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Utility of the MMPI-A in predicting suicidal behavior in adolescent inpatients

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UTILITY OF THE MMPI-A IN PREDICTING SUICIDAL BEHAVIOR IN ADOLESCENT INPATIENTS

An Abstract of a Thesis

Submitted

In Partial Fulfillment

of the Requirements for the Degree

Specialist in Education

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ABSTRACT

This study was designed to examine whether the new Minnesota Multiphasic Personality Inventory--Adolescent (MMPI-A) Content Scales could assist in the identification and prediction of suicidal behaviors in adolescent inpatients. In addition, the relationship of the MMPI-A Content Scales and four indirect and four direct measures of suicidal risk were examined. The four indirect measures of suicidal risk were the Brief Symptom Inventory subscales of depression, psychoticism, and hostility and the Piers-Harris Children's Self-Concept Scale.

Subjects were adolescent inpatients ages 15 to 18 (n = 135). Subjects were divided into two groups based on psychiatric diagnosis at admission and responses of the participants to the first item on the Suicidal Behaviors Questionnaire (SBQ). Of the 135 subjects, 65 were classified as suicidal and 70 were classified as non-suicidal.

Results showed that the MMPI-A Content Scales of depression, alienation, and low self-esteem reliably discriminated between the suicidal and non-suicidal groups. The suicidal adolescents scored significantly higher than the non-suicidal adolescents on the three MMPI-A Content Scales. Moderate correlations were found between the indirect measures of suicidal risk and the MMPI-A Content Scales. Specifically, those Content Scales which purportedly measured the same construct as the indirect

measures were significantly correlated, providing evidence of convergent validity. Low to moderate correlations were found between the MMPI-A Content Scales and the direct measures of suicidal risk.

Overall, it was found that the MMPI-A Content Scales (depression, alienation, and low self-esteem) may be useful in discriminating between suicidal and non-suicidal adolescents. However, additional analyses should be conducted to validate these results. In addition, future research should include non-hospitalized adolescent controls and should evaluate the significance of factors including family functioning, specific age, diagnosis, and gender differences in adolescent suicidal behavior.

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has been approved as meeting the thesis requirement for the Degree of Specialist in Education.

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Dedicated in loving memory of my Grandma,

Helen Letty Smith Bowman

Thank you for teaching me.

I have "made do."

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CHAPTER 1

INTRODUCTION AND PROBLEM STATEMENT

Introduction

Adolescent suicide is a complex and multifaceted phenomena. The escalating incidence and prevalence have prompted considerable research regarding the causes and precipitating factors.

Suicidality can be defined within a continuum that consists of ideation, gestures, partial self-destruction, non-fatal attempts, and completions (Maris, Berman, Maltsberger, & Yufit, 1992). According to Shneidman:

> Suicide is a conscious act of self-induced annihilation best understood as a multidimensional malaise in a needful individual who defines an issue for which the suicide is perceived as the best solution. (Maris et al., 1992, p. 4)

Prevalence and Incidence

Between 1960 and 1990, the rate of suicide for individuals between the ages of 15 to 24 increased from 5.2 to 13.2 per 100,000 (National Center for Health Statistics, 1993). This constitutes a 154% increase, while the corresponding general population (ages 5 and over) experienced an increase of only 8.5%. According to the 1991 United States Bureau of the Census, suicide has become the third leading cause of death among 15 to 24 year olds in the United States with the greatest increase among white males (Garland & Zigler, 1993; Henry, Stephenson, Hanson, & Hargett, 1993; Tishler, McKenry, & Morgan, 1981).

The above figures are contrasted with figures reported in the 1986 National Center for Health Statistics which indicate that in 1984, suicide rose from the third to the second leading cause of adolescent death (Cole, 1989a; Kashden, Fremouw, Callahan, & Franzen, 1993). The issue as to whether suicide is actually the second or third cause of death becomes irrelevant when it is realized how many adolescents choose to prematurely end their own lives. Allen (1987) estimates that approximately 5,000 completed suicides occur in the United States yearly for this age group.

The matter of under-reporting must also be explored, since suicide not only carries social stigma, but religious considerations and economic consequences. Thus, many families may choose to conceal the suicide. Furthermore, many suicides occur without a note of intent and are ruled as accidental. The actual rate of suicide may, therefore, be much higher than reported (Garland & Zigler, 1993).

Suicide Attempts

It has been estimated that the rate of suicide attempts may be 50 to 200 times greater than that of completed suicides and that between 6% and 13% of adolescents have attempted suicide (Garland & Zigler, 1993; Tishler et al., 1981). This is particularly true for females who attempt suicide three times as often as males. Males complete suicide at a rate of 18.4 to 4.4, nearly four times that of

females. This may be due, however, to the higher lethality of method frequently chosen by males. In 1987, more than three fourths of self-inflicted deaths by gunshot were accomplished by white males, while females chose poisoning or carbon monoxide inhalation. (Berman & Jobes, 1991).

Substance abuse is another factor affecting suicide attempts. Brent et al. (1988) determined that one third of the adolescent completers in their study were intoxicated at the time of death. Callahan (1993) reports similar results. In a review of the literature, he found that a diagnosis of substance dependence significantly increased the risk for attempted suicide. In addition, merely the use of substances (without a diagnosis) was a significant risk factor.

Statement of the Problem

The prevalence and incidence of adolescent suicide has escalated over the past 30 years. This is a serious concern for parents, educators, and mental health clinicians. Although many risk factors have been identified which encompass psychosocial, environmental, and psychological domains, accurate prediction of adolescent suicide remains elusive. Since so many adolescents die by suicide, it is imperative that accurate prediction methods become available.

Purpose of Study

This study examined the responses of suicidal and non-suicidal adolescents on the Minnesota Multiphasic Inventory-Adolescent (MMPI-A) Content Scales to determine if this new instrument was useful in assessing and predicting adolescent suicidal behavior. In addition, the relationship between the new MMPI-A Content Scales and four indirect and four direct validated measures of suicidal risk were examined.

The indirect measures of suicidal risk which were used in this study were the Piers-Harris Children's Self-Concept Scale (Piers, 1984) and three subscales of the Brief Symptom Inventory: Depression, Hostility, and Psychoticism (BSI; Derogatis, 1992). The Piers-Harris was used as an overall measure of self-concept and the three subscales of the BSI were used as measures of psychopathology. Self-concept, hostility, and psychopathology have all been identified as risk factors for suicidal behavior (see Brent, et al., 1994; Marciano & Kazdin, 1994).

The direct measures of suicidal risk which were used in this study were the four subscales of the Multi-Attitude Suicide Tendency Scale (Orbach et al., 1991): Attraction to Life, Repulsion by Life, Attraction to Death, and Repulsion by Death. Bonferroni-adjustment was used to control for error; alpha was set at .05 divided by the number of variables.

Hypotheses

In this study, the following hypotheses were tested:

1. The MMPI-A Content Scales will discriminate between suicidal and non-suicidal adolescents. Specifically, suicidal adolescents will score higher than non-suicidal adolescents on the Adolescent-Depression (A-dep), Adolescent-Alienation (A-aln), and Adolescent-Low Self-Esteem (A-lse) Content Scales.

2. There will be a significant relationship between responses on the MMPI-A Content Scales and the indirect measures of suicidal risk for the suicidal adolescents.

3. There will be a significant relationship between responses on the MMPI-A Content Scales and the direct measures of suicidal risk for the suicidal adolescents.

4. The MMPI-A Content Scales will predict suicide likelihood over and beyond those predicted by the direct measures of suicidal risk.

Limitations

The subjects in this study were adolescent inpatients, therefore, the results may not generalize beyond this population. Secondly, the instruments used in this study rely on accurate self-reporting. The accuracy of the responses are unknown. Finally, other important variables, such as family functioning, gender, diagnosis, and specific age of the participants were not considered in this study.

Definition of Terms

For clarity, the following terms are defined:

Psychological Autopsy. A method utilized to determine the factors which have preceded a completed suicide. The life events as well as psychological intactness of suicide victims are examined to ascertain the precipitants of the suicide. This may include interviews with parents, significant others, teachers, or friends. In addition, permanent records such as medical and school records are reviewed (Brent, Perper, Moritz, Allman, et al., 1993).

Self-Concept/Self-Esteem. The terms self-concept and self-esteem will be used interchangeably. Self-concept/self-esteem is defined as a relatively stable set of self-perceptions which reflect both a description and evaluation of self (Piers, 1984).

Suicidality. Encompassing all thoughts and behaviors related to suicide.

Suicide. Purposeful self-inflicted death.

Suicide Attempt. Overt acts intended to cause death to self.

Suicidal Behaviors. Persistent behaviors that may harm or cause death (e.g.--reckless driving, substance abuse).

Suicide Ideation. Thoughts of wanting to kill self.

CHAPTER 2

REVIEW OF THE LITERATURE

Far too many adolescents are using permanent solutions to address the momentary hopelessness and despair in their lives. In order to effectively address this problem, the precipitating events and factors that lead to suicidal attempts and completions must be examined. There are numerous factors which have been identified as useful predictors of suicide. It has been estimated that nearly 85-95% of all suicide completers have been diagnosed with mental illnesses such as depression or personality disorders. Further indicators include ideation, prior suicide attempts, social isolation, hopelessness, and life stress (Maris et al., 1992).

Psychosocial Predictors

Through the use of psychological autopsy, Marttunen, Aro, Henriksson, and Lonnqvist (1994) examined the relationships between psychosocial stressors and psychiatric diagnoses in 53 adolescent (ages 13-19) suicide completers. Subjects were divided into three groups: alcohol dependent completers (n = 14), depressed completers (n = 18), and others (n = 21). It was found that the types of psychosocial stressors preceding the suicide differed according to the diagnosis (alcohol dependent or depressed). Alcohol dependent completers were characterized by recent interpersonal separation and lack of family support. In

contrast, depressed completers were characterized by interpersonal conflict and somatic illness.

Among a sample of 1,710 adolescents representing nine high schools in west central Oregon, Andrews and Lewinsohn (1992) determined that of the 7.1% who had attempted suicide, a significantly greater proportion of attempters were females. Furthermore, attempters were more likely to be from a single-parent home, in which the father was absent and did not have a college degree ($p < 0.001$). Of the sample, 21.1% had experienced some form of suicidal ideation, 16.3% reported thinking of death, 13.3% wished they were dead, 12.9% had thoughts of killing themselves, and 8.3% had formulated a suicide plan. In addition, this study found that the adolescents who attempted suicide were typically those who had some type of mental disorder, primarily disturbances in mood. The authors suggest that the following predictors be utilized to identify potential suicide attempters: being female, coming from a father-absent home, having a father without a college degree, experiencing thoughts of suicide, having a diagnosed mental disorder, and a history of suicidal attempts.

In a further analysis of the data, psychosocial characteristics of the suicide attempters were examined (Lewinsohn, Rohde, & Seeley, 1993). It was determined that adolescents with a prolonged history of depression were more likely to have engaged in suicidal behaviors. In addition,

adolescent suicide attempters were found to "endorse the same maladaptive cognitive patterns known to be associated with depression, lack adequate personal resources for coping with the environment, and experience reduced social support from their family" (p. 66).

Although the previous studies (e.g., Andrews & Lewinsohn, 1992; Lewinsohn et al., 1993) ascertained factors which contributed to prior adolescent suicide attempts, most of the research was based on retrospective self-report. Therefore, an additional study was conducted using the original data to determine the degree to which psychosocial characteristics "precede and predict future suicide attempt." The analysis was conducted using the 26 adolescents who attempted suicide during the time period (mean interval 13.8 months) between the first and second assessment. It was determined that the two demographic variables most predictive of future suicide attempt were "having been born to a teenage mother and having parents with less education." A multivariate analysis further identified six variables which were found to significantly contribute to the prediction of suicide attempt: past suicide attempt, recent suicide attempt by a friend, suicidal ideation, current depression, lowered self-esteem, and having a younger mother (Lewinsohn, Rohde, & Seeley, 1994).

Since many of these factors occur in the lives of adolescents who do not manifest suicidal behaviors, it is difficult to accurately predict which individuals will eventually attempt suicide. The identification of specified risk factors does not necessarily indicate that an individual will attempt suicide. (Maris et al., 1992). However, the prospective approach as utilized in the Lewinsohn et al. (1994) study provided a unique opportunity in which to examine the lives of 26 adolescents both before and following a suicide attempt. This allowed for an analysis of the variables which contributed to the attempt during the period of distress, thus increasing sensitivity and specificity for future prediction.

Environmental Factors

There are various speculations as to the etiology of adolescent suicidal behaviors, ranging from environmental determinants to intraindividual characteristics and pathology. Research addressing the relationship between environmental factors and adolescent suicidal behavior include the following as delineated in Henry et al. (1993): loss of a family member, the feeling of being ignored by parents, economic insecurity, parental alcohol abuse, depression or suicide attempts in other family members, high parental expectations, change in residence, ineffective family communications, abuse or neglect, and marriage of the adolescent.

Negative Life Events

de Wilde, Kienhorst, Diekstra, and Wolters (1992) examined the life events of adolescent suicide attempters, depressed adolescents, and a control group (n = 158). They found that adolescents who had attempted suicide differed from depressed adolescents and normals in the severity and longevity of negative life events. Furthermore, the negative life events often began in childhood and continued throughout adolescence. For example, adolescent suicide attempters experienced more changes in living situations, caretakers, separation of parents, changes in residence, and sexual abuse than either depressed or "normal" adolescents. This study substantiates previous research which has indicated the presence of negative life events in the lives of suicidal adolescents. The authors suggest, based on these findings, that the risk of adolescent suicide may be identified in childhood and interventions applied before the actual attempt occurs.

A study conducted by Kosky, Silburn, and Zubrick (1990) also confirmed the significance of negative life events in adolescent suicidal behavior. They discovered that 82% of suicidal adolescents in their study had hostile home environments and had experienced persistent interpersonal tension within the family.

Family Structure and Functioning

The deterioration of the family unit resulting in consequences such as marital dissatisfaction, separation, and divorce further contributes to the development of suicidal behaviors in adolescents. Tishler et al. (1981) examined the significant events, depressive symptoms, and demographic variables associated with 108 adolescent suicide attempters (mean age, 15.07). The data were collected over a two year period at Children's Hospital Emergency Room. It was discovered that only 49% of the adolescents were living with both parents. Furthermore, 60% of the adolescents who were living with both parents rated their parent's marriage as poor. Eighteen percent of the adolescents reported that one or both of their parents had a drinking problem and 22% reported that someone in their family had exhibited suicidal behavior in the past. During assessment of the factors preceding the suicide attempt, the most frequently cited reason for the attempt was parental problems. The authors suggest that the precipitating circumstances must be examined within the context of the adolescent's life events.

Adams, Overholser, and Lehnert (1994) examined family functioning as perceived by suicidal adolescents. Adolescents were divided into four groups: psychiatric inpatients who had attempted suicide (n = 35), nonsuicidal psychiatric inpatients (n = 29), high school suicidal ideators (n = 33), and nonsuicidal high school students

(n = 37). The groups completed various self-report measures regarding family functioning, depression, self-esteem, hopelessness, and suicidal ideation. Results indicated that both the suicide attempters and suicidal ideators perceived their families as having more difficulties adapting to change and solving problems. These families were detached, unable to communicate effectively, and engaged in frequent power struggles. Furthermore, it was reported that the suicidal adolescents had impaired relationships with their mothers, which was characterized by intense and negative communication.

Exposure to Suicide

A further environmental risk factor that has received considerable attention is the relationship between exposure to suicide and the subsequent occurrence of suicidal attempts and completions. It has been hypothesized that exposure to a suicide completion may trigger subsequent suicide attempts and completions among the contacts of the victim (Brent, et al., 1989).

To test this hypothesis, often referred to as the "contagion" hypothesis, Brent et al. (1989) examined profiles of high school students who became suicidal following two suicides which occurred in their high school within a four day period. Within 18 days of the first suicide completion, 7 students attempted suicide and 23 "manifested serious suicidal ideation." Statistically, the

rate of suicide completion was 1,435 times of that which would be expected. The suicide attempts were 2.3 times the expected rate. The authors concluded that exposure to suicide does indeed affect subsequent suicide attempts and completions. Furthermore, it was determined that close friends of suicide victims became suicidal at a "lower psychopathological threshold" than did appropriate controls. In addition, suicidal students who were casual acquaintances with the victims were found to have had a past or current psychological problem which exposure further exacerbated. Media publicity has also been acknowledged as a precipitating factor in adolescent suicide attempt and completion. As cited in Brent et al. (1989) suicide rates increased 7-10% following media exposure. However, this increase was found primarily in the adolescent and young adult population.

Culture

According to Hendin (1987), cultural and social differences should be considered when addressing adolescent suicide. For example, he attributes the incidence of suicide among African-American adolescents to the culture's overt rejection of this group. He also suggests that the increasing population among adolescents has created a stressful situation in which adolescents must compete for limited resources (jobs, college, etc.). This stress is

then manifested in increased suicide attempts and completions.

Societal technological advances may also be a factor in adolescent suicide. Although technology is responsible for the creation of new jobs, it is also responsible for the elimination of many. This constant change in occupational expectations as well as high unemployment may create "dangerous discrepancies" between adolescent expectations and reality (Allen, 1987).

Psychological Factors

A substantial amount of research has also focused on individual characteristics to explain the phenomenon of suicidal behaviors. The following psychological characteristics of suicidal adolescents have been delineated by various authors: depression, hopelessness, impulsivity, conduct disorder, personality disorder, and low self-esteem which includes feelings of loneliness, personal inadequacy, failure, and social isolation.

Family psychopathology has also been suggested as a factor in adolescent suicide. Pfeffer, Normandin, and Kakuma (1994) found significant differences between the families of suicide ideators, attempters, and controls. Relatives of suicidal ideators and attempters were compared with relatives of a control group to examine family factors such as alcoholism, suicide attempts, affective disorders, and antisocial disorders. It was ascertained that nearly

50% of the mothers of the suicide attempters had also attempted suicide. Of these mothers, over 75% had attempted suicide before the attempter's 12th birthday. In addition, suicide attempters and ideators had significantly more first degree relatives with antisocial personality disorders, substance abuse disorders, and histories of assaultive behavior.

Depression

A significant relationship between depression and suicidal behavior has been established by various researchers (Apter, Bleich, Plutchik, Mendelshon, & Tyano, 1988; Brent, Johnson, et al., 1993; Brent, Perper, Moritz, Allman, et al., 1993; Cole, 1989a; de Wilde, Kienhorst, Diekstra, & Wolters, 1993; Kovacs, Goldston, & Gatsonis, 1993). According to a review cited in Maris et al. (1992), approximately 15% of individuals diagnosed as clinically depressed eventually commit suicide during the time period when the depression begins to subside.

Through the use of psychological autopsy, Brent, Perper, Moritz, Allman, et al. (1993) found that the most significant risk factor for completed adolescent suicide was major depression. Sixty-seven adolescent suicide completers were matched with 67 community controls in order to determine the psychiatric risk factors for the development of suicidal behaviors and attempts. It was determined that suicide completers had a much higher rate of depression than

did the community controls; this was further intensified when coupled with substance abuse. Furthermore, it was found that most of the suicides occurred early in the depressive episode.

Cole (1989a) likewise discovered a strong relationship between depression and suicide among adolescents. In order to assess the precipitants of suicidal behavior, Cole conducted two studies which examined depression, hopelessness, and suicidal behavior. His first study included 281 midwest high school students: 167 girls and 114 boys with a mean age of 17. The students completed eight measures which assessed depression, hopelessness, and suicidal behaviors. Cole discovered that depression was significantly more closely related to suicidal behavior than was hopelessness, especially among his male subjects. Among female subjects, after controlling for depression, hopelessness was moderately correlated with the display of suicidal behavior.

Cole's second study was conducted with 53 male juvenile delinquents who were in residential correction facilities (mean age 15.7). Among this population, Cole found that poor coping strategies were significantly related to past suicide attempts, as well as predicted future attempts, while depression was related only to past attempts. Utilizing the data from both studies, Cole ascertained that hopelessness was not a critical factor in predicting

suicidal behavior, especially for males. Rather, the factors most clearly related to adolescent suicide were depression, poor coping strategies, and a lack of self-efficacy.

Impulsivity

Impulsivity is another factor which has been frequently observed among adolescent suicide attempters and completers (Brent, Perper, Moritz, Allman, et al., 1993; Crumley, 1979; Crumley, 1981; Kashden, Fremouw, Callahan, & Franzen, 1993). Kashden et al. (1993) empirically demonstrated that impulsivity was a crucial factor among suicidal adolescents. It was determined that adolescents who had attempted or contemplated suicide were significantly more behaviorally impulsive than those who had not. Kashden examined three groups of adolescents (ages 13-18): suicidal inpatients (n = 23), non-suicidal inpatients (n = 20), and high school controls (n = 20). Each of the students were assessed using six measures which addressed impulsivity, problem-solving ability, hopelessness, depression, and suicidal behavior. Suicidal inpatients were significantly more behaviorally impulsive than either the non-suicidal inpatients or the high school controls. This research suggests that impulsivity may lead to problem-solving deficits which contribute to suicidal behavior.

Crumley (1979) also found evidence of impulsivity in an examination of 40 adolescents following a suicide attempt.

Although all 40 adolescents were psychiatrically ill before the suicide attempt (as diagnosed using the Diagnostic and Statistical Manual of Mental Disorders, American Psychiatric Association, 1987), impulsivity was a significant factor in the suicide attempt.

Impulsivity among suicide attempters and completers was documented by Brent, Perper, Moritz, Baugher, et al. (1993). They examined suicide in adolescents with no apparent psychopathology. Seven completers were examined through psychological autopsy which utilized interviews of parents, siblings, and friends and reviewed demographic variables. It was determined that among the impulsive group, one of the greatest predictors of suicide was the accessibility of a loaded gun, especially in the home.

Personality Disorders

It has been suggested that a link exists between personality disorder and suicidality (Apter et al., 1988). Through the use of psychological autopsy, Brent, Perper, Moritz, Allman, et al. (1993) ascertained that conduct disorder was a significant risk factor for suicidal behaviors; the risk was intensified by the absence of depression. This further supports the influence of impulsivity since two clinical characteristics of conduct disorder are impulsivity and aggression. In addition, Apter et al. (1988) found that adolescent inpatients with the diagnosis of conduct disorder were more likely to

contemplate, attempt, and complete suicide than their depressed counterparts.

A study by Brent, Johnson et al. (1993) determined that adolescent suicide attempters were more likely to have been diagnosed with a personality disorder than their psychiatric controls. Specifically, there was a greater "prevalence and severity" of borderline personality traits, which were often accompanied by a diagnosis of affective disorder. In addition, this study found that impulsivity, hostility, impulsive violence and aggression were not factors in suicidality. However, the attempters in this sample were predominately female, which may explain the absence of these variables. The authors suggest that poor social skills and interpersonal problem-solving deficits may contribute to the association between personality disorders and suicidality found in females. In contrast, the association between attempted suicide and impulsive and aggressive behaviors may be more characteristic of males.

More recently, Brent, et al. (1994) examined the prevalence of personality disorders, personality traits, and impulsive violence in adolescent suicide completers. Completers (n = 43) were demographically matched with similar community controls on the variables of diagnosable personality disorders, dimensional personality traits, and measures of impulsive violence. It was determined that *personality disorders, particularly Cluster B disorders*

(histrionic, narcissistic, borderline, and antisocial) were significantly more common in suicide completers. In addition, suicide completers were more likely to have had a history of aggression and impulsive violence.

Self-Concept/Self-Esteem

An area that has received limited attention in the literature is that of self-concept/self-esteem and its relationship to suicidal behavior and attempts. Stivers (1990) states that the most effective way to prevent adolescent suicide is to ensure the development of positive self-esteem; thus, "the host will become immune to the disease of depression and all other symptomatology of suicide ideation" (p. 303). Although this statement may sound somewhat simplistic, research supports the contribution of low self-esteem in the development of depression (Battle, 1980; Yanish & Battle, 1985), which has been deemed a significant factor in suicide ideation and attempts (Apter et al., 1988; Brent, Johnson, et al., 1993; Brent, Perper, Moritz, Allman, et al., 1993; Cole, 1989; de Wilde et al., 1993; Kovacs et al., 1993). Since adolescents with low self-esteem are often dependent on external indications of their worth, the cessation of external reinforcement causes an increase in the adolescent's feelings of worthlessness (Stivers, 1990).

Research has also substantiated the effect of self-esteem on suicide ideation (Dukes & Lorch, 1989; Kienhorst,

de Wilde, Van Den Bout, Diekstra, & Wolters, 1990; Leduc & Labreche-Gauthier, 1992). Interestingly, Kosky, Silburn, and Zubrick (1990) discovered that suicide ideators and suicide attempters were a part of the same "at-risk population." Therefore, a relationship can be established between self-esteem, suicidal ideation, and suicidal attempts. An analysis of responses from 9,752 7th-12th graders revealed that both purpose in life and perception of self were major factors in the prediction of suicide ideation (Dukes & Lorch, 1989).

Leduc and Labreche-Gauthier (1992) obtained data from 150 adults and 558 adolescents to determine the correlates of suicide ideation in both populations. Data were gathered regarding demographics, perceived health, suicide ideation, self-esteem, depression, life stress, and social support. Low self-esteem was found to be the best single predictor of suicide ideation in adults followed by recent negative stress and depression. A bivariate analysis of the data revealed that depression and low self-esteem were also significantly related to suicide ideation in adolescents. However, multivariate analysis identified depression as the single best predictor for adolescents, which increased significantly with the inclusion of self-esteem.

Research conducted by Kienhorst et al. (1990) obtained similar results. Data were collected which included suicidal behavior, sociodemographics, alcohol and drug

usage, depression, hopelessness, self-esteem, and perceived parental relationships. Students from 39 secondary schools (n = 9,393), ages 14-20, participated in the study. Among these students, 203 had previously attempted suicide. A multivariate analysis of the data found that the "role of psychological characteristics," specifically depression and self-concept, were better predictors of suicidal behavior than such sociodemographic factors as gender or parental divorce.

Marciano and Kazdin (1994) examined the relationship between self-esteem, depression, hopelessness, and suicidal intent with a sample of 123 children, ages 6-13. Using discriminant analysis, it was found that self-esteem accounted for significant variance; the single variable solution accurately identified 62.4% of the cases. When depression was included, 65.4% of the subjects were correctly identified. Although depression, as measured by the Children's Depression Inventory (CDI), was the best predictor of suicidal ideation and attempt, the authors determined that a significant relationship between self-esteem and suicidality remained. Furthermore, when the CDI was replaced by a diagnosis of depression, self-esteem became the only variable which accurately discriminated between nonsuicidal and suicidal children.

Review of Assessment Measures

Adolescents' lives are affected by both intraindividual factors and environmental factors. It is, therefore, essential that the identification of predictors occur at each level in order to design and apply effective prevention and intervention strategies. In a review of suicidal assessment instruments, Garrison, Lewinsohn, Marsteller, Langhinrichsen, and Lann (1991) reported that a large percentage of adolescents reliably disclose their distress states on a self-report instrument. Various self-report instruments exist which have been designed to identify adolescents who may be at-risk for suicidal behaviors. The following self-report instruments will be reviewed: the Suicidal Ideation Questionnaire (SIQ), Piers-Harris Children's Self-Concept Scale, Brief Symptom Inventory (BSI), Multi-Attitude Suicide Tendency Scale (MAST), Suicide Probability Scale (SPS), Reasons for Living Inventory (RFL), and the Minnesota Multiphasic Personality Inventory--Adolescent (MMPI-A).

Suicidal Ideation Questionnaire. The SIQ was developed by William Reynolds in 1983 to assess adolescent suicidal ideation. It was based upon the premise that ideation often precedes suicidal behaviors and attempts. Therefore, a measure which could accurately detect adolescents with thoughts of suicide would allow for early intervention and prevention efforts. The SIQ does not allow for prediction

of suicide attempts but rather for identification of those individuals who have thoughts of suicide and may be more likely to engage in suicidal behaviors or attempts.

The SIQ items were developed by conducting interviews with 150 depressed adolescents in midwestern communities. Following the interviews, 30 items were selected and field tested with 100 adolescents ages 14-19. From this testing, the SIQ and the SIQ-JR were created. The SIQ is a 30-item scale for high school students (grades 9-12) and consists of declarative statements related to suicidal thoughts. The responses are scored on a 7-point Likert scale and range from "I never had this thought" to "almost every day." The SIQ-JR is similar to the SIQ but consists of only 15 items, thus accommodating the younger reader.

The standardization sample for the SIQ included 890 junior high students and 1,290 high school students from the midwest. The sample for the high school version included 78% whites, 19% blacks, 1.5% Asians, 0.4% Hispanics, and 1% other. The junior high version included 74% whites, 22% blacks, 1.7% Asians, 0.8% Hispanics, and 1.6% other.

Internal consistency was determined using Cronbach alpha. Alpha coefficients for the SIQ (high school version) were .97; the SIQ-JR obtained coefficients ranging from .93 to .94. Test-retest reliability was ascertained utilizing a high school sample (n = 801). Test-retest reliability for this sample was .72, with the second testing occurring four

weeks later. The item-total scale correlations for both forms of the SIQ ranged from .70 to .90.

Construct validity was determined by analyzing the relationships between SIQ scores and measures of depression, hopelessness, and self-esteem. Predictive validity has not yet been established (Bascue, 1991; Kramer & Conoley, 1992; Reynolds, 1991).

Piers-Harris Children's Self-Concept Scale. The Piers-Harris Children's Self-Concept Scale is a self-report measure that assesses self-concept in children ages 8-18. It can be used as either a screening or assessment device. As measured in the Piers-Harris, self-concept is considered a relatively stable construct which reflects an individual's perceptions (both descriptive and evaluative) of their behaviors and attributes. The Piers-Harris addresses conscious self-perceptions and is based upon six theoretical assumptions. First, self-concept is phenomenological; it cannot be directly observed. Secondly, there are two components to self-concept: global and specific. The global component refers to how individuals perceive themselves as a whole person; the specific component refers to self-perceptions in specific areas. Thirdly, self-concept is generally stable and is not easily altered. Fourthly, self-concept is expressed in both a self-evaluative and self-descriptive manner. It represents judgements of oneself and how these judgements are evaluated

in comparison to others and self internal standards. Fifthly, children at different developmental stages express and experience self-concept in a dissimilar manner. Finally, self-concept is a motivating force and allows individuals to reduce ambiguity in their relationships and choices.

The Piers-Harris is an 80-item scale, written at the third grade level, which consists of declarative statements which can be responded to positively or negatively. The raw score is the number of items marked in the positive direction and ranges between 0-80. Normed in 1966 on a sample of 1,183 Pennsylvania school children in grades 4-12, it was found that the mean total raw score was 51.8 with a standard deviation of 13.87. Scores ranging above or below one standard deviation are considered deviant. Therefore, self-concept which is either too high or too low should be seriously evaluated.

Internal consistency is high with alpha coefficients ranging from .90 to .92. Test-retest reliabilities have been found to range from .51 over a one year interval to .96 over a 3-4 week interval. The test is considered a measure of global self-concept; however, six factor scores can also be evaluated: behavior, intellectual and school status, physical appearance, anxiety, popularity, and happiness/satisfaction (Piers, 1984).

Factor validity was examined using a sample of 299 elementary, 302 junior high, and 300 senior high students by Michael, Smith, and Michael (1975). The factors of behavior, intellectual/school status, and physical appearance were replicated in each of the three samples; the factors of anxiety and happiness were partially replicated and the factor representing popularity was replicated only in the junior and high school sample.

Platten and Williams (1979) found factor instability between two administrations to a single group of elementary children. They administered the Piers-Harris twice (ten week intervals) to a group of 159 fourth through six grade black and Mexican-American students. Although five factors were identified during the two administrations, the items which loaded on each factor differed. Therefore, Platten and Williams suggest that the factor stability may be affected by such variables as time of school year, ethnicity, and the test structure. These results were replicated in 1981 using a sample of 193 fourth through six grade, black, white, and Mexican-American students. The authors suggest that researchers who wish to determine changes in self-concept (over time with the same group) should determine the factor structures within their own test data (Platten & Williams, 1981).

Wolf, Sklow, Hunter, Webber, and Berenson (1982), using a sample of 406 biracial students, found support for the six

factor solution as proposed by Piers and Harris. Moreover, an additional factor emerged which the authors identified as aggression. The authors also examined race, sex, and age responses on the seven factors. On the behavior factor, it was found that females have greater dissatisfaction with themselves. Responses on the intellectual factor indicated that white children had higher self-concepts than black children and boys had higher self-concepts than girls. Furthermore, self-concept on this factor increased with age. There was a slight decrease of self-concept with age on the physical appearance factor and responses on the anxiety factor indicated that boys were more anxious than girls. On the popularity factor, boys regarded themselves as more popular with white boys responding most positively. No significant effects were found on the happiness factor while white children regarded themselves as more aggressive than black children.

Brief Symptom Inventory. The Brief Symptom Inventory (BSI) is a 53-item self-report measure which evaluates distress in nine symptom dimensions: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. Additionally, the BSI provides three global indices of distress: global severity, positive symptom index, and positive symptom total. The inventory is used

for both adolescents and adults and can be completed in 10-12 minutes.

Internal consistency was determined utilizing Cronbach's alpha. Alpha coefficients ranged from .71 on the psychoticism to .85 on the depression subscales. Test-retest reliability coefficients, over a 2 week period, ranged from .68 on somatization to .91 on phobic anxiety; the three global indices obtained reliability coefficients of .80 and above.

Concurrent validity was established by correlating the BSI with other measures of distress. The correlations ranged from .30 to .72. Predictive and construct validity have not yet been established. Although the BSI is not an exclusive suicide identification instrument, individuals at-risk for suicidal behaviors and/or attempts may be identified through their responses (Conoley & Kramer, 1989; Sweetland & Keyser, 1991).

Multi-Attitude Suicide Tendency Scale. The Multi-Attitude Suicide Tendency Scale was developed by Orbach et al. in 1991 to assess suicide tendency in Israeli children and adolescents. It is based on the theory that suicidal behavior is the result of a conflict between attitudes toward life and death. The competing attitudes are as follows: attraction to life, repulsion by life, attraction to death, and repulsion by death. To examine the theory, a preliminary pool of 112 items were generated which reflected

each of the four attitudes. This initial item pool was tested and reduced to 44 representative items. These 44 items were then administered to 90 normal, suicidal, and psychiatric adolescents. Factor analysis revealed the presence of four distinct factors; items which did not load at .50 or above or loaded equally on two factors were eliminated.

To provide additional validation, the revised version consisting of 30 items was tested on a sample of 165 normal, suicidal, and psychiatric adolescents. Internal consistency was computed for each factor. Alpha values are as follows: AL = .83, RL = .76, AD = .76 and RD = .83. Further analysis indicated that the three groups of adolescents provided significantly different responses to the items on each factor. In comparison to the other two groups, the suicidal group scored lower on attraction to life, higher on repulsion by life, higher on attraction to death, and lower on repulsion to death (Orbach et al., 1991).

To further examine the psychometric properties of the MAST in an American sample, Osman, Barrios, Grittman, and Osman (1993) administered the scale to a college sample (n = 408). Subjects were divided into four groups: those who reported no suicidal ideation, those who reported nonserious ideation, those who had considered or planned suicide, and those who had attempted suicide. Internal consistency was computed for each factor. The alpha values

were similar to those reported by Orbach et al. (1991) and are as follows: AL = .82, RL = .75, AD = .71 and RD = .89. A significant difference was found among the four groups in their responses to attraction to life, repulsion by life, and attraction to death. This is consistent with the results found by Orbach et al. (1991) in his research with Israeli adolescents.

More recently, Osman et al. (1994) examined the psychometric properties of the MAST using three American adolescent samples. The participants consisted of 130 high school students, 45 psychiatric, and 40 suicidal adolescent inpatients. The four factor model was supported; alpha values were as follows: AL = .86, RL = .78, AD = .74, and RD = .91. Three of the MAST subscales (AL, RL, and AD) were found to discriminate between the two psychiatric groups (control and suicidal). Two of the subscales (AL and RL) correlated significantly with other suicidal measures. According to Osman et al. (1994), the AL and RL may be the most useful subscales in identifying suicidality in the American adolescent population. It was found that the AL subscale differentiated between the suicidal and nonsuicidal groups; the nonsuicidal groups had significantly higher scores on the AL subscale than the suicidal group. The RL and AD subscales were most useful in identifying the suicidal group. The suicidal group had significantly higher

responses on these two subscales than did the nonsuicidal groups.

Although there has been little research with this instrument, preliminary results indicate that the MAST may be a useful instrument in discriminating between suicidal individuals and others (Osman, Barrios et al., 1993).

Suicide Probability Scale. Developed in 1982 by John Cull and Wayne Gill, the Suicide Probability Scale (SPS) is a self-report measure which yields an overall suicide risk score across four dimensions: hopelessness, suicide ideation, negative self-evaluation, and hostility. The SPS can be used to assess and predict suicide risk for adolescents and adults ages 14 and above. Responses to the 36 items are scored on a four-point Likert scale and range from "most or all of the time" to "none or little of the time."

The SPS was standardized on a sample of 1,158 individuals from the San Antonio, Texas area: 562 normals, 260 psychiatric inpatients, and 336 suicide attempters. The sample was comprised of adolescents and adults (although the group was overwhelmingly adult) and was ethnically diverse: 43.8% Hispanic, 43.1% white, and 13.2% black and other minorities.

Internal consistency was determined to be .93 for the total scale and ranged from .62 to .89 for the subscales. Split-half reliability was found to be .93 for the total

scale and ranged from .58 to .88 for the subscales. Test-retest reliability was measured on two occasions. The first group was comprised of 80 non-suicidal individuals with retesting three weeks after the initial test; reliability was found to be .92. The second assessment was conducted with a sample of 472 diverse individuals with retesting 10 days after initial testing; reliability was found to be .94.

Three types of validity were examined on the SPS: content validity, criterion validity, and construct validity. Content validity was determined through item analysis and by correlating the SPS items with an MMPI scale designed to assess potential suicide risk. Criterion validity ranged from .06 to .65 and was determined by correlating items with group membership (normal, psychiatric, suicide attempter). All correlations (except the .06) were significant and revealed the items' ability to discriminate between attempters and non-attempters. Further analyses were conducted using the MMPI as comparison to determine construct validity. The correlations were consistent with MMPI suicide patterns and thus suggested that the SPS exhibited construct validity (Bardwell, 1985).

Although the SPS appears to possess sufficient reliability and validity, it has been suggested that the scale does not accurately assess the suicidal risk of adolescents. The SPS was standardized using a predominately

adult population and, therefore, may not appropriately identify adolescents who are at risk for suicidal behaviors. In a study utilizing 217 normal high school students, Tatman, Green, and Karr (1993) found that their sample scored significantly higher than Cull and Gill's normative sample. Furthermore, the SPS failed to discriminate between the Tatman et al. sample and the original psychiatric inpatient sample. Therefore, when used with adolescents, the SPS may yield a greater number of false positives and corresponding hospitalizations (Tatman et al., 1993).

Reasons for Living Inventory. The Reasons for Living Inventory (RFL) was developed by Linehan, Goodstein, Nielsen, and Chiles (1983) to assess the "life-oriented beliefs and expectations" which inhibit suicidal behaviors. Linehan et al. maintain that non-suicidal individuals adhere to a variety of beliefs which are not compatible with suicidal behaviors. This adaptive belief system is frequently absent from those individuals with suicidal ideation and behaviors. The RFL was, therefore, developed to identify the adaptive beliefs which serve to protect individuals from self-destruction.

The RFL is a 48-item self-report instrument which was originally designed for use with adults. There are six subscales: Survival and Coping Beliefs, Responsibility to Family, Child-related Concerns, Fear of Suicide, Fear of Social Disapproval, and Moral Objections. In the initial

development of the RFL, 343 reasons for living (during periods when suicide was considered) were generated. Content analysis reduced this pool to 72 items. The items were then organized into an inventory and administered to two separate populations: 218 Washington, DC volunteers and 213 Seattle, Washington mall shoppers.

Factor analysis revealed six factors (subscales) utilizing 48 items; those items which did not load sufficiently on a factor were eliminated from the inventory. The retained items were then randomly ordered and respondents were instructed to rate each item as to its importance as a reason for not committing suicide. The ratings yielded six scale scores which were computed by calculating the mean score for each set of items. The internal consistency for each scale was found to range from .72 to .89. Further analysis revealed that the subscales sufficiently differentiated between suicide ideators and non-ideators and attempters from non-attempters (Linehan et al., 1983).

Utilizing a sample of 116 undergraduates with nonserious suicidal ideation, Osman, Jones, and Osman (1991) obtained results which supported the high internal consistency found by Linehan et al. (1983). Cronbach alpha coefficients for the subscales were found to range from .79 to .91 and .70 for the total inventory. Test-retest reliability (over three weeks) was also examined and ranged

from .75 to .85 for the subscales and .83 for the total inventory. In a further exploration of the RFL, Osman, Gregg, Osman, and Jones (1992) again found evidence of high internal consistency for the subscales ranging from .79 to .92. However, factor analysis results supported five factors rather than six as established by Linehan et al. (1983). Osman et al. (1992) determined that items from Fear of Social Disapproval and Fear of Suicide loaded on the same factor. This combined factor was tentatively named Fear of Suicide and Social Disapproval.

To determine the validity of the five factor solution, Osman, Gifford, Jones, Lickiss, Osman, and Wenzel (1993) examined the RFL using a sample of undergraduates (n = 407) who exhibited a range of suicidal ideation. Results from this diverse group supported the six factor solution as originally suggested by Linehan et al. (1983). Once again, high internal consistency was found with alphas for the subscales ranging from .74 to .92 and total scale .89 . In an effort to validate the RFL for use with adolescents, Cole (1989b) conducted two studies: the first with "normal" highschool students (n = 285) and the second with inpatient juvenile delinquents (n = 79). The results were generally comparable to those found by Linehan et al. (1983) who examined adult response patterns. Adolescents whose responses were consistent with positive reasons for living were less likely to have reported engaging in suicidal

ideation or behavior. In addition, the Survival and Coping Belief scale and Responsibility to Family scale adequately differentiated between suicidal ideators and attempters and non-ideators/attempters.

In a further exploration of the RFL, Connell and Meyer (1991) found that the factors Survival and Coping Beliefs, Responsibility to Family, and Moral Objections discriminated among college undergraduates (n = 205). It was determined that individuals who had never considered suicide possessed stronger coping beliefs, stronger responsibilities to family and stronger moral objections to suicide than those individuals who had considered suicide. Furthermore, as values decreased on the SCB scale, suicide intent increased. Individuals who recounted temporary or nonserious suicidal ideation also reported stronger feelings of responsibility to family as compared to those who had serious thoughts of suicide. Furthermore, it was determined that hopelessness increased and social desirability decreased as suicidal ideation and behaviors increased (Connell & Meyer, 1991).

Minnesota Multiphasic Personality Inventory--Adolescent. Previous studies have obtained inconsistent results regarding the utility of the MMPI in differentiating between non-suicidal and suicidal individuals. Leonard (1977) correctly identified all of her subjects (n = 16) according to MMPI profiles. These results, however, have not been replicated and many researchers (i.e., Clopton,

Pallis, & Birtchnell, 1979; Clopton, Post, & Larde; 1983; Spirito, Faust, Myers, & Bechtel, 1988; Watson, Klett, Walters, & Vassar, 1984) have provided evidence arguing against using the MMPI as a suicide identification tool.

In 1992, final revisions were completed on a form of the MMPI which was specifically designed for use with adolescents. The MMPI-A was normed on a sample of 805 boys and 815 girls, ages 14-18, from several geographic regions in the United States. The MMPI-A consists of 478 items, many of which were originally included in the MMPI and MMPI-II. However, items which were not applicable to adolescents were eliminated and relevant items were included. In addition to the standard scales, the MMPI-A has included content scales which assess such areas as self-esteem, school issues, alcohol/drug problems, suicidal behavior, eating disorders and conduct problems (Butcher & Pope, 1992; Butcher & Williams, 1992; Butcher, Williams, Graham, et al., 1992).

During the development of the MMPI-A, 70 items from the original instrument were modified to eliminate sexist language, awkward wording, and increase relevance to adolescents' life. Since these changes could potentially alter the psychometric properties of the inventory, Archer and Gordon (1994) examined the item responses of adolescents on the MMPI, the MMPI-A, and the MMPI Form TX (the experimental test form of the MMPI-A). Based on the results

from a sample of 265 adolescents, it was determined that the item modifications did not significantly affect the psychometric integrity of the inventory. Although the MMPI-A cannot be viewed as an equivalent form of the MMPI, the psychometric properties are sufficient to allow for generalizability between the two forms.

Since the MMPI-A is relatively new, studies are not yet available which address its efficacy in identifying suicidal adolescents.

CHAPTER 3

METHOD

Subjects and Procedure

Subjects were adolescent inpatients from a regional mental health center in Iowa. The sample included males and females ages 15 to 18 (n = 135). A range of diagnostic conditions represented in the population include depression, conduct disorder, oppositional defiant disorder, and anxiety. Within two weeks of admission, potential subjects were administered a battery of measures assessing intelligence, self-concept, personality, and suicidality. Subjects who showed borderline levels of intelligence (as measured by the WISC-R) were not included in this study. Permission to conduct research was obtained from the superintendent of the institution (see Appendix I). Although the institution's research policy states that patients' responses to various assessment measures may be used for research purposes, subjects were given the opportunity to decline participation.

Subjects were divided into two groups (suicidal and non-suicidal) based upon: (a) psychiatric diagnosis at admission using the Diagnostic and Statistical Manual of Mental Disorders-Revised (DSM III-R; American Psychiatric Association, 1987) and (b) responses to the first item on the Suicidal Behaviors Questionnaire (SBQ; Linehan & Nielson, 1981): "Have you ever thought about or attempted

to kill yourself?" Those who responded "Never" or "It was just a brief passing thought" were placed in the non-suicidal group. Participants who responded "I have had a plan at least once to commit suicide" or "I have attempted to kill myself, and really hoped to die" were placed in the suicidal group. The SBQ was administered to validate the admission diagnosis. If the admission diagnosis and SBQ results were not consistent, the subject was not retained in the study.

Measures

The following measures were individually administered to each subject: (a) the Suicidal Behaviors Questionnaire, (b) Multi-Attitude Suicide Tendency Scale, (c) Piers-Harris Children's Self-Concept Scale, (d) Brief Symptom Inventory, and (e) the Minnesota Multiphasic Personality Inventory for Adolescents.

Suicidal Behaviors Questionnaire (SBQ; Linehan & Nielsen, 1981). The SBQ is a direct four-item questionnaire which assesses suicidal ideation and behavior. Questions are included regarding prior suicide attempts (0 = "Never" to 3 = "I have attempted to kill myself, and really hoped to die"); prior ideation (1 = "Never" to 5 = "Very often"); suicide threats (1 = "No" to 3 = "More than once, during more than one period of time"); and likelihood of future attempts (0 = "Never" to 5 = "Rather likely"). The SBQ is given in Appendix II.

Multi-Attitude Suicide Tendency Scale (MAST; Orbach et al., 1991). The MAST is a 30-item scale which directly assesses suicidal risk in adolescents and is based on the theory that suicidal behavior is the result of competing attitudes between life and death. Response alternatives to each item range from 1 = "I strongly agree" to 5 = "I strongly disagree."

There are four subscales: Attraction to Life (AL), Repulsion by Life (RL), Attraction to Death (AD), and Repulsion by Death (RD). Internal consistency has yielded the following Cronbach alpha values: AL = .83, RL = .76, AD = .76 and RD = .83 (Orbach et al., 1991). Similar results have been found by Osman et al. (1993) using a college sample and Osman et al. (1994) using a group comprised of normal high school, psychiatric, and inpatient suicidal adolescents.

Preliminary psychometric properties of the MAST have revealed adequate reliability and validity in Israeli and American samples. Orbach et al. (1991) found that suicidal Israeli adolescents scored lower on Attraction to Life, higher on Repulsion by Life, higher on Attraction to Death, and lower on Repulsion to Death. According to Osman et al., the AL and the RL subscales may be the most useful in identifying suicidality in the American adolescent population. In this study, however, all four subscales of the MAST will be analyzed. The MAST is in Appendix III.

Piers-Harris Children's Self-Concept Scale (Piers, 1984). The Piers-Harris is an 80-item, self-report instrument which measures self-concept in children ages 8-18. It consists of declarative sentences which can be responded to positively or negatively. As measured by the Piers-Harris, self-concept is considered a relatively stable construct which reflects an individual's perceptions (both descriptive and evaluative) of their behaviors and attributes.

The raw score is the number of items marked in the positive direction and ranges between 0-80. The mean total raw score is 51.8 with a standard deviation of 13.87. Scores ranging above or below one standard deviation are considered deviant. Therefore, self-concept which is either too high or too low should be seriously evaluated.

Internal consistency is high with alpha coefficients ranging from .90 to .92. Test-retest reliabilities have been found to range from .51 over a one-year interval to .96 over a 3-4 week interval. Although the test is considered a measure of global self-concept, six factor scores can also be evaluated: behavior, intellectual and school status, physical appearance, anxiety, popularity, and happiness/satisfaction (Piers, 1984).

Self-concept has been found to be a useful indicator of potential suicidal risk (Kienhorst et al., 1990). Therefore, this study will use the raw score on the Piers-

Harris as an overall measure of self-concept. (Because the Piers-Harris is copyrighted, the items will not be included in this manuscript).

Brief Symptom Inventory (BSI; Derogatis, 1992). The Brief Symptom Inventory (BSI) is a 53-item self-report measure which evaluates distress in nine symptom dimensions: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. Additionally, the BSI provides three global indices of distress: global severity, positive symptom index, and positive symptom total. The inventory is used for both adolescents and adults and can be completed in 10-12 minutes. Items are prefaced by the question "How much were you distressed by:" and response alternatives range from 0 = "not at all" to 4 = "extremely."

Internal consistency has been determined utilizing Cronbach's alpha. Alpha coefficients range from .71 on the psychoticism subscale to .85 on the depression subscale. Test-retest reliability coefficients, over a 2-week period, have been found to range from .68 on somatization to .91 on phobic anxiety; the three global indices obtained reliability coefficients of .80 and above.

Concurrent validity has been established by correlating the BSI with related measures of distress; correlations range from .30 to .72. Predictive and construct validity

have not yet been established. Although the BSI is not an exclusive suicide identification instrument, individuals at-risk for suicidal behaviors and/or attempts may be identified through their endorsement of specific symptoms related to suicidal behavior (Conoley & Kramer, 1989; Sweetland & Keyser, 1991). This study will use the depression, hostility, and psychoticism subscales exclusively. (Because the BSI is copyrighted, it will not be included in this manuscript).

Minnesota Multiphasic Personality Inventory--Adolescent (MMPI-A; Butcher, Williams, Graham, et al., 1992). The MMPI-A is a 478-item inventory designed specifically to assess psychopathology in adolescents, ages 14-18. Items can be responded to "true" (statement is mostly true of me) or "false" (statement is mostly false of me). The existence of psychopathology can be identified by *t*-scores greater than 65; scores below 50 suggest that the adolescent was either unaware of the existence of a problem or responded accurately.

During the development of the MMPI-A, 70 items from the original instrument (MMPI) were modified to eliminate sexist language, awkward wording, and increase relevance to adolescents' life. Since these changes could potentially alter the psychometric properties of the inventory, Archer and Gordon (1994) examined the item responses of adolescents on the MMPI, the MMPI-A, and the MMPI Form TX (the

experimental test form of the MMPI-A). Based on the results from a sample of 265 adolescents, it was determined that the item modifications did not significantly affect the psychometric integrity of the inventory. Although the MMPI-A cannot be viewed as an equivalent form of the MMPI, the psychometric properties are sufficient to allow for generalizability between the two forms.

The MMPI-A contains validity, standard, supplementary, and content scales, however, this study will use the content scales exclusively. The MMPI-A Content Scales are as follows: Adolescent-Anxiety (A-anx), Adolescent-Obsessiveness (A-obs), Adolescent-Depression (A-dep), Adolescent-Health Concerns (A-hea), Adolescent-Alienation (A-aln), Adolescent-Bizarre Mentation (A-biz), Adolescent-Anger (A-ang), Adolescent-Cynicism (A-cyn), Adolescent-Conduct Problems (A-con), Adolescent-Low Self-Esteem (A-lse), Adolescent-Low Aspirations (A-las), Adolescent-Social Discomfort (A-sod), Adolescent- Family Problems (A-fam), Adolescent-School Problems (A-sch), and Adolescent-Negative Treatment Indicators (A-trt). (Because the MMPI-A is copyrighted, it will not be included in this manuscript).

Data Analysis

It was hypothesized that the MMPI-A Content Scales would discriminate between suicidal and non-suicidal adolescents. Specifically, suicidal adolescents were hypothesized to score higher than non-suicidal adolescents

on the Adolescent-Depression (A-dep), Adolescent-Alienation (A-aln), and Adolescent-Low Self-Esteem (A-lse) Content Scales. To test this hypothesis, a multivariate analysis of variance (MANOVA) was conducted to compare the means of the two groups with alpha set at .05.

Secondly, it was hypothesized that there would be a significant relationship between responses on the MMPI-A Content Scales and the indirect measures of suicidal risk (BSI-Hostility, BSI-Psychoticism, BSI-Depression, & Piers-Harris) for the suicidal adolescents. To test this hypothesis, a Pearson product-moment correlation was computed between the MMPI-A Content Scales and each indirect measure of suicidal risk. Bonferroni-adjustment was used to control for error; alpha was set at .05 divided by the number of variables.

Thirdly, it was hypothesized that there would be a significant relationship between responses on the MMPI-A Content Scales and the direct measures of suicidal risk (MAST subscales: AL, RL, AD, RD) for the suicidal adolescents. To test this hypothesis, a Pearson product-moment correlation was computed between the MMPI-A Content Scales and each direct measure of suicidal risk (i.e., the four MAST subscales). Bonferroni-adjustment was used to control for error; alpha was set at .05 divided by the number of variables.

Fourthly, it was hypothesized that the MMPI-A Content Scales would predict suicide likelihood over and beyond those predicted by the direct measures of suicidal risk. To test this hypothesis, a regression analysis was computed using suicide likelihood as the dependent variable; the direct measures of suicide risk and the MMPI-A Content Scales were the independent variables.

CHAPTER 4

RESULTS

Discriminant Validity

Based upon the subjects' psychiatric diagnosis at admission and their responses to the first item on the SBQ (Linehan & Nielson, 1981), 65 subjects were identified as suicidal and 70 subjects were identified as non-suicidal. To determine if the MMPI-A Content Scales could reliably discriminate between the suicidal and non-suicidal groups, a multivariate analysis of variance (MANOVA) was conducted to compare the means of the two groups. The overall MANOVA was significant, Hotelling's T = .77, p< .001. The related mean responses of the suicidal and non-suicidal groups were significantly different on the following three MMPI-A Content Scales: Adolescent-Depression (A-dep), $F(1,133)$ = 91.7, p<.001; Adolescent-Alienation (A-aln), $F(1,133)$ = 64.3, p<.001; and Adolescent-Low Self-Esteem (A-lse), $F(1,133)$ = 82.4, p<.001 (see Table 1). The suicidal adolescents scored significantly higher than the non-suicidal adolescents on all three MMPI-A Content Scales. These findings support the first hypothesis which stated that suicidal adolescents would score significantly higher than non-suicidal adolescents on the Adolescent-Depression (A-dep), Adolescent-Alienation (A-aln), and Adolescent-Low Self-Esteem (A-lse). The results also support the literature which suggests that depression and low self-

esteem are potential risk factors in the development of adolescent suicidal ideation and behavior (i.e., Lewinsohn et al., 1994).

Table 1

Discriminant Validity--MMPI-A Content Scales

	Suicidal (N = 65)		Non-Suicidal (N = 70)			
Content Scales	Mean	SD	Mean	SD	F(1,133)	P
Depression	65.51	11.8	47.79	9.7	91.7	.001
Alienation	63.77	13.4	47.84	9.4	64.3	.001
Low Self-Esteem	62.75	11.2	47.00	8.9	82.4	.001

Correlational Analysis

A Pearson product-moment correlational analysis was conducted to test the second hypothesis. Results revealed overall moderate correlations between the indirect measures of suicidal risk (BSI-Hostility, BSI-Psychoticism, BSI-Depression, and Piers-Harris Children's Self-Concept Scale) and the MMPI-A Content Scales for the suicidal group. Thus, the second hypothesis was not supported. The following MMPI-A Content Scales correlated significantly (p=.003) with all of the indirect measures of suicidal risk: Obsessiveness (A-obs), Bizarre Mentation (A-biz), and Anger (A-ang). Anxiety (A-anx), Depression (A-dep), Alienation

(A-aln), Low Self-Esteem (A-lse), and Family Problems (A-fam) correlated significantly with BSI-Psychoticism, BSI-Depression, and the Piers-Harris scales. All correlations with the Piers-Harris were negative suggesting that adolescents presenting with high self-concept may report low levels of general psychopathology. The only MMPI-A Content Scale which did not correlate significantly with any of the indirect measures of suicidal risk was the Adolescent-Health Concerns Scale (A-hea) (see Table 2).

An examination of the relationship of the MMPI-A Content Scales and the direct measures of suicidal behavior (AL, RL, AD, RD), revealed low to moderate correlations, providing no support for the third hypothesis. The following MMPI-A Content Scales correlated negatively at a significant value with the MAST-AL (Attraction to Life) subscale: Social Discomfort (A-sod), Family Problems (A-fam), and Negative Treatment Indicators (A-trt). This finding suggests that adolescents who are attracted to life do not score high on the areas of the MMPI-A which assess social discomfort, family problems, or negative treatment indicators. However, the MMPI-A Family Problems and Negative Treatment Indicators Content Scales correlated positively with the MAST-RL (Repulsion by Life) subscale, indicating that these two MMPI-A Content Scales are associated with subjects who do not enjoy life and feel alienated from their families (see Table 3).

Table 2

Correlations Between MMPI-A Content Scales and Indirect Measures of Suicidal Risk

Content Scales	BSIHOS	BSIPSY	BSIDEP	PHARR
AANX	.096	**.426**	**.400**	**-.362**
AOBS	**.350**	**.435**	**.382**	**-.425**
ADEP	.265	**.389**	**.467**	**-.383**
AHEA	.223	.347	.235	-.268
AALN	.329	**.417**	**.403**	-.327
ABIZ	**.374**	**.508**	.344	-.324
AANG	**.602**	**.375**	**.393**	**-.394**
ACYN	**.502**	**.354**	.279	-.254
ACON	**.526**	.307	.308	.275
ALSE	.276	**.478**	**.464**	**-.470**
ALAS	.339	.227	.209	**-.395**
ASOD	.147	.220	.331	**-.357**
AFAM	.281	**.400**	**.373**	**-.465**
ASCH	.313	.171	.326	**-.415**
ATRT	.226	.342	**.460**	**-.396**

Note: Significant values are in bold.

p = .003 (.05/15)

Table 3

Correlations Between MMPI-A Content Scales and Direct Measures of Suicidal Risk

Content Scales	AL	RL	AD	RD
AANX	-.171	.057	.070	-.218
AOBS	-.152	-.055	.124	-.218
ADEP	-.289	.192	.160	-.223
AHEA	-.026	.068	.095	.129
AALN	-.307	**.357**	.251	-.035
ABIZ	-.009	.188	.257	.083
AANG	-.165	.114	.173	-.111
ACYN	-.143	.249	.280	-.023
ACON	-.223	.179	.196	-.010
ALSE	-.302	.102	.143	-.090
ALAS	-.299	.110	-.089	-.211
ASOD	**-.432**	.143	-.062	-.089
AFAM	**-.449**	**.438**	**.387**	-.020
ASCH	-.210	.136	.079	.112
ATRT	**-.430**	**.362**	**.365**	-.074

Note: Significant values are in bold.

p = .003 (.05/15)

Predictive Validity of the MMPI-A Content Scales

Regression analysis was conducted to determine if any of the MMPI-A Content Scales could predict group membership (suicidal/non-suicidal) over and above that of the direct measures of suicidal risk. The four MAST subscales (AL, RL, AD, RD) and four MMPI-A Content Scales (A-fam, A-dep, A-aln, & A-lse) were used as predictors of suicide likelihood. All eight predictors were forced into the equation. Results showed that three variables remained significant predictors of suicide likelihood: Attraction to Life (MAST-AL), Attraction to Death (MAST-AD) and Adolescent-Low Self-Esteem (MMPI-A). Thus the only MMPI-A Content Scale which significantly contributed to the prediction of suicide likelihood was Low Self-Esteem (see Table 4). These results support research suggesting that low self-esteem is involved in the development of adolescent suicidal behavior. The inclusion of the MAST-AL subscale also supports research by Osman et al. (1994) which found that the AL subscale negatively correlated with other measures of suicidal risk and was a useful predictor of adolescent suicidal behavior.

Table 4

Significant Predictors of Suicide Likelihood

Variables	Beta	T	Sig. T
AL	-.4057	-5.72	.001
ALSE	.3689	5.43	.001
AD	.1392	2.09	.04

CHAPTER 5

DISCUSSION

The rate of adolescents between the ages of 15 to 24 who complete suicide has increased 154% over the past 30 years. Suicide has now become the third leading cause of death for this age group and is rapidly approaching the second cause of death. The ability to accurately predict which adolescents will eventually attempt suicide is inadequate. This study was designed in response to the problems associated with the prediction of adolescent suicide.

The responses of suicidal and non-suicidal adolescents on the Minnesota Multiphasic Inventory-Adolescent (MMPI-A) Content Scales were examined to determine if this new instrument was useful in assessing and predicting adolescent suicidal behavior. Furthermore, the relationship between the new MMPI-A Content Scales and four indirect and four direct validated measures of suicidal risk were examined.

The indirect measures of suicidal risk which were used in this study were the Piers-Harris Children's Self-Concept Scale (Piers, 1984) and three subscales of the Brief Symptom Inventory: Depression, Hostility, and Psychoticism (BSI; Derogatis, 1992). The Piers-Harris was used as a general measure of self-concept and the three subscales of the BSI were used as measures of general psychopathology. Self-

concept, hostility, and psychopathology have all been identified as risk factors for suicidal behavior (Brent, et al., 1994; Marciano & Kazdin, 1994).

The direct measures of suicidal risk which were used in this study were the four subscales of the Multi-Attitude Suicide Tendency Scale (MAST; Orbach et al., 1991): Attraction to Life, Repulsion by Life, Attraction to Death, and Repulsion by Death. Bonferroni-adjustment was used to control for error; alpha was set at .05 divided by the number of variables.

As hypothesized, the MMPI-A Content Scales (Depression, Alienation, and Low-Self-Esteem) did reliably discriminate between the suicidal and non-suicidal groups. This is an important consideration when utilizing the MMPI-A as an assessment tool. Adolescents who score high on this combination of particular Content Scales could be at an increased risk for suicidal behavior. The ability to reliably differentiate between suicidal and non-suicidal adolescents could allow the clinician to make recommendations for the management of the adolescent.

The second hypothesis was not supported. Moderate correlations were found between the indirect measures of suicidal risk and the MMPI-A Content Scales. Specifically, those Content Scales which purportedly measured the same construct as the indirect measures were significantly correlated. This indicates that the MMPI-A can be used to

adequately measure the constructs of hostility, psychoticism, depression, and self-concept.

Support was not found for the third hypothesis. Low to moderate correlations were found between the direct measures of suicidal risk and the MMPI-A Content Scales. The only Content Scales which correlated significantly with any of the MAST subscales were: Alienation, Social Discomfort, Family Problems and Negative Treatment Indicators. The MMPI-A Content Scale of Alienation (A-aln) correlated positively with the MAST-RL (Repulsion by Life) subscale. The A-aln Content Scale measures the adolescent's feeling of being disliked by others, feeling that no one cares about them or understands them, and a general emotional distance from others (Butcher & Williams, 1992). This is compatible with the content of the RL which contains such statements as, "Not important to my family" and "No one really loves me." The RL is one of the two MAST subscales which Osman et al. (1994) found most useful in the assessment of suicidality. Therefore, the MMPI-A Alienation subscale may be a useful indicator in the assessment of adolescent suicide attempts.

The MMPI-A Family Problems (A-fam) Content Scale also correlated positively with the MAST-RL subscale. Adolescents who receive high scores on the A-fam subscale have considerable problems such as anger, disagreement, lack of love with their parents and other family members. They

believe that they cannot rely on their family members and do not feel close to their parents (Butcher & Williams, 1992). These results also support the compatibility of the MAST and the MMPI-A. Since a significant correlation exists between the RL (a useful predictor of suicidality) and the Family Problems subscale, the A-fam subscale may also be a useful indicator of adolescent suicide attempts.

The Family Problems (A-fam) subscale correlated negatively with the MAST-AL (Attraction to Life) subscale. The AL was the additional subscale which Osman et al. (1994) found most useful in the assessment of suicidality in adolescents. This indicates that adolescents who report negative family problems do not respond affirmatively to statements regarding the positive aspects of living. According to research by Osman et al. (1994), adolescents who do not experience life as positive may be at increased risk for attempting suicide.

The Social Discomfort (A-sod) subscale also correlated negatively with the MAST-AL subscale. Adolescents who score high on the A-sod content scale report shyness, difficulty making friends, a dislike of social gatherings, and an avoidance of others (Butcher & Williams, 1992). The negative correlation between the AL and the A-sod subscales suggests that adolescents who report positive attraction to life may have less problems in several social interpersonal areas including making friends and interacting socially.

Since the AL has been found useful in the assessment of suicidality, the significant correlation between the A-sod and the AL may indicate the need to employ precautionary measures for adolescents with elevated scores on the A-sod.

The fourth hypothesis was not supported. Three variables adequately predicted group membership (suicidal/non-suicidal): MAST-AL (Attraction to Life), MAST-AD (Attraction to Death), and MMPI-A Low Self-Esteem (A-lse). Although the only MMPI-A variable to contribute to the predictive model was the A-lse, two of the above variables were determined useful in discriminating the two groups (as mentioned in the discussion of hypothesis 1). Furthermore, the inclusion of the MAST-AL and low self-concept, again, indicate their usefulness in the assessment of suicidality.

Directions for Future Research

In conclusion, it appears that the MMPI-A Content Scales (Depression, Alienation, & Low Self-Esteem) may contribute to the assessment and prediction of adolescent suicidal behavior. However, these MMPI-A Content Scales should be further examined utilizing other validated measures of suicidal risk. In addition, research should also include non-hospitalized adolescent controls. The presence of psychopathology may affect the pattern of responding thus limiting the generalizability of results to adolescent inpatients. Finally, other important variables

such as family functioning, specific age, diagnosis, and gender differences should be included in future investigations.

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APPENDIX A

INFORMED CONSENT

APPENDIX A

ATTACHED IS THE RESEARCH PROPOSAL "THE RELATIONSHIP BETWEEN PERSONALITY CHARACTERISTICS AND SUICIDAL BEHAVIOR IN PSYCHIATRIC ADOLESCENTS" SUBMITTED BY KIMBERLY KING, UNI GRADUATE STUDENT, FOR HER MASTER'S THESIS. THIS PROPOSAL HAS BEEN REVIEWED BY THE RESEARCH COMMITTEE AND APPROVED.

RESEARCH COMMITTEE:

X APPROVED
4-20-94
DATE

____ NOT APPROVED
Robert S. Hamm Ed.D
CHAIRMAN, RESEARCH COMMITTEE

MEDICAL STAFF:

X APPROVED
4-20-94
DATE

____ NOT APPROVED
[illegible] M.D.
PRESIDENT, MEDICAL STAFF

SUPERINTENDENT:

X APPROVED
4/20/94
DATE

____ NOT APPROVED
B. J. Dave, M.D
B. J. DAVE, M.D., SUPERINTENDENT

GOVERNING BODY:

X APPROVED
4/22/94
DATE

____ NOT APPROVED
[signature]
HAROLD TEMPLEMAN, ACTING ADMINISTRATOR
DIVISION OF MH/MR/DD

APPENDIX B

SUICIDAL BEHAVIORS QUESTIONNAIRE

APPENDIX B

Suicidal Behaviors Questionnaire

1. Have you every thought about or attempted to kill yourself?

   0 = Never
   1 = It was just a brief passing thought
   2 = I have had a plan at least once to commit suicide
   3 = I have attempted to kill myself, and really hoped to die

2. How often have you thought about killing yourself in the past year?

   1 = Never 2 = Rarely 3 = Sometimes
   4 = Often 5 = Very Often

3. Have you ever told someone that you were going to commit suicide, or that you might do it?

   1 = No
   2 = At one time, during on short period of time
   3 = More than once, during more than one period of time

4. How likely is it that you will attempt suicide someday?

   0 = Never 1 = No chance at all
   2 = Rather unlikely 3 = Unlikely
   4 = Likely 5 = Rather likely
   6 = Very unlikely

APPENDIX C

MULTI-ATTITUDE SUICIDE TENDENCY SCALE

APPENDIX C

Multi-Attitude Suicide Tendency Scale

This questionnaire lists different attitudes or beliefs which people sometimes hold. Please read each statement carefully and decide how much you agree or disagree with the statement. There are no right or wrong answers. Indicate your agreement with each item by placing the appropriate number on the line preceding that item.

1 = I strongly agree
2 = I moderately agree
3 = I neither agree nor disagree
4 = I moderately disagree
5 = I strongly disagree

____ 1. Most of the time I feel happy.

____ 2. Life seems to be one long and difficult struggle.

____ 3. I fear the idea that there is no return from death.

____ 4. I fear death because all my mental and spiritual activity will stop.

____ 5. Even though things may be tough at times I think it's worth living.

____ 6. I feel that close people make me feel good.

____ 7. I fear death because my identity will disappear.

____ 8. I know people who have died and I believe that I will meet them when I die.

____ 9. I don't ask for help even when things are very tough for me.

____ 10. Thinking about death gives me the shivers.

____ 11. I am afraid of death because my body will rot.

____ 12. I fear death because it means that I will not be able to experience and think anymore.

____ 13. I can see myself as being very successful in the future.

____ 14. I feel that I am not important to my family.

____ 15. Sometimes I feel that my family will be better off without me.

____ 16. Sometimes I feel that my problems can't be solved.

____ 17. Death can change things for the better.

____ 18. I like to do many things.

____ 19. Death is actually eternal life.

____ 20. The thought that one day I will die frightens me.

____ 21. I don't like to spend time with my family.

____ 22. Many problems can be solved by death alone.

____ 23. I believe that death can bring a great relief from suffering.

____ 24. I fear death because all my plans will come to an end.

____ 25. I am very hopeful.

____ 26. In some situations it is better to die than go on living.

____ 27. Death can be a state of rest and calm.

____ 28. I enjoy many things in life.

____ 29. Death frightens me more than anything else.

____ 30. No one really loves me.