project is voluntary, and that he or she may withdraw from the
project at any time. Further, a subject's participation, refusal to
participate, or withdrawal will not affect any services the
subject is receiving or will receive at the institution in which
the research is being conducted.

If you have any questions, please contact me at
(408) 924-2480.

Appendix B

Items of the Stress-Related Growth Scale with Assignment to Subscales

Self-Enhancement

- I learned that I was stronger than I thought I was.**
- I realized I have a lot to offer other people.**
- I learned to respect others' feelings and beliefs.**
- I learned to look at things in a more positive way.**
- I learned better ways to express my feelings.**
- I learned not to let hassles bother me the way they used to.**
- I learned to take more responsibility for what I do.**
- I don't take most things for granted anymore.**
- I feel freer to make my own decisions.**
- I learned that I have something of value to teach others about life.**
- I learned to appreciate the strength of others who have had a difficult life.**
- I learned not to "freak out" when a bad thing happens.**
- I learned to think more about the consequences of my actions.**
- I learned to get less angry about things.**
- I learned to be a more optimistic person.**
- I learned to approach life more calmly.**
- I learned to be myself and not try to be what others want me to be.**
- I learned to accept myself as less than perfect.**

- I learned to work through problems and not just give up.
- I learned to be a more confident person.
- I learned to be open to new information and ideas.
- I learned to deal better with uncertainty.
- I learned that most of what used to upset me were little things that aren't worth getting that upset about.
- I learned to stand up for my personal rights.

Relationship with Others

- I developed new relationships with helpful others.
- I became more accepting of others.
- I realized I have a lot to offer other people.
- I learned to respect others' feelings and beliefs.
- I learned to be nicer to others.
- I learned that I have something of value to teach others about life.
- I learned to appreciate the strength of others who have had a difficult life.
- I learned how to reach out and help others.
- I learned to listen more carefully when others talk to me.
- I now better understand why, years ago, my parents said/did certain things.
- I learned to communicate more honestly with others.
- I learned that it's OK to ask others for help.
- A prior relationship with another person became more meaningful.

- I became better able to view my parents as people, and not just as “parents.”
- I learned that there are more people who care about me than I thought.
- I developed a stronger sense of “community,” of “belonging” – that I am part of a larger “group.”

Life Philosophy

- I rethought how I want to live my life.
- I learned that I want to accomplish more in life.
- My life now has more meaning and satisfaction.
- I learned to live for today, because you never know what will happen tomorrow.
- I don't take most things for granted anymore.
- I learned to appreciate the strength of others who have had a difficult life.
- I learned to think more about the consequences of my actions.
- I learned to accept myself as less than perfect.
- I learned to take life more seriously.
- I learned to find more meaning in life.
- I changed my life goals for the better.
- I learned not to take my physical health for granted.
- I learned to be open to new information and ideas.
- I learned that I want to have some impact on the world.
- I learned that most of what used to upset me were little things that aren't worth getting that upset about.

-A prior relationship with another person became more meaningful.

-I became better able to view my parents as people, and not just as “parents.”