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Relation of Family Functioning to Treatment Outcomes in Day and Residential Programs: A Clinical Study with Emotionally Disturbed Adolescents

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A Dissertation submitted to the Graduate School at the University of Missouri- St. Louis, in partial fulfillment of the requirements for the degree

Doctor of Philosophy in Psychology.

June 23, 2008

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Abstract

Residential and day facilities are important providers of treatment for seriously emotionally disturbed adolescents. The primary difference between the two types of treatment programs is that adolescents attending day treatment reside with their families while those in residential programs live at the treatment facility. Very few studies have addressed the relation of family functioning to treatment outcomes for adolescents. Furthermore, extant research has not investigated whether the relation of family functioning to treatment outcomes is different for adolescents in residential and day programs, This study proposed that adolescents from severely dysfunctional families at admission would have better outcomes in their social, educational, and overall functioning in residential treatment, and those from less severely dysfunctional families would make gains in day treatment. The sample included a total of 86 adolescents from day and residential programs. There were 43 adolescents from each treatment group, and the two groups were matched on age, gender, and level of family functioning. The results did not support the main hypotheses. However, univariate analyses revealed that the type of treatment program and the severity of dysfunction in families at admission were independently related to the outcome measures: social, educational, and overall functioning at discharge. Adolescents in the day program made significantly more gains in their social and overall functioning at discharge. Family functioning at admission was found to have a significant effect on the educational functioning of adolescents in both treatment groups at discharge. In addition, the covariate, length of stay, was found to be significantly related to the outcome measures. The findings from this study have important implications for the treatment of emotionally disturbed adolescents. The results

from this study highlight the significance of social skills training for emotionally disturbed adolescents. The findings also suggest that day and residential programs should consider the level of dysfunction in families as well as the benefits of gradually transitioning patients to the next level of care as important factors in treatment.

Dedication

This dissertation is dedicated to the memory of my father, Mr. N. Shanker, who passed away before he could see this project come to fruition. He is deeply missed.

Acknowledgements

There are innumerable people who have supported me throughout my graduate training. It would be impossible to name them all, but I would like to mention a few people whose support and guidance has helped me through this process. I would like to thank my dissertation advisor, Dr. Jayne Stake, for her wisdom and encouragement. I would also like to thank my committee, Dr. Matthew Taylor, Dr. Victor Battistich, and Dr. Kamila White, for dedicating their time and effort in helping me improve my dissertation. My deep appreciation to the wonderful team at the Hawthorn Children's Psychiatric Hospital, especially Dr. Michael Stake and Sally Maguire, whose assistance in making the data available to me made this project possible. A very special thank you to Dr. Steve Sowden and Josh Vinocour, who served as independent raters, for dedicating several months from their busy schedules to this project.

I would like to express my gratitude and appreciation also to Dr. Brian Vandenberg for several years of guidance and support. There have been many clinical supervisors whose dedication in serving the mental health needs of children has fueled my passion for clinical work. A special thanks to Dr. Vetta Sanders-Thompson who has mentored me over the years.

My deepest gratitude to my husband, Prasad, and my parents, Lakshmi and Shanker, for their support and help through the rigors of graduate training. Finally, but most importantly, I would like to thank the one person whose unflinching belief in me through the ups and downs of this incredible journey has made every day worth it: my wonderful daughter, Hansika, 'my little swan'.

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Relation of Family Functioning to Treatment Outcomes in Day and Residential Programs: A Clinical Study with Emotionally Disturbed Adolescents

Emotional disturbance in children and adolescents refers to a wide range of internalizing and externalizing symptoms such as emotional withdrawal, poor social interactions, and behavioral outbursts that impair children's ability to function emotionally, socially, and academically. Children and adolescents with emotional disturbance often have mental health diagnoses that include mood disorders, anxiety disorders, and behavioral disorders (Connor et al, 2004). The incidence of mild to severe emotional disturbance in the general population of children and adolescents in the United States is estimated to be approximately 20% (Blom, 1991; Spencer et al, 1997). An estimated 5% of children and adolescents are believed to suffer from serious emotional disturbance (Blom, 1991). Among 9 to 17 year olds, the incidence of serious emotional disturbance is approximately 5-9% (Friedman, Katz-Levey, Manderschied, & Sondheimer, 1996).

Children with emotional disturbance frequently have problems functioning in several areas of their lives, including home and school (Blom, 1991). Their symptoms are consistent with emotional and/or behavioral disorders that require multiple therapeutic services, including mental health and educational services (Greenbaum et al, 1996). According to recent statistics, 20% of children who are diagnosed with serious emotional disturbances are placed in day or residential treatment facilities (Spencer et al, 1997). There are, over 1,523 day and residential treatment facilities in the United States that annually provide mental health treatment and educational services to an estimated 117,720 children with serious emotional disturbance (Spencer et al, 1997).

Approximately half these children attend day treatment programs while the other half are placed in residential facilities.

Three important issues that have been found to be related to serious emotional disturbances in children and adolescents are: the level of family functioning, children's educational functioning, and their competence in using social skills. Children are influenced by major systems in their lives, such as family, school, and their communities (Bronfenbrenner, 1992). The impact of the family system is especially salient for children with emotional disturbances. Children who have serious emotional disturbances are not only affected by the level of dysfunction in their family, but the severity of the family's dysfunction can also be related to treatment outcomes. Researchers have found that one of the issues associated with family dysfunction for seriously disturbed children is ineffective parenting (Thompson et al, 1996). In addition to family issues, children with serious emotional disturbances often have impairments in their educational functioning and may present with problems such as learning disabilities (Pazaratz, 2001; Lohnes, 1998). In regular school environments, these children have been found to have poor educational outcomes, with the drop out rate for adolescents in this population being 50% (Carran et al, 1996). Those who continue to remain in school have been found to have poorer grades and higher rates of academic failure than their peers (Carran et al, 1996). Deficits in social skills impact home and school functioning by exacerbating emotional and behavioral problems in these children and impeding their ability to develop positive peer relations (Grizenko, Papineau & Sayegh, 1993). Day and residential treatment programs provide a combination of individual, group, and family

therapy, social skills training, and educational remediation for children and adolescents (Gagnon & McLaughlin, 2004; Hicks & Munger, 1990).

Day treatment for Children and Adolescents

History of Day Treatment Programs

Day treatment for emotionally disturbed children and adolescents is one of the most intensive therapeutic services that allow children to receive treatment while continuing to live at home and be involved in their communities (Grizenko, 1997; Hicks & Munger, 1990). Day treatment programs for children and adolescents with serious emotional disturbances began to emerge in Russia, Europe, and Canada in the 1930s and 40s (Kiser, Ackerman & Pruitt, 1987). In the United States, day treatment programs for children and adolescents were first established in 1943, but had a slow growth over the decades, with only 10 such treatment programs in existence in 1963 (Grizenko & Paineau, 1992; Metzger, 1987). By 1972, there were 90 day treatment programs in the country (Zimet & Farley, 1985). The initial day treatment programs were described as "partial hospitalization" programs (Robinson & Rapport, 2002). The integration of mental health and educational services for children and adolescents through day treatment programs in hospitals, schools, and other treatment facilities expanded significantly in the 1980s. During this time, state and federal governments passed several laws requiring special educational services to be provided to children with mental health needs. A decrease in the hospital space available for full hospitalization of children with mental health needs and the need to comply with the laws requiring the provision of special educational services to these children forced an integration of mental health and educational programs, resulting in the establishment of a number of day

treatment programs all over the country (Freeman, Goldberg & Sonnega, 1983). By 1981, 353 such programs existed in the country and currently, there are over 750 (Grizenko & Papineau, 1992; Spencer et al, 1997).

Components of Day Treatment Programs

Day treatment programs typically involve children in treatment for a minimum of 5 hours a day with most programs running for 8 hours a day, 5 days a week (Friedman et al, 1982; Kiser, Ackerman & Pruitt, 1987; Kiser, Culhane & Hadley, 1995). Day treatment programs may be based in a hospital setting, on a University campus, or may even be conducted in a public school setting (Byalin et al, 1987; Glassman & Flaherty, 1998; Hicks & Munger, 1990; Karagiannakis et al, 2005; Kiser et al, 1988; Linnihan, 1977; Lohnes, 1998; Weist, 1998). Day treatment programs that are hospital-based continue to be referred to as "partial hospitalization" or "partial-hospital" programs (Gabel, Swanson & Shindledecker, 1990). Children referred to day treatment programs are usually moderately to severely emotionally disturbed, but due to the highly structured treatment milieu, day treatment programs do not admit children who are severely cognitively limited or may exhibit symptoms of psychosis requiring full hospitalization (Comer, 1985; Kiser, Ackerman & Pruitt, 1987; Kiser, Culhane & Hadley, 1995; Topp, 1991).

Day treatment programs in the country follow a wide range of theoretical orientations that include psychodynamic, behavioral, and cognitive-behavioral theories (Glassman & Flaherty, 1998; Grizenko, 1997; Kiser & Pruitt, 1991a; Lyman & Prentice-Dunn, 1991; Linnihan, 1977; Robinson & Rapport, 2002; Rey et al, 1998). Despite the different theoretical orientations from which interventions are adopted by day treatment

programs, most programs are based on the philosophy that the systems that impact children, specifically family and school systems, also need to be addressed in treatment (Karagiannakis et al, 2005; Kiser et al, 1984).

Treatment Effectiveness on Family, Educational, Social, and Overall Functioning

Family functioning. Emotional disturbance in children is often related to the level of dysfunction in the family unit. Many of these children come from home environments that have significant impairments in family functioning, such as family conflicts, child abuse, and poor parenting skills (Gabel, Swanson & Shindledecker, 1990; Keitner & Miller, 1990; Kiser et al, 1988; Kiser, Culhane & Hadley, 1995; Sylvan & Matzner, 1999). Day treatment programs adopt the approach that in addition to treating children, treatment should address the family system impacting the child (Kiser & Pruitt, 1991b). Day treatment programs therefore provide intensive therapeutic help not only to children, but also to their families (Kiser et al, 1984). Most day treatment programs involve the family by making family therapy a mandatory component of the program to improve the functioning of the family unit (Cornwall & Blood, 1998; Zimet & Farley, 1985). Along with family therapy, some day treatment programs involve parents in treatment through participation in the children's daily activities such as lunch, but many day treatment programs also include parenting skills classes and participation in treatment review meetings (Glassman & Flaherty, 1998; Pazaratz, 2001; Ross & Schreiber, 1975).

A practical consideration involved in parental participation in day treatment is getting parents to attend family therapy sessions or parenting programs. Families that cannot attend during the day have to make the extra effort to transport their children back

during the evening hours to participate in these programs (Glassman & Flaherty, 1998). Besides participating in treatment, parents of children in day treatment also have the responsibility of implementing treatment recommendations and managing behavioral issues at home (Grizenko & Papineau, 1992; Kiser & Pruitt, 1991b). Unlike inpatient and residential treatment programs, where trained staff are given the responsibility to monitor treatment, these additional responsibilities that are placed on day treatment parents can be relevant to the outcomes of treatment.

There is limited research investigating the relation that family functioning may have to the outcomes of day treatment for children and adolescents. Moreover, because day treatment programs involve families in the treatment process, extant research has focused on investigating treatment outcomes on family functioning, with the assumption that progress made by families in treatment will be related to children's treatment success. However, results from existing studies are conflicting with regard to the value of involving parents in treatment through therapy and other services. Some studies and qualitative assessments of day treatment programs indicate that there are positive changes in family functioning when parents are involved in treatment (Linnihan, 1977; Ross & Schreiber, 1975). A qualitative analysis of adolescents attending a day treatment program found that involvement of parents in treatment increased stability in family functioning for the adolescents attending the program (Tolmach, 1985). In addition to improving the overall outcomes of treatment, parental involvement in day treatment also has been found to increase the likelihood of children being integrated into a regular academic environment (Grizenko, 1997). However, this study (Grizenko, 1997) did not report the severity of family dysfunction at admission, therefore making it difficult to

infer if children from severely dysfunctional families were able to make gains in treatment. In a study with 50 children discharged from a day treatment program, Prentice-Dunn, Wilson, and Lyman (1981) reported that parental involvement was a significant predictor of the behavioral outcome and academic success of children. However, the study did not investigate if the level of family dysfunction was related to treatment outcomes for children. It is possible that families with less severe dysfunction had a greater degree of involvement in treatment that was related to better behavioral and academic outcomes for their children.

Although most of the current research supports the importance of addressing family functioning to enhance treatment outcomes for children and adolescents, results from a study by Blom, Farley, and Ekanger (as cited in Zimet & Farley, 1985) indicated that there was no significant relation of parental involvement to treatment outcomes for children. Zimet and Farley (1985) posit that the results obtained by Blom et al. can be attributed to their treatment program's emphasis on individual therapy for children with a limited focus on including the family in treatment. However, these conflicting results and the limited number of studies make it difficult to generalize the research findings on how family functioning is related to the progress made by children in day treatment programs.

Moreover, while there is empirical support for the involvement of families to enhance treatment outcomes for children and adolescents, the question that remains unanswered by the existing research is: Is the severity of family dysfunction related to the treatment outcomes for children and adolescents in day treatment programs?

Educational Functioning. Children with emotional disturbances have difficulties in their educational functioning. These difficulties may stem from learning disorders or psychosocial issues that impede functioning in the school environment (Pazaratz, 2001; Lohnes, 1998). Many of the children and adolescents referred and admitted to day treatment programs are unable to function within their regular school environment (Zimet & Farley, 1985). The structure and expectations in the regular school environment can exacerbate behavioral problems such as aggression with peers and non-compliance with teachers, further isolating children from daily classroom and peer activities. Researchers have found that problems such as unemployment and criminal behavior faced by older adolescents with serious emotional disturbances are related to their failure in school (Carran, 1996). These adolescents have also been found to have a higher drop out rate in school than the general population (Carran, 1996).

Because children spend at least 6 hours of each week day at school, problems at school can have ramifications on the functioning of emotionally disturbed children in other areas of their lives. The emotional disturbances of children often result in contentious relationships with the school that can contribute to the isolation of children and their families from the local community (Cheney, Osher & Caesar, 2002). The services provided by day treatment programs help children and their families reintegrate into their local schools and communities (Grimes, Gardner & Weiss, 1983; Hicks & Munger, 1990). Day treatment programs integrate several modalities of mental health treatment with special educational services for emotionally disturbed children (Freeman, Goldberg & Sonnega, 1983; Friedman et al 1982; Sylvan & Matzner, 1999; Tolmach, 1985; Topp, 1991). Children who acquire skills that help them function in areas such as

school have better overall outcomes in treatment than those children who receive only symptom focused mental health treatment (Blom, 1991). The integration of academic remediation through special education services and classroom related treatment such as behavior modification has long-term implications in helping children improve in their educational functioning.

Most day treatment programs provide educational services in the academic areas of reading, writing, and mathematics, as well as behavior modification through therapeutic classrooms (Friedman et al, 1982; Ross & Schreiber, 1975). While the literature on day treatment programs for emotionally disturbed children acknowledges the academic problems faced by these children and the importance of educational remediation in managing behavioral issues, there is very little research that specifically addresses the outcomes of educational remediation in day treatment. The limited research addressing educational remediation in day treatment has found that the educational services provided by day treatment programs have an important role to play in the treatment process. In a study with 135 adolescents receiving educational remediation at a day treatment program, Cornwall and Blood (1998), found fewer behavioral problems and better functioning in the community at discharge and at a 6-month follow-up for adolescents who completed the treatment. In a qualitative description of day treatment outcomes, Tolmach (1985) reported that over a 3-year period, adolescents attending a day treatment program made significant gains in their educational functioning. Although no standardized measures were used to assess the progress made in educational functioning, Tolmach reported that during each year that

adolescents spent in the program, they made a 1.5 grade level increase in their reading and math levels.

School is an important system in the lives of children and adolescents, but it is also closely connected to their home environment through homework, parent-teacher contact, and other school activities. This close contact between school and home is salient for children and adolescents in day treatment programs because homework and daily behavior sheets are an important aspect of educational remediation and help to establish the link between school and home (Lyman & Prentice-Dunn, 1991). Despite the importance of the connection between school and home for emotionally disturbed children in day treatment programs, the relation of family functioning to the outcomes of educational remediation in day treatment has yet to be investigated.

Social functioning. Some researchers propose that a deficit in social skills increases behavioral problems in children because they lack skills for conflict resolution, peer negotiation, and social interactions (Hicks & Munger, 1990). An integral component of day treatment programs is social skills training. Training in social skills is emphasized for children in day treatment because group therapy and other group activities are an important part of the treatment program. Furthermore, because day treatment programs do not include long periods of isolation, seclusion with one-on-one attention or physical restraint for children who act out as a result of poor social skills, children and adolescents admitted to day treatment programs must be provided with social skills training so that they can function within the program (Kiser et al, 1984). Children and adolescents attending day treatment also need to be able to extend the use of their social skills to function within their families and community (Glassman & Flaherty,

1998). Friedman, Quick, Mayo, and Palmer (1982) found that combining social skills training with other therapeutic services for adolescents attending a day treatment program was positively related to verbal and non-verbal behavior outcomes. Furthermore, a follow-up study conducted after a year indicated that a majority of the adolescents continued to maintain their success in social and behavioral outcomes in their interactions within the community. In a 5-year follow-up study with 33 children who completed a day treatment program, Grizenko (1997) found that children who had completed the day treatment program were able to establish successful peer relations even 5 years after discharge.

Social skills training focuses on issues such as conflict resolution, peer negotiation, and communication skills. Similar skills, such as conflict resolution and communication, are also addressed within the context of family therapy. However, the relation of family functioning to treatment outcomes in social functioning for children and adolescents in day treatment has yet to be addressed by researchers.

Overall functioning. Although some studies investigating day treatment programs have addressed treatment outcomes on interpersonal factors such as family, educational, and social functioning, other researchers have investigated the overall functioning of children in day treatment. Comer (1985) reported a decrease in behavioral problems, better school attendance, and greater family harmony with a sample of 41 adolescents attending a day treatment program. Similar results were reported by Grimes, Gardner, and Weiss (1983) in a 1-year follow-up with a day treatment sample that received a combination of educational and mental health services. In a recent study with a day treatment elementary and adolescent sample, children were found to have made gains in

treatment from the time of initial assessment at admission through a 9-month period (Robinson & Rapport, 2002). Although these studies reported day treatment outcomes on the overall functioning of children, there is a major weakness that limits the validity of the findings. These studies were descriptive in nature and did not include a comparison group, making it difficult to infer if outcome was related to treatment or to other factors, such as the severity of the family's dysfunction at admission.

There are a few studies addressing outcomes in day treatment that have used comparison or control groups. A study with children attending a day treatment program used a matched sample from a waitlisted group as a control and found that children in the day treatment program had positive outcomes in behavior management, educational functioning, and family functioning when compared to the children on the waitlist, who had received educational and mental health treatment in the community (Grizenko, Papineau & Sayegh, 1993). Similarly, a 3-year follow-up comparison of a group of adolescents attending a day treatment program to a group of adolescents rejected from the program also found that adolescents who had attended the program had better outcomes in their overall functioning (Rey et al, 1998). However, methodological problems in this study (Rey, Enshire, Wever & Apollonov, 1998) limit generalization of the findings. Although the adolescents in the control sample were matched on age, gender, and level of aggression, they did not receive treatment because they refused to attend or were not considered appropriate for the program. It is therefore difficult to infer if the success of the adolescents attending the program was because of factors such as their motivation for treatment and appropriateness for the program. However, studies using retrospective data with large samples have also reported positive treatment outcomes. A day treatment

sample of 114 children were found to have improved behavior, better family functioning, and improved peer relations even a year after discharge (Kiser et al, 1996). Although positive outcomes were reported for the children attending the program, (Kiser et al, 1996) there was no comparison group, therefore making it difficult to infer if the observed outcomes were due to the treatment.

Moreover, existing studies have not investigated how the severity of impairment in family functioning at admission into a day treatment program is related to children's overall functioning at discharge. The importance of understanding the relation of family functioning is highlighted by findings from a study that was conducted across three day-treatment centers by Gabel, Swanson and Shindledecker (1990). The researchers found that children with severe family dysfunction at admission had poorer outcomes at discharge. These findings indicate that the level of family functioning at admission is an important factor to consider in treatment outcomes. However, a serious limitation of Gabel, Swanson, and Shindledecker's (1990) study was that outcome was measured only by whether children remained with their families at the end of treatment or required out-of-home placement. This study, therefore, does not elucidate the relation of family functioning to children's overall outcome in treatment. Furthermore, although the results of this study highlight the importance of investigating family dysfunction, it did not shed light on the relation of family functioning to children's educational, social, and overall functioning. Because children and adolescents in day treatment programs live with their families and day treatment programs emphasize family participation in the treatment process, it is important to understand if family functioning is a relevant factor to treatment outcomes.

Residential treatment for Children and Adolescents

History of Residential Treatment Programs

All residential facilities provide "round-the-clock", intensive, out-of-home group mental health, and educational services to emotionally disturbed children and adolescents (Asarnow, Aoki & Elson, 1996; Connor et al, 2002; Wells, 1991). Residential programs are also referred to as residential treatment programs or residential facilities in the research literature. Although they provide mental health care, residential facilities are not classified as hospitals because they do not provide round-the-clock medical attention. Children in these facilities are treated by multidisciplinary teams that include psychologists, social workers, special education teachers, psychiatrists, psychiatric nursing staff, and psychiatric aides (Joshi & Rosenberg, 1997). Residential programs for children have been in existence for several decades (Joshi & Rosenberg, 1997). Unlike the history of day treatment programs, which is connected to educational policies, the history of residential programs in the country has been linked to the passage of child welfare laws (Yelton, 1993). In the early 1900's, the use of foster homes was widely prevalent as a means of out-of-home placement for children. However, in the 1960s and 70s, the number of children placed in foster care increased dramatically, and the amount of time that children spent in foster care lengthened. The increasing demands for foster placement of children and adolescents led to the passage of child welfare laws that helped mitigate the pressure on the foster care system. During this time, the use of residential facilities for children with emotional disturbances and severe family dysfunction began to increase significantly (Yelton, 1993).

The past few decades have seen a dramatic increase in the number of children placed in residential programs. This number has grown from 29,000 children placed in residential facilities in 1982 to approximately 117,720 in 1997 (Connor et al, 2002). By the year 2002 there were about 588,000 children who have been placed in out-of-home care with almost 18% of these children living in residential facilities (Hussey & Guo, 2002, 2005). It has been estimated that over 58,000 of the children placed in residential care are diagnosed with serious emotional disturbances (Spencer et al, 1997).

Components of Residential Treatment Programs

Studies indicate that children in residential placement have poor family, educational, and social functioning (Landsman et al, 1996). Researchers have recommended that in order for treatment outcomes to be positive, children in residential programs should receive services in all 3 areas of functioning (Blackman, Eustace & Chowdhury, 1991). In addition to therapeutic services, many residential programs provide children with educational services and social skills training to help them function better in their home and school environments (Curry, 1991). Many residential facilities have special education therapeutic classrooms on site (Connor et al, 2002; Hussey & Guo, 2005; Miskimins, 1990). Alternatively, there are also residential programs that transport children to local public schools where special education teachers provide services within self-contained classrooms (Joshi & Rosenberg, 1997; Lorandos, 1990). Along with mental health services such as individual, group, and family therapy and educational services in therapeutic classrooms, children and adolescents at most residential facilities receive pharmacotherapy, language, and speech services (Joshi & Rosenberg, 1997; Knecht & Hargrave, 2002).

Residential programs implement interventions from a wide range of theoretical orientations, which include psychoanalytic, psycho-educational, cognitive-behavioral, and behavioral approaches (Byrnes et al, 1999; Small, Kennedy & Bender, 1991; Wells, 1991). These treatment facilities also vary in the amount of structure that is incorporated in the day-to-day activities for the children (Wells, 1991).

Treatment Effectiveness on Family, Educational, Social, and Overall Functioning

Family functioning. Children are often placed in a residential program not only due to impairments in their functioning, but also due to the severity of their family's dysfunction (Wells, 1991). Descriptive data from residential programs indicate that a large number of children in residential treatment facilities come from families with severe dysfunctions such as parental violence, ineffective parenting, neglect, and child abuse (Connor et al, 2004; Fairhurst, 1996; Hussey & Guo, 2005; Krueger & Drees, 1995; Small, Kennedy & Bender, 1991). Placement in a residential program allows children and their families to be separated during treatment. This separation enables treatment providers to address the severity of impairment in children's functioning independent of their family dysfunction, in treatment. However, there are very few studies that have investigated the relation of family functioning to the treatment outcomes of emotionally disturbed children in residential care.

The brief contact that children and adolescents in residential programs have with their families limits the incorporation of treatment interventions by parents into their day-to-day activities. Because many children and adolescents in residential treatment come from dysfunctional families, placement in a residential program may leave them feeling blamed for the problems of the entire family (Brown, 1991). Family therapy attempts to

establish communication between family members and address family dynamics so that children in residential treatment understand their role and their family's responsibilities to bring about changes. Although day treatment involves the family's cooperation in implementing changes in their daily activities, the onus of implementing treatment recommendations falls on the program staff at residential facilities (Brown, 1991; Landsman et al, 2001). Involving parents in treatment prepares them for resuming child rearing responsibilities when their children return home. The physical separation of children and adolescents from their families makes it necessary for residential programs to make a greater effort to involve families in the treatment process. Some residential facilities help parents develop parenting skills and competence to manage their children's behavior by implementing programs such as parenting classes and support groups (Carlo & Shennum, 1989; Fairhurst, 1996; Knecht & Hargrave, 2002).

Parents of children in residential programs participate in treatment through their involvement in family therapy, parenting skills training, visits made to their children at the facility, and home visits made by their children. The investigation of parental participation in residential treatment can help shed light on the relation of family functioning to children's treatment outcomes. Sunseri (2001) found that children in residential care who were visited frequently by their parents were more often able to successfully complete treatment, when compared to those children who were visited less frequently. Furthermore, Sunseri also found that home visits made by children in residential care enhanced their progress in treatment. However, Sunseri's study does not investigate if families that made greater efforts to be involved in the treatment of their

children were less dysfunctional. It is therefore unclear if children's treatment outcomes were related to the level of family functioning.

Similar methodological limitations are present in a large scale study with 234 children that was conducted across three residential programs. Baker, Blacher, and Pfeiffer (1993) investigated parental participation in treatment by identifying the amount of contact families maintained with their children who were in residential care. The researchers found that one-third of the children in the study had no contact with their families and almost 50% of the children in the study had fewer than three contacts per year with their families. However, Baker et al. (1993) did not investigate if parental participation in treatment was related to the level of family dysfunction. Furthermore, treatment outcomes for children were not addressed in the study. Findings from the study, therefore, could not clarify if family functioning was related to the treatment success of children in the three residential programs.

For families that are involved in the treatment process, home visits by children provide parents with the opportunity to implement interventions that they have learned in treatment. The hands-on experience in parenting their children can also increase parents' competence and confidence in their parenting skills. Carlo and Shennum (1989) assigned parents to one of three treatment groups: parents who received only experiential treatment, parents who received only a didactic component of treatment, and parents who received both. In a 3-year follow-up study with the children and their families, they found that treatment outcomes were most successful when parents had received a combination of experiential and didactic components of the program. However, treatment outcome was measured by whether the children were successfully reintegrated

with their families at discharge or received placement elsewhere (Carlo & Shennum, 1989). The relation of family functioning to treatment outcomes for children was not addressed in the study.

Other studies investigating family involvement in treatment have also found it to be a strong predictor of the progress made by children and adolescents in residential care. In a 1 to 3-year follow-up with severely emotionally disturbed adolescents at a residential program, Blackman, Eustace, and Chowdhury (1991) found that involvement of the family in treatment through family therapy, parent education, and parent support resulted in a significant improvement in family functioning as well as in the overall functioning of adolescents. Moreover, the gains made in treatment were also found to have been maintained over a 1 to 3-year period. Although the findings of this study reinforce the importance of the family in the treatment of children in residential care, it does not address how the severity of family dysfunction is related to treatment outcomes for adolescents. Similar results were found by Stage (1999), who reported that participation in family therapy was positively related to children's successful transition from residential care. However, outcome in Stage's study was measured by the placement of children after discharge and not by their functioning. Moreover, neither study used comparison or control groups.

A study by Landsman, Groza, Tyler, and Malone (2001) compared children in a residential program that provided only basic therapeutic services for children and their families with a group that received enhanced family involvement in treatment through special activities that integrated the family into the program. Landsman et al. (2001) found that the group receiving enhanced family treatment demonstrated significant

positive outcomes in family functioning and also in the overall functioning of children, when compared to the other group. Additionally, the success of the outcomes was found to be stable over time. Landsman et al. used a quasi-experimental design because they did not randomly assign children to the two groups. Moreover, the groups were not matched, and it is therefore difficult to determine if the success of treatment could be attributed to factors other than family involvement. Because of the limitations in the extant research, it is unclear if the separation of children and their families in residential treatment is related to treatment outcomes and furthermore, if the relation of the severity of family dysfunction to children's treatment outcomes is mitigated by the separation.

Existing research on family functioning in residential samples is limited and does not address how the severity of the family's dysfunction is related to treatment outcomes for children. Assessing the level of family functioning when children are admitted to a residential program, the use of comparison groups, and investigating treatment outcomes on children's functioning can help explain if family functioning is a relevant factor in residential treatment outcomes for children and adolescents.

Educational functioning. Educational programs are an important component of residential facilities. Many children who are placed in residential programs have serious educational deficits and a history of academic failure at school (Miskimins, 1990). Al Ansari, Gouthro, Ahmad, and Steele (1996) conducted a study at a residential program with a sample of 60 emotionally disturbed adolescents who had poor academic achievement, behavioral problems, and poor peer relations. The researchers found that over a 10 to12-week period, adolescents who did not have a learning disorder at admission had better behavioral outcomes than those whose emotional diagnosis was

compounded with a learning disorder. Although they were able to demonstrate changes in behavior by using a pre-post design, with data collected at admission and discharge, a major limitation of the study by Al Ansari et al. (1996) is that they did not investigate educational functioning of the adolescents in the sample as a treatment outcome.

The importance of addressing children's educational needs in residential programs is underscored by research that indicates special educational services are the most commonly used services in residential programs for emotionally disturbed children (Asarnow, Aoki & Elson, 1996). Many residential facilities are equipped with self-contained therapeutic classrooms that are staffed by special education teachers (Grizenko & Papineau, 1992; Hussey & Guo, 2005). Children attend these classes for a minimum of 5 hours a day, just as they would attend class during a regular school day (Grizenko & Papineau, 1992). Despite the importance of remediation in educational functioning, there are very few studies that have investigated treatment outcomes on the educational functioning of children in residential care.

Although the number of studies investigating children's educational functioning in residential programs is limited, existing research supports the importance of educational remediation. In a large scale, 4-year follow-up study with 503 children in residential care, Thompson, Smith, Osgood, Dowd, Friman, and Daly (1996) compared the outcome of a group of children in a residential program with a comparison group of children who were not placed in the program. Treatment for children in the residential program emphasized educational remediation in a therapeutic classroom. The non-treatment group comprised children who were eligible for the residential program but were not accepted due to limited space. Children in the non-treatment group continued to

receive services in the community. The researchers found that the treatment group had significant improvements in educational functioning as well as overall functioning when compared to the non-treatment group. Follow-up data for 4 years after discharge indicated that these benefits were maintained over time, as indicated by significantly better grade point averages, number of years of schooling that was completed, and the rate of graduation from high school or earning a GED. Similar results were found in another study with 111 adolescents in a residential program. Hooper, Murphy, Devaney, and Hultman (2000) used follow-up data that was collected every 6 months for a period of 2 years after the adolescents were discharged from the program. The findings indicated that over half the adolescents who had attended the program made progress in their educational functioning and also demonstrated positive changes in overall functioning (Hooper et al, 2000).

Extant research indicates that educational services provided to children and adolescents in residential programs make a positive difference in their educational functioning. However, a serious limitation in the existing research is that the relation of family functioning to the educational success of children and adolescents in residential care has not been investigated. Since the goal of residential care is to reintegrate children and adolescents with their families, it is important to understand if the severity of family dysfunction is related to children and adolescent's educational functioning. Research investigating the relation of family functioning to children's educational functioning in residential care, would help inform treatment planning.

Social functioning. Because residential programs are 24-hour group care facilities, children in these programs must develop social skills in order to be able to

successfully function in their day-to-day activities. The success of the overall treatment in residential care is contingent on children and adolescents being able to negotiate conflicts, communicate effectively with peers and staff, and use problem solving skills. Social skills training are, therefore, an integral component of treatment in residential facilities. In a descriptive analysis of a residential treatment program, Joshi and Rosenberg (1997) found that children with severe social impairment at admission continued to have difficulties even 12 months after residence at the facility. However, there is a lack of research with children and adolescents in residential programs that addresses the success of treatment such as social skills training on their social functioning. Moreover, existing research has not investigated the role of family functioning in children's social functioning.

The family is an important agent of socialization for children (Bronfenbrenner, 1992). Therefore children from families with severe dysfunctions may also demonstrate serious deficits in their social skills. Extant research has not investigated if family functioning is related to treatment outcomes in the social functioning of children and adolescents in residential care. It is possible that placing children and adolescents in residential care and thereby removing them from a severely dysfunctional family environment may be related to positive treatment outcomes in their social functioning.

Overall functioning. Children in residential programs have been found to have more behavioral, academic, and social problems than children in the general population (Wells & Whittington, 1993). However, the systematic investigation of treatment outcomes in the overall functioning of children in residential programs is limited. In a sample of children admitted to a residential program over a 5 year period, Hussey and

Guo (2005) found that children who exhibited severity in symptoms had a greater length of stay in the facility. However, because the researchers did not investigate treatment outcomes for the children in the residential facility, it is not possible to infer the success of treatment on the overall functioning of children in the facility.

Some of the factors associated with better outcomes in overall functioning for residential children include the types of symptoms that children present at admission and the severity of these problems. There is some data to indicate that those children in residential care who have more internalizing symptoms rather than behavioral problems have better outcomes in overall functioning at the completion of treatment (Connor et al, 2002). Gosset, Barnhart, Lewis, and Phillips (1977) found that the severity of impairment in children's functioning at admission into a residential program was related to their overall functioning at discharge. However, the relation of the severity of family dysfunction at admission to the treatment outcomes for children in their overall functioning has not been investigated.

There is some evidence to indicate that including the family in treatment is related to the overall treatment success of children in residential care. Blackman, Eustace, and Chowdhury (1991) found that the integration of family, social, and educational components of treatment was related to significantly better success rates in overall functioning at discharge as well as in 1 to 3-year follow-ups in a residential program for adolescents. The study addressed the importance of treating the family unit to adolescent's overall success in treatment. However, the researchers did not investigate the relation of family functioning to treatment outcomes for adolescents. It was therefore

unclear if adolescents who were successful in treatment came from less severely dysfunctional families at admission.

The limited research addressing treatment outcomes for emotionally disturbed children in residential programs is plagued with methodological flaws. A review of the extant research indicates that most studies use a single, within-group, pre-post design (Curry, 1991). A major limitation in the use of this design is the absence of a control or comparison group which makes it difficult to infer if the treatment has been effective or if children would have made progress without treatment or at an alternative type of program, such as day treatment. Furthermore, the lack of investigation into the role of family functioning in treatment outcomes of children's overall functioning raises the question of whether children who come from families with severe dysfunction do better in residential treatment due to the separation from their families.

Comparative Research on Treatment Effectiveness of Day and Residential Programs

There is very little research that has compared treatment outcomes of day and residential treatment programs. Both day and residential treatment facilities integrate mental health and educational services for children, but children in day treatment programs receive services whilst residing with their families, while placement in a residential program entails the separation of children and their families. A major difference between day and residential treatment, therefore, is the relation of family functioning to treatment outcomes for children and adolescents. However, the differential role of family functioning in day and residential treatment programs, on the educational, social, and overall functioning of emotionally disturbed children has yet to be investigated. Data obtained from comparative studies would provide valuable

information to treatment providers in considering the severity of family dysfunction when making decisions about whether to place children and adolescents in day or residential treatment programs.

The few studies that have compared outcomes for day and residential treatment samples have significant limitations. The only large scale study was conducted by Byrnes, Hansen, Malloy, Carter, and Curry (1999). Byrnes et al. (1999) conducted a 4-year study comparing treatment outcomes for day and residential programs with a sample of 532 adolescents with severe behavioral problems. Although adolescents in both programs received the same therapeutic services, the researchers found that residential treatment had better outcomes. However, a serious weakness of this study was the outcome measures used by the researchers. Byrnes et al. assessed the success of treatment by conducting a post-discharge follow-up on the criminal behaviors of the adolescents in the sample. The higher rates of criminal behaviors among adolescents who were discharged from the day treatment program led the researchers to conclude that residential treatment had been more successful. However, this study did not address the role of family functioning on treatment outcomes. Moreover, the researchers did not investigate if the relation of family functioning to the treatment outcomes in the educational, social, and overall functioning of the adolescents was different for the two programs.

A long term follow-up study with seriously emotionally disturbed children who had been assigned to day or residential treatment programs was conducted by Erker, Searight, Amanat, and White (1993). The researchers compared the treatment outcomes between the 2 programs by following the sample for a period of 10 years. They found

no significant differences in the outcomes of day and residential treatment on social and overall functioning. However, they did find that children who had better social and overall functioning at admission into both programs had better outcomes. Their results indicate that over two-thirds of the children in the combined sample demonstrated significant improvement in outcome. A significant strength of the study was that outcomes were measured by family, educational, and social functioning and also by the overall functioning of the children.

Despite the positive treatment outcomes found for children in both the day and residential treatment programs, the study by Erker et al. (1993) had methodological limitations. Erker et al. did not use a matched sample for their study. Moreover, children in the day treatment program received a significantly greater number of family therapy sessions than children in residential treatment. Since the families in both groups did not receive the same therapeutic services, it is unclear if the progress made by children was related to the treatment or if there were other factors such as the severity of family functioning that may have been relevant to their success. Because this study did not investigate the relation of family functioning at admission, to treatment outcomes, it is difficult to conclude that there was no difference between the two treatment groups.

Methodological Considerations

Over the past few decades, with the emergence of a greater number of day and residential treatment facilities for emotionally disturbed children, some researchers have attempted to investigate treatment outcomes in these programs. However, there are a very limited number of studies addressing this issue, and the extant research is plagued by serious methodological problems. Studies have often used a within sample design

that does not offer a basis of comparison, therefore making a clear causal inference difficult (Blackman, Eustace & Chowdhury, 1991; Robinson & Rapport, 2002). The use of comparison or control groups would help clarify to what extent success in outcome is attributable to treatment. Another problematic issue is that the existing studies have investigated outcome in only one or two of the areas of children's functioning, such as social or overall functioning. While factors such as family, social and educational functioning address the interpersonal aspects of children's functioning, overall functioning includes intrapsychic functioning and dynamics such as symptom severity, life satisfaction, judgment, thinking, and mood. It is, therefore, important to investigate interpersonal as well as intrapsychic outcomes for children in day and residential treatment.

Moreover, the role of family functioning in treatment success has not been adequately addressed. Researchers have assumed that the success of treatment on children's family and overall functioning extends to other areas such as educational and social functioning (Curry, 1991; Grizenko, Papineau & Sayegh, 1993). In particular, because the family is an important system that impacts children, it is possible that family functioning is relevant to treatment outcomes in children's functioning. It is, therefore, critical to investigate the relation of family functioning at admission to each of the significant areas of children's functioning: educational, social, and overall functioning, at discharge. Furthermore, investigating if the severity of family dysfunction at admission is related to treatment outcomes differently for children in day and residential programs will inform treatment providers if children and adolescents from severely dysfunctional families should live at home or at a residential facility during the course of treatment.

The Current Study

Study Overview and Research Questions

An extensive review of the literature indicates that there is a need for research addressing the relation of family functioning to the selection of a treatment program, when the options are residential and day treatment programs. As noted before, the primary difference between day and residential treatment programs is that adolescents in day treatment programs live with their families and those in residential programs reside at the facility. Therefore, the relation of family functioning to treatment outcomes can be different for adolescents in day and residential programs. Extant research, however, has not addressed this critical issue. The proposed study will fill this gap by exploring the relation of the severity of family dysfunction and its interaction with the type of treatment program: day and residential programs, to treatment outcomes in the areas of educational, social, and overall functioning of adolescents.

Because they reside at the treatment facility, adolescents in residential programs have contact with their families for short periods of time and usually within a therapeutic context. Therefore, for adolescents in residential programs, the severity of family dysfunction may not interact with the treatment modality. Adolescents with severe family dysfunction in day treatment, however, continue to reside with their families while they attend the treatment program. The severity of family dysfunction can, therefore, be related to treatment outcomes for adolescents in day treatment programs. Therefore, it is predicted that adolescents with severe family dysfunction at admission will show more progress in educational, social, and overall functioning at discharge, in residential treatment than in day treatment.

On the other hand, adolescents from families that have mild/moderate family dysfunction may benefit from the implementation of therapeutic interventions in their daily interactions with family members. Since adolescents in day treatment programs live with their families, parents can implement treatment recommendations and provide feedback to treatment providers about the impact of the interventions on children's functioning at home and in the community. It is therefore predicted that adolescents with mild/moderate family dysfunction at admission will show more progress in educational, social, and overall functioning at discharge, in day treatment than in residential treatment.

This study, therefore, investigates the relation of family functioning to treatment outcomes for adolescents in day and residential programs. The current study attempts to control for an important methodological flaw that is present in the extant research on day and residential treatment for seriously emotionally disturbed adolescents: namely, use of a comparison group. This study compares adolescents from day and residential treatment programs. Furthermore, adolescents from both programs in the sample have been matched on age, gender, and family functioning.

Methods

Participants

The sample for this research was comprised of patients who participated in day and residential treatment programs at a state mental health facility in a large Midwestern city. Treatment data were derived from retrospective chart reviews of patients discharged from the facility from the years 1993 to 2006. The sample included 43 adolescents from each program, matched on age, gender, and level of family functioning, with a total of 86 participants. A priori power analyses indicated that to get power of .80 ($p < .05$), with a

medium effect size of d = .50, a sample size of N = 126 was recommended. To get a power of .80 ($p < .05$) with a large effect size of d = .80 a sample size of N = 49 was recommended. Because there was a smaller pool of discharged patients with complete records in day treatment and the residential sample was matched to day treatment on age, gender, and level of family functioning, the total sample size for this study was 86.

There were 61 participants who were identified as Caucasian, 21 as African-American and 4 as bi-racial. There were 70 male and 16 female participants in the study who ranged in age from 13 to 16 years. Complete demographic information for the participants is presented in Table 1. At the time of data collection, socio-economic data on the participants were not available. However, because families received services without charge and admission to the programs was not restricted by family income, participants represented a wide range of income levels. The mean length of stay of adolescents in the day treatment program was 15.81 months (SD = 8.79), and the mean length of stay for adolescents in the residential program was 8.06 months (SD = 5.13). A t-test was performed to determine whether there were significant differences in length of stay for the day and residential treatment groups. The results indicated that the length of stay was significantly longer in the day treatment than the residential program, t (2, 84) = 4.94, $p < .01$, d = 1.08. The racial/ ethnic compositions of the day and residential treatment groups were also found to be statistically significant, χ^2 (2, N = 86) = 10.57, $p < .01$.

Table 1

Demographic Characteristics of Participants

Participant Characteristics	Means/Percentages	*n*	Range
	Day Treatment		
Age	14.5 (1.09 SD)	43	13-16
Gender			
Male	81.4%	35	
Female	18.6%	8	
Ethnic Background			
Caucasian	79.1%	34	
African American	11.6%	5	
Other	9.3%	4	
	Residential Treatment		
Age	14.5 (1.09 SD)	43	13-16
Gender			
Male	81.4%	35	
Female	18.6%	8	
Ethnic Background			
Caucasian	62.8%	27	
African American	37.2%	16	
Other	--	0	

Measures

Scores for family, social, educational, and overall functioning at admission and discharge were based on diagnostic criteria for Axes IV and V in the DSM-III-R (1987), DSM-IV (1994), and DSM-IV-TR (2000). Although there were significant changes to Axes I, II, and III between the third and fourth editions of the DSM, there were no changes in criteria for determining Axis IV scores (Wayland, 2001). The only change

from the DSM-III-R to the DSM-IV for Axis V was a recommendation to use the lowest applicable score for global functioning (http://www.dsmivtr.org/2-3changes.cfm).

Family functioning. Axis IV scores based on diagnostic criteria in the DSM-III-R (1987), DSM-IV (1994), and DSM-IV-TR (2000) for problems with primary support group at admission were used as the measure of family functioning. The criterion used by clinicians to determine severity of problems in family functioning was disruption in the family due to the death of a family member, health problems of family members, separation, divorce or estrangement between the parents, domestic conflict, removal of the adolescent and/or other children from the home, remarriage of one or both parents that exacerbated stress levels within the family, sexual or physical abuse of the adolescent, parental overprotection of the adolescent and/or other children in the home, neglect of the adolescent and/or other children in the home, inadequate discipline, discord between siblings, and birth of a sibling. The level of dysfunction in the family was determined by how severely any of the above mentioned criteria impacted the functioning of the family unit. The family functioning score was based on the severity of the dysfunction in the family at the time of the adolescent's admission into the program. Family functioning scores could range from 0 to 3 with 0 = *no problems with family functioning*, 1 = *mild problems with family functioning*, 2 = *moderate problems with family functioning*, and 3 = *severe problems with family functioning*. There were no families scoring 0. Because there were few scores of 1, adolescents with family functioning scores of 1 and 2 were combined to form a category of *mild/moderate.* Thus, all adolescents had family functioning scores of either 1 (*mild/moderate*) or 2 (*severe*).

Educational functioning. Axis IV scores based on diagnostic criteria in the DSM-III-R (1987), DSM-IV (1994), and DSM-IV-TR (2000) for educational problems were used as the measure of educational functioning. Educational functioning scores could range from 0 to 3 with 0 = *no problems with educational functioning*, 1 = *mild problems with educational functioning*, 2 = *moderate problems with educational functioning*, and 3 = *severe problems with educational functioning*. The criteria used by clinicians to determine severity of educational functioning of the adolescent included problems such as: poor grades, not completing academic work, discord with teachers or classmates, and behavioral issues in the school environment. The scores for educational functioning were based on the severity of problems at the time of the adolescent's admission and discharge from the program.

To obtain scores indicative of changes in the educational functioning of the adolescents, the difference between scores assigned at admission and discharge of the patient were calculated and used as treatment outcomes for educational functioning in some of the analyses. A change score of 0 indicates that adolescents had not made any gains in their educational functioning in treatment. Negative scores (-1 to -3) indicate that there was a regression in the educational functioning of the adolescent, with a score of -3 being indicative of greater negative change. Positive scores (+1 to +3) are indicative of gains made in treatment with the higher scores reflecting greater positive changes in educational functioning.

Social functioning. Axis IV scores based on diagnostic criteria in the DSM-III-R (1987), DSM-IV (1994), and DSM-IV-TR (2000) for problems related to the social environment were used as a measure of social functioning in the current study. Scores

for social functioning could range from 0 to 3 with 0 = *no problems with social functioning*, 1 = *mild problems with social functioning*, 2 = *moderate problems with social functioning,* and 3 = *severe problems with social functioning*. The criteria used by clinicians to determine the severity of problems in social functioning were: social isolation, social skills deficits, problems with conflict negotiation, and inadequate social support. The scores for social functioning were based on the severity of the problems at the time of the adolescent's admission and discharge from the program.

To obtain scores indicative of changes in the social functioning of the adolescents, the difference between scores assigned at admission and discharge of the patient were calculated and used as treatment outcomes for social functioning in some of the analyses. As in the case of educational functioning, a change score of 0 in social functioning indicates that adolescents had not made any gains in their social functioning in treatment. Negative scores (-1 to -3) indicate that there was a regression in the social functioning of adolescents, with a score of -3 being indicative of greater negative change. Positive scores (+1 to +3) are indicative of gains made in treatment with the higher scores reflecting greater positive changes in social functioning.

Overall functioning. Overall functioning was based on Axis V, Global Assessment of Functioning (GAF) in the DSM-III-R (1987), DSM-IV (1994), and DSM-IV-TR (2000). GAF scores range from 1 to 100 and reflect an individual's global functioning based on their psychological, social, and occupational functioning. GAF scores do not take into consideration physical and environmental limitations that may impair an individual's functioning. They reflect the severity of the individual's symptoms, dynamics such as life satisfaction, judgment, thinking, and mood. GAF scores

are grouped by decile (e.g.: 1 to 10, 11 to 20, 21 to 30) in the DSM to provide ten ranges of functioning. The lowest range of scores (1 to10) in the DSM reflects extremely severe impairments in overall functioning and the highest range of scores (91 to 100) reflects superior functioning. Clinicians assigning GAF scores picked a single score from 1 to 100 that reflected the adolescent's overall functioning. For the purpose of this study, the GAF scores were collapsed into six categories: score = 1 (*GAF = 71-100*), score = 2 (*GAF = 61-70*), score = 3 (*GAF = 51- 60*), score = 4 (*GAF = 41- 50*), score = 5 (*GAF = 31- 40*), score = 6 (*GAF = 1-30*). Single scores ranging from 1 to 6 were used to indicate overall functioning. A higher score is indicative of more severe impairment in functioning. For example, an overall functioning score of 1 refers to GAF scores from 71 – 100, while a score of 6 refers to GAF scores from 1 – 30.

To obtain scores indicative of changes in the overall functioning of the adolescents, the difference between the overall functioning scores at admission and discharge were calculated and used as measures of treatment outcomes for overall functioning in some of the analyses. A change score of 0 indicates that adolescents had not made any gains in their overall functioning in treatment. Negative scores (-1 to -5) indicate that there was a regression in overall functioning of adolescents with a score of -5 reflecting the most negative change. Positive scores (+1 to +5) are indicative of overall gains made in treatment with higher scores reflecting greater positive changes in overall functioning.

Procedure

Data collection for the study was based on retrospective chart review. Original coding was assigned by clinicians who treated the adolescents at admission and

discharge. The principle investigator reviewed the charts of patients who had been discharged from residential and day treatment programs at a Midwestern state children's psychiatric facility between the years 1993 and 2006. No information that could identify patients and their families was included in the data. A preliminary review of patient charts indicated that the day treatment program at the state facility had a smaller pool of discharged patients. Therefore, the day treatment sample was identified first. Records of all adolescents between the ages of 13 and 16 who had been discharged from the day treatment program were reviewed; a sample of 43 adolescents with complete records was obtained. Adolescents discharged from the residential program were matched on age, gender, and level of family functioning with those of the day treatment sample to complete the data set.

Data that were collected from retrospective chart reviews included age, gender, race/ethnic identity of the patient, length of stay in the treatment program, level of family functioning at admission (mild/moderate or severe), level of social functioning at admission and discharge (mild, moderate, or severe), level of educational functioning at admission and discharge (mild, moderate, or severe), and level of overall functioning at admission and discharge (Axis V GAF scores ranging from 1 to 100). Data screening indicated that all the scores were within the specified ranges.

In the initial data collection, when scores on any of the variables were found to be missing, clinicians who had treated the patient were contacted. They were requested to review the patient's chart and assign the missing score. This procedure was successful for obtaining all but two of the missing scores. When the clinicians who had treated the patients with the two missing scores were found to be unavailable, the principle

investigator carried out a detailed review of the relevant charts and, based on extensive clinical records and interviews with staff that had been part of the multidisciplinary team treating the adolescent, assigned scores for the participants with missing data[1].

To obtain an additional set of outcome data to evaluate the hypotheses, a second set of scores were assigned by two independent raters who were advanced graduate students from the Doctoral program in Clinical Psychology at the University of Missouri-St. Louis. A checklist based on criteria used by the original clinician raters for social, educational, and overall functioning was created by the primary investigator to serve as a guide for the independent raters. To increase the variance of the scores and to serve as a further guide for the independent raters, the social and educational functioning scores were defined as follows: If no criteria were met, score = 0 (*no problems*), if one to two criteria were met, score = 1 (*mild problems*), if three to four criteria were met, score = 2 (*moderate problems*), if five to seven criteria were met, score = 3 (*severe problems*), and if more than seven criteria were met, score = 4 (*extremely severe problems*). The Global Assessment of Functioning (GAF) scores were based on diagnostic criteria in the DSM-IV-TR (2000). For overall functioning, the raters assigned a single score between 1 and 90, for admission and discharge. A GAF score of 90 was chosen as the upper limit for the independent ratings because there were no GAF scores higher than 90 in the original scores assigned by the clinicians. In addition, the GAF scores were collapsed into six categories: score = 1 (*GAF = 71-90*), score = 2 (*GAF = 61-70*), score = 3 (*GAF = 51-60*), score = 4 (*GAF = 41- 50*), score = 5 (*GAF = 31- 40*), score = 6 (*GAF = 1-30*). Raters had the option of rating N/A for social, educational, or overall functioning if they could not determine a score based on the information in the patient charts. However, the

[1] The means for the two variables matched the two scores assigned by the primary investigator.

raters were able to assign all scores based on the information in the charts, and there were no ratings of N/A for any of the participants.

To establish inter-rater reliability, the two independent raters were trained extensively to assign codes with the use of the criteria checklist. Charts of patients not selected for the study were used for this rater training. When significant inter-rater reliability (*kappa* > .80, $p < .01$) was established, the two raters proceeded to independently conduct retrospective chart reviews for the participants in the study. Both raters independently rated the same set of 40 patient charts on social, educational, and overall functioning at admission and discharge. Then each rater coded 23 of the remaining 46 charts.

Results

In this description of results, original clinicians will be referred to as the *clinician raters* and the scores assigned by the clinician raters will be referred to as the *clinician scores* or *clinician ratings*. The independent raters who assigned scores will be referred to as the *independent raters* and scores assigned by them will be referred to as the *independent raters' scores* or *independent ratings*. Also, for both sets of raters, when the discharge scores are used as dependent variables in the analyses, they will be referred to as *discharge* or *post- scores*. The difference between the scores assigned at admission (pre-scores) and discharge (post-scores) will be referred to as *change scores* in the analyses.

Preliminary Analyses for Clinician Ratings

Table 2 provides descriptive data for clinician scores for both treatment groups. Because the GAF scores were collapsed into six categories for the analyses, the scores for

overall functioning in the table below range from 1 – 6 with a higher score indicating greater impairment in functioning.

Table 2

Mean Clinician Ratings for Social, Educational, and Overall Functioning

	Admission (*SD*)	Discharge (*SD*)	Change (*SD*)
	Day Treatment (*n* = 43)		
Social	2.70 (.51)	1.58 (1.10)	1.12 (1.01)
Educational	2.74 (.49)	1.88 (.93)	.86 (.94)
Overall	4.40 (.62)	3.00 (1.46)	1.40 (1.55)
	Residential treatment (*n* = 43)		
Social	2.84 (.48)	2.35 (.65)	.49 (.67)
Educational	2.53 (.63)	2.30 (.64)	.23 (.61)
Overall	4.63 (.98)	3.49 (.91)	1.14 (1.15)

Significant differences were found in *t*-tests between the day and residential treatment programs for: discharge scores in social, t (2, 84) = -3.34, $p < .01$, $d = .852$, and overall functioning, t (2, 84) = -1.12, $p < .01$, $d = .403$; admission scores in educational functioning were also different for the two groups, t (2, 84) = 1.72, $p < .01$, $d = .372$.

As can be seen in Table 3, none of the change scores derived from the clinician raters violated the assumptions of normality.

Table 3

Psychometric Properties of Clinician Change Scores as Dependent Variables (N = 86)

	Mean (*SD*)	Skew (*SE* of Skew)	Kurtosis (*SE* of Kurtosis)	Range
Social Functioning	.80 (.91)	.50 (.26)	-.46 (.51)	-1 – 3
Educational Functioning	.55 (.85)	.56 (.26)	.47 (.51)	-1 – 3
Overall Functioning	1.27 (1.36)	-.27 (.26)	-.31 (.51)	-3 – 4

Table 4 provides intercorrelations between the clinician change scores. As seen below, social functioning was found to be significantly correlated with educational functioning and overall functioning. There was also a significant correlation between educational and overall functioning. The magnitude of the correlations was moderate in size and indicated that each variable contributed some unique information about the functioning of the individual. Each variable was therefore treated separately in the analyses. Further analyses of the clinician scores addressed the relationships between family functioning; treatment group; and social, educational, and overall functioning of emotionally disturbed adolescents.

Table 4

Intercorrelations Between Clinican Change Scores for Social, Educational, and Overall Functioning

Pre-post scores	1	2	3
	Adolescents (N = 86)		
1. Social Functioning	__	.402**	.417**
2. Educational Functioning		__	.371**
3. Overall Functioning (GAF)			__

** = significant at the .01 level

Preliminary Analyses for Independent Ratings

Inter-rater reliability (kappa) for a random sub-sample of 40 participants was determined for the two independent raters who assigned social, educational, and overall functioning scores. Inter-rater reliability (kappa) for the scores assigned by the independent raters is presented in Table 5.

Table 5

Interrater Reliability (kappa) Between Rater 1 and Rater 2 Scores for Social, Educational, and Overall Functioning

	1	2	3
	Adolescents (n = 40)		
1. Social Functioning			
Admission	.724**	—	—
Discharge	.830**	—	—
2. Educational Functioning			
Admission	—	.763**	—
Discharge	—	.887**	—
3. Overall Functioning (GAF)			
Admission	—	—	.807**
Discharge	—	—	.787**

** = significant at the .01 level

The significant kappa scores indicated that when the two raters independently reviewed the same pieces of clinical information in the patients' charts and assigned scores for social, educational, and overall functioning, there was an adequate degree of agreement between their scores.

The means for admission and discharge scores assigned by the independent raters as well as the means for change scores are presented in Table 6. As mentioned earlier, the scores for social and educational functioning have a greater variance than the clinician scores and range from 0 to 4, with higher scores reflecting greater severity of problems. The GAF scores for overall functioning have been categorized and range from 1 – 6 with a higher score being indicative of greater impairment in functioning.

Table 6

Mean Independent Ratings for Social, Educational, and Overall Functioning

	Admission (*SD*)	Discharge (*SD*)	Change (*SD*)
Day Treatment (*n* = 43)			
Social	2.02 (.99)	.98 (1.08)	1.05 (1.09)
Educational	1.91 (1.00)	.93 (.86)	.98 (1.06)
Overall	4.07 (1.28)	2.93 (1.59)	1.14 (1.63)
Residential treatment (*n* = 43)			
Social	2.14 (.97)	1.07 (1.08)	1.07 (1.10)
Educational	1.95 (.95)	1.26 (1.03)	.70 (.77)
Overall	4.79 (1.06)	3.35 (1.11)	1.44 (1.25)

A *t*-test indicated that there were significant differences between the day and residential treatment programs for discharge scores in educational, t (2, 84) = -1.60, $p < .05$, d = .348, and overall functioning, t (2, 84) = -1.42, $p < .01$, d = .307.

As can be seen in Table 7 below, none of the change scores derived from the clinician raters violated the assumptions of normality.

Table 7

Psychometric Properties of Independent Raters' Change Scores as Dependent Variables (N = 86)

	Mean (*SD*)	Skew (*SE* of Skew)	Kurtosis (*SE* of Kurtosis)	Range
Social Functioning	1.06 (1.09)	.22 (.26)	-.11 (.51)	-2 – 3
Educational Functioning	.84 (.93)	.42 (.26)	.46 (.51)	-1 – 4
Overall Functioning	1.29 (1.45)	-.83 (.26)	3.72 (.51)	-5 – 5

Intercorrelations between the change scores for the independent raters are presented in Table 8. Social functioning was found to be significantly correlated to educational and overall functioning, while educational functioning was found to be significantly correlated to overall functioning. The magnitude of the correlations was moderate in size and indicated that each variable contributed some unique information about the functioning of the individual. Each variable was therefore treated separately in the analyses. Further analyses with the independent raters' scores addressed the relationships between family functioning; treatment group; and social, educational, and overall functioning of emotionally disturbed adolescents.

Table 8

Intercorrelations Between Independent Raters' Change Scores for Social, Educational, and Overall Functioning

Pre-post scores	1	2	3
	Adolescents (N = 86)		
1. Social Functioning	__	.555**	.490**
2. Educational Functioning		__	.385**
3. Overall Functioning (GAF)			__

** = significant at the .01 level

Relation between Clinician and Independent Rater Scores

Correlations between the clinician and independent raters' admission scores for social, educational, and overall functioning are presented in Table 9. As seen below, the correlations for the admission scores were very low. Overall functioning scores assigned by the independent raters were moderately correlated with the clinicians' social functioning scores. Also, the overall functioning scores assigned by the independent and clinician raters were moderately correlated.

Table 9

Intercorrelations Between Clinician and Independent Raters' Admission Scores for Social, Educational, and Overall Functioning

	Clinician Scores		
	1	2	3
Independent Scores			
	Adolescents (N= 86)		
1. Social Functioning	.015	.138	.150
2. Educational Functioning	-.082	.103	.082
3. Overall Functioning (GAF)	.242*	.107	.298**

* = significant at the .05 level
**= significant at the .01 level

As can be seen in Table 10 below, there was a better correlation between clinician and independent raters discharge scores than was seen with the admission scores. Overall functioning scores assigned by the independent raters were found to be moderately correlated with clinicians' scores for social, educational, and overall functioning.

Table 10

Intercorrelations Between Clinician and Independent Raters' Discharge Scores for Social, Educational, and Overall Functioning

	Clinician Scores		
	1	2	3
Independent Scores			
	Adolescents (N= 86)		
1. Social Functioning	.092	.089	.213*
2. Educational Functioning	.118	.125	.105
3. Overall Functioning (GAF)	.340**	.346**	.350**

* = significant at the .05 level
**= significant at the .01 level

Correlations between the clinician and independent change scores are seen in Table 11. There were very low correlations between the two sets of change scores. As Table 11 indicates, a moderately significant correlation was found between the clinician and independent change scores for overall functioning only.

Table 11

Intercorrelations Between Clinician and Independent Raters' Change Scores for Social, Educational, and Overall Functioning

	Clinician Scores		
	1	2	3
Independent Scores			
	Adolescents (N= 86)		
1. Social Functioning	-.012	.125	.208
2. Educational Functioning	.015	.074	.085
3. Overall Functioning (GAF)	-.007	.163	.322**

** = significant at the .01 level

Separate correlations were also carried out with admission and discharge scores for the day and residential treatment sub-samples and are reported in Table 12. For the day treatment group, independent raters' social functioning discharge scores were moderately correlated with clinician admission scores for social and educational functioning. The independent raters' admission and discharge scores for overall functioning were moderately correlated with clinician ratings for social functioning at discharge. The overall functioning discharge scores were also moderately correlated with clinician assigned social scores at admission and educational scores at discharge.

For the residential group only the overall functioning discharge scores assigned by the independent and clinician raters were significantly correlated.

Table 12

Intercorrelations Between Clinician and Independent Raters' Discharge Scores for Social, Educational, and Overall Functioning: Day and Residential Groups

	Clinician Scores					
	1		2		3	
	Pre	Post	Pre	Post	Pre	Post
Independent Scores						
Day Treatment (n = 43)						
1. Social Functioning						
Pre	.109	.124	.208	.135	.181	.030
Post	.382*	.119	.302*	.238	.157	.182
2. Educational Functioning						
Pre	-.148	.128	-.050	.064	.108	-.072
Post	.175	.292	.183	.230	.187	.140
3. Overall Functioning (GAF)						
Pre	.253	.304*	.218	.151	.197	.020
Post	.450**	.371*	.280	.385*	.001	.288
Residential Treatment (n = 43)						
1. Social Functioning						
Pre	-.093	-.127	.109	-.256	.116	-.041
Post	-.108	.033	-.056	-.115	.029	.262
2. Educational Functioning						
Pre	-.019	-.115	.241	-.017	.057	-.028
Post	-.091	-.198	.152	-.058	.136	.027
3. Overall Functioning (GAF)						
Pre	.194	.265	.136	-.022	.358*	.251
Post	-.009	.187	.101	.211	.073	.444**

*= significant at the .05 level
** = significant at the .01 level

Analysis of Change as Measured by Clinician Ratings

Two separate multivariate analyses of variance (MANOVA) were conducted to examine the relation between family functioning at the start of treatment and treatment outcomes in social, educational, and overall functioning for adolescents in day and residential programs using the clinician ratings. Both analyses comprised a 2 x 2 (family functioning scores at admission [mild/moderate or severe] by treatment group [day and residential treatment]) MANOVA. For both the MANOVA analyses, length of stay in the program was included as a covariate because it was found to be moderately related to social (r = -.311, p < .01), educational (r = -.338, p < .01), and overall functioning at discharge (r = -.275, p < .05). Because lower scores are indicative of better social, educational, and overall functioning, negative correlations between the length of stay and outcome variables mean that a longer stay in a treatment program was related to better functioning at discharge.

For the first MANOVA, discharge scores for social, educational, and overall functioning served as the dependent variables, with their corresponding admission scores treated as covariates to control for initial functioning. In the second MANOVA, the change scores for social, educational, and overall functioning served as the dependent variables.

In the first MANOVA, Box's M (F = 1.786, p < .05) was significant, indicating that there was a violation of the assumption that the observed covariance matrices of the dependent variables were equal across groups. However, the statistical procedures used are considered robust for the type of violation found in this sample, so no alterations were necessary for the planned analyses (Tabachnick & Fidell, 2001).

Contrary to hypotheses, in the first MANOVA, with discharge scores as the dependent variables, there were no significant main or interaction effects for family functioning or treatment group. In addition, significant effects were not found for the covariate length of stay. The admission scores for educational and overall functioning were also not found to be related to the dependent variables. However, the covariate, social functioning at admission, was found to be significantly related to the dependent variables, F (3, 76) = 4.356, $p < .01$, $\eta^2 = .147$. Further analyses indicated that social functioning at admission was moderately related to social ($r = .392$, $p < .01$), educational ($r = .396$, $p < .01$), and overall ($r = .321$, $p < .01$) functioning at discharge, suggesting that adolescents who had less impairment in social functioning at admission did better in their social, educational and overall functioning at discharge.

Although there were no significant main or interaction effects for treatment group and family functioning on the dependent variables, initial descriptive analyses for clinician data (see Table 2), had suggested that adolescents in the day treatment program made greater gains in treatment in their social, educational, and overall functioning than adolescents in the residential treatment program. To explore possible differences in treatment outcome for the two groups, univariate analyses were examined for each treatment outcome. As seen in Table 13, the univariate analyses confirmed expectations of differences in the outcomes for the two treatment groups. The type of treatment program had a significant main effect on social functioning, with adolescents in the day treatment program demonstrating significantly greater improvements in their social functioning at discharge than adolescents in the residential program. However, the type of treatment program did not have a significant effect on educational and overall

functioning. In addition, there were no main univariate effects for family functioning on the social, educational, or overall functioning of the patients. Results from the analyses also indicated that there were no significant interaction effects between family functioning and type of treatment group on the outcome variables.

The covariate factors, admission scores for educational and overall functioning, did not have significant main effects on any of the dependent variables indicating that adolescent's educational and overall functioning at admission was not significantly related to the discharge scores. However, the covariate, social functioning at admission, was found to be significantly related to social functioning at discharge, F (1, 85) = 10.255, $p < .01$, $\eta^2 = .116$, educational functioning at discharge, F (1, 85) = 6.195, $p < .05$, $\eta^2 = .074$, and overall functioning at discharge, F (1, 85) = 8.418, $p < .05$, $\eta^2 = .097$. Adolescents with better social functioning at admission improved in their social, educational, and overall functioning at discharge. These findings suggest that social functioning at admission may have greater relevance to treatment outcomes than educational or overall functioning at the time of admission.

The covariate, length of stay, was found to be significantly related to the educational functioning of adolescents at discharge, F (1, 85) = 4.548, $p < .05$, $\eta^2 = .055$. Adolescents who stayed longer in a treatment program were found to have better educational functioning scores at discharge ($r = -.338$, $p < .01$). A t-test had indicated that adolescents in the day treatment group had a significantly longer stay in treatment. They also had significantly more impairment in educational functioning at admission so they had to make greater gains to have better discharge scores than the residential patients. Further examination of the mean scores for the two treatment groups suggests

that adolescents in the day treatment program had better discharge scores in their educational functioning than the residential patients, but as mentioned earlier, this difference was not statistically significant.

Table 13

Multivariate Analysis of Variance (MANOVA) with Pre and Post Scores for Social, Educational, and Overall Functioning

Variable	*df*	*F*	η^2	*p*
Tests of Between-Subjects Effects				
Family functioning				
Social Functioning	1	.172	.002	.68
Educational Functioning	1	.045	.001	.83
Overall Functioning	1	.296	.004	.59
Treatment group				
Social Functioning	1	4.184*	.051	.04
Educational Functioning	1	.622	.008	.43
Overall Functioning	1	.387	.005	.54
Treatment group X Family Functioning				
Social Functioning	1	.032	.000	.86
Educational Functioning	1	.003	.000	.96
Overall Functioning	1	.052	.001	.82

* = significant at the .05 level

A second MANOVA was conducted using change scores for social, educational, and overall functioning as the dependent variables. Box's M was not significant, indicating that there was no violation of the assumption that the observed covariance matrices of the dependent variables was equal across groups. Contrary to expectations, but consistent with the first analyses, the multivariate analysis did not indicate significant main or interaction effects for family functioning or treatment group. The covariate, length of stay, also did not have a significant effect on the dependent variables. However, because descriptive data as well as findings from the univariate analyses following the first MANOVA had indicated that the type of treatment program may have important clinical implications, the univariate analyses were examined. As seen in Table 14, the univariate analyses from this analysis confirmed that there was a significant difference between the two treatment programs in the changes made by adolescents in their social functioning by discharge. Adolescents in the day treatment program demonstrated more positive changes in their social functioning than adolescents in the residential treatment program, but these differences in the change scores were not significant in a *t*-test. There were no significant univariate effects for the type of treatment program on the change scores for educational and overall functioning. Univariate effects for family functioning or interaction effects were also not significant.

Table 14

Multivariate Analysis of Variance (MANOVA) with Change Scores for Social, Educational, and Overall Functioning

Variable	*df*	*F*	η^2	*p*
Tests of Between-Subjects Effects				
Family functioning				
Social Functioning	1	.141	.002	.71
Educational Functioning	1	.020	.000	.89
Overall Functioning	1	.226	.003	.64
Treatment group				
Social Functioning	1	4.165*	.049	.05
Educational Functioning	1	3.731	.044	.06
Overall Functioning	1	.082	.001	.78
Treatment group X Family Functioning				
Social Functioning	1	.156	.002	.69
Educational Functioning	1	.255	.003	.62
Overall Functioning	1	.081	.001	.78

* = significant at the .05 level

Analysis of Change as Measured by Independent Raters

Two 2 x 2 (family functioning scores at admission [mild/moderate or severe] by treatment group [day and residential treatment]) MANOVAs were conducted using scores assigned by the independent raters for social, educational, and overall functioning. In the first MANOVA, discharge scores for social, educational, and overall functioning served as the dependent variables. Adolescent length of stay in the program and admission scores for social, educational, and overall functioning were treated as covariates to control for initial functioning. Box's M was not significant, indicating that there was no violation of the assumption that the observed covariance matrices of the dependent variables was equal across groups. In the second MANOVA, change scores served as the dependent variables and length of stay was treated as a covariate.

Contrary to expectations, in the first multivariate analysis with discharge scores as the outcome variables, there was no significant main or interaction effects for family functioning or treatment group. These multivariate findings are consistent with the results of the multivariate analyses using the clinicians' ratings. Also, consistent with findings from the clinician data, the covariate, length of stay F (3, 76) = 3.448, $p < .05$, $\eta^2 = .120$, was significantly related to the outcome variables. Further analyses indicated that a longer stay in treatment was related to better social ($r = -.287$, $p < .01$) and educational ($r = -.222$, $p < .01$) functioning at discharge. As mentioned earlier, patients in the day treatment program had a significantly longer stay in treatment than residential patients. While *t*-tests did not reveal significant differences between the discharge scores for social functioning in the two treatment groups, the difference in the educational functioning was significant, with day treatment patients demonstrating more improvements at discharge.

The covariates social, F (3, 76) = 14.026, $p < .01$, $\eta^2 = .356$, educational, F (3, 76) = 21.529, $p < .01$, $\eta^2 = .459$, and overall scores at admission, F (3, 76) = 1885.961, $p < .01$, $\eta^2 = .987$ were also found to be positively related to their corresponding discharge scores.

Although the MANOVA was not significant, in the univariate analyses using clinician's data, there were differences in the treatment outcomes for the day and residential programs. Therefore, univariate analyses were performed using the independent rater's scores. In the univariate analyses, the type of treatment program had a significant main effect on the overall functioning of adolescents, suggesting that adolescents in one of the programs had better treatment outcomes in their overall functioning. The mean independent rater scores (see Table 6) show lower discharge scores in overall functioning for day treatment (M = 2.93) when compared to the residential scores (M = 3.35). An earlier t-test had indicated that this difference between the overall functioning discharge scores for the day and residential treatment groups was significant, with adolescents in the day treatment program demonstrating greater improvement at discharge. .

There were no significant univariate main effects of treatment program for social or educational functioning. Family functioning at admission was found to have a significant univariate main effect on the educational functioning of adolescents. Adolescents from mild/moderate as well as severely dysfunctional families had similar mean scores in their educational functioning at admission. The mean educational functioning score at admission was 1.90 for patients from mild/moderately dysfunctional families and 1.94 for those coming from severely dysfunctional families. However, at the time of discharge, adolescents from mild/moderately dysfunctional families had made

greater improvements in their educational functioning (M = .80), than patients from severely dysfunctional families (M = 1.18). However, these changes should be interpreted with caution because there were far fewer families with mild/moderate dysfunction (n = 20) than those with severe dysfunction (n = 66) in the sample. Also, a t-test did not indicate a significant difference in the educational functioning discharge scores between the mild/moderate and severely dysfunctional families. Family functioning did not have a significant effect on social or overall functioning. Further, there were no significant interaction effects between family functioning and type of treatment group on the outcome variables.

Similar to the findings from the clinician data, the covariate, length of stay, was significantly related to the overall functioning of adolescents at discharge, F (1, 85) = 10.022, p<.05, η^2= .114, with a longer stay in treatment related to better outcomes. Day treatment patients had a longer stay in the program and did significantly better in their overall functioning at discharge than the residential patients. The covariate factors, admission scores for social, educational, and overall functioning were significantly related to their corresponding discharge scores: social functioning at admission was positively related to social functioning at discharge, F (1, 85) = 24.045, p < .01, η^2= .236; educational functioning at admission was positively related to educational functioning discharge, F (1, 85) = 35.769, p < .05, η^2= .314; and overall functioning at admission was positively related to overall functioning at discharge, F (1, 85) = 4379.37, p < .05, η^2= .983.

Table 15

Multivariate Analysis of Variance (MANOVA) with Independent Raters' Scores for Social, Educational, and Overall Functioning

Variable	*df*	*F*	η^2	*p*
Tests of Between-Subjects Effects				
Family functioning				
Social Functioning	1	.215	.003	.64
Educational Functioning	1	4.758*	.057	.03
Overall Functioning	1	1.962	.025	.17
Treatment group				
Social Functioning	1	.000	.000	.99
Educational Functioning	1	.489	.006	.49
Overall Functioning	1	4 .448*	.054	.03
Treatment group X Family Functioning				
Social Functioning	1	.781	.010	.38
Educational Functioning	1	.048	.001	.83
Overall Functioning	1	.018	.000	.90

* = significant at the .05 level

A second 2 x 2 (family functioning by treatment group) MANOVA was conducted using change scores for social, educational, and overall functioning as the dependent variables. Box's M ($F = 2.231$, $p < .01$) was significant, indicating that there was a violation of the assumption that the observed covariance matrices of the dependent

variables were equal across groups. However, as mentioned before, the statistical procedures used are considered robust for the type of violation found in this sample, so no alterations were necessary for the planned analyses (Tabachnick & Fidell, 2001). Adolescent length of stay in the program was treated as a covariate. Contrary to expectations, but consistent with previous multivariate analyses, there were no significant main or interaction effects for family functioning and treatment group on the dependent variables. However, consistent with previous analyses, the covariate, length of stay, was significantly related to the change scores as dependent variables, F (3, 76) = 4.615, $p <$ .01, $\eta^2 = .149$. Longer participation in a treatment program was found to be positively related to changes in educational ($r = .250$, $p < .01$) and overall ($r = .255$, $p < .05$) functioning at discharge.

Because previous univariate analyses had suggested that the type of treatment program and family functioning were relevant to some of the treatment outcomes, univariate analyses were performed. Consistent with the univariate analyses using independent raters' discharge scores as the dependent variables, in the univariate analyses using change scores (see Table 16), there was a significant difference in the two treatment programs on the changes made by adolescents in their overall functioning. As explained in the earlier MANOVA, adolescents in the day treatment program had better discharge scores in their overall functioning. However, the independent raters' scored residential patients as having greater severity in their overall functioning at admission. When the mean change scores in overall functioning for both treatment groups is examined, the data suggest that the residential group made more gains in overall functioning, but this difference was not found to be statistically significant. There were

no significant main effects for treatment program in social and educational functioning or for family functioning on the outcome variables. Results from the univariate analyses did not indicate significant interaction effects between family functioning and type of treatment group.

Consistent with previous analyses, the covariate, length of stay, was significantly related to the change scores for social F (1, 85) = 5.307, p<.05, η^2= .061, educational F (1, 85) = 4.999, p<.05, η^2= .058, and overall functioning, F (1, 85) = 12.886, p<.01, η^2= .137, suggesting that patients who stayed longer in treatment demonstrated more gains. Day treatment patients had a significantly longer stay in treatment, but the differences in the change scores between the two treatment groups for all three outcome variables were not significant.

Table 16

Multivariate Analysis of Variance (MANOVA) with Independent Raters' Change Scores for Social, Educational, and Overall Functioning

Variable	*df*	*F*	η^2	*p*
Tests of Between-Subjects Effects				
Family functioning				
Social Functioning	1	.471	.006	.50
Educational Functioning	1	3.547	.042	.06
Overall Functioning	1	2.228	.027	.14
Treatment group				
Social Functioning	1	.590	.007	.44
Educational Functioning	1	.017	.000	.90
Overall Functioning	1	5 .422*	.063	.02
Treatment group X Family Functioning				
Social Functioning	1	.576	.007	.45
Educational Functioning	1	.002	.000	.96
Overall Functioning	1	.020	.000	.89

* = significant at the .05 level

Summary of Results

Contrary to expectations, in the multivariate analyses with clinician scores, there were no significant main or interaction effects for treatment group or family functioning on social, educational, and overall functioning of adolescents. However, adolescents who

had less severe social functioning at admission did better in their social, educational, and overall functioning at discharge. An examination of the univariate analyses indicated that there was a significant difference in the two treatment groups in social functioning at discharge, with adolescents in the day treatment program demonstrating significantly greater improvements in their social functioning than those in the residential program. These findings are consistent with the day treatment program's emphasis on social skills training for patients.

The findings also indicated that patients who remained in treatment longer made more gains in their educational functioning. Further examination of the data suggested that patients in the day treatment program had better discharge scores in their educational functioning, but the difference in the educational discharge scores between the two treatment groups was not statistically significant. Patients in the day treatment program also had a significantly longer stay than those in residential treatment. Although both treatment programs followed similar special education curriculums, adolescents in the day treatment program had a longer stay because they were transitioned out of the program gradually before being discharged to the next level of care.

Results from a second set of multivariate analyses, using admission and discharge scores compiled by an independent set of raters, were consistent with findings from the clinician data. Contrary to initial expectations, even with data from the independent raters, there were no significant multivariate main or interaction effects of treatment group or family functioning on the outcome variables. However, in the univariate analyses there were differences in the two treatment programs on the overall functioning of patients, with adolescents in the day treatment program demonstrating significantly

more improvement in their overall functioning than the residential patients. In addition, a longer stay in treatment was also significantly related to the change scores for social, educational and overall functioning of adolescents. As mentioned earlier, the day treatment adolescents had a significantly longer stay in the program than the residential patients. The results also indicated that better social, educational, and overall functioning scores at admission were positively related to their corresponding treatment outcomes.

In the univariate analyses, adolescents, who came from families with mild to moderate problems in family functioning at admission, demonstrated more improvements in their educational functioning at discharge. Adolescents from both treatment programs were assigned similar admission scores for educational functioning by the independent raters. However, patients whose family dysfunction at admission was rated as mild/moderate had better educational functioning scores at discharge. Also, the difference between the discharge scores for educational functioning between the mild/moderate and severely dysfunctional families was not statistically significant.

Discussion

This study addressed the relation of family functioning at admission to the social, educational, and overall functioning of emotionally disturbed adolescents in day and residential treatment programs. Contrary to expectations, the results did not support the main research questions. There was no evidence to support the hypotheses that adolescents from severely dysfunctional families at admission would have better treatment outcomes in residential treatment or that those from less severely dysfunctional families would make gains in day treatment. Although analyses did not provide support for the hypotheses, univariate analyses suggested that the type of treatment program and

the severity of dysfunction in families at admission were independently related to the outcome measures. In addition, the patient length of stay was significantly related to the outcome measures.

Multivariate analyses of clinician and independent raters' data failed to confirm main or interaction effects of treatment group and family functioning on social, educational, and overall functioning of adolescents. However, because of significant univariate effects, and given the potential clinical utility of these findings, univariate analyses were examined and reported for both sets of data.

Relation of Treatment Program to Outcomes

In this study, univariate analyses of the clinician data indicated that adolescents in the day treatment program made significantly more improvements in their social functioning by discharge than adolescents in the residential program. However, univariate analyses using the independent ratings did not corroborate this finding. Despite these discrepant findings, univariate analyses using the independent ratings indicated that adolescents in the day treatment program demonstrated significantly more gains in their overall functioning by discharge than the residential patients. In both clinician and independent raters' data, day treatment and residential patients did not have significant differences in their admission scores for social and overall functioning. However, the significant gains shown by day patients at discharge suggest that they were better able to make improvements during the course of treatment in the day program.

The findings that adolescents in day treatment made more gains than residential patients in their social and overall functioning by discharge have important implications for the treatment of emotionally disturbed adolescents. Although the independent scores

did not indicate a significant difference in social functioning at discharge between the two treatment groups, the day treatment program's emphasis on social skills training may provide an explanation of the clinician results and an avenue for future research. Social skills training may be associated with a reduction in emotional and behavioral problems that may have contributed to improving the overall functioning of adolescents.

The extant research supports the importance of social skills training to the overall functioning of emotionally disturbed patients. Because adolescents who attend day treatment programs live at home and are a part of their communities, day programs focus on social skills' training as an important component of treatment. Research has suggested that patients with deficits in social skills have limited abilities to develop peer relations, and this impairment in their social functioning can affect their overall functioning by exacerbating emotional and behavioral problems (Grizenko, Papineau & Sayegh, 1993). By addressing impairments in social functioning, day treatment programs may foster better treatment outcomes in emotionally disturbed adolescents. This is consistent with the research done by Grizenko (1997), who found better social functioning even five years after discharge in patients who had attended a day treatment program. Early research by Friedman, Quick, Mayo, and Palmer (1982), had also suggested that combining social skills training with other therapeutic services for adolescents attending a day treatment program helped patients develop skills that improve overall functioning.

In addition to significant differences in social and overall functioning at discharge between the two treatment groups, the mean discharge scores from both sets of data showed that the day treatment patients made more improvements than the residential patients in their educational functioning. However, the small sample size and low power

made it difficult to detect significant differences in the multivariate analyses between the treatment groups on the outcome measures.

Relation of Family Functioning to Outcomes

In the univariate analyses with clinician data, there were no significant effects of family functioning on the outcome measures. However, univariate analyses with independent raters' data indicated that family functioning at admission had a significant effect on the educational functioning of adolescents in both treatment groups at discharge. Adolescents whose families were rated as less severely dysfunctional at admission demonstrated more improvements in their educational functioning by discharge.

The existing research suggests that families have an important role in the educational functioning of emotionally disturbed patients. Prentice-Dunn, Wilson, and Lyman (1981) had reported in their study with 50 children discharged from a day treatment program that parental involvement was a significant predictor of the behavioral outcome and academic success of children. These results are supported by Grizenko (1997), who found that parental involvement in a treatment program improves patients' prospects of returning to a regular education classroom. While this line of research is suggestive, the effect of the severity of family dysfunction at admission to treatment outcomes has not been addressed by previous researchers.

The current finding that there are differences in educational functioning at discharge between less and more severely dysfunctional families in both treatment groups is an important contribution that should be considered by future researchers. A plausible explanation for the educational gains made by adolescents in the day program could be

that families with less severe dysfunction at admission are able to provide a better learning environment for their adolescent at home. The home situation of less dysfunctional families would likely be calmer and less chaotic for adolescents. For adolescents from less severely dysfunctional families in both treatment programs, and especially for patients in the residential program who do not live at home, gains made in educational functioning may also be attributed to greater participation by their families in treatment and better collaboration with the treatment team in treatment planning and implementation.

Relation of Length of Stay to Outcomes

Although the main research questions were not supported, the data suggest that the length of stay in treatment had a significant effect on the outcome measures, with a longer stay in treatment associated with more improvements. In this study, the length of stay for adolescents in the day treatment program was significantly longer than the length of stay for the residential group. The results from the clinician data indicated that the length of stay was significantly related to the educational functioning of adolescents at discharge, but there was no statistical significance in the educational discharge scores for the day and residential group. When the independent raters' data was examined, the length of stay was significantly related to overall functioning at discharge with adolescents in the day treatment group making significantly more gains than the residential patients.

The finding from the independent ratings in this study that a longer stay in treatment was related to greater improvements in overall functioning in day treatment patients may stem from the day treatment program's protocol to gradually transition

adolescents to the next level of care. When patients are ready for discharge, they spend part of the day at the next placement, but continue to attend the day treatment program for a few hours every day so that they can participate in treatment while they make the transition to their new environment. In contrast, when residential patients are discharged to the next level of care, their treatment is terminated at the facility, so they have a shorter stay in the treatment program when compared to day treatment patients.

The independent raters' data also indicated that the length of the stay was significantly related to the change scores in social, educational, and overall functioning. However, the difference between the day and residential patients in their change scores, that is, the changes made between admission and discharge in the outcome variables, was not significant. Extant research has not addressed the comparative benefits of longer stay in treatment between day and residential groups. A study by Hussey and Guo (2005) found that over a 5-year period, severity in symptoms was related to a longer stay in residential treatment, but they did not investigate treatment outcomes for the patients.

Limitations of the Current Study

To explore the main research questions, two different sets of scores were used as outcome measures. The original clinician scores comprised one set of measures, and the scores for the outcome variables assigned by two trained independent raters comprised a second set of measures. However, the correlations between the clinician and independent scores were lower than expected. A possible explanation for the low correlations could be that the experiential interactions that the clinicians had with the patients contributed to their clinical judgment when they assigned the scores at admission and discharge. In

contrast, the independent raters assigned scores based solely on the documentation available to them in the patients' charts.

Although the correlations between the clinician and independent raters' scores were low, significant correlations were found between their admission, discharge, and change scores for overall functioning. While the clinician and independent raters' scores were assigned at different times and were based on somewhat different sets of information, there was a significant correlation between the overall scores. The significant correlations between the two sets of overall functioning scores may mean that, for the sample in the current study, overall functioning was a more valid indicator of clinical change.

Correlations between the clinician and independent scores were also examined separately for the two treatment groups. For the day treatment group, there were no significant correlations between the clinician and independent scores for the same variables. However, in the residential group, there were significant correlations between the clinician and independent scores for overall functioning at admission and overall functioning at discharge. A possible explanation for the significant correlations between the clinician and independent overall functioning scores for the residential group can be found in the manner in which clinical information was documented in the residential charts. Clinicians in the residential program document treatment changes based on a medical model of symptom reduction in patients that is more reflective of overall functioning. More detailed information on overall functioning in the residential charts may have provided the independent raters with adequate information to assign admission and discharge scores that correlated significantly with the clinician scores for the

residential program. Similar information about overall functioning based on the medical model was less documented in day treatment charts.

A significant limitation of this study that limited the power to detect any main and interaction effects for family functioning and treatment group on the outcome variables was the small sample size. A larger sample size would have increased the power to detect any possible combined effects. An additional limitation of this study was the use of clinical data from patient charts and non-availability of other measures for family functioning and the outcome variables. An attempt was made to address this limitation by increasing the variance of scores for the outcome variables assigned by the independent raters. However, the small sample size meant that there was low power to detect any effects. It is important to note that although the findings did not support the main research questions, the results from the independent rater data confirmed some of the findings derived from the clinician data, thereby adding to the evidence that treatment group and family functioning are important variables in treatment outcomes.

Another significant limitation of this study is that adolescents were not randomly assigned to the two treatment groups. Therefore, although there were significant differences between the day and residential adolescents in some of the outcome variables, it is not possible to infer that the type of treatment group had an effect on treatment outcomes. Also, the significant difference in the length of stay between the two treatment groups is a limitation of this study. When the length of stay was controlled in the univariate analyses, there were differences in the two treatment groups for social and overall functioning. However, the length of stay was also found to have an effect on the outcome variables. Because adolescents in the day treatment program had a significantly

longer stay in treatment than the residential patients, the effects of the two variables, treatment group and length of stay, were conflated.

The issue of shared method variance is another limitation of this study because the constructs for this study were assessed by the same method, i.e. using scores from the DSM. Another major limitation of this study is the use of data derived from Axes IV and V scores in the DSM-III-R, DSM-IV, and DSM-IV-TR. The DSM is a multi-axial manual that serves as a diagnostic tool for clinicians. Scores for Axes IV and V, based on diagnostic criteria in the DSM, serve an important clinical purpose. But extant research has not addressed the reliability and validity of using Axis IV scores from the DSM-III-R, DSM-IV, and DSM-IV-TR for clinical research. Hilsenroth et al (2000) reported moderate reliability and validity for Axis V scores from the DSM-IV. However, they used GAF scores from the DSM-IV and two experimental scales to assess the relational, social, and occupational functioning of adults in an outpatient clinic with mild to moderate psychopathology.

Despite these limitations, this study has important clinical relevance. It addresses the differential utility of day and residential treatment programs. There is very little research that has compared treatment outcomes of day and residential treatment programs, so this study makes an important contribution to the existing research. It also highlights the importance of social functioning in the treatment of seriously emotionally disturbed adolescents. Often, treatment in mental health facilities tends to focus on symptom reduction. Historically, social functioning has been a domain addressed by day treatment programs (Kiser et al, 1984), and the results from this study are consistent with previous findings that social skills training is an important component of treatment for

emotionally disturbed patients that can improve their overall functioning (Friedman, Quick, Mayo, & Palmer, 1982).

Directions for Future Research

Despite the limitations of this study, the issues identified should be addressed by future researchers. Data for this study were comprised of scores from Axes IV and V of the DSM-IV that served as measures of family, social, educational, and overall functioning in adolescents. GAF scores are not widely used as measures of overall functioning (Goldman, Skodol & Lave, 1992). Similarly, while extensively used in clinical work, Axis IV scores have seldom been used in research. The relevance of family functioning to the differential utility of day and residential programs is an important area of research. In the future, researchers should consider using other measures such as: Family Adaptability and Cohesion Evaluation Scale- Version III (FACES-III) to assess family functioning (Olson, 1985); achievement tests such as the Wide Range Achievement Test- IV (WRAT-IV) to assess educational functioning; and Child Behavior Check List (CBCL) or Behavior Assessment System for Children (BASC) to assess social functioning. The use of standardized measures will address issues of shared method variance as well as reliability and validity of scores.

One of the practical limitations of designing a long-term study with measures administered at admission and discharge is that such studies can be expensive to conduct. It can also be challenging to obtain data from clinical populations. However, these limitations should not deter researchers from addressing the issues that were addressed in the current study. The methodology used in the current study can serve as a model for future researchers who must collect data at one point in time. Researchers using clinical

data can derive a second set of measures by having independent raters assign scores based on retrospective chart review. In this manner, two sets of data can be derived at the same time.

There are demographic factors that may be examined in future research. Due to a disproportionate ratio of boys to girls in the sample, gender differences could not be addressed in this study. Future research should examine the relevance of gender, socio-economic status and racial/ethnic group to treatment outcomes.

Although this study did not find family functioning to be relevant to the differential utility for day and residential treatment programs, the results of this study have highlighted the salience of social functioning in the treatment of seriously emotionally disturbed adolescents. The importance of social skills training in day treatment has been addressed to a greater degree in the literature than its relevance in residential treatment (Grizenko, 1997; Joshi and Rosenberg, 1997). The improvements made in social and overall functioning by adolescents in the day treatment sample of this study lend support to the day treatment program's philosophy of addressing social deficits in emotionally disturbed patients.

This study also makes a unique contribution to the extant literature in highlighting the importance of the length of stay in treatment. Although earlier research has suggested that patients with more severe impairment tend to stay in treatment longer (Hussey & Guo, 2005), this study suggests potential benefits of a gradual transition to the next level of care, which may allow patients to maximize the gains from treatment. Ultimately, both residential and day treatment programs are important in the mental health care of emotionally disturbed adolescents. Gaining a better understanding of factors that can

improve social, educational, and overall functioning for seriously emotionally disturbed adolescents can help optimize the utility of both types of treatment programs.

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