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The Development of the Stress-Response Scale for Adolescents

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THE DEVELOPMENT OF THE STRESS-RESPONSE SCALE

FOR ADOLESCENTS

by

Steven Curtis

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

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This work is dedicated to Pandy. May he be
playing happily in doggy heaven.

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ABSTRACT

The Development of the Stress-Response

Scale for Adolescents

by

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Utah State University, 1989

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Adolescence is an important period in the life
cycle for which to study stress, due to the many involved
developmental changes that require adaptation. This
adaptation can be very stressful and result in pathology.
Stress is defined as a "process" involving a continual
transaction between stressors in the environment, mediating
variables, and stress responses.

The Stress-Response Scale for Adolescents (SRSA)
was developed to measure self-perceived stress responses of
those between the ages of 14 to 20. The SRSA's development
involved three studies. Study 1 involved item selection,
scale construction, item reduction, and estimations of
internal consistency and validity. Truthfulness items were
developed to determine the honesty of responses.

Study 2 tested the ability of the SRSA, through
role-enactment methodology, to distinguish those in a high-
stress condition versus those in a low-stress condition.
Study 3, again with the use of role-enactment methodology,

tested the potential of the SRSA to detect changes in stress-response levels when individuals were taken from a low-stress to a high-stress condition and vice versa.

The final SRSA includes 32 stress-response and six truthfulness items. Initially, factor analysis of the SRSA revealed a high loading of gender on the primary factor. Separate forms were created for males and females. Repeat factor analyses of items in the two forms revealed four factors each for males and females but were of questionable utility due to high intercorrelations. All sections of the SRSA should be used for most purposes. Internal consistency estimates of the SRSA are .96 ($\underline{p}$ < .05) for females and .94 ($\underline{p}$ < .05) for males. Validity estimates are all in the expected direction and range from .25 to .79 for both males and females. The truthfulness items have a coefficient alpha of .82 for females and .77 for males, with validity estimates ranging from .34 for females to .14 ($\underline{p}^S$ <.05) for males. Studies 2 and 3 revealed that the SRSA does have the potential of differentiating between those in different stress conditions and also of detecting stress-response changes.

It was concluded that the SRSA, although in preliminary form, has the potential of assessing the stress response in adolescents as long as the discussed weaknesses, such as small sample size and nonrandomization, are taken into account.

(145 pages)

CHAPTER I

STATEMENT OF THE PROBLEM

Overview of Thesis Work

The objective of the study was to create a valid and
reliable instrument for assessing self-perceived stress
responses among adolescents. This objective was
accomplished through three separate studies. Study 1
involved item generation, scale development, and
determination of validity and reliability. Study 2
investigated the potential of the instrument to distinguish
between adolescents in a high-stress condition and those in
a low-stress condition. Study 3 examined the ability of
the instrument to detect changes in stress-response levels
when individuals are taken from a low-stress to a high-
stress condition.

Introduction

Adolescence is commonly seen as a very stressful
period. The individual begins to make the transition from
childhood to adulthood--commonly referred to as second
individuation (Adams & Gullotta, 1983). Dating begins, the
physique changes radically, importance of peers increases,
and conflict between parents and the adolescent increases
due to autonomy striving. Many parents face changes in
parenting, from expecting compliance to treating children
as equals while fearing the time when their "baby" will

reach adolescence, given concerns about substance abuse, promiscuity, delinquency, and general rebellion. As will be shown in greater detail, adolescence is an important stage in which to study both normative and clinical stress.

Stress and Theories of Adolescent Development

From the early scholastic writings on adolescence, stress has played an important role in theories of adolescent development. Adolescence was originally described as a period of "storm and stress" by Hall (1916). Hall's view of adolescence focuses on recapitulation and corresponds to a time when the human race was in a turbulent transitional stage (Muuss, 1975). Keniston (1975) has also described adolescence as stressful, stating that a central theme of youth is tension between self and society. The adolescent struggles to define the self through expression of ambivalence toward the self and society. Feelings of isolation, unreality, absurdity, and disconnectedness from the world are more intense than in any period of life.

In psychoanalytic theory stress plays a vital role in adolescent development (Coleman, 1980). Psychoanalytic theory views adolescence as a turbulent period; at puberty there is an increase in the sexual tensions of the id demanding gratification that clashes with the disapproving superego. The ego is unable to satisfy either the id or

the superego and is subdued in the process. The balance
among the three personality mechanisms, which emerge during
the latency stage, is upset, producing conflict, turmoil,
and psychological disequilibrium (Muuss, 1982) [See Anna
Freud's (1958) writings for a careful delineation of the
defense mechanisms of adolescence]. There is awakened
sexuality and increased vulnerability (Coleman, 1980). The
ego attempts to cope, using such defense mechanisms as
repression, denial, intellectualization, rationalization,
asceticism, and regression (Muuss, 1982). This results in
a growing intensity of unpredictable and uncontrollable
affective responses such as temper tantrums, daydreams,
lying, and cheating (Muuss, 1982). The adolescent looks
outside the family for appropriate love objects and severs
(or supplements) the emotional ties with the family through
displacement. Adolescence is associated with emotional
volatility and regressive behavior that is both necessary
and universal (Adelson & Doehrman, 1980). Adolescence
produces its own symptomatology, and in severe cases
resembles a psychotic, borderline state (Freud, A., 1965).

Peter Blos (1962), a modern psychoanalytic writer,
sees adolescence as a stressful period when the adolescent
is in the psychological process of adaptation to the
conditions of puberty. He describes adolescence as a
series of phases. Before a stable identity is achieved the
adolescent must pass through phases of self-consciousness

and fragmented existence accompanied by feelings of tension and isolation, loneliness and confusion (Blos, 1962). Stress plays a central part in Erik Erikson's theory of identity development (Adams & Gullotta, 1983). Erikson states that during adolescence the individual must establish a sense of personal identity and avoid the dangers of role diffusion and identity confusion (Muuss, 1982). This has been termed the "identity crisis" or the "normative crisis" and is seen as a normal phase of increased inner conflict and as the most outstanding characteristic of adolescence (Blos, 1962; Muuss, 1982). During identity development the adolescent assesses strengths and weaknesses and determines how to deal with them. The adolescent must decide where he/she came from, who he/she is, and what he/she wants to become. Identity is acquired through individual effort. There is a danger in role diffusion that could result in alienation and a lasting sense of isolation and confusion. The increased inner conflict and possible harsh outcomes associated with identity development place pressure upon the individual that can be very stressful.

Forms of Stress at Adolescence

Specific adolescent developmental, social, physical, and environmental stresses have been identified by scholars, practitioners, and educators. As noted by Adams and Gullotta (1983), Hamburg (1974) identifies multiple factors thought to create stressful influence upon adolescents. These include hormonal changes that affect physical growth and emotions, changes in family and peer relationships, and environmental changes associated with school structures and transitions.

Konopka (1980), likewise, lists key events of adolescence that are considered stressful. Adolescents experience the development of sexual maturity, which creates a new perspective of the self and influences relationships with others. Adolescents begin to move away from the protection of their parents toward interdependence in three areas: with peers, with elders on an interacting level as opposed to a dependent level, and with younger children on a nurturing rather than play level. Moving away from dependency creates emotional strain. Adolescents are also conscious of the self in interaction with others. This results in a redefinition of the world, which may be thrilling but also frightening. Coinciding with this, adolescents confront and adopt their own values. They often feel hurt when others do not accept their adopted value systems. Adolescents become participants in society

rather than observers. This is difficult and brings with it enormous potential for stress. Young people also have an immense amount of energy, enabling them to go long hours without sleep, have extreme mood swings, and engage in physical activities requiring great exertion.

Petersen and Spiga (1982) state there are unique "developmental stresses" in adolescence corresponding to the biological, cognitive, and social changes that occur. As noted by Adams and Gullotta (1983), "stress accompanies any changes in life " (p. 65). Biological, cognitive, and social changes are stressful, since they all require adaptation on the part of the individual.

The major biological changes of adolescence are the result of puberty. As noted by Petersen and Spiga (1982), at puberty there is rapid growth to adult appearance, development of mature reproductive capacity, internal endocrinological changes, and formation of secondary sex characteristics. These changes can have a vast impact upon the individual. Development to adult appearance may lead to expectations for the adolescent to act like an adult. Asynchrony of growth among body parts during the growth spurt may have a negative effect upon the adolescent's self-perception. The ability to reproduce may cause fear of sexuality, intimacy, and reproductive potential. Therefore, changes at puberty are stressors that can have

temporary adverse psychological consequences (Steinberg, 1985).

The cognitive change at adolescence includes developing the capacity for formal operational thought (Elkind, 1975). With the advent of formal operational thought the adolescent gains the ability to examine possibilities, to generate and test hypotheses, to think ahead and plan for the future, to consider personal thoughts, and to contemplate beyond the limits of childhood (Adams & Gullotta, 1983; Elkind, 1975; Keating, 1980; Steinberg, 1985). Not all adolescents develop formal operational thought, but there is little direct research that addresses whether this increases or decreases stress (Petersen & Spiga, 1982). However, egocentrism emerges as a result of formal operational thought (Elkind, 1975) and that can be stressful. The adolescent fails to differentiate between the ideas of others and his own. The adolescent assumes that others are as obsessed with his/her behavior and appearance as he/she is. As a result the adolescent constructs an imaginary audience. There is an increase in self-consciousness and a feeling of constant scrutiny by others. The adolescent comes to see himself as unique and special (Adams & Gullotta, 1983), which may cause difficulty since others may not agree. Elkind (1975) refers to this as the adolescent's "personal fable".

The third set of changes are social in nature. There is an increased orientation toward the peer group. Peer group influences in perceptions of academic success, music preference, leisure activities, personality development, and participation in illicit activities such as substance use and delinquency. The reason for this increased influence is that peers reinforce behavior, provide feedback on various aspects of the self, and are associated with changing aspects of psychological drives involving narcissism and phallic conflicts (Adams & Gullotta, 1983). Status within the peer group becomes vital (Steinberg, 1985). Conformity is important and may result from the change in pubertal status (Petersen & Spiga, 1982). The adolescent may look to peers for new ways to adapt to changes and for evidence of progress. Comparison to the peer group may be helpful, but it can also hurt the individual, since conformity may result in decreased tolerance to the norm. Those who deviate in physical development, social skills, or values may be rejected by the group. Also, adolescents find themselves in situations they know nothing about such as experimentation with drugs and sex and pressure to try new things.

Another social change is a transition between school structures (Petersen & Spiga, 1982). Young people are moved from a single classroom to a setting that has many classrooms. The adolescent is placed for the first time

with others of different ages. This transition may be particularly stressful. Other social changes involve the relationship between the parent and the adolescent and societal status. Relationships with parents change because of changes in physical size, the acquisition of secondary sex characteristics, parents feeling themselves getting older, and anticipation of future separation. The adolescent's societal status changes because he/she can vote, is no longer a minor, and has different economic conditions (Steinberg, 1985). All of these changes place stress upon the adolescent.

Individual Variations to Adolescent Stress

There is individual variation in how adolescents respond to the events in their lives. Not all experience adolescence as traumatic (Bandura, 1975; Offer & Offer, 1975). For example, in one early and often-cited study, Bandura (1975) found little support for the storm and stress description of adolescence. The parents he studied were not more controlling and prohibitive. Emancipation was completed rather than initiated during adolescence. Membership in peer groups did not necessarily generate conflict within the family.

Likewise, Offer and Offer (1975), in a longitudinal study of male adolescents, found that not all adolescents have difficulties. They studied a population of typical,

middle-class, midwestern, male adolescents who were considered "normal" at the initiation of the study over an eight year period. Different developmental patterns emerged. Three distinct groups were identified and described. The first group, the "continuous" growth group, accounted for twenty-three percent of the population. This group progressed through adolescence in a smooth manner with purpose and self-awareness toward a healthy adult life. There was respect, trust, and affection between generations. The adolescents were happy and had good close relationships. Their backgrounds were free of problems and traumas. They handled normal developmental changes smoothly. Their families were intact, and their childhoods were unmarked by death or serious illness.

Offer and Offer identified a second, "surgent" growth group that accounted for thirty-five percent of their sample. This group was not free from problems and traumas. There was more interpersonal and intrapersonal conflict. The families were more likely to be affected by separation, death, and severe illness. They were able to cope with the average environment but not with unanticipated sources of anxiety. They were more prone to depression but were not particularly oriented to do something about it. In general, they adapted well to the normal developmental stresses but did so with a suppression of emotionality.

Offer and Offer called the third group "tumultuous." This group comprised twenty-one percent of their sample and was nearly identical to descriptions of the storm and stress view of adolescence. They had internal turmoil manifested in overt behavioral problems, self-doubts, conflicts, and inconsistency in feelings. They had less stable backgrounds, more marital conflicts between their parents, and a higher percentage of mental illness than the previous groups. They tended to be in the lower social economic clases. More events were experienced as psychological traumas. Their difficulties were greater than their satisfactions. A high percentage had overt clinical problems such as depression. They were more dependent on the peer group and began dating younger. They tended to be sensitive and introspective individuals. They did not do well academically and vocationally.

Twenty-one percent of the sample could not be classified into any of the groups. Offer and Offer state that clinically they were similar to and possibly a blend of the first two groups.

Offer and Offer conclude that a high level of turmoil is characteristic of only one route of adolescence. The key to a nonstressful adolescence seems to be a nonstressful childhood.

Offer and Offer's study is noteworthy in that ot demonstrates that not all adolescents have difficulties.

However, their findings cannot be generalized to today's adolescents, since the study was conducted some time ago and the subjects were not drawn from a random sample of a known population. Also, twenty-one percent of the adolescents in their study were not classified into any group. However, the study gave strong support to the idea that a large percentage (at least 50 percent) of adolescents do experience stress to a significant degree. As noted by Offer and Offer, most adolescents make the transition to adulthood without severe problems, but in some cases the changes and demands of adolescence leave feelings of helplessness, confusion, and pessimism about the future (Steinberg, 1985).

Studying stress in adolescence will help determine the differences between those adolescents who make the transition into adulthood smoothly and those who have severe problems. It is necessary to study both "normal" and "abnormal" adolescents to determine who needs intervention and how it should be provided (Petersen & Spiga, 1982).

Models of Stress

There are four definitional orientations of stress: stimulus, response, interactional, and informational (Feuerstein, Labbe, & Kuczmierczyk, 1986).

In a <u>stimulus-based definition</u> stress is defined in terms of the stimulus characteristics of the environment that are disruptive to the individual (Feuerstein et al., 1986). The stimuli that are disruptive are called "stressors," and the response is called "strain." This concept of stress is based on engineering principles, in that external stressors give rise to a stress reaction, or strain, within the individual (Cox, 1978). Hook's Law of Elasticity parallels to orientation. The law states that if the strain produced by a given stress falls within the "elastic limit" of the material, when the stress is removed the material will return to its original condition. However, if the strain passes beyond the elastic limit, some permanent damage will result (Cox, 1978). This implies that people have some built-in resistance to stress. Up to a threshold of tolerance stress can be dealt with, but when it becomes intolerable permanent damage will result. The stimulus definitional orientation is the one used in everyday language. For example, people talk about a meeting as "stressful."

Holmes and Rahe (1967) identified numerous stressful situations or life events. Divorce, death of a significant other, promotion, and vacation are examples of stressful life events. Lazarus and Folkman (1984) state there are three types of stressors. The first is major changes that affect a large number of persons. These include events

such as earthquakes, nuclear explosions, and other major
catastrophic events. The second type of stressors is major
changes affecting one or a few people. These include death
of a loved one, a serious illness, or loss of a job.
Lazarus and Folkman (1984) term the third type "daily
hassles." Daily hassles are those events that irritate
people, such as conflict with a spouse, a flat tire, or a
deadline. Even though "daily hassles" are less extreme
than the other stressors, there is evidence that suggests
they may even be more stressful than catastrophic events
(Csikszentmihalyi & Larson, 1984; Lazarus & Folkman, 1984).

Response definitions focus on response to a stressor.
Selye's (1980) response definition states that stress is
"the nonspecific response of the body to any demand" (p.
127). The demand is the stress-producing factor, stimulus,
or "stressor." The nonspecific response is adaptive and is
always the same regardless of the stressor. What varies is
the degree of the response, which depends on the intensity
of the demand for adjustment. The stress response may be
psychological or physiological. Stress may be pleasant
(eustress) or unpleasant (distress) and cannot be avoided.

The stress response progresses through three stages as
the individual is exposed to repeated or continual
stressors, which Selye (1980) describes as the "general
adaptation syndrome" (GAS). The first stage is the alarm
reaction stage, when the body first reacts to a diverse

stimulus to which it is not adapted. The alarm reaction
stage has two phases. The shock phase is the initial and
immediate reaction to the stimulus. The countershock phase
is the rebound reaction that mobilizes the defenses of the
body. The stage of resistance is the second stage and
corresponds to the body adapting to the stressor and a
disappearance or improvement of symptoms. During this
stage there is a concurrent reduction in resistance to
other stressors. The third stage is the stage of
exhaustion. During this stage symptoms reappear, since the
adaptability of the organism is finite. The body's energy
is depleted, which may result in the development of
disease, even death (Feuerstein et al., 1986).

Interactional definitions view stress as an ongoing
transaction between the environment and the person. The
person can influence the impact of a stressor through self-
regulation of behavioral, emotional, and cognitive coping
strategies (Feuerstein et al., 1986). This model consists
of five stages (Cox, 1978). The first stage is when
internal or external stressors are placed on the
individual. The second stage consists of the perception of
the stressors and cognitive appraisal. "Cognitive
appraisal" is a person's evaluations of stressors and
resources for dealing with them (Coyne & Lazarus, 1980).
Stress occurs when a person perceives a difference between
the demands of the stressor and the resources for coping

with it. Ego strength, personality, and intelligence are variables that result in individual variations of cognitive appraisal (Feuerstein et al., 1986). The third stage is the stress response, which is a way of coping with the stressor through cognitive, behavioral, and physiological actions that serve to reduce the demand. The fourth stage is the appraisal of whether the responses reduced the demand. If the demand is still present, stress continues. The fifth stage involves feedback loops to every point in the system to allow any necessary modification of events. This model is distinct from the stimulus and response models in that internal events are recognized as important in the stress process, and there are feedback loops that make the model circular rather than linear.

Information-processing definitions consider both the stressor and response while emphasizing that neither can be recognized without an individual's interpretation of the stimuli as stressful. Hamilton (1980) proposes an information-processing view of stress, stating that the term stress conveys that people are faced with demands on behavior that they find difficult to meet. These demands require physiological energy, rapid processing of stimuli that are more infrequent and more complex than general, and a search for responses that yield a subjective state of calmness and stillness. When appropriate processes, operations, or outcomes are only partially available, then

it is said that the person is under stress. The stimuli that create the demand cannot be considered stressful unless the individual interprets them as such. Interpretation requires selective attention, a decision about which stimuli to process in short-term memory, and the presence of cognitive predispositions, which are long-term memory stores that determine whether stimuli are aversive or pleasurable. Each of these processes is a part of the cognitive appraisal of stimuli, and each places demands on the processing resources. In addition, these processes elicit previously conditioned affective-emotive responses, which places further demands on energy resources and indirectly increases the information-processing load, given their vital function in activating the cognitive predispositions.

Hamilton (1980) states that stress is an imprecise term for stressors, strain, and informational load. Stressors are those demands that require reduction. Strain is the pressure on the cognitive and biological system derived from stressors. The greater the number of stressors the greater the strain. The information load is the sum of events taking place in the processing system. The greater the number of stressors, the greater the strain, and the greater the informational load.

Stimulus-based definitions and response-based definitions are narrow in their views, since defining

stress in terms of either gives a limited picture. As shown by the interactional and information-processing models there are many other factors to take into account when viewing stress, such as coping skills and informational load. People vary in their responses to stimuli (Lazarus & Folkman, 1984), and neither model can account for the variations. On the other hand, the interactional and information-processing models attempt to explain the reasons behind individual variations. The information-processing model attempts to present a finer-grained analysis of internal events than the interactional model but also fails to adequately discuss one copes with stress.

<center>Combining Models of Stress</center>

It is possible to combine the models for a coherent view of stress. Each model covers a specific area and presents valuable information. Congruence among models suggests that "stressors" are internal or environmental stimuli that place demands upon the organism and require a response to adapt. As noted by the interactional and information-processing models, internal events influence how a particular stimulus will be perceived. The stimuli is first appraised and interpreted as stressful, creating a demand. A demand that is perceived as greater than the

available resources for coping leads to stress. Also, the appraisal process and its multiple simultaneous demands place strain upon the information-processing system, therein increasing stress.

With the mediation of these internal processes the individual responds to the stressor to reduce the demand in the least destructive manner. The stress response has cognitive/emotional, behavioral, and physiological components. Coping skills, such as rationalization, isolation, withdrawal, and relaxation, are thought to be influenced by self-esteem, personality, intelligence, and learning. Feedback loops among the stressor, the internal processes, and the stress response, modify appraisals and responses.

According to Selye's (1980) general adaptation syndrome, the body cannot tolerate stress forever. Exposure to repeated stressors that are interpreted as stressful and are not reduced within a moderate period will result in energy depletion and lead to physiological and psychological pathology.

The study of stress needs not focus on a particular model. The integration of the models provides a more detailed view of the stress process. Stress can be studied by looking at the stimulus, the response, internal events and environmental variables, all important components of stress research. The key is to define the aspect being

studied so that others can understand what is meant by "stress."

A Model of Adolescent Stress

Petersen and Spiga (1982) present a model of stress in adolescents from a biopsychosocial-developmental perspective. This perspective takes into account the biological, cognitive, affective, and behavioral functions of the individual and interactions among these functions and with the environment. The model is similar to the interactional model except that it is refined specifically to understanding stress in adolescence. In the model there are "normative developmental stresses" and "unpredictable life-event" stresses. "Stresses" are stressors that require adaptation. The normal developmental stressors are those that are specific to the age group, including biological changes at puberty and changes in social status that necessitate adaptation. The unpredictable life-event stressors are events that impact the individual and are commonly referred to in stimulus-based models. Examples include death of a loved one, loss of a friend, discord at home, and accidents.

In Petersen and Spiga's (1982) model, the stress response has behavioral, affective, and physiological components. Behavioral responses include those which reduce the affective arousal caused by the stressor. This

can be done by removing the stressor or by altering one's
relation to it. Common mechanisms to achieve a reduction
of affective arousal, as well as depression, anger, and
anxiety, include the psychoanalytically based defense
mechanisms of isolation, denial, and intellectualization.
Petersen and Spiga are vague in describing these behavioral
responses. Actually, the responses they do describe are
not behavioral in the strictest sense, except possibly
isolation. What seems to be the main point is that
behavioral responses are those techniques an individual
employs to reduce the impact of the stressor. Observable
behavioral responses include relaxation, exercise, and
aggression.

The affective stress responses described by Petersen
and Spiga (1982) include changes in self-image and
emotional tone. Adolescents may experience trauma in
response to the demands of puberty. Trauma has been shown
to progress through stages of denial, intrusion, and
working through. Each of these stages involves changes in
cognition, emotion, and self-control. At first, the
adolescent may deny that changes are taking place. Then
the feelings and thoughts associated with the changes
intrude into the consciousness. Finally, the individual
integrates these new feelings and thoughts with prior self-
perceptions and perceptions of the outside world.

Physiological responses include changes in the functioning of the body. Petersen and Spiga (1982) do not clearly delineated what these changes are. Instead they point out there is evidence to suggest that levels of physiological arousal may impair higher levels of cognitive functioning. For example, neuroendocrine arousal may affect emotional behavior leading to depression and anger. Poor management of stressors may lead to cardiac disorders. Petersen and Spiga further suggest that the impulsiveness seen in adolescents may have an underlying physiological component of depression caused by responses to stress.

Petersen and Spiga (1982) acknowledge that there are individual reactions to stressors that are influenced by mediating factors between the stressor and the stress response. The amount of preparation an individual has for handling stress alters the stress reaction. The development that precedes adolescence may strengthen or weaken the ability to adapt. This has been noted by both Offer and Offer (1975) and Blos (1962).

The timing is also important in understanding an adolescent's response to a stressor. Coleman's (1980) "focal theory" states that issues come into focus at distinctly different times. so stresses that require adaptation are rarely concentrated. Most young people are able to cope successfully when issues are dealt with singly. Individuals who must respond to numerous stressors

simultaneously, face a higher probability that they will adapt with a greater incidence of serious pathology.

The information-processing concept of information load helps to explain why encountering many stressors simultaneously is more stressful than encountering stressors sequentially. The processing system can handle only a limited amount of information at any given time. The greater the strain on the system the greater the "load". The informational load is finite, so when the demands exceed the load the person loses the ability to cope effectively. Taking this one step further (again with Selye's (1980) concept of the general adaptation syndrome in mind), as demands continue the body eventually reaches a stage of exhaustion and, ultimately, pathology.

Petersen and Spiga (1982) state that individual vulnerability is a mediator between the stressor and the response. Some adolescents seem to be invulnerable to stress while others are not. The amount of social support available is also a mediating variable. Adolescents who have better relationships and communication with their parents and/or peers also have higher self-esteem and a more positive emotional tone. Better relationships and communication helps the adolescent handle stressors, since "others" can provide support and give information on effective management strategies.

Petersen and Spiga's (1982) model of stress is an attempt to describe stress in adolescence. Recognizing age-specific developmental stressors, mediating variables, and stress responses takes us one step closer to a full understanding of stress during adolescence. However, the model lacks specificity. The types of stress responses unique to adolescence need to be more clearly discussed. The mediating variables need to be described in more detail. Also the manner in which feedback loops (to various parts of the stress process) operate in the model is ambiguous.

Objectives

One could take any of the many models of stress, examine them in great detail, and design stress-assessment instruments based upon the model chosen. The purpose of this study was not to test which model or models are the most viable in understanding the stress process. Rather, the focus was on measurement of the subjective stress-response in adolescents. It is recognized that measurement is accomplished in increments. The study was meant to determine whether a reliable and valid assessment of the stress response could be developed. It was hoped that the instrumentation developed could be used to determine the predictive utility of models for understanding the stress process.

This study was a rudimentary measurement study. The purpose was to develop an instrument to measure the stress response of adolescents. The stress response was chosen for measurement because stress models recognize and give it importance in assessing levels of stress. Other focal points, such as the number of stressors present and the coping mechanisms utilized, are important components but do not give accurate information on the level of stress being experienced. By measuring the stress response of a adolescents it was thought that it would be possible to identify those who are experiencing severe reactions to stressors and to design interventions for reducing or adapting to the demands. After a valid and reliable measure of the stress response has been developed, a comparison of individuals who have severe stress responses to those who do not could be conducted to further understanding of the characteristics that influence reactions to stressors.

An instrument that measures self perception was chosen because self-report assessments are economical, easily scored, transportable, and provide information on the stress-response experience from individuals who are actually experiencing it (Derogatis, 1982).

CHAPTER II

DEFINITION OF TERMS

Operationalized Definition of Stress

This study's definition of stress integrates aspects
of many of the models discussed earlier. The term "stress"
is replaced by the term "stress process." The stress
process is defined as the continual transaction between the
person and the environment in which demands are placed upon
the individual that requires adaptation. Adaptation refers
to the change in behavior that has survival value for
handling current or impending environmental demands. The
stress process may be separated into "stressors,"
"mediating variables," and "stress responses." "Stressors
are those events wherein the individual experiences
discomfort and must make changes to adapt. Stressors may
be internal or external. Mediating variables such as
cognitive appraisal, coping skills, personality, individual
vulnerability, and information load influence how a person
responds to a stressor and account for the variation
between individuals in stress responses. Stress responses
are reactions to stressors. Stress responses may have
cognitive/emotional, physiological, and/or behavioral
components. It is recognized there is an ongoing feedback
system among the stressors, the stress responses, and the
mediating variables that can alter the course of events.

Exposure to repeated stressors that are considered stressful and to which the impact has not been reduced will result in psychological, behavioral, and physiological pathology. This process follows the stages of the general adaptation syndrome.

In adapting the definition specifically to the study of adolescence, it is recognized that there are developmental and social contextual stressors, with the latter consisting of predictable and unpredictable events. Also there are age-specific and age-independent mediating variables and stress responses.

Distinctions Between Stress And Anxiety

There is confusion about stress and anxiety in much of the published literature. Anxiety and stress have each been defined as a stimulus, a response, and an intervening state. The relationship between these two terms has not been clearly established (Endler & Edwards, 1982). Some authors even feel there is no difference between (Lazarus & Folkman, 1984).

Spielberger (1972), in an attempt to clarify the two terms, defines anxiety as an emotional state and stress as the objective properties of a stimulus that, with a perception of threat, produces an anxiety emotional state. Spielberger (1972) differentiates between trait anxiety (A-trait) and state anxiety (A-state). State anxiety is the emotional reaction to a perceived stressful stimulus. This

emotional reaction includes feelings of tension, fear, and increased autonomic activity. Trait anxiety refers to stable individual differences in anxiety proneness.

Endler and Edwards (1982) adopt Spielberger's concepts and present an interaction model of anxiety that incorporates the concept of stress. Stress is defined as a situation variable that may be perceived as threatening and could cause an increase in state anxiety. The perception of the stress as threatening is influenced by the person's predisposition or anxiety trait. The extent to which anxiety is expressed is dependent upon the situation variable, which may be an interpersonal threat, physical danger, or an ambiguous threat. The increase in state anxiety is followed by defenses or other coping responses.

Our view of anxiety follows the definitions given above. Anxiety is an emotional state or stress response that involves feelings of tension, fear, and increased autonomic activity caused by a perceived threat. The objective properties of the stimulus associated with the threat is the stressor. The amount of anxiety experienced is influenced by individual vulnerability and other mediating variables. The stress response is the reaction to the stressor, which may or may not include anxiety. The interplay of stressors, mediating variables, and stress responses is termed the "stress process."

The Stress Response

We consider the stress response to be the individual's reaction to a particular stressor and to involve physiological, behavioral, and cognitive/emotional components. The physiological component is changes in bodily functioning. For example, the body reacts to stressors with an increasing heart rate, a decrease in blood flow to the extremities, and an increase in blood pressure. The cognitive/emotional component includes subjective feelings of fear, depression, mind racing, and mood changes. The behavioral component includes overt behavioral responses such as aggression, crying, restlessness, impulsivity, and withdrawal and intrapsychic processes commonly recognized as defensive behaviors or mechanisms. These components are considered to be interrelated constructs, one affecting the other.

CHAPTER III

MEASUREMENT OF STRESS

Researchers have worked both in the natural environment and in the laboratory to measure stress (Coyne & Lazarus, 1980). The effects of stress have been assessed directly by measuring changes in physiological functioning under stress (Everly & Sobelman, 1987; Feuerstein et al., 1986). Observations have been conducted of behavior thought to be associated with stress (Evans, 1978). Self-report instruments have been used extensively when direct physiological measurement or behavioral observations were inappropriate or impractical. The self-report has been used to quantify the number of stressors in an individual's life (Holmes & Rahe, 1967; Sarason, Johnson, & Siegel, 1978); to look at mediating variables between stressor and response (Billings & Moos, 1981; Folkman & Lazarus, 1980); to assess the stress response in adults (Derogatis, 1982); and to look at stressors, mediating variables, and stress-response together to reveal an overall stress profile (Derogatis, 1987).

Self-Report Measurement of Stress

Self-report measures of the stress response have their theoretical basis in psychopathology (Derogatis, 1982)

rather than in stress theory, as does stressor-oriented research. There are hundreds of measures of physiological and psychological symptoms that may reflect stress responses but that do not measure the stress-response in its entirety.

There are a number of stress-response measures. For example, the Minnesota Multiphasic Personality Inventory (Hathaway & McKinley, 1940), one of the best known psychological tests in existence (Derogatis, 1982; Everly & Sobelman, 1987), has been widely used as an outcome measure in stress research (Davis & Wedseth, 1978; Miyabo, Asato, & Mizushima, 1979). The Symptom Checklist--90-R (SCL-90-R) (Derogatis, 1975) is a measure of symptomatic and psychological distress and has been used to detect variations in depression and anxiety associated with sexual dysfunction and death (Derogatis, 1982). The Beck Depression Inventory (BDI) measures the behavioral manifestations of depression (Beck, 1961). The Profile of Mood States (POMS) measures variations of mood on five different dimensions (McNair, Lorr, & Droppleman, 1971). The State-Trait Anxiety Inventory (STAI) is designed to measure trait and state anxiety (Spielberger, Gorsuch, Lushene, & Vagg, 1977). The Strain Questionnaire (SQ) measures the physical, behavioral, and cognitive components of strain (LeFebre & Stanford, 1985). Each of these instruments in one way or another has been used to measure the effects of stress. For a more detailed summary of

these and other instruments see Everly and Sobelman (1987)
or Derogatis (1982).

Self-Report Measures of Stress
For Adolescents

Little research has been conducted to study stress in
adolescents. The instruments used have focussed on life
events and stressors in the adolescent's life (e.g., Beall
& Schmidt, 1984; Forman, Eidson, & Hagan, 1983; Johnson &
McCutcheon, 1980; Yeaworth, York, Hussey, Ingle, & Goodwin,
1980).

There are self-report instruments available that can
measure a particular aspect of the stress response but do
not measure the stress response specifically. For example,
a widely used measure to assess anxiety in children and
adolescents is the Children's Manifest Anxiety Scale
(Castanada, McCandless, & Palermo, 1956). This has been
revised to the What I Think and Feel scale (Reynolds &
Richmond, 1978).

The Stait-Trait Anxiety Inventory for Children (STAIC)
(Spielberger, 1973) is used to measure state and trait
anxiety in children up to the age of twelve. The
previously mentioned State-Trait Anxiety Inventory
(Spielberger et al., 1977) can be used to measure anxiety
in older children and adolescents. The Multifactorial
Scale of Anxiety (Fenz, 1967) measures muscle tension,
autonomic arousal, and feelings of insecurity and may be

used to measure with adolescents and adults.

The Sixteen Personality Factors Questionnaire can be used with both children and adolescents up to age eighteen to measure anxiety, tension, and level of control (Cattell, 1970). The Youth Self-Report (YSR) can be used with adolescents up to the age of eighteen to measure depression, somatic complaints, social withdrawal, and aggression (Achenbach & Edelbrock, 1986). The Minnesota Multiphasic Personality Inventory can be used with adolescents sixteen and older as a stress-outcome measure (Everly & Sobelman, 1987).

Each of the above instruments was developed for a purpose other than to measure the stress response in adolescents. Using them to measure the stress response in adolescents could lead to inaccurate results and interpretations. To study stress in adolescents a valid and reliable instrument that has been developed specifically to measure the adolescent's stress-response is needed.

CHAPTER IV

STUDIES 1, 2 AND 3

Overview

Three studies were involved in the development of the stress-response scale. Study 1 involved construction of the scale and testing it for estimates of internal consistency and specific types of validity. Study 2 involved determining whether the scale could differentiate between adolescents in a high-stress condition and those in a low-stress condition. Study 3 sought to determine if the scale could detect changes in stress perception when adolescents were taken from a low-stress condition to a high-stress condition and vice versa.

Study 1

Objective

The first study focussed on developing a valid and reliable self-report measurement instrument of the stress-response in adolescents.

Procedure

Content and face validity of scale items. In that no instrument has been developed to measure the stress response in adolescents, the development of the instrument began with the generation of scale items. Studies of the stress response, such as Cox (1978), were reviewed in

detail. From this study items thought to be reflective of the stress response and consistent with theoretical and research knowledge were collected. For example, Cox discusses the symptoms involved in the "flight or fight" response, which is a physiological reaction to the perception of danger. Some of the symptoms include an increase in heart rate, an increase in respiration, and cold extremities. Therefore, items consistent with this theory, such as "My heart beats rapidly" and "I have shortness of breath" and which may be said to be a particular stress response, were included. Measurement instruments with items related to the stress response were also reviewed. For example, the Beck Depression Inventory measures depression, which is thought to be a major component of chronic stress. By looking at this scale ideas were developed on how to construct items related to depression. Informal stress-response checklists not yet published but used in clinical settings were also of considerable value in generating potential items. From these reviews, only the adjective describing the stress response was noted at first. Later, they were developed into short "I" statements. It was felt that short statements would be easier to understand than longer statements. Items that reflect in the cognitive/emotional, behavioral, or physiological components of the stress response were sought. All items were written so that a high number on the Likert scale next to each item meant a

stronger stress response. No reverse items, in which lower scores mean a stronger stress response, were included. Perhaps in further development this could be possible.

After an item pool had been generated, 15 professionals (psychologists, professors, graduate students of psychology, and teachers) who work with adolescents in clinical, school, or social settings were asked for feedback on which items they felt were indications that an adolescent is under stress. They were also asked to generate additional items as needed. This process was meant to establish content and face validity of the instrument.

Truthfulness items. As a way of determining the honesty of the subject, items thought to be answered affirmatively by most subjects were included to develop a truthfulness subscale similar to the L scale on the MMPI (Hathaway & McKinley, 1940).

Scale construction and name. The items chosen for selection were combined into a single preliminary instrument covering the three components of the stress response. Each component was reflected by approximately the same number of items. The items were put in random order, except for the truthfulness items. The truthfulness items were placed after every 9th stress-response item. Each item had a 5-point Likert Scale placed next to it with 0 being "Not at all" and 4 being "Extremely so." Instructions were developed for completing the scale. The

individual is asked to state whether and to what degree they are (or have recently) experienced the circumstances stated in each item. Scoring was designed to involve adding the numerical responses. A high score reflects a high level and a low score a low level of stress. On the truthfulness scale a high score reflects a lack of truthfulness in responding.

This stress-response scale was named the Stress-Response Scale for Adolescents (SRSA).

Population. One hundred and forty-two adolescent high-school and college students were chosen to participate in Study 1. Included in the sample were 76 males and 66 females, ages 14 to 20, from grades 9 through 15 (junior in college). The high-school students were chosen from regular education classrooms at two high schools in the Cache County School District in Utah. The principals of each school were asked to select classes that included an even distribution of males and females at each grade level. The college students were selected from two undergraduate lower-division classes at Utah State University.

Administration. In a group classroom setting, subjects were asked to complete the preliminary SRSA, the Life Events Checklist (LEC), the State-Trait Anxiety Inventory (STAI), a shortened version of the Marlowe-Crowne Social Desirability Scale (M-C SDS), and the Psychopathology and Superior Adjustment subscales of the Offer Self-Image Questionnaire for Adolescents (OSIQ).

Description of instrumentation. The Life Events
Checklist (LEC) (Johnson & McCutcheon, 1980) was chosen for
use in this study to determine the number of life events
subjects had experienced. The LEC is a self-report
checklist designed to measure the number and severity of
major life changes an individual experiences. The 46 items
were developed for use with children and adolescents ages
12-17. The LEC asks the respondent to note, of the 46
events, which were experienced in the past year. Validity
data have been obtained by correlating the LEC with
instruments that measure a variety of stress-related
symptoms. These correlations range from .21 to .24.

The State-Trait Anxiety Inventory (STAI) (Spielberger
et al., 1977) was chosen to measure the anxiety component
of the stress response in our subjects. The STAI is
designed to measure state and trait anxiety in adolescents
in grades 9-15 (13-15 reflect college years) and in adults.
The instrument includes 40 items. Median alpha
coefficients for state and trait anxiety are .92 and .90,
respectively. Validity data is extensive. For example,
validity data have been derived from correlations with
other anxiety scales and personality tests and by using the
STAI to distinguish between various groups with known
anxiety. Correlations are generally very satisfactory.
For example, correlations of the trait-anxiety subscale
with other trait-anxiety scales range from .73 to .85.

A shortened form of the Marlow-Crowne Social
Desirability Scale (M-C SDS) was chosen to measure the
tendency of subjects to respond on the SRSA in a perceived
socially desirable as opposed to a true-to-life fashion.
The original M-C SDS was designed to measure the trend
toward choosing the socially desirable response set (Crowne
& Marlowe, 1960). Kuderson-Richardson formula-20 (K-R 20)
reliability coefficients range from .73 to .87 for college
males and females. A shorter form of the M-C SDS was
developed (the M-C 1 [10]) and is used in this study
(Strahan & Gerbasi, 1972). The K-R 20 reliability on the
M-C 1 (10) coefficient range from .59 to .70 for college
males and females. Even though it would have been
statistically better to use the original M-C SDS,
practicality limited the number of items to be given the
subjects, and the shortened scale was chosen as an
acceptable substitute.

The Offer Self-Image Questionnaire for Adolescents
(OSIQ) (Offer, Ostrov, & Howard, 1981) was chosen to assess
the level of adjustment and coping ability of our subjects.
The OSIQ assesses the self-image and adjustment of
adolescents ages 13 to 19 years. The questionnaire
contains 11 scales, two of which were used in this study.
Scale 10, Psychopathology, was chosen to assess the level
of adjustment. This subscale is designed to identify the
presence of any severe psychopathology. Scale 11, Superior
Adjustment, was chosen to measure coping ability. This

scale measures how well the adolescent copes with himself, significant others, and the world. Test-retest reliability is reported with stability coefficients that range from .48 to .84, with an average of .73, over a six-month period. Internal consistency estimates are reported with a Cronbach's alpha of .48 to .85 with a mean of .63. The OSIQ has been shown to distinguish between normal and abnormal adolescents as well as to discriminate among psychologically similar subgroups within the normal population.

Establishment of validity of the SRSA. Validity is "the extent to which any measuring instrument measures what it is intended to measure" (Carmines & Zeller, 1979, p. 17). According to the Standards for Educational and Psychological Testing (1985) validation of a test involves three analyses: content, criterion-related, and construct validity estimations. The estimation of content validity of the SRSA with regard to the stress response was discussed earlier.

Data on construct validity were assessed by several methods. A factor analysis was conducted on the responses to each item of the SRSA to see if the three theoretical stress-response components were discrete factors or whether a single inclusive factor was observed. If three distinct factors did emerge, which corresponded to the three components, each component's contribution to the overall measurement of the stress response was to be determined by

correlational analysis. If factors emerged that were unrelated to the components then further examination of the items would be necessary to determine what they were measuring.

More evidence of construct validity was obtained by correlating the score on the SRSA, for each subject and established factor, with the scores on the STAI. The STAI is an instrument that measures the state and trait anxiety component of the stress response. To establish construct validity the score on the SRSA should correlate positively (to a moderate degree) with the scores on the STAI.

Construct validity was also estimated with discriminant validity analyses. This was assessed by the use of the shortened version of the Marlow-Crowne Social Desirability Scale (M-C 1(10). A high correlation between the M-C 1(10) and the SRSA would indicate that the SRSA measured socially desirable responses. A non significant correlation would indicate the SRSA measured something other than socially desirable responses. To establish discriminant validity, the M-C 1(10) should have zero or negative correlation with the SRSA.

Evidence of criterion-related validity was obtained from several sources. Concurrent validity was assessed by correlating the score on the SRSA, for each subject and established factor, with the scores on the two scales of the OSIQ. Individuals who scored high on the SRSA should have had lower scores on the Superior Adjustment subscale

of the OSIQ and vice versa. Individuals who scored high on the SRSA should have had higher scores on the Psychopathology subscale and vice versa. Predictive validity was assessed by correlating the score on the Life Events Checklist (LEC) with the score on the SRSA. In stress models the greater the number of stressors the individual faces, the greater the stress response. Individuals who score high on the LEC should have high self-perceived stress.

Establishment of validity of the truthfulness items. Concurrent and construct validity of the truthfulness items was assessed by correlating the total of these items with the totals on the M-C 1(10) and the other measures. Truthfulness scale items, it was hoped, would correlate highly with the M-C 1(10) in a positive direction and show a zero or negative direction with the other measures, except for the Superior Adjustment subscale, for which a zero or positive correlation was expected.

Establishment of reliability. Internal consistency (reliability) of the SRSA was estimated using Cronbach's alpha on the items remaining after the factor analyses. Coefficient alpha was computed to assess the consistency of all responses in each component. Coefficient alphas were also computed on truthfulness items to establish faith that this measure was also internally consistent.

Item reductions were undertaken until a consistent and internally reliable series of subscales were established.

The factor analysis was then re-computed. Item reductions were also undertaken on the truthfulness scale items until that scale was internally reliable.

Reliability and validity of criteria measures. Prior to validation computations of the SRSA, the criteria measures were checked for adequate reliability and convergent/divergent validity. Cronbach's alpha was computed for each scale. To provide estimates of convergent/divergent validity the criteria scales were correlated using a Pearson product-moment correlation. These procedures were useful in proving that the instruments were adequate statistically for the final validation computations.

Role-Enactment Methodology

Role-enactment methodology was used in studies 2 and 3 as a substitute for actually placing subjects in high- and low-stress conditions. Role-enactment methodology asks subjects to report how they would behave in a particular situation in which they are asked to imagine themselves. The subjects typically read a script and then report how they would respond in the same situation. The subjects must make cognitive decisions on how they would behave, determine the social norms operating in the situation, and assess the social desirability and consequences of behaving in a certain way (Adams & Schvaneveldt, 1985).

As noted by Adams and Schvaneveldt (1985) role-enactment methodology is a viable alternative to deception and to placing subjects in uncomfortable situations. For example, using a script that subjects read and showing a picture of the shock apparatus, Mixon (1977) was successful in replicating Milgram's (1963) research on obedience. While Adams and Schvaneveldt recognize certain limitations to role-enactment methodology, they feel it can be used as the first in a series of steps to assess the effects of aversive conditions on psychological functioning.

Study 2

Purpose

To provide additional evidence of construct validity, Study 2 was designed to evaluate the ability of the Stress-Response Scale for Adolescents (SRSA) to discriminate between those individuals in a high-stress condition and those in a low stress conditions.

Hypothesis

It was hypothesized that subjects in a high-stress condition would report a greater magnitude of stress response than subjects in a low-stress condition as measured by the SRSA.

Procedure

Population. Twelve male and twenty-five female high-school students from the Cache County School District and

undergraduate college students from Utah State University participated in the study. The mean age was 17.5 and ranged from 16 to 19. The high-school students were chosen by school counselors and were in either a parenting or English class. The counselor chose the classes based on the criterion of having students at either the junior or senior level. It was felt by the researcher that role-enactment methodology would work best at the upper age range of the adolescent population. The undergraduate subjects were obtained by asking for volunteers in a lower-division psychology class. The criterion was that the students be age 21 or under.

Design. High-school subjects in the English class were placed in the high-stress condition, and those in the parenting class were placed in the low-stress condition. The undergraduate college students were randomly assigned to either the low stress or the high- stress condition. In the low-stress condition, subjects were asked to read a script that depicted a scene that was considered nonstressful. After reading the script, subjects were asked to respond to the SRSA as if they were actually in the scene described. Subjects in the high- stress condition were asked to read a script that depicted a scene that was considered highly stressful. Subjects were asked to respond to the SRSA as if they were actually in the particular scene described in the script.

Script development. Adolescent literature was reviewed to find material that could be viewed as either stressful or non-stressful. Librarians at the university, city, and school libraries, along with a professor of adolescent literature, were consulted. The literature surveyed contained many stressful scenes but very few nonstressful scenes. Biofeedback and stress-management literature was then reviewed for nonstressful scenes. Finally, scripts were developed that were judged by the author and thesis committee to be stressful and nonstressful. See Appendix B for these scripts.

Data analysis. Scores of the low- and high-stress conditions were compared using a one-tailed t-test. Significance was set at the $p < .05$ level. If $p > .05$ it was concluded that there was no statistical difference in SRSA scores between conditionss, and that the scale lacked the sensitivity to distinguish those adolescents in high-stress conditions from those in low-stress conditions. If $p < .05$ was observed, there was less than five chances in 100 that the differences in scores were due to chance. It was concluded that the scale had potential for distinguishing between adolescents in a high-stress condition and those in a low-stress condition.

Study 3

Purpose

Study 3 was designed to determine the ability of the
Stress Response Scale for Adolescents (SRSA) to detect
changes in stress levels when individuals were taken from a
low-stress condition and placed in a high-stress condition
--a within-subject comparison. This was designed to
provide further construct validity data.

Hypothesis

It was hypothesized that there would be an increase in
the amount of stress response reported when individuals
were taken from a low-stress condition and placed in a
high-stress condition and vice versa as measured by the
SRSA.

Procedure

Population. Twenty-three male and thirty-three female
high-school students from the Cache County School District
and undergraduate students from Utah State University
participated in the study. The mean age was 17.5. The
school counselor chose two classes, a sociology class and a
psychology class, based on the requirement that the classes
have students at the junior and senior levels. Again, as
in study 2, older adolescents were desired since role-
enactment methodology was being used. The college students
were obtained by asking students in two undergraduate

psychology classes to volunteer for participation under the requirement that they be age 21 or under.

Design. A within-group design was used. Role-enactment methodology was utilized to set up stressful and nonstressful conditions. Subjects were asked to first read the script depicting a scene that was considered nonstressful. The subjects were then asked to respond to the SRSA as if they were actually in the described situation. The same scripts from study 2 were used for study 3. After completing the SRSA, subjects were again asked to read a script, but this time the script described the stressful situation. The subjects were asked to respond to the SRSA as if they were in the scene depicted. The procedure was counterbalanced with half of the subjects moving from low- to high-stress conditions and the remaining half in a counter high to low sequence. Subjects in the high-school psychology class were placed in the high-stress to low-stress condition and subjects in the high-school sociology class were placed in the low-stress to high-stress condition. The undergraduate college students were randomly assigned to either condition.

Data analysis. Scores for each administration of the SRSA were calculated. The scores obtained on the SRSA for each administration were compared by computing a one-tailed t-test. Significance was set at the $p < .05$ level. If significant differences were found, it was concluded that

the SRSA had <u>promise</u> in <u>detecting changes</u> in an
adolescent's stress-response level.

CHAPTER V

RESULTS

Study 1

Three basic studies were completed to provide initial reliability and validity for the Stress-Response Scale for Adolescents (SRSA). The first investigation had the specific goals of scale construction and estimation of reliability and validity. Studies 2 and 3 had goals of providing additional information about construct validity.

Initial SRSA

The initial and final versions of the SRSA for females and males are found in Appendix C. After item generation and elimination of scale items, seventy items were chosen for the initial phase of the SRSA. All were considered by the experts to be reflective of the stress response among adolescents. Items not deemed to be reflective of the stress response were discarded prior to the final selection. These procedures ensured content and face validity of the SRSA for the purpose intended. The initial truthfulness scale contained 8 items.

Data

The majority of the data collected was intact, of excellent quality, and had few missing values. There were four males who purposely provided false answers, and these

data were discarded. Missing values for the factor
analyses were deleted pairwise. That is, correlation
coefficients were computed using cases with complete data
on the pair of variables to be correlated regardless of
missing values on any other variables. On the reliability
analyses, missing values were assigned the mean value of
the particular scale and included in the analyses. In all
other analyses, missing values were handled according to
the default mode of the SPSS-X (SPSS-X User's Guide, 1988)
statistical package. The number of missing values was
quite low, and different ways of handling them were tried
without any significant differences in results.
Contrasting n sizes reported for analyses are the result of
handling missing values according to the specific
statistical procedure.

Factor Analyses

Construct validity was estimated using a standard
principal components factor analysis using varimax
rotation. Oblique rotations were initially attempted, but
convergence was not obtained in over 50 iterations.
However, varimax rotations resulted in convergence in 8
iterations. Gender was found to load highly on the main
factor in the initial analysis, indicating a sex difference
in responses to the SRSA. Separate analyses were then
conducted for males and females using varimax rotations.
Conversion was obtained for the females' items in 15
iterations and in 13 iterations for the males'. In both

analyses the Kaiser-Meyer-Olkin measure of sampling adequacy was "meritorious," according to the SPSS-X Advanced Statistical Guide (1986), and the Barlett Test of Sphericity was non-significant (p < .001), indicating that factor analysis was appropriate for the obtained data.

For both male and female analyses, four major factors emerged. Given limitations of the sample size (66 females and 72 males), a conservative estimate of an eigenvalue of 1.50 or better and weightings of .40 or higher were used to eliminate items. Factors with less than six items per factor and/or with an eigenvalue less than 1.50 were eliminated. Items loading less than .40 on a given factor were also eliminated. Cronbach's alpha was then computed for each factor. Items were eliminated that reduced the computed alpha to a large degree. The factor analyses were then recomputed on the reduced items. Varimax rotations again were used. The number of iterations for conversion, the Kaiser-Meyer-Olkin Measure of sampling adequacy, and the Barlett Test of Sphericity were essentially identical to the first analyses.

In Tables 1 and 2 the corresponding eigenvalues, percentage of variance attributed to each factor, and cumulative percentages of variance are reported for the four significant factors that emerged for the female and male subjects. These factors are detailed with corresponding item weights in Tables 3 and 4.

Table 1

<u>Eigenvalues and Variance Accounted by Each Factor From a</u>

<u>Principle Components Analysis with Varimax Rotation of the</u>

<u>Female SRSA Items</u>

Factor	Eigenvalue	% Variance	
		Individual	Cumulative
1 (general stress)	13.81	43.2	43.2
2 (low energy /pressure)	2.29	7.1	50.3
3 (anxiety)	1.85	5.8	56.1
4 (anger)	1.60	5.0	61.1

<u>Note</u>.   Factors with eigenvalues less than 1.50 and with
fewer than 6 items were omitted.

Table 2

Eigenvalues and Variance Accounted by Each Factor From a
Principle Components Analysis with Varimax Rotation of the
Male SRSA Items

Factor	Eigenvalue	% Variance	
		Individual	Cumulative
1 (general stress)	12.45	38.9	38.9
2 (sub-general stress)	2.70	8.4	47.4
3. (low energy /pressure)	1.92	6.0	53.4
4 (anxiety)	1.60	5.0	58.4

Note. Factors with eigenvalues less than 1.50 and with
fewer than 6 items were omitted.

Factor analysis suggests that four factors are found within the larger construct of the stress response for both females and males. Factor 1 is the main factor and is quite similar for both sexes. This factor is mainly a combination of physiological and emotional/cognitive reactions with a few behavioral items, and it appears to measure general stress-response factor. Factor 2 for the females is made up of items reflecting the experience of pressure and low energy and is the low energy/pressured factor. Factor 2 for the males is somewhat difficult to interpret, since the items do not consistently reflect any one aspect of stress. This factor is similar to the general stress-response factor and is named the sub-general stress-response factor. Factor 3 for the females is mainly made up of anxiety-type items and is termed the anxiety factor. Factor 3 for the males is similar to Factor 2 for the females and is also called the low energy/pressured factor. Factor 4 for the females is made up of items reflecting anger or the expression of anger and is termed the anger factor. Factor 4 for the males is similar to Factor 3 for the females and is also termed the anxiety factor. In summary, the males and females have general stress-response, anxiety, and low-energy/pressured factors in common. The males differ from the females in that the males have a sub-general stress-response factor and the

Table 3

Factor Loadings From a Principle Components Analysis With

Varimax Rotation of the Female SRSA Items

Item	Factor			
	1	2	3	4
Uptight	.80			
Nauseated	.69			
Stomach problems	.65			
Nervous	.62		.42	
Tense	.61	.61		
Keyed up	.60			
Overwhelmed	.57	.54		
Health problems	.57			
Frustrated	.54			
Head pressured	.53	.46		
Muscles tight	.53			
Tired		.80		
Eyes tired		.70		
Restless		.67		
Emotional		.63		
Worry	.48	.60		
Pressured	.40	.55		
Mouth/throat dry		.44		
Doubt self			.69	
Mind blank			.68	
Muscle twitches			.68	
Confused			.66	
Trouble talking			.66	
Forgetful			.58	.45
Frequent accidents	.45		.53	
Pains	.41		.52	
Feel like crying	.42		.45	
Arguments				.83
Yell at others				.78
Happy to mad fast	.44			.60
Anger easily	.43			.60
Bugged easily	.42			.56

Note. Loadings less than .40 were omitted.

Table 4

Factor Loadings From a Principle Components Analysis With

Varimax Rotation of the Male SRSA Items.

Item	Factor			
	1	2	3	4
Stomach problems	.73			
Nauseated	.72			
Muscles tight	.71			
Light headed	.68			
Arguments	.63			
Health problems	.62			
Mind races	.57			
Feel like crying	.56	.52		
Uptight	.56			.42
Keyed up	.55			
Short of breath	.50			.46
Muscle twitches	.45			.45
Pimples		.72		
Happy to mad fast		.66		
Trouble talking		.64		
Bored		.63		
Confused		.57	.50	
Bathroom frequently		.57		.46
Mind blank	.45	.56		
Overwhelmed	.44	.50	.44	
Stressed			.79	
Doubt self			.77	
Trouble sleeping	.42		.63	
Tired			.63	
Easily frustrated		.42	.55	
School problems		.42	.44	
Hands shake				.79
Restless				.63
No time to think				.60
Frequent accidents				.58
Decisions difficult		.45		
Nervous			.46	.46

Note. Loadings less than .40 were omitted.

females have an anger factor. It must be kept in mind that even though several factors are similar, items within the factors vary.

Tables 5 and 6 display the correlations among the total SRSA scores and individual scores on each factor for males and females. According to varimax rotations the factors should not be highly correlated. This is the case when the factors are correlated using factor scores taking into account factor weights. However, for simplicity in future scoring purposes, the factor weights were not used to calculate the correlations. Instead, each item was considered to add as much to the total score as any other item in a given factor. Therefore, a score on a given factor for correlation purposes involved adding only the ratings for each item. Again, this procedure did not take into account factor weights, and thus when the factors were correlated high correlations between factors were observed. As Tables 5 and 6 demonstrate, using this procedure the factors are highly correlated with each other and with the total score. From these correlations, it can be justified that a total SRSA score can be used by itself to measure the general stress response, and individual factor scores can be used for more specific purposes.

Internal Consistency and Validity of Measures

Estimates of internal consistency and convergent/divergent validity were computed on the criteria

Table 5

Pearson Product-Moment Correlations Among Total SRSA Scores
and Individual Scores On Each Factor For Females (n=66)

Dimension	SRSA Total	Factor			
		1	2	3	4
SRSA Total	1.00	.97	.91	.89	.78
Factor 1	----	1.00	.88	.83	.70
Factor 2	----	----	1.00	.70	.64
Factor 3	----	----	----	1.00	.67
Factor 4	----	----	----	----	1.00

Table 6

Pearson Product-Moment Correlations Among Total SRSA Scores
and Individual Scores On Each Factor For Males (n=72)

Dimension	SRSA Total	Factor			
		1	2	3	4
SRSA Total	1.00	.93	.90	.88	.87
Factor 1	----	1.00	.75	.76	.81
Factor 2	----	----	1.00	.84	.71
Factor 3	----	----	----	1.00	.65
Factor 4	----	----	----	----	1.00

measures used for validation of the SRSA and associated factors. This endeavor was meant to provide evidence of reasonable faith in using these measures in the SRSA's validation analyses.

Internal consistencies for the criteria measures using Cronback's alpha are reported in Table 7 for both males and females. Alphas ranged from a low of .50 to a high of .93. Most of the alphas were in the expected range and were judged acceptable. However, the alpha of the Shortened Marlow-Crowne Social Desirability Scale (MC-1 (10)) for males was lower than expected at .50. The alphas for the MC-1 (10) (.61) and the Superior Adjustment subscale of the Offer Self-Image Questionnaire (OSIQ) for females (.54) were likewise only marginally acceptable. No reliability analyses were performed on the Life Events Checklist (LEC), because the instrument does not lend itself to internal consistency computations.

Tables 8 and 9 provide estimates of the associations between the criteria measures for the female and male subjects using zero-order Pearson product-moment correlations. Reasonable convergent/divergent validity was found. For example, with the female subjects the LEC as a measure of stressors was significantly ($p < .05$) correlated with state-anxiety, trait-anxiety, and psychopathology, all in the expected direction. As another example, the state-anxiety subscale of the State-Trait Anxiety Inventory (STAI) was significantly correlated ($p < .05$) for both

Table 7

Internal Consistency Reliability Coefficients of Criteria

Scales for Female and Male Subjects

Scale	Cronbach's alpha	
	Female Subjects (n=66)	Male Subjects (n=72)
State-anxiety (STAI)	.92	.93
MC-1(10)	.61	.50
Psychopathology (OSIQ)	.76	.76
Superior adjustment (OSIQ)	.54	.77
Trait-anxiety (STAI)	.92	.91

STAI = State-Trait Anxiety Inventory
MC-1(10) = Shortened Marlow Crowne Social
           Desirability Scale
OSIQ = Offer Self-Image Questionnaire

Table 8

Pearson Product-Moment Correlations Among Criteria Scales

for Female Subjects

Scale	Scale					
	LEC	SAS	SDS	SA	PP	TAS
LEC (n=66)	1.00	.26*	-.01	-.14	.29*	.31*
SAS (n=66)	----	1.00	-.15	-.27*	.67*	.63*
SDS (n=66)	----	----	1.00	.11	-.18	-.26*
SA (n=66)	----	----	----	1.00	-.48*	-.45*
PP (n=66)	----	----	----	----	1.00	.84*
TAS (n=66)	----	----	----	----	----	1.00

*$p < .05$

LEC = Life Events Checklist
SAS = State-anxiety subscale of the
      State-Trait Anxiety Inventory
SDS = Shortened version of the
      Marlow-Crowne Social Desirability Scale
SA = Superior Adjustment subscale of the
      Offer Self-Image Questionnaire
PP = Psychopathology subscale of the
      Offer Self-Image Questionnaire
TAS = Trait-anxiety subscale of the
      State-Trait Anxiety Inventory

Table 9

<u>Pearson Product-Moment Correlations Among Criteria Scales</u>

<u>for Male Subjects</u>

Scale	Scale					
	LEC	SAS	SDS	SA	PP	TAS
LEC (n=72)	1.00	.14	-.05	-.17	.05	.12
SAS (n=72)	----	1.00	-.17	-.09	.68*	.80*
SDS (n=70)	----	----	1.00	.15	-.24	-.25*
SA (n=71)	----	----	----	1.00	-.34*	-.29*
PP (n=71)	----	----	----	----	1.00	.73*
TAS (n=70)	----	----	----	----	----	1.00

*p < .05

LEC = Life Events Checklist
SAS = State-anxiety subscale of the
      State-Trait Anxiety Inventory
SDS = Shortened version of the
      Marlow-Crowne Social Desirability Scale
SA = Superior Adjustment subscale of the
      Offer Self-Image Questionnaire
PP = Psychopathology subscale of the
      Offer Self-Image Questionnaire
TAS = Trait-anxiety subscale of the
      State-Trait Anxiety Inventory

females and males in the expected positive direction with psychopathology and trait anxiety. A few exceptions to our expectations were found. The LEC for the males did not correlate to a significant degree with any of the criteria measures, indicating that the LEC has questionable validity. The expectation was that the LEC would correlate in a positive direction with psychopathology, state anxiety, and trait anxiety. The LEC was expected to correlate with superior adjustment in a negative direction. For the females the LEC did not correlate significantly with superior adjustment.

The majority of the scales had adequate reliability and adequate divergent/convergent validity for use in the estimation of validity for the SRSA. The Life Events Checklist, especially for the males, had the poorest estimate of validity, so correlations with this instrument should be interpreted with caution. There was enough confidence in the reliability of the criteria measures overall to use them in the validation of the SRSA.

Internal Consistency of SRSA and Factors

Computed coefficient alphas of items making up each individual factor delineated in Tables 3 and 4 are summarized in Tables 10 and 11. Tables 10 and 11 also give the coefficient alpha computed on all 32 of the SRSA stress-response items. Internal consistency using Cronbach's alpha ranged from .86 to .96 for females and

Table 10

Internal Consistency Reliability Coefficients of Items in the SRSA for Females (n=66)

Items	Internal consistency (Cronbach's alpha)	
All items	0.96	32 items
Factor 1	0.94	18 items
Factor 2	0.92	11 items
Factor 3	0.89	10 items
Factor 4	0.86	6 items

Table 11

<u>Internal Consistency Reliability Coefficients of Items in the SRSA for Males (n=72)</u>

Items	Internal consistency (Cronbach alpha)	
All Items	0.94	32 items
Factor 1	0.92	15 items
Factor 2	0.98	12 items
Factor 3	0.89	9 items
Factor 4	0.88	10 items

males. The coefficient alpha computed on all 32 of the stress-response items was remarkably high (.94 for males and .96 for females), indicating that using all of the items of the SRSA to give a general stress-response score can be justified.

Additional Validity Estimates

Validity estimates are presented in Tables 12 and 13 as Pearson product-moment correlations between the criteria scales, the total score of the 32 stress-response item SRSA, and the individual scores of the associated four factors for males and females. As detailed in Tables 12 and 13, all correlations were in the expected direction with all being significant for females ($p < .05$) and the majority being significant for the males. Excluding the MC-1(10), the absolute value of the correlations between the total SRSA score and criteria scales ranged from .24 to .79. The validity coefficients for the individual factors are similar to each other and to the total SRSA, indicating commonality in measurement. These procedures established evidence of criterion-related and construct validity.

SRSA scores were also compared, using t-test analyses, between subjects scoring high and low on the truthfulness items. This was done separately for males and females. The groups were separated by using the median score on the truthfulness scale. SRSA scores were also compared for those scoring high and low on the Shortened Marlow-Crowne

Table 12

Pearson Product-Moment Correlations Between Criteria

Scales, SRSA Total, and Associated Factor Scores For Female

Subjects

Scale		SRSA[a]	Factor			
			1	2	3	4
LEC	(n=66)	.38	.39	.35	.35	.21
SAS	(n=66)	.62	.61	.55	.60	.41
SDS	(n=66)	-.31	-.28	-.21	-.27	-.48
SA	(n=66)	-.28	-.20	-.20	-.37	-.24
PP	(n=66)	.67	.60	.55	.72	.57
TAS	(n=66)	.65	.56	.50	.71	.61

Note. All correlations are significant ($p < .05$).

[a]Total score on the 32 stress-response items.

LEC = Life Events Checklist
SAS = State-anxiety subscale of the
      State-Trait Anxiety Inventory
SDS = Shortened version of the
      Marlow-Crowne Social Desirability Scale
SA = Superior Adjustment subscale of the
      Offer Self-Image Questionnaire
PP = Psychopathology subscale of the
      Offer Self-Image Questionnaire
TAS = Trait-anxiety subscale of the
      State-Trait Anxiety Inventory

Table 13

Pearson Product-Moment Correlations Between Criteria

Scales, SRSA Total, and Associated Factor Scores For Male

Subjects

Scale		SRSA[a]	Factor			
			1	2	3	4
LEC	(n=72)	.25*	.26*	.18	.18	.25*
SAS	(n=72)	.72*	.67*	.70*	.67*	.60*
SDS	(n=72)	-.17	-.10	-.21*	-.18	-.11
SA	(n=71)	-.24*	-.06	-.39*	-.29*	-.19*
PP	(n=71)	.68*	.53*	.76*	.65*	.58*
TAS	(n=70)	.79*	.70*	.84*	.77*	.56*

*p < .05

[a]Total score on the 32 stress-response items.

LEC = Life Events Checklist
SAS = State-anxiety subscale of the
      State-Trait Anxiety Inventory
SDS = Shortened version of the
      Marlow-Crowne Social Desirability Scale
SA = Superior Adjustment subscale of the
      Offer Self-Image Questionnaire
PP = Psychopathology subscale of the
      Offer Self-Image Questionnaire
TAS = Trait-anxiety subscale of the
      State-Trait Anxiety Inventory

Social Desirability Scale, again using the median score as the criterion for separation. There were no significant differences between SRSA scores for all analyses, indicating there was no relationship between responding in a socially desirable fashion and patterns of responding on the SRSA.

Internal Consistency and Validity of Truthfulness Scale Items

Internal consistency of the truthfulness scale items was estimated using Cronbach's alpha. The initial truthfulness scale contained eight items. For both the males and females, 2 items were eliminated because they were not consistent with the other items. The final coefficient alpha for females was .82 (n=66) and for males was .77 (n=70). Both alphas were significant, indicating this scale has fairly strong internal consistency.

Validity data for the truthfulness items are presented in Table 14 as Pearson product moment correlations between the truthfulness scale item total and criteria measures. For the females all correlations were in the expected direction. The correlation with the Shortened Marlow-Crowne Social Desirability Scale was .38 ($p<.05$), indicating good concurrent validity. Table 14 also indicates that for the male subjects all correlations were in the expected direction. The correlation between the

Table 14

Pearson Product-Moment Correlations Between Criteria Scales
and Total Score on the Truthfulness Scale

Scale	Truthfulness Scale	
	Females (n=66)	Males (n=72)
SRSA	-.24*	-.16
LEC	-.08	.11
SAS	-.21*	-.40*
SDS	.38*	.14
SA	.34*	.16
PP	-.24*	-.37*
TAS	-.37*	-.49*

*p < .05

SRSA = Total score on the 32 stress-response
       items of the SRSA
LEC = Life Events Checklist
SAS = State-anxiety subscale of the
       State-Trait Anxiety Inventory
SDS = Shortened version of the
       Marlow-Crowne Social Desirability Scale
SA = Superior Adjustment subscale of the
       Offer Self-Image Questionnaire
PP = Psychopathology subscale of the
       Offer Self-Image Questionnaire
TAS = Trait-anxiety subscale of the
       State-Trait Anxiety Inventory

truthfulness scale items and the MC-1(10) was non-significant (p>.05), indicating uncertain concurrent validity.

SRSA Descriptive Statistics

The mean total and standard deviation of the SRSA's 32 stress-response items and of the six truthfulness items are given in Table 15 for female and male subjects. The mean SRSA total for males is lower than the mean SRSA total for females. Again, the males and females have separate versions of the SRSA, so average scores on one version are different from average scores on another version. The distribution of SRSA total scores for females is close to being normally distributed, as noted from visual inspection of plotted data. The distribution for the males is moderately skewed to the left. The mean truthfulness scores and corresponding standard deviations are fairly equal for both sexes.

T-Score Conversion and Comparison

Using the appropriate mean and standard deviation for the specific sex, a T-score conversion table was constructed to enable the SRSA score to be converted into a T-score for comparison purposes. Table 16 and Table 17 give the converted T-scores for each possible score on the total 32-item SRSA for both males and females. Percentiles

Table 15

Descriptive Statistics of the SRSA and Truthfulness Scale

Scale	(n)	Mean	Standard Deviation
Females			
SRSA[a]	66	56.08	27.73
TS[b]	66	14.42	4.24
Males			
SRSA[a]	72	34.44	21.78
TS[b]	72	12.74	4.28

[a]32 stress-response item SRSA total

[b]Truthfulness item scale total

are also given. A T-score of 50 indicates an average score on the SRSA for this study's sample.

Male and female subjects with SRSA T-scores greater than or equal to 60 (1 standard deviation above the mean) were compared to those with SRSA T-scores below 60 by analyzing the differences between mean scores on the LEC STAI and the two subscales of the OSIQ through the use of t-tests. It was expected that those subjects with T-scores greater than or equal to 60 would show significantly (p < .05) more psychopathology, less adjustment, more state and trait anxiety, and have more stressors than those subjects with T-scores below 60. The results are displayed in Tables 18 and 19.

Table 16

SRSA T-Score and Percentile Conversion Table for Females

R-Score[a]	T-score	%tile	R-Score[a]	T-Score	%tile
0	29		39	44	24
1	29		40	44	26
2	30	2	41	44	27
3	30		42	45	28
4	31	3	43	45	29
5	31		44	45	30
6	31		45	46	33
7	32		46	46	37
8	32		47	47	39
9	32		48	47	
10	33	4	49	47	40
11	33		50	48	41
12	34		51	48	45
13	34		52	48	46
14	34		53	49	48
15	35	6	54	49	52
16	35	7	55	50	
17	35	8	56	50	53
18	36	11	57	50	54
19	36		58	51	56
20	37	12	59	51	57
21	37	13	60	51	58
22	37		61	52	59
23	38	14	62	52	61
24	38		63	53	
25	38		64	53	64
26	39	15	65	53	66
27	39	16	66	54	
28	40	18	67	54	67
29	40	19	68	54	68
30	40		69	55	
31	41		70	55	69
32	41		71	56	
33	41	20	72	56	70
34	42		73	56	
35	42		74	57	
36	42		75	57	74
37	43		76	57	
38	43	21	77	58	75

[a]SRSA raw score

(Table continues)

Table 16 (continued)

R-Score[a]	T-score	%tile	R-Score[a]	T-Score	%tile
78	58	76	104	68	96
79	59	79	105	68	
80	59	80	106	69	
81	59	81	107	69	
82	60		108	69	
83	60		109	70	97
84	60		110	70	98
85	61	82	111	71	
86	61		112	71	
87	62	83	113	71	
88	62		114	72	
89	62	84	115	72	
90	63		116	72	
91	63	85	117	73	
92	63	86	118	73	
93	64		119	74	
94	64	89	120	74	
95	65	90	121	74	
96	65	91	122	75	
97	65	92	123	75	
98	66	93	124	75	
99	66	94	125	76	
100	66		126	76	
101	67	95	127	77	
102	67		128	77	
103	68				

[a]SRSA raw score

Table 17

SRSA T-Score and Percentile Conversion Table for Males

R-Score[a]	T-score	%tile	R-Score[a]	T-Score	%tile
0	34		39	52	61
1	35		40	53	62
2	35		41	53	63
3	36		42	53	64
4	36	2	43	54	65
5	36		44	54	66
6	37	3	45	55	70
7	37	4	46	55	71
8	38	5	47	56	
9	38	9	48	56	75
10	39	11	49	57	76
11	39	12	50	57	77
12	40	15	51	58	78
13	40	16	52	58	79
14	41	18	53	58	82
15	41		54	59	83
16	42	19	55	59	84
17	42	23	56	60	
18	42	24	57	60	86
19	43	33	58	61	
20	43	34	59	61	
21	44	35	60	62	87
22	44	39	61	62	89
23	45		62	63	
24	45		63	63	90
25	46	40	64	64	
26	46		65	64	91
27	47	41	66	64	
28	47	44	67	65	
29	48	47	68	65	92
30	48	48	69	66	
31	48	49	70	66	94
32	49	50	71	67	
33	49	52	72	67	
34	50	53	73	68	95
35	50	54	74	68	
36	51	55	75	69	
37	51	57	76	69	96
38	52	60	77	70	

[a]SRSA raw score

(Table continues)

Table 17 (continued)

R-Score[a]	T-score	%tile	R-Score[a]	T-Score	%tile
78	70		104	82	
79	70		105	82	
80	71	97	106	83	
81	71		107	83	
82	72		108	84	
83	72		109	84	
84	73		110	85	
85	73		111	85	
86	74		112	86	
87	74		113	86	
88	75		114	87	
89	75		115	87	
90	76		116	88	
91	76		117	88	
92	76		118	88	
93	77		119	89	
94	77		120	89	
95	78		121	90	
96	78		122	90	
97	79		123	91	
98	79		124	91	
99	80		125	92	
100	80		126	92	
101	81		127	93	
102	81	98	128	93	
103	81				

[a]SRSA raw score

Table 18

t-test Comparisons of Means on Criteria Measures for Female
Subjects by SRSA T-Scores

Scale	Group	n	Mean	SD	p
LEC	≥	12	9.42	2.84	
	<	54	7.74	3.74	.01*
SAS	≥	12	58.08	9.41	
	<	54	42.56	10.53	.00*
TAS	≥	12	56.08	8.92	
	<	53	43.36	9.89	.00*
PP	≥	12	49.00	7.03	
	<	54	37.87	9.94	.00*
SA	≥	12	52.75	6.09	
	<	54	59.91	7.81	.01*

Note.

SD = Standard Deviation
≥   = T-scores greater than or equal to 60
<   = T-scores less than 60
p   = t-test probability
LEC = Life Events Checklist
SAS = State-anxiety subscale of the
        State-Trait Anxiety Inventory
SA = Superior Adjustment subscale of the
        Offer Self-Image Questionnaire
PP = Psychopathology subscale of the
        Offer Self-Image Questionnaire
TAS = Trait-anxiety subscale of the
        State-Trait Anxiety Inventory

*p < .05

Table 19

t-test Comparisons of Means on Criteria Measures for Male

Subjects by SRSA T-Scores

Scale	Group	n	Mean	SD	p
LEC	≥	10	8.00	4.52	
	<	62	7.93	4.70	.97
SAS	≥	10	55.40	11.24	
	<	62	36.82	10.67	.00*
TAS	≥	10	55.70	9.54	
	<	60	41.02	9.18	.00*
PP	≥	10	49.00	9.83	
	<	61	36.03	9.86	.00*
SA	≥	10	55.00	11.36	
	<	61	57.86	12.49	.01*

Note.

SD = Standard Deviation
≥ = T-scores greater than or equal to 60
< = T-scores less than 60
p = t-test probability
LEC = Life Events Checklist
SAS = State-anxiety subscale of the
       State-Trait Anxiety Inventory
SA = Superior Adjustment subscale of the
       Offer Self-Image Questionnaire
PP = Psychopathology subscale of the
       Offer Self-Image Questionnaire
TAS = Trait-anxiety subscale of the
       State-Trait Anxiety Inventory

*p < .05

Tables 18 and 19 indicate all results were in the expected direction, with the exception that male subjects with SRSA T-scores above 60 did not have significantly more stressors or were significantly less adjusted than those with T-scores below 60.

Study 2

Study 2 was designed to evaluate the ability of the SRSA to discriminate between those individuals in a high-stress condition and those in a low-stress condition to establish additional construct validity for the SRSA measure. For each subject in each condition the ratings on each of the 32 items of the male or female version of the SRSA were totalled to produce an overall SRSA score. These scores were compared across conditions and gender to determine if the results met the desired objectives.

Table 20 and Table 21 give the number of subjects, mean SRSA score, the standard deviation of the SRSA scores, and the 1-tailed probability for males and females by condition. As noted in Table 20, the female subjects in the high-stress condition had significantly ($p < .05$) higher SRSA scores than female subjects in the low-stress condition. Similarly, male subjects in the high-stress condition had significantly higher ($p < .05$) SRSA scores than male subjects in the low-stress condition.

Table 20

Comparison of SRSA Scores by Condition for Female Subjects

Condition	n	Mean	SD	p
Low stress	14	26.14	19.65	
High stress	11	81.45	19.54	0.00*

Note.

Mean = Mean SRSA score
SD   = Standard Deviation
p   = t-test probability (one-tailed)

*p < .05

Table 21

Comparison of SRSA Scores by Condition for Male Subjects

Condition	n	Mean	SD	p
Low stress	4	34.50	22.72	
High stress	8	72.00	26.02	0.02*

Note.

Mean = Mean SRSA score
SD   = Standard Deviation
p   = t-test probability (one-tailed)

*p < .05

Study 3

Study 3 was designed to determine the ability of the SRSA to detect changes in stress levels when subjects were taken from a low-stress condition and placed into a high-stress condition and vice versa. This provides even further evidence of construct validity. The ratings on each of the 32 stress-response items were added to produce an SRSA score. This was done separately for each individual by gender. The SRSA scores were then analyzed for significant changes for each sex by condition.

The results of Study 3 are presented in Table 22 for the female subjects and Table 23 for the male subjects. Both female and male subjects showed significant (p < .01) reductions in SRSA scores after being moved from the high-stress condition to the low-stress condition. Both female and male subjects showed significant increases in SRSA scores after being moved to a high-stress condition from a low-stress condition.

Table 22

Changes in SRSA Scores For Female Subjects by Condition

Condition	n	Mean	SD	p
High Stress		71.0	26.6	
To	14			0.00*
Low Stress		19.6	18.7	
Low Stress		32.0	17.3	
To	19			0.00*
High Stress		85.3	23.6	

Note.

Mean = Mean SRSA score
SD   = Standard Deviation of mean SRSA scores
p   = t-test one tailed probability

*p < .05

Table 23

Changes in SRSA Scores For Male Subjects by Condition

Condition	n	Mean	SD	p
High Stress		60.0	25.8	
To	14			0.00*
Low Stress		19.3	9.5	
Low Stress		46.4	16.6	
To	19			0.00*
High Stress		78.6	22.1	

Note.

Mean = Mean SRSA score
SD   = Standard Deviation of mean SRSA scores
p   = t-test one tailed probability

*p < .05

CHAPTER VI

DISCUSSION

Summary

The purpose of the study was to construct a reliable and valid self-report instrument that measures the stress response in adolescents. The importance of studying stress in adolescence, the forms of stress at adolescence, the individual variations of stress among adolescents, models of stress in general, and a model of stress in adolescence are presented in the introductory chapter. Stress, the stress process, and stress response are defined, along with a discussion on the distinction between stress and anxiety, in the second chapter. Chapter 3 reviews the measurement of stress, with the major focus on self-report measures of stress.

The objective of the thesis work was met by conducting three studies. In study 1 scale items were generated, carefully selected, and constructed into a scale. The scale was then administered to various groups of adolescents along with criterion scales. Estimates of reliability and validity were obtained. Item reduction occurred until the final scale was completed. Study 2 determined whether the completed scale (SRSA) could distinguish between those in a high-stress condition and those in a low-stress condition. Study 3 determined whether the scale could detect changes in the stress

response when individuals were taken from a low-stress condition and placed in a high-stress condition and vice versa.

The completed SRSA consists of two forms, one for males and one for females. In the initial factor analyses, gender loaded highly on the main factor necessitating the creation of separate stress-response scales for each gender. Each form consists of 32 stress-response items and six truthfulness-scale items. The truthfulness items were constructed to determine how honest the subject is in filling out the SRSA. Four factors emerged from the factor analyses for each gender. The female form contains an overall general stress-response factor, a low energy/pressured factor, an anxiety factor, and an anger factor. The male form contains an overall general stress-response factor, a sub-general stress-response factor, a low energy/pressured factor, and an anxiety factor. The factors are similar for each gender but there are enough differences to require separate forms. The general stress-response factors for both males and females include physiological, cognitive/emotional, and some behavioral items. The sub-general stress-response factor for males was difficult to interpret and seems most like the general stress-response factor. These factors for both males and females are highly reliable and at the same time highly correlated with each other when factor weights are not used in score computation. The factors were also highly

correlated with the total score of the 32 stress-response items of the SRSA. The factors have similar validity estimates.

The 32 stress-response items of the SRSA have a high coefficient alpha of .96 for the female form and .94 for the male form. Validity estimates are in the expected direction and range from .38 to .67 for females and .25 to .79 for males. The truthfulness-scale items have a coefficient alpha of .82 for females and .77 for males. The validity coefficient for the truthfulness-scale items, when compared to another social desirability scale, is .38 for females and .14 (not significant at $p < .05$) for males. For the study 1 sample of the 32 stress-response items the mean score was 56.1 with a standard deviation of 27.7 for females and a mean score of 34.4 with a standard deviation of 21.7 for males. For the truthfulness items, females had a mean score of 14.4 with a standard deviation of 4.2, while males had a mean score of 34.4 with a standard deviation of 12.7. A T-score conversion table was constructed to convert SRSA raw scores to T-scores using this sample's mean and standard deviation for each gender. Male and female subjects having T-scores one standard deviation above the mean (T-score of 60) reported significantly more psychopathology, state and trait anxiety, and less adjustment. Female subjects reported significantly more life events. In study 2, subjects in the low-stress condition had significantly lower scores on

the SRSA than subjects in the high-stress condition. In
study 3, subjects reported a significant increase in SRSA
scores when taken from a low-stress condition to a high-
stress condition. Subjects had a significant decrease in
SRSA scores when taken from a high-stress condition to a
low-stress condition.

Evaluation of Objectives

The purpose of the study was met, in that a valid and
reliable instrument was constructed to measure the self-
perceived stress-response in adolescents. The reliabilty
estimates are excellent, and the validity estimates are
quite satisfactory. The SRSA has potential for detecting
changes in stress-response levels and distinguishing those
in a high-stress condition versus those in a low-stress
condition.

The factor analyses did not produce factors consistent
with earlier theoretical discussion. It was noted that the
stress response has behavioral, cognitive/emotional, and
physiological components. The stress response, as noted by
the composition of the main general stress-response factors
for both males and females, is indeed a combination of
physiological, cognitive/emotional, and some behavioral
items, but the components are so interrelated that they
cannot be considered separate factors. What did result
from the factor analyses are factors thought to reflect a
general stress response, anger, anxiety, low energy, and

pressure for females and a general and sub-general stress-response, anxiety, low energy, and pressure for males. However, these factors were so interrelated that their contribution to the measurement of the stress response is considered minimal. For most purposes the total score from the 32 stress-response items is probably the most useful component of the test.

The negative or non-significant correlations between the social desirability scale and the SRSA for both males and females indicate that high perceived and reported stress-response levels, as indicated by responses to the SRSA, are not due to subjects responding in a socially desirable fashion. The truthfulness-scale items correlate with the social desirability scale in a positive fashion for females and in a nonsignificant positive direction for males, indicating that, at least for female respondents, when there is a high score on the truthfulness scale the accuracy of the SRSA score is questionable. The truthfulness scale for males is not as valid, but the validity coefficient obtained indicates at least the same trend for males as for females. When high scores on the truthfulness scale items are obtained the score on the SRSA may not be as accurate for either gender, since the subject may not be honest in responding.

Weaknesses

The SRSA is in preliminary form, and the results are tentative at best. There are weaknesses in the three studies which make any definite conclusions questionable. One weakness to all three studies is that the samples used were not selected randomly, nor were all the subjects assigned randomly to the different conditions. Since randomization was not achieved, the results cannot be generalized to any population beyond the sample without the possibility of errors in conclusions. The results from this study technically cannot be generalized to other adolescents. This makes the SRSA scores obtained from other adolescents speculative at best. Another weakness is that the number of subjects used in the scale's development was small. A larger sample may reveal results that are different from the results in this thesis.

The use of self-report as the only method of obtaining data on the validation of the SRSA is also of concern. Self-report is valuable since it is important to understand how a subject is perceiving stress, and the purpose of this thesis was to make a self-report instrument. However, validation included only self-report measures, which leads to the question of how accurate the self-reported responses were. The subjects may have been perceiving differently than they were actually reporting. More objective validation procedures need to be employed in order to strengthen the SRSA's validity.

Another weakness of this study is that in Study 2 and Study 3 role-enactment methodology was used, thus subjects were not actually in stressful or non-stressful conditions. It cannot be concluded that the SRSA can detect "actual" changes in stress responses or distinguish between those in actual high-stress conditions those in actual low-stress conditions. It can only be concluded that the SRSA has "potential" for doing so.

Another concern is that SRSA scores for the male population were not distributed normally, instead they were skewed toward the lower end of the scale. This lack of a normal distribution may pose difficulty in discriminating different magnitudes of the stress response for those males who report lower levels of perceived stress response.

Keeping the above weaknesses in mind, at this stage in the scale's development the SRSA should be backed with established measures with strong reliability and validity for use as a clinical or research instrument.

Uses of the SRSA

The SRSA does have promise as an instrument in assessing the stress response in adolescents. Scores obtained can be converted to T-scores and comparisons made to the sample of adolescents employed in this study. T-scores of 60 or above for both males and females indicate that individuals reported more psychopathology and other stress-related conditions than those with T-scores below

60. A potential use is as a screening instrument to help determine those adolescents who may be at risk to develop stress-related psychopathology. Those adolescents who score high on the SRSA can be interviewed to determine just what stressors are in their lives and to what extent those stressors are affecting them. Those adolescents found to have many stressors and to be experiencing a severe stress response can be included in programs designed to help adapt to and manage stressors. One such program that could be molded to the adolescent population, is stress- inoculation training (SIT) (Meichenbaum & Deffenbacher, 1988), which has the purpose of "inoculating" an individual to stress similar to using a vaccine to inoculate against disease. This training is preventive in that it attempts to prevent pathology from occurring rather than treating the pathology after it has formed. The SRSA could be vital in this process.

To aid in the understanding of stress in adolescence and ultimately to aid in the development of stress-measuring instruments for adolescents, models of stress in adolescence need to be more clearly delineated. The current model is not adequate, and the general stress models are not specific enough for the study of adolescence. Stressors in adolescence should be described more clearly. How adolescents respond to stress needs to be studied more carefully in concrete terms that allow measurement. Understanding the way adolescents handle

stress is crucial to determining why some react more positively than others to the same stressor. The SRSA can aid in this research process as one of the measures used to collect data.

Future Research Directions

Again, the SRSA is only in preliminary form. Developing a measurement instrument is done in increments. This thesis is one small increment toward a fully developed scale that measures the entire stress process in adolescents. The stress process as defined includes stressors, mediating variables, and the stress response. The SRSA only looks at the stress response. Further development of the SRSA, with the lofty goal of creating an instrument that looks at the entire stress process, can take many directions. To strengthen the SRSA the scale should be readministered to a randomly selected group of adolescents from a specifically defined population. The number of subjects should be larger than in this study to allow for greater power in data analyses. Factor analyses, reliability estimates, and validity estimates should be computed to verify the results of the study. The emerged factors should be carefully reviewed to determine specifically what they are measuring. With repeated administration of the SRSA, items that are thought to measure the stress response but are not included in the SRSA should be piloted to determine their usefulness.

Items that are reversed, in which high scores mean low stress, should also be piloted for inclusion into the SRSA, so that not all items require the same response direction to be an indication of a higher stress response. The validation process should include some objective measurement to determine accuracy of the self-reported responses on the SRSA. This may not be done easily. An example of a more objective validation procedure is that subjects could be interviewed about a particular topic and the number of verbalizations reflecting the stress response could be counted and correlated with scores on the SRSA. Subjects in actual stressful and nonstressful conditions should be evaluated with the SRSA to determine if the SRSA can detect actual changes in stress-response levels and distinguish those in each condition. With this random sample, a larger sample size, repeat analyses, inclusion of possible new and reversed items, and more objective and real-life validation procedures, the SRSA could have better norms for comparison with a stronger research base to allow stronger conclusions to be made.

As a final research direction, the SRSA can be combined with knowledge about stressors and mediating variables in adolescence to construct a scale that assesses adolescents' stressors, stress response, and methods of handling stress similar to the Derogatis Stress Profile (Derogatis, 1987), which assesses all of these areas in adults. A scale of this type could greatly enhance our

understanding of the entire process of stress in adolescence and help in the prevention of stress-related pathology.

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APPENDIXES

Appendix A

Criteria Measures

Life Events Checklist

Below is a list of things that sometimes happen to people. Put an 'X' in the space by each of the events your have experienced during the past year (12 months). For each of the events you check also indicate whether you would rate the event as a **good** event or as a **bad** event. Remember, for each event you have experienced during the past year, (1) place an 'X' in the space to indicate you have experienced the event, and (2) indicate whether you viewed the event as a good or bad event by circling either good or bad for each item you put an 'X' by.

To get some idea of the type of events you will be asked to rate, please read over the entire list before you begin. Only respond to those events you have actually experienced during the past year.

	Event	X	Type of event (Circle one)	
1.	Moving to a new home	___	Good	Bad
2.	New brother or sister	___	Good	Bad
3.	Changing to new school	___	Good	Bad
4.	Serious illness or injury of family member	___	Good	Bad
5.	Parents divorced	___	Good	Bad
6.	Increased number of arguments **between** parents	___	Good	Bad
7.	Mother or father lost job	___	Good	Bad
8.	Death of a family member	___	Good	Bad
9.	Parents separated	___	Good	Bad

Life Events Checklist (Continued)

Event	X	Type of event (Circle one)
10. Death of a close friend	___	Good Bad
11. Increased absence of parent from home	___	Good Bad
12. Brother or sister leaving home	___	Good Bad
13. Serious illness or injury of close friend	___	Good Bad
14. Parent getting into trouble with the law	___	Good Bad
15. Parent getting a new job	___	Good Bad
16. New stepmother or stepfather	___	Good Bad
17. Parent going to jail	___	Good Bad
18. Change of parents' financial status	___	Good Bad
19. Trouble with brother or sister	___	Good Bad
20. Special recognition for good grades	___	Good Bad
21. Joining a new club	___	Good Bad
22. Losing a close friend	___	Good Bad
23. Decrease in number of arguments between parents	___	Good Bad

(Life Events Checklist Continues)

Life Events Checklist (Continued)

Event	X	Type of event (Circle one)	
24. Losing a job	___	Good	Bad
25. Making the honor role	___	Good	Bad
26. Getting your own car	___	Good	Bad
27. New boyfriend/girlfriend	___	Good	Bad
28. Failing a grade	___	Good	Bad
29. Increase in number of arguments with parents	___	Good	Bad
30. Getting a job of your own	___	Good	Bad
31. Getting into trouble with the police	___	Good	Bad
32. Major personal illness or injury	___	Good	Bad
33. Breaking up with boyfriend/girlfriend	___	Good	Bad
34. Making up with boyfriend/girlfriend	___	Good	Bad
35. Trouble with teacher	___	Good	Bad
36. Failing to make an athletic team	___	Good	Bad
37. Being suspended from school	___	Good	Bad
38. Making failing grades on report card	___	Good	Bad
39. Making an athletic team	___	Good	Bad

(Life Events Checklist Continues)

Life Events Checklist (Continued)

Event	X	Type of event (Circle one)	
40. Trouble with classmates	___	Good	Bad
41. Special recognition for athletic performance	___	Good	Bad
46. Getting put in jail	___	Good	Bad
Other events which have had an impact on your life. List and rate.			
47. _____ _____	___	Good	Bad
48. _____ _____	___	Good	Bad
49. _____ _____	___	Good	Bad
50. _____ _____	___	Good	Bad

State-Trait Anxiety Inventory

State-Anxiety Subscale

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate circle to the right of the statement to indicate how you feel **right** now, that is, **at this moment**. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

		Not at all	Somewhat	Moderately so	Very Much so
1.	I feel calm	1	2	3	4
2.	I feel secure	1	2	3	4
3.	I am tense	1	2	3	4
4.	I feel strained	1	2	3	4
5.	I feel at ease	1	2	3	4
6.	I feel upset	1	2	3	4
7.	I am presently worrying over possible misfortunes	1	2	3	4
8.	I feel satisfied	1	2	3	4
9.	I feel frightened	1	2	3	4
10.	I feel comfortable	1	2	3	4
11.	I feel self-confident	1	2	3	4
12.	I feel nervous	1	2	3	4
13.	I am jittery	1	2	3	4
14.	I feel indecisive	1	2	3	4
15.	I am relaxed	1	2	3	4
16.	I feel content	1	2	3	4
17.	I am worried	1	2	3	4
18.	I feel confused	1	2	3	4
19.	I feel steady	1	2	3	4
20.	I feel pleasant	1	2	3	4

State-Trait Anxiety Inventory

Trait Anxiety Subscale

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you **generally** feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

	Almost never	Sometimes	Often	Almost always
21. I feel pleasant	1	2	3	4
22. I feel nervous and restless	1	2	3	4
23. I feel satisfied with myself	1	2	3	4
24. I wish I could be as happy as others seem to be	1	2	3	4
25. I feel like a failure	1	2	3	4
26. I feel rested	1	2	3	4
27. I am "calm, cool, and collected"	1	2	3	4
28. I feel that difficulties are piling up so that I cannot overcome them	1	2	3	4
29. I worry too much over something that really doesn't matter	1	2	3	4
30. I am happy	1	2	3	4
31. I have disturbing thoughts	1	2	3	4
32. I lack self-confidence	1	2	3	4

(Trait Anxiety Subscale Continues)

Trait Anxiety Subscale (Continued)

	Almost never	Sometimes	Often	Almost always
33. I feel secure	1	2	3	4
34. I make decisions easily	1	2	3	4
35. I feel inadequate	1	2	3	4
36. I am content	1	2	3	4
37. Some unimportant thought runs through my mind and bothers me	1	2	3	4
38. I take disappoint-ments so keenly that I can't put them out of my mind	1	2	3	4
39. I am a steady person	1	2	3	4
40. I get in a state of tension or turmoil as I think over my recent concerns and interests	1	2	3	4

Offer Self Image Questionnaire

Superior Adjustment and Psychopathology Subscales

After carefully reading each of the statements on the following pages, please write the number in the blank at the far right of the page that indicates how well the item describes you: The numbers correspond with categories that range from **"DESCRIBES ME VERY WELL"** (1) to **"DOES NOT DESCRIBE ME AT ALL"** (6).
Please write in only one number for each statement.

Example

    Statement: <u>I am an adolescent</u>.

    Choice of answers:

1-DESCRIBES ME VERY WELL   **2-DESCRIBES ME WELL**

3-DESCRIBES ME FAIRLY WELL   **4-DOES NOT QUITE DESCRIBE ME**

5-DOES NOT REALLY DESCRIBE ME   **6-DOES NOT DESCRIBE ME AT ALL**

    Response: <u>1</u>

Please respond to all items.

               Thank you

Superior Adjustment and Psychopathology
Subscales (Continued)

PP = Psychopathology Subscale
SA = Superior Adjustment Subscale

1-DESCRIBES ME VERY WELL   2-DESCRIBES ME WELL

3-DESCRIBES ME FAIRLY WELL   4-DOES NOT QUITE DESCRIBE
                                    ME

5-DOES NOT REALLY DESCRIBE ME   6-DOES NOT DESCRIBE ME AT
                                    ALL

PP 1. I am afraid that someone is
       going to make fun of me.   1___

S   2. If I would be separated from
       all the people I know,
          I feel that I would not be able
       to make a go of it.   2___

PP 3. I am confused most of the time.   3___

S   4. I do not like to put things in
       order and make sense
       of them.   4___

PP 5. I often blame myself even when
       I'm not really at blame.   5___

PP 6. Sometimes I feel so ashamed of
       myself that I just want
       to hide in a corner and cry.   6___

S   7. When a tragedy occurs to one of
       my friends, I feel
       sad too.   7___

S   8. I am a superior student in school.   8___

PP 9. I feel empty emotionally most
       of the time.   9___

Superior Adjustment and Psychopathology
Subscales (Continued)

PP = Psychopathology Subscale
SA = Superior Adjustment Subscale

1-DESCRIBES ME VERY WELL   **2-DESCRIBES ME WELL**

3-DESCRIBES ME FAIRLY WELL   **4-DOES NOT QUITE DESCRIBE
                                          ME**

5-DOES NOT REALLY DESCRIBE ME   **6-DOES NOT DESCRIBE ME AT
                                          ALL**

S   10. Our society is a competitive one,
       and I am not afraid
       of it.   10____

S   11. I find it very difficult to
       establish new friendships.   11____

S   12. Working closely with another fellow
       never gives me pleasure.   12____

PP   13. I often feel that I would rather
       die than go on living.   13____

PP   14. Other people are not after me to
       take advantage of me.   14____

S   15. If I know that I will have to
       face a new situation, I will try in
       advance to find out as much as
       possible about it.   15____

S   16. Whenever I fail in something
       I try to find what I can
       can do in order to avoid
       another failure.   16____

PP   17. Even though I am continuously
       on the go, I seem unable
       to get things done.   17____

PP   18. I believe I can tell the real
       from the fantastic.   18____

(Superior Adjustment and Psychopathology
Subscales Continues)

Superior Adjustment and Psychopathology
Subscales (Continued)

PP = Psychopathology Subscale
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1-DESCRIBES ME VERY WELL   **2-DESCRIBES ME WELL**

3-DESCRIBES ME FAIRLY WELL   **4-DOES NOT QUITE DESCRIBE**
                                         ME

5-DOES NOT REALLY DESCRIBE ME   **6-DOES NOT DESCRIBE ME AT**
                                         ALL

S   19. I am certain that I will not
     be able to assume responsibilities
     for myself in the future.   19____

PP   20. When I enter a new room I have a
     strange and funny feeling.   20____

S   21. I do not rehearse how I might deal
     with a real coming event.   21____

PP   22. When I am with people I am bothered
     by hearing strange noises.   22____

S   23. I do not enjoy solving
     difficult problems.   23____

S   24. Worrying a little about one's
     future helps to make it
     work out better.   24____

S   25. Dealing with a new intellectual
         subject is a challenge for me.   25____

PP   26. I do not have any fears which
     I cannot understand.   26____

PP   27. No one can harm me just by not
     liking me.   27____

Shortened Marlow-Crowne Social Desirability Scale

Please circle True (T) or False (F) for each of the following items.

1. I like to gossip at times.   T   F

2. There have been occasions when I took
    advantage of someone.   T   F

3. I'm always willing to admit it when I
    make a mistake.   T   F

4. I sometimes try to get even rather than
    forgive and forget.   T   F

5. I always try to practice what I preach.   T   F

6. I never resent being asked to return a favor.   T   F

7. I have never been irked (bugged) when people
    expressed ideas very different from my own.   T   F

8. At times I have really insisted on having
    things my own way.   T   F

9. There have been occasions when I felt like
    smashing things.   T   F

10. I have never on purpose said something
    that hurt someone's feelings.   T   F

Appendix B

Scripts

*Script for stressful condition

    In this vignette we have a scenario that we would like
you to read. We want you to do the best at identifying
with it by pretending that you are actually in the
situation described.
    Yesterday, you remember thinking that you were the
happiest person in the whole earth, in the whole galaxy, in
all of God's creation. Could that only have been yesterday
or was it endless light-years ago? You were thinking that
the grass had never smelled grassier, the sky had never
seemed so high. Now it's all smashed down upon your head
and you wish you could just melt into the blaaaa-ness of
the universe and cease to exist. Oh, why, why, why can't
you? How can you face your friends? How can you? By now the
word has gotten around the whole school, you know it has!
Yesterday you bought a diary because you thought at last
you'd have something wonderful and great and worthwhile to
say, something so personal that you wouldn't be able to
share it with another living person, only yourself. Now
like everything else in your life, it has become so much
nothing.
    You were all set to go out with this person that you
have had a crush on for all your life and you have waited
for the chance for this person to recognize you and to see
you. You finally were able to talk to this person and it
ended up that you two were going to go out on a date. But
something happened. You don't really understand how this
person could have done this to you. This person ended up
not showing and you heard that this person told your
friends that it was all a joke. This person whom you've
had such a crush on burned you royally. Yesterday when your
plans were all set up you thought you'd literally and
completely die with happiness. You really did! And now the
whole world is cold and gray and unfeeling. To make matters
worse, your mother is nagging you to clean up your room.
How can she nag you to clean up your room when you feel
like dying? Can't you even have the privacy of your own
soul? Now you have to go through a long lecture by your
mother about your attitude and your immaturity.
    Now you are at school and it is a nightmare. You are
afraid to see this person every time you turn the corner in
the hall, yet you are desperate for fear that you wouldn't
see this person. You keep telling yourself, "Maybe
something went wrong and the person will explain. Maybe
this person does like you after all."
You now have lunch and you try to avoid your friends but
they find you. They are all laughing at you that you got
stood up. Don't they care? How could they be so
insensitive? They are making fun of you and calling you a
nerd. You pretend to not care but you do. You care so much
that your whole insides are shattering. How can it be
possible for you to be so miserable and embarrassed and

humiliated and beaten and still function, still talk and smile and concentrate? How could this person have done this to you? You feel that no one cares about you. You wouldn't hurt anyone in this whole world. You wouldn't hurt them physically or emotionally, how then can people so consistently do it to you? Even your parents treat you like you are stupid and inferior and ever short. You guess that you'll never measure up to anyone's expectations. You feel that you surely don't measure up to what you'd like to be.

You go to your part time job and there are a thousand things to do. You are feeling so uptight and you really don't feel like working but the work has got to be done. On your job you do the same old thing day after day and you are getting sick of it. You can't stand the people you work with. They are all so boring and old. They can't understand you and they treat you like a little kid that doesn't know anything. You could never tell them what is going on because they'll laugh at you too. How could they understand anyway? How can anyone understand ? You feel so distant from everyone. Your boss begins to complain about your work and attitude. He threatens to fire you if you don't shape up. Why does he treat you so horrible? What have you done to deserve it? You feel like the whole world is against you.

You've never been treated well your entire life. You feel so ugly. You wonder how anyone could like you because of your looks.
Furthermore you think that everyone is looking at you and laughing at the way you dress. Your parents won't give you much money and you have to buy your own clothes. But your job doesn't pay much so you can't afford the clothes you like. You are beginning to look as slobby as you feel. How could things be so awful? Why couldn't things go better for you? Why did I have to get burned? Why does my mother nag at me so much? Why do my friends laugh at me? Why is my job so boring? Can't my boss understand what I am going through? Why do I feel so ugly and uncared for?

*Adapted from Go Ask Alice (p.7) by Anonymous. Copyright 1971 by Prentice-Hall.

*Script for non-stressful condition

   In this vignette we have a scenario that we would like
you to read. We want you to do the best at identifying
with it by pretending that you are actually in the
situation described.

   You find yourself standing in a green country field in
the summer. It is just about dawn, just light enough to
see. Off in the distance you can see a grove of trees.
They appear misty and dew-covered; the dark green leaves
are beautiful in this early-morning light. There's no one
else around; except for the sounds of birds, it is quiet.
The tree grove seems inviting, so you go over to it and
become a part of this tranquil scene, standing in the
center of a circle formed by trees. You touch the tree
bark and feel it's rough, cracked surface. You feel the
soft, plush grass beneath your feet as well. You feel
anything and everything; it's all here for you. You notice
a breeze passing where you stand. It's only a slight cool
morning breeze, but it seems to make a kind of music as it
rustles the leaves and grass. Because you're feeling
loose, relaxed, calm and heavy, sort of special, you can
settle down in the center of the grove. You breathe deeply
in and out...inspiration, intake, absorption,
connection.....freely breathing, soft and easily. You can
hear some good music now while you relax, if you listen
very closely. It's very soft at first, but grows louder as
you imagine it. It is one of your favorite songs, and it
seems to be riding in on the breeze, so you stay with it
for a moment or two.

   Now you look around again to find that the music has
taken you somewhere else, away from the tree grove. You are
now sitting comfortably next to a clear, cool pond. You
sit down, relaxed, right next to the water, looking
directly into the water. You watch the ripples, small,
gentle ripples. There's an occasional glimpse of you
reflection. The water can inspire you to unwind a little
bit more, loosen your shoulders, jaw, forehead, stretch
your arms, fluid movements as the water flows. The water
might touch you with some small magic, maybe a sense of
worth, sweet emotion, a deep kind of knowing which may have
eluded you before. You are captured by how light strikes
it. And now you hear music again. It's music that reminds
you of water. You hear it when you begin to imagine
it...silvery, fluid, dipping, splashing... and you feel
yourself swaying along with it for a little while.

   Overhead, a large bird crosses the sky, great wings
gliding so gracefully in the sky. You imagine how it would
feel to glide along like the bird. What would it feel like
to fly? You imagine how it would look from the bird's
view, high over the clear pond, over you. You picture how
you look from above as you recline by the pond. You can
still see the moon, even though it's getting lighter. The
day is still young. Here, right now, you're feeling all

right and you can bask in these images, as if they were heat, or silk draping all over you. All cares and concerns, past and future, have no real place where you are now. This is your private oasis.

You stretch out more now, allowing the new morning sun to reach you. The rays feel warm, friendly, old friends. Your eyes are closed. You're trusting the earth's gravity, which holds you so safely. A kaleidoscope of images now appears to you, one by one, as if you were receiving and opening gifts. First view a multi-colored tropical fish swimming through water, serene, graceful, strange with all the colors and fish-behaviors and in such a different medium from yours, in harmony with the world as it is. The fish is swimming around plants, shells and rocks. The fins are silver and long. The movement is <u>so quiet</u>. These long, fine tendrils propel the fish through warm, blue-green water.

Now the fish is gone, and your favorite color appears in the form of a circular color wheel. The wheel spins rapidly, sending splashes of this great color out in all directions. The wheel gradually turns more slowly, and your relaxed stated feels deeper. You feel heavy and unwilling to move, warm, but not really asleep. You are content; you lie here undisturbed. Perhaps you are repairing parts of yourself now, those which have been torn and frayed by pressures and uncertainty.

Appendix C

The Stress-Response Scale for Adolescents

Initial 70 stress-response item
and 8 truthfulness items SRSA

Below are some statements that are possible descriptions of yourself. Please read the statements carefully and circle the number that corresponds to how you have been feeling, acting or thinking overall the **last couple of days, including today**. Keep in mind that there are no right or wrong answers.

Not at all	Somewhat so	Moderately so	Quite a bit	Extremely so
0	1	2	3	4

L = Truthfulness Scale Item

1.	I feel my heart pounding ...0	1	2	3	4
2.	I have sweaty hands 0	1	2	3	4
3.	I go to places to be by myself 0	1	2	3	4
4.	I have nervous habits such as biting my nails 0	1	2	3	4
5.	I have trouble concentrating 0	1	2	3	4
6.	I have pressure on me 0	1	2	3	4
7.	I daydream 0	1	2	3	4
8.	My mouth and/or throat feel dry 0	1	2	3	4
9.	My breathing is tight 0	1	2	3	4
L1.	I get along with everyone 0	1	2	3	4
11.	I am startled easily by things such as small sounds 0	1	2	3	4
12.	I act without thinking 0	1	2	3	4

Not at all	Somewhat so	Moderately so	Quite a bit	Extremely so
0	1	2	3	4

L = Truthfulness Scale Item

13. I have difficulty making
    decisions more than usual 0   1   2   3   4

14. I don't have time to
    think or reflect 0   1   2   3   4

15. I feel light headed 0   1   2   3   4

16. I am bugged easily 0   1   2   3   4

17. I feel tense 0   1   2   3   4

18. My muscles are tight 0   1   2   3   4

19. I have stomach problems 0   1   2   3   4

L2. I like everyone 0   1   2   3   4

21. I have headaches 0   1   2   3   4

22. I yell or talk loudly
    at others 0   1   2   3   4

23. I get into arguments 0   1   2   3   4

24. I have trouble sleeping 0   1   2   3   4

25. I grind my teeth 0   1   2   3   4

26. I feel nervous 0   1   2   3   4

27. I feel uptight 0   1   2   3   4

28. I am quick to go from
    happy to mad 0   1   2   3   4

29. I laugh easily 0   1   2   3   4

L3. I always return favors 0   1   2   3   4

31. I am having problems in
    school 0   1   2   3   4

32. I have health problems 0   1   2   3   4

Not at all	Somewhat so	Moderately so	Quite a bit	Extremely so
0	1	2	3	4

L = Truthfulness Scale Item

33. I have pimples 0   1   2   3   4

34. I am tired 0   1   2   3   4

35. I go to the bathroom
    frequently 0   1   2   3   4

36. I am always wanting to eat ...0   1   2   3   4

37. I am emotional 0   1   2   3   4

38. My eyes feel tired 0   1   2   3   4

39. I am restless 0   1   2   3   4

L4. I am always happy 0   1   2   3   4

41. I feel stressed 0   1   2   3   4

42. I easily anger 0   1   2   3   4

43. I have trouble talking
    to others 0   1   2   3   4

44. I am jealous of
    someone else 0   1   2   3   4

45. I have problems
    sitting still 0   1   2   3   4

46. I feel hot or cold often 0   1   2   3   4

47. I feel a lump in my throat ...0   1   2   3   4

48. My hands shake 0   1   2   3   4

49. I have shortness of breath ...0   1   2   3   4

L5. I always admit to my
    mistakes 0   1   2   3   4

51. I have trouble relaxing 0   1   2   3   4

52. My head feels pressured 0   1   2   3   4

Not at all	Somewhat so	Moderately so	Quite a bit	Extremely so
0	1	2	3	4

L = Truthfulness Scale Item

53. I feel overwhelmed 0   1   2   3   4

54. I doubt myself 0   1   2   3   4

55. I have nightmares 0   1   2   3   4

56. I worry 0   1   2   3   4

57. I have frequent accidents
such as dropping things
or falling down 0   1   2   3   4

58. I am easily frustrated 0   1   2   3   4

59. My mind goes blank 0   1   2   3   4

L6. I am always kind 0   1   2   3   4

61. I forget things 0   1   2   3   4

62. I have muscle twitches 0   1   2   3   4

63. I feel nauseated 0   1   2   3   4

64. I have trouble getting out
of bed in the morning 0   1   2   3   4

65. I have butterflies in
my stomach 0   1   2   3   4

66. I get confused 0   1   2   3   4

67. My mind races or spins 0   1   2   3   4

68. I have pains in the
muscles of my back,
shoulders, or neck 0   1   2   3   4

69. I feel keyed up 0   1   2   3   4

L7. I always keep secrets 0   1   2   3   4

71. I am bored 0   1   2   3   4

Not at all	Somewhat so	Moderately so	Quite a bit	Extremely so
0	1	2	3	4

L = Truthfulness Scale Item

72. I am lonely 0   1   2   3   4

73. I have trouble getting
    along with my parents 0   1   2   3   4

75. I feel like crying 0   1   2   3   4

76. I am busy 0   1   2   3   4

77. I feel self-conscious 0   1   2   3   4

L8. I am always pleased
    with others 0   1   2   3   4

SRSA-M (Final Version)
(Male form)

Below are some statements that are possible descriptions of yourself. Please read the statements carefully and circle the number that corresponds to how you have been feeling, acting or thinking overall the <u>last couple of days, including today</u>. Keep in mind that there are no right or wrong answers.

Not at all	Somewhat so	Moderately so	Quite a bit	Extremely so
0	1	2	3	4

1.	I get along with everyone ..0	1	2	3		4
2.	I have difficulty making decisions more than usual ..0	1	2	3		4
3.	I don't have time to think or reflect 0	1	2	3		4
4.	I feel light headed 0	1	2	3		4
5.	My muscles are tight 0	1	2	3		4
6.	I have stomach problems 0	1	2	3		4
7.	I like everyone 0	1	2	3		4
8.	I get into arguments 0	1	2	3		4
9.	I have trouble sleeping 0	1	2	3		4
10.	I feel nervous 0	1	2	3		4
11.	I feel uptight 0	1	2	3		4
12.	I am quick to go from happy to mad 0	1	2	3		4
13.	I always return favors 0	1	2	3		4
14.	I am having problems in school 0	1	2	3		4
15.	I have health problems 0	1	2	3		4
16.	I have pimples 0	1	2	3		4
17.	I am tired 0	1	2	3		4

	Not at all	Somewhat so	Moderately so	Quite a bit	Extremely so
	0	1	2	3	4

18. I go to the bathroom frequently 0   1   2   3   4

19. I am restless 0   1   2   3   4

20. I am always happy 0   1   2   3   4

21. I feel stressed 0   1   2   3   4

22. I have trouble talking to others 0   1   2   3   4

23. My hands shake 0   1   2   3   4

24. I have shortness of breath .0   1   2   3   4

25. I feel overwhelmed 0   1   2   3   4

26. I doubt myself 0   1   2   3   4

27. I have frequent accidents such as dropping things or falling down 0   1   2   3   4

28. I am easily frustrated 0   1   2   3   4

29. My mind goes blank 0   1   2   3   4

30. I am always kind 0   1   2   3   4

31. I have muscle twitches 0   1   2   3   4

32. I feel nauseated 0   1   2   3   4

33. I get confused 0   1   2   3   4

34. My mind races or spins 0   1   2   3   4

35. I feel keyed up 0   1   2   3   4

36. I am bored 0   1   2   3   4

37. I feel like crying 0   1   2   3   4

38. I am always pleased with others 0   1   2   3   4

SRSA-F (Final Version)
(Female form)

Below are some statements that are possible descriptions of yourself. Please read the statements carefully and circle the number that corresponds to how you have been feeling, acting or thinking overall the <u>last couple of days, including today</u>. Keep in mind that there are no right or wrong answers.

Not at all	Somewhat so	Moderately so	Quite a bit	Extremely so
0	1	2	3	4

1.	I have pressure on me 0	1	2	3	4
2.	My mouth and/or throat feel dry 0	1	2	3	4
3.	I get along with everyone ..0	1	2	3	4
4.	I am bugged easily 0	1	2	3	4
5.	I feel tense 0	1	2	3	4
6.	My muscles are tight 0	1	2	3	4
7.	I have stomach problems 0	1	2	3	4
8.	I like everyone 0	1	2	3	4
9.	I yell or talk loudly at others 0	1	2	3	4
10.	I get into arguments 0	1	2	3	4
11.	I feel nervous 0	1	2	3	4
12.	I feel uptight 0	1	2	3	4
13.	I am quick to go from happy to mad 0	1	2	3	4
14.	I always return favors 0	1	2	3	4
15.	I have health problems 0	1	2	3	4
16.	I am tired 0	1	2	3	4
17.	I am emotional 0	1	2	3	4

Not at all	Somewhat so	Moderately so	Quite a bit	Extremely so
0	1	2	3	4

18. My eyes feel tired 0   1   2   3   4

19. I am restless 0   1   2   3   4

20. I am always happy 0   1   2   3   4

21. I easily anger 0   1   2   3   4

22. I have trouble talking
to others 0   1   2   3   4

23. My head feels pressured 0   1   2   3   4

24. I feel overwhelmed 0   1   2   3   4

25. I doubt myself 0   1   2   3   4

26. I worry 0   1   2   3   4

27. I have frequent accidents
such as dropping things
or falling down 0   1   2   3   4

28. I am easily frustrated 0   1   2   3   4

29. My mind goes blank 0   1   2   3   4

30. I am always kind 0   1   2   3   4

31. I forget things 0   1   2   3   4

32. I have muscle twitches 0   1   2   3   4

33. I feel nauseated 0   1   2   3   4

34. I get confused 0   1   2   3   4

35. I have pains in the
muscles of my back,
shoulders, or neck 0   1   2   3   4

36. I feel keyed up 0   1   2   3   4

37. I feel like crying 0   1   2   3   4

38. I am always pleased
with others 0   1   2   3   4