VARIATIONS IN DELIVERY OF SPECIFIC PROCESS

AND CONTENT COMPONENTS OF

THE STRENGTHENING FAMILIES PROGRAM

By

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Abstract

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The present study examined the relation of adherence to specific content and process components to outcomes in the Strengthening Families Program for Parents and Youth 10-14. The present study is a reanalysis of a global study of adherence and outcomes. The majority of studies of implementation quality assess implementation globally. The present study demonstrated the importance and utility of considering delivery of specific content and process components when assessing implementation quality. The previous global assessment found no relation of adherence to outcome.

The sample included 11 program implementations in Washington State. Nested within those programs were 47 facilitators, 133 parent participants, and 144 youth participants. Observers rated adherence of program delivery. Parents and youth completed pretests and posttests measuring targeted outcomes. Program elements were coded into content and process categories. Correlation analyses revealed which components were related to outcomes. Correlations between adherence to components and youth outcomes were trivial. However, adherence to several components was significantly correlated with the parent outcome. I followed up significant correlations for parents with hierarchical multilevel analyses to assess

individual level predictors of outcome and to check for interactions of adherence and minority status.

Hierarchical multilevel analyses revealed that the relationship of adherence to outcomes was moderated by minority status for parents. I discuss implications for program facilitators, evaluators, and prevention science and highlight strengths and limitations.

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CHAPTER 1

Introduction

The goal of the present study is to determine whether variations in the delivery of standardized program content are related to targeted program outcomes. Federal and state agencies endorse and disseminate prevention programs that have been shown effective in randomized controlled trials (RCTs). Success of these programs depends on high quality implementation when they are translated into real-world settings, outside the context of a controlled research environment. In the study of evaluation, implementation quality has been neglected (Fixsen, Naoom, Blase, Freidman, & Wallace, 2005; Rogers, 1995). When conducted, studies of implementation quality usually consist of global assessments of how much or how well program content was implemented rather than assessing implementation of specific types of program process and content. Such a breakdown of implementation assessment into specific aspects of process and content is referred to as component analysis.

Global assessments of the completeness or quality of delivery do not provide information regarding the importance of specific program activities. Component analysis can provide information regarding the implementation of specific processes and content and their contribution to outcome. When researchers and stakeholders know the contribution of specific components, they are better able to utilize results from studies of implementation. In the present study, I conduct a component analysis of a family based prevention program, the Strengthening Families Program for Parents and Youth 10-14 (SFP).

I review the current state of implementation assessment and demonstrate the need for component analysis. The present study is an extension of a previous study of global adherence to program content in a multi-site implementation of SFP. That study found no relation of overall

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adherence to program outcome. The goal of the current study is to determine whether implementation, when measured as adherence to specific components of program process and content, is related to program outcome.

This is the first study of the SFP to examine process and content on so specific a level. This thesis provides valuable information for stakeholders regarding the implementation of the SFP, and demonstrates how component analysis can increase the utility of implementation assessment.

History and Overview

In the 1960s the federal government devoted large amounts of money to social programs. These Great Society programs addressed a variety of issues including mental health, poverty, housing, welfare, and family functioning (Patton, 1997). In the 1970s programs competed with the Vietnam War for funding. Evaluation emerged as a means for identifying programs worth funding (Patton). Many early evaluation studies focused on program effectiveness. As the field of evaluation developed, issues other than outcome came to be of interest. In the mid to late 1970s evaluation of implementation became a central issue. Researchers began to question the assumption that adopting agencies implemented innovations as intended. For example, the Rand project studied the implementation of educational innovations throughout the United States (Berman & McLaughlin 1976).

Fullen and Pomfret (1977) reviewed the Rand project and several other early studies of implementation of innovations in education. They demonstrated the importance of assessing implementation. Fullen and Pomfret found that often, the actual use of innovations differed from the intended use. In addition, studies that assessed implementation and outcome showed that quality of implementation was often associated with outcomes. Fullen and Pomfret also observed

that implementation was conceptualized and measured in different ways. They identified two broad implementation orientations: The fidelity orientation (a belief that innovations should be implemented as originally intended) and the adaptation orientation (a belief that innovations should be modified to better suit the population and context in which they are delivered). Fullen and Pomfret also demonstrated the need for component analyses. They found that some components were implemented more effectively than others; some components were more difficult to implement; and that specific components have different contributions to outcome.

I highlight these issues because thirty years later, they are still important in implementation assessment. The following review of literature discusses these issues in greater detail. I first discuss the importance of studying implementation, then current conceptualizations of implementation. I discuss how implementation has been measured, and demonstrate the need for component analyses. I introduce the SFP and review assessments of its implementation. Finally, I introduce the goals of the current study, my research questions and hypotheses.

The Importance of Studying Implementation

The Preventive Intervention Research Cycle

Mrazek and Haggerty (1994) described the preventive intervention research cycle as composed of the following stages: (a) problem analysis, (b) information review, (c) program design and pilot testing, (d) advanced testing, and (e) dissemination. A feedback loop informs program theory and design based on the outcomes of the cycle. Figure 1 provides a graphic representation of this cycle.

The first stage, problem analysis, consists of a needs assessment. Program developers determine the need for prevention programs by reviewing epidemiological information about specific problems, their costs to society, and by assessing community concern. In stage two,

Information Review, program developers review relevant scientific information, existing treatments, risk and protective factors, and existing preventive research and programs addressing the problem. Program Design and Pilot Testing, stage three, involves theory selection and program design as well as design and implementation of outcome evaluations and feasibility assessment. In stage four, Advanced Testing, community collaboration is stepped up for program revision and multiple field trials. Efficacy trials continue and developers identify core elements essential to achieving outcomes. Stage five, Dissemination, entails large scale implementation and continued evaluation of the program. A manual outlining core elements of programs or program curriculum facilitates dissemination. Stage five includes the design of real-world evaluations. Finally, the feedback loop is the review of studies during early testing and after dissemination to determine program effectiveness in reducing the problem. Feedback includes concerns of community members, program providers, and participants and informs theory and design of programs.

The study of implementation is important in the preventive intervention research cycle and is valuable to both program developers and program providers, funders, and other stakeholders. Program developers use assessments of implementation to understand how programs work and the contribution of individual program components to outcomes, to improve programs, and to increase program feasibility. Studying implementation is important to program providers and stakeholders because of the relation of high quality implementation and desired outcomes. Providers and stakeholders use implementation assessments to determine which programs to adopt, for valuable feedback to stakeholders, and to inform the training of program facilitators. In the following sections I discuss these roles of implementation assessment in different stages of the prevention research cycle.

Implementation Quality and Theory and Program Development

In the early stages of the preventive intervention research cycle, a program theory is formulated and tested. Global assessments of implementation along with outcome assessments provide information about the overall validity of program theory. Assessment of specific components provides detailed information about the validity of different aspects of theory, as well as understanding of how programs work and the contributions of specific activities to specific outcomes.

Assessment of implementation in pilot programs is necessary for valid feedback regarding theory because of what has been termed Type III error (Kalafat, Illback, & Sanders, 2007; Dusenbury, Brannigan, Falco, and Hansen, 2003). A Type III error (see figure 2) occurs when erroneous conclusions are drawn from results of an intervention not implemented as intended. An intervention not implemented as intended is implemented with low fidelity. As illustrated in figure 2, a low fidelity implementation leads to different outcomes than an intervention implemented as planned. The difference in outcome renders feedback information invalid.

Patton (1997) demonstrated the importance of measuring implementation with a dramatic example of Type III error. Pilot testing of a welfare parenting education program was to take place in a major city. Evaluators conducted participant interviews before the program was to begin and then again eighteen months later. They found no measurable differences from pretest to posttest, and the program was terminated. Further examination revealed that political battles had prevented the program from being implemented. The program outcomes were evaluated, no effects were found, and funding was cut—all without the program actually being implemented.

In Patton's (1997) example above, the results of the program seemed to indicate the program theory was not valid. In reality, because of low-fidelity implementation or lack of implementation the results were not related to the theory. Outcome is only useful to inform theory when implementation is documented (Orwin, 2000; Dusenbury et al., 2003). When assessment of implementation is global, and high quality implementation is associated with desired outcomes, the entire theory is validated. However, component analysis is required for more specific information regarding mechanisms of change.

Implementation assessment can demonstrate ways in which programs can be improved (Orwin, 2000; Dusenbury et al., 2003). Component analysis during pilot testing or field trials can reveal program components that do not contribute to desired outcomes or that contribute to undesired outcomes. Developers can use the resulting information to eliminate program components that are not beneficial or may be harmful. In addition, component analysis in early testing and trials may reveal aspects of a program that are particularly difficult to implement and may decrease feasibility. With information regarding component difficulty, developers can eliminate or adjust program components to increase feasibility.

Implementation Assessment and Practice

Studying implementation remains important throughout the later stages of the preventive intervention research cycle, when programs move from more controlled settings to real-world dissemination. As with theory, global assessments of implementation provide limited information for improving practice; component analysis provides more specific and usable feedback.

It is not the domain of program providers and stakeholders to design and revise program theory. Providers and Stakeholders are interested in achieving desirable outcomes. Many

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providers and stakeholders have chosen careers that work towards improving their communities or the lives of individuals in their communities. Others volunteer their spare time to improve their communities. Funders devote large amounts of money with the expectation that programs lead to better outcomes for families, individuals, and communities. Providers and stakeholders are interested in implementation quality because of its relation to outcomes. Several studies have linked high quality implementation with better outcomes (Blakely et al., 1987; Kalafat et al., 2007; McDonnell, Rodgers, Short, Norell, Pinter, Dyck, 2007). Global assessments of implementation can make providers more aware of their implementation. When overall quality is poor, implementers may recognize the need to improve implementation to achieve greater outcomes. Similarly, global assessments of implementation can also demonstrate the need for greater or more extensive training (Kalafat et al., 2007).

When selecting programs for adopting, organizations and funders are also concerned with feasibility. Global assessments of implementation can provide information about program feasibility, and may reveal information about contextual issues that affect implementation quality (Orwin, 2000). For example, implementation evaluations may show a program is consistently implemented with low quality in rural communities, but implemented with high quality in urban communities. Organizations seeking programs to adopt can compare their characteristics to the characteristics identified as markers or barriers to quality implementation. Organizations select programs based on feasibility and goodness of fit.

Component analysis can provide more useful information regarding implementation and training than global assessments of implementation. Component analysis reveals which program components are most essential for desired outcomes. When implementation quality is poor, component analysis not only demonstrates the need for improvement, but also which specific

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program components need to be delivered more effectively. Similarly, program directors can use results of component analyses to emphasize the importance of essential components during training and devote extra time to program components that are difficult to implement or are consistently implemented with low fidelity. Program providers may also provide technical support for facilitators for essential or difficult components. In global assessments these difficult components are not differentiated from other components.

Real-World Dissemination and Implementation Quality

Implementation assessment is especially important in wide-scale dissemination in real-world settings. Real-world implementers tend to make substantial modifications to both process and content when delivering programs (Berman & McLaughlin, 1976; Dusenbury et al., 2003; Fullen & Pomfret, 1977). There are several differences between contexts of RCTs and real-world implementations that may account for greater adaptation in dissemination.

Environmental control is different in real-world settings. In RCTs, careful controls are emphasized and necessary to demonstrate the causal influences of the program. In real-world dissemination, causality is assumed so environmental control is less emphasized. The relaxed controls of real-world implementation as well as other contextual differences may lead to increased adaptations.

For example, participants are carefully selected and randomly assigned into control or treatment conditions in RCTs. In real-world implementations participants volunteer or are recruited. The participants in real-world dissemination of programs often are older or younger than participants in RCTs and may differ from RCT participants in ethnicity and other demographic characteristics. Similarly, religion, social norms, political orientations, and other macro-system characteristics of real-world implementation may vary from those of RCTs'. Real-

world implementers may consider these differences and adapt program activities or content seeking for a better fit with participants or environment.

In addition, large-scale implementations are often not centralized, with several implementers delivering the program at several different sites. For these reasons reinvention, or adapting program content and activities, tends to be more prevalent in real-world implementations of social programs. These adaptations may result in a better fit of program activities and participant characteristics, leading to improved retention and outcomes. Alternatively, adaptations may alter essential program activities, leading to poorer or undesirable outcomes.

Conceptualization and Measurement of Implementation

In this section I discuss some of the many ways implementation has been conceptualized and measured, because no standard definition or measure of implementation quality has emerged in the literature (Dusenbury, 2003). First I discuss the importance assigned by some researchers to fidelity of program delivery in contrast to those who assign greater importance to adaptation of programs. I also discuss how some researchers have measured adaptations separately from fidelity. Second, I provide examples of how researchers have defined and measured aspects of implementation quality, including program delivery, receipt, and context.

The conceptualization of implementation determines to a large degree how implementation is measured (Orwin, 2000). Measurement of implementation may be broad or narrow in scope. Researchers may employ either quantitative or qualitative methods (Orwin). Researchers may utilize a variety of informants, including observers, facilitators, and participants. Measurement may take many different formats, such as checklists, questionnaires, record reviews, observations, or interviews. Formats for measuring implementation vary from

single items to complex systems utilizing multiple sources and formats (Gingiss et al., 2006).

Fidelity and Adaptation

Fullen and Pomfret (1977) identified two opinions about implementation quality. The fidelity approach consists of measuring the correspondence of the actual use of an innovation with its intended or planned use. The contemporary "strict fidelity" school of thought describes fidelity in similar terms. Fullen and Pomfret conceptualized mutual adaptation as emphasizing how programs develop or change during the adoption and implementation process. Like fidelity, the conceptualization of adaptation has not changed considerably.

Some researchers view adaptation and fidelity as representing two poles of a single underlying construct. In the single-construct view, low fidelity is equivalent to high adaptation, and high fidelity is equivalent to low adaptation. Therefore, any adaptation to a program results in decreased fidelity. McGrew and colleagues (1994) endorsed the single-construct perspective, conceptualizing fidelity as conformity with prescribed elements and absence of non-prescribed elements.

Others have taken more moderate approaches. Blakely et al. (1987) developed two alternative definitions of adaptation that were more than synonyms for "low fidelity." They defined both additions of new elements and modification of program elements as program adaptation. In their conceptualization, fidelity and reinvention could be measured independently. Blakely et al. measured the relations of fidelity and reinvention to outcomes in a variety of educational and criminal justice programs. They found that fidelity and reinvention in the form of additions were both positively related to outcome, a finding that would not have been possible had Blakely and his colleagues conceptualized reinvention as simply "low fidelity."

Dusenbury, Brannigan, Hansen, Walsh, and Falco (2005) had a similar conceptualization of fidelity and adaptation. They measured adherence, quality, and adaptation separately in implementation of the Life Skills Training Program. Dusenbury et al. rated adaptations as being either consistent with or detracting from the program objectives. They found that teachers who adapted activities consistent with program objectives were more likely to implement the program more completely than teachers whose adaptations were inconsistent with program objectives. Similar to Blakely and colleagues (1987), Dusenbury et al. would not have come up with these results had they conceived adaptation as simply "low fidelity implementation." McGill-Franzen (2005) argues that in studying implementation, the presence of adaptations is not as important as the appropriateness of the adaptations. Appropriate adaptations may lead to better retention and desired outcomes. Inappropriate adaptations may decrease desired outcomes, or possibly have harmful effects.

Some conceptualizations of implementation focus more directly on adaptations. Kumpfer, Alvarado, Smith, and Bellamy (2002) were interested in the effects of adaptations and did not consider fidelity in their review of cultural adaptations of the Strengthening Families Program. Program adaptations included versions for African Americans, Pacific Islanders, Hispanics, and American Indians. Adaptations included the use of more culturally relevant examples, pictures, stories, videos; adjusted reading level, deletion of some material, addition of culturally based material, translation of materials into different languages, and the modification of some content. The adapted programs reviewed by Kumpfer et al. (2002) varied in outcome; some resulted in better retention of participants with little change or some decrease in desired outcome.

In sum, conceptualization of implementation may focus solely on fidelity, solely on adaptation, or be more moderate and focus on both. Measuring both fidelity and adaptation separately can create greater sensitivity in measuring implementation, as demonstrated by Blakely et al. (1987) and Dusenbury et al. (2005).

Delivery and Receipt of Program Material

In addition to adaptations, there are other important aspects of implementation. Orwin (2000) states that implementation includes both delivery and receipt of program material and points out that both are necessary in order to achieve program goals. For the purposes of the current study, program delivery is conceptualized and measured as *adherence* and *quality,* and program receipt is conceptualized and measured as *dosage* and *participant responsiveness*. Finally, *program differentiation* is the measurement of delivery or receipt of specific features of a program.

Adherence. Adherence refers to strictly adhering to the implementation that is dictated by program theory (Dane and Schneider, 1998; Dusenbury et al., 2003). It is a measure of the completeness of delivery and is a common measure of implementation. Hall and Loucks (1978) developed a strategy for assessing adherence. They defined social programs as consisting of a set of components. Adherence scores are the percentage or proportion of components that are completed during program delivery.

In the study noted above, Dusenbury et al. (2005) measured adherence in the implementation of the Life Skills Training program in seven Baltimore middle schools. They used trained observers who recorded the total number of objectives and major points teachers covered. Observers gave half points when teachers only partially met objectives. Observers also provided global ratings of the proportion of major points and objectives covered.

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Quality. Quality of implementation refers to the competence with which providers deliver

program material (Dane and Schneider, 1998; Dusenbury et al., 2003). Quality ratings may

include assessing a variety of facilitator characteristics, such as attitude, enthusiasm, teaching

methods, communication, and interaction. For example, McDonell, et al. (2007) measured

quality of implementation in Multiple Family Group treatment, an intervention for

schizophrenia. Trained observers rated clinicians' competence on two dimensions for each phase

of a session. The first item asked how skillfully the clinician conducted the particular phase, and

the second asked how well clinicians worked together during the phase (two clinicians deliver

the intervention). Interestingly, McDonnell et al. found that competence could only be reliably

measured by skilled clinicians, suggesting that quality ratings may be more accurate if observers

have experience delivering the program or intervention.

Dosage. Dosage refers to completeness of the implementation (Dusenbury et al., 2003).

Dosage could be defined in terms of the amount of a program delivered, or the amount of a

program received by participants. For the purposes of this review, dose is considered the amount

of a program received by participants. Measures of dosage do not indicate whether a program

objective was met. Dusenbury et al. (2003) recommend three formats for complete measurement

of dosage: 1) facilitator self reports for all sessions, 2) observer ratings of dosage for a sample of

sessions, and 3) attendance data from each participant.

Faw, Hogue, and Liddle (2005) measured dosage in their evaluation of the Adolescent

Treatment Program, a residential treatment program for adolescent substance abuse. Faw and her

colleagues used daily logs to assess dose. Program staff completed daily logs which included

type and duration of service, and time of day service took place for each participant, each day of

the evaluation period. Faw et al. were able to show the percent of prescribed services participants completed and also how percentage of services completed varied over time.

Participant responsiveness. Participant responsiveness refers to the degree to which participants are engaged in program sessions and activities. Measures of responsiveness may include items that assess participation in program activities, and whether participants discussed the program with others or recommended the program to others (Hansen, 1996). Assessing the responsiveness of participants provides valuable information regarding involvement and participation, but provides limited information about which program activities and content were completed in implementation.

Dent et al. (1998) measured participant responsiveness to two levels of the Project Towards No Drug Abuse. Dent and colleagues used questionnaires to assess how much Southern California students liked the program, were interested in the program, whether they would recommend it to others, the degree to which the program interfered with school, and how helpful/believable the content was.

Program differentiation. Program differentiation is the degree to which unique or identifying elements are present in implementation. Differentiation may be measured using any of the methods described above. The defining feature of program differentiation is its focus on specific elements. Possibly the greatest value of measuring program differentiation is its contribution to component analysis (Dusenbury et al., 2003).

Hansen et al. (1988) measured the impact of three different alcohol prevention curricula on mediating variables. One curriculum involved training children in peer resistance skills. Another included normative education, or clarification of the actual group norms and beliefs regarding alcohol use. The third curriculum focused on increasing student awareness of the

consequences of drinking. Hansen et al. assessed the degree to which each curriculum was implemented by having students complete questionnaires regarding information covered in the curricula. The questions included had only one correct answer, and were scored 1 for correct or 0 for incorrect. Students scored higher on the questions regarding the curriculum they were exposed to, indicating that for each group the assigned curriculum was delivered, and elements from the other curricula were not present in the implementation.

Using one of these measures of quality of implementation does not preclude the use of other measures. One assessment of implementation can, and should, consider both delivery and receipt. Dane and Schneider (1998) recommend using all five methods for more complete and accurate assessment of implementation.

Context of Implementation

In addition to delivery and receipt there are contextual aspects of implementation. Evaluation must consider the program structure, and the environment in which a program is delivered (Chen, 1990; Fixsen, et al., 2005). Chen notes that social programs are not delivered in a vacuum and that environmental factors influence outcome.

Structure. Measures of structure and context are present in the literature and often related to outcome. Structural issues include: participant characteristics, implementer characteristics, and mode of delivery (Chen, 1990). The SFP offers an example of how a participant characteristic can influence implementation. The program is designed for participation of parent and youth dyads. It is a structural issue of implementation if one parent has two children participating in the program. Similarly it is a structural issue if a youth is participating with a non-custodial aunt, uncle, or friend of the family.

Structural issues of implementer characteristics include the ratio of program staff to participants, and the training, education, and experience of program staff. For example, some mental health programs may specify that a clinical psychologist or nurse be on the program staff. The presence or absence of these team members is a structural issue of implementation.

Timing is a structural issue of delivery mode. A program may be designed for delivery over the course of days, weeks or months. Programs may be designed to be implemented in one session, or several sessions. It is a structural issue of implementation when program content is condensed and delivered in a shorter amount of time than intended, or expanded and delivered in more sessions or a longer time frame then intended.

Measures of structure often require little more than a review of program records. McGrew et al. (1994) measured structure of 18 implementations of Assertive Community Treatment. McGrew and colleagues measured client-to-staff ratio, team size, whether teams included a psychiatrist and nurse, frequency and locations of program activities, and other structural elements of treatment. They found that some structural variables, including whether teams included a psychiatrist and nurse were correlated with improved outcomes for participants.

Environment. The environment influences how programs are implemented. Three important environmental factors are implementing organization characteristics, the micro-context, and the macro-system (Chen, 1990).

Organizational variables influence implementation at all levels (Fixsen et al., 2005). The organization, resources, relations to other organizations, and other characteristics of the implementing organization affect its ability to train facilitators and coordinating programs. Training of program staff and coordination of programs affect implementation and therefore outcomes.

The micro-context, or immediate social context with which the participants interact, is another contextual issue that affects program outcome. For example, a tobacco prevention program implemented in a school is likely to affect children of smokers differently than children of non-smokers. Another example of the importance of the micro-context is that substance use treatment programs are more successful when participants' families are warm and supportive (Chen, 1990).

Finally, the macro-system is another important contextual issue. The macro-system includes local and national cultural influence, current political issues, current state of the economy, history, and current social issues (Chen, 1990). The macro-system is important because it influences the micro-context, the implementing organization, and its relations with other organizations. The macro system's influence is omnipresent and affects implementation at all levels (Fixsen, et al., 2005).

Kalafat et al. (2007) included environmental measures in their assessment of implementation of the Family Resource Center program. Evaluators reviewed program records and interviewed coordinators, staff, parents, and school principles at 20 centers. They assessed each center's relationship with the community, school, and families. Teachers also completed a survey to assess school knowledge, support, and involvement with Family Resource Centers.

Conclusion

Table 1 summarizes the fidelity, adaptation, and moderate approaches; types of implementation assessment; and contextual considerations in implementation. Studies of adaptation are of great value when they consider the appropriateness of adaptations, and how adaptations influence outcome. Unfortunately, most studies of adaptations only consider the overall presence or absence of adaptation. As Blakely et al. (1987) and Dusenbury et al. (2005)

demonstrated, adaptations may increase or decrease desired outcomes depending on their appropriateness. These findings demonstrate limitations in assessing only the presence or absence of adaptations.

With the exception of program differentiation, the measures of delivery and receipt discussed above are usually used as global assessments of implementation, treating all program components equally. For example, in Cantu's (2007) global assessment of adherence of SFP, ice-breaking activities were treated the same as practicing peer refusal skills. While both of these activities may be important, they serve very different purposes. Ice breakers build rapport and group cohesion. Practicing peer resistance reinforces skills that help adolescents avoid engaging in problem behaviors. Both may contribute to outcome, but it is likely they contribute in different ways or to different types of outcome. Component analysis may reveal the important differences in the contribution of various process and content components in social programs. Adherence, quality, dosage, and participant responsiveness may all be used as measures in component analyses.

It can be argued that assessing the context of implementation does not constitute actual assessment of implementation. Contextual factors may be considered markers, or barriers and bridges to implementation. Regardless of how it is referred to, the context influences both implementation and outcome. Context is also important to consider for component analysis, because contextual factors may influence or interact with various components differently.

The Strengthening Families Program

The SFP is an evidence based substance use prevention program that has been shown effective in improving parenting skills in adult participants and decreasing the likelihood that youth participants will engage in substance use (Spoth, Redmond, & Shin, 1998; Spoth,

Redmond, & Shin, 2000: Spoth, Redmond, & Shin, 2001). In 1993, Richard Spoth and Virginia Molgaard of Iowa State University developed the program based on Karol Kumpfer's original Strengthening Families Program (Kumpfer, Molgaard, and Spoth, 1996). Kumpfer's program was intended for drug addicts and their children ages six to ten. Spoth and Molgaard developed the program to serve a universal population rather than a high-risk population, to suit a more rural population than was targeted by the original program content, and to be developmentally appropriate for older children, ages 10-14.

The program is delivered in seven two-hour sessions. Sessions are designed to be carried out one night a week for seven weeks. The first hour of each session, parents meet in one group and youth meet in a separate group. In the second hour, parents and youth meet together. The SFP curriculum for parents uses processes such as videos, instruction, discussion, and skills practice that emphasize warmth, communication, consequences, and setting clear limits for youth. Youth learn about managing stress, communicating with parents, resisting peer pressure and other skills using similar processes (Spoth et al., 2001).

Program Theory

Social Development Model. The Social Development Research Group developed the social development model to explain prosocial and deviant behavior (Catalano, Kosterman, Hawkins, Newcomb, and Abbott, 1996). The theory is a synthesis of control theory, social learning theory, and differential association theory. According to the theory, children learn patterns of behavior from socializing agents such as family, school, peers, and other community institutions. Four constructs are important in the socialization of children: opportunities they perceive for involvement, the involvement and interaction they engage in, rewards they receive for involvement, and attachment and commitment to socializing agents.

According to Catalano and colleagues (1996), these constructs form a path leading to either prosocial or antisocial behavior. The greater the opportunities for involvement youth perceive, the more likely they are to engage in activities and become involved. As youth are rewarded for involvement they become attached and committed to the socializing agents with whom they are involved. Youth conform to the social norms and rules of the socializing agents they are committed to in order to protect their bond or connection to those agents. When youth are attached and committed to prosocial agents they conform to prosocial norms and standards. Youth tend to engage in delinquent and antisocial behaviors when they are attached to antisocial agents or not attached and committed to prosocial agents (Catalano et al.). The SFP targets protective factors in youth and their families that increase the likelihood of youth attaching to prosocial agents and conforming to prosocial norms and standards.

Timing. The SFP targets youth ages 10-14 based on research on optimal timing of prevention programs. Key risk periods for substance abuse are during major transitions in children's lives ("Preventing Drug Abuse," 2005; Spoth et al., 2001). In addition to the stress of transitioning from elementary school to middle school, young adolescents experience the stress of beginning pubertal development (Eccles, Midgley, Wigfield, Buchanan, Reuman, Flanagan et al., 1993; Simmons & Blyth, 1987). Adolescents may be overwhelmed by the new demands of this period of transition (Eccles, Midgley, Wigfield, Buchanan, Reuman, Flanagan et al., 1993) and are likely to be exposed to substances and substance use for the first time during middle school ("Preventing Drug Abuse," 2005; Spoth, Redmond et al., 1999; Spoth et al., 2001). Adolescents are at greater risk of long-term substance abuse problems if they initiate substance use before age 15 (Spoth, Redmond et al., 1999; Spoth et al., 2001). Early intervention may stop

early problem behavior from developing into a disorder (Nation et al., 2003). The transition from elementary to middle school is an ideal time for preventive interventions.

Risk and Protective Factors. Substance use risk factors are present prior to substance use and positively related to the probability of substance use (Hawkins, Catalano, & Miller, 1992). Risk-focused approaches attempt to decrease or eliminate risk factors present in youths' lives (Hawkins et al., 1992). Some risk factors for adolescent substance use Hawkins and colleagues (1992) identified include family conflict, early and persistent problem behaviors, and attitudes favorable to drug use. Protective factors mediate or moderate the influence of risk on development (Hawkins et al., 1992). Factors that protect youth from the risk of substance use include family cohesion, stable positive events in the family, and restrictiveness, clarity, and warmth in parenting (Dumka, Roosa, Michaels, & Suh, 1995). SFP addresses risk and protective factors through a variety of program content areas delivered through multiple processes.

The content of the parent sessions includes clarifying expectations, appropriate discipline, following through with consequences, regulating strong emotions, and effective communication (Kumpfer et al., 1996; Spoth et al., 2002). Skills taught in the youth session parallel the skills addressed in parent sessions (Kumpfer et al., 1996; Spoth et al., 2002). The content of the youth sessions includes prosocial goals for the future, dealing with stress and strong emotions, empathy and appreciation for parents, and peer resistance and relationship skills (Kumpfer et al., 1996; Spoth et al., 2002). In the family session, parents and youth learn conflict resolution and communication skills (Spoth et al., 2002).

In the parent sessions, parents receive information, engage in role-plays, group discussions, and watch video demonstrations. Youth engage in small and large group discussions, skills practice, social bonding activities, and play games (Bode, n.d.). In family

sessions, parents and youth play games, complete projects together, practice skills together, engage in discussions, and watch video demonstrations (Bode).

Program Outcomes. Studies have shown the effectiveness of the SFP in improving parenting skills, increasing protective factors and decreasing risk factors for substance abuse (Spoth, Redmond, & Shin, 1998; Spoth, Redmond, & Shin, 2000: Spoth, Redmond, & Shin, 2001). It is not clear from the research which program activities and program content contribute to positive changes in families and youth. Program components are likely to have differential effects on outcomes (Fullen and Pomfret, 1977; Dusenbury et al., 2003). A goal of the present study is to identify which program processes and content areas are most important for outcomes.

Previous Studies of SFP Implementation Quality

Spoth et al. (2004) assessed the quality of implementation of SFP and its relation to outcomes in the RCT. Twenty-one programs took place in 11 mid-western schools. Children and their families from 11 other mid-western schools served as a control group. Trained observers used detailed checklists to rate whether program facilitators completed each program activity. Spoth et al. classified schools as "lower adherence" if the implementation met two criteria. First, adherence in one parent, youth, or family sessions was less than 80%. Second, adherence in another set of sessions was less than 85%. At posttest, participants in both high and low fidelity implementations scored higher on targeted parenting behaviors than control participants. At one and one half years past baseline, parents in low adherence implementations were not significantly different from control parents on targeted behaviors, but parents in high adherence implementations continued to score higher on measures of targeted parenting behaviors. In addition, at one and a half years past baseline, youth from high adherence implementations

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showed a marginally significant tendency to report greater substance refusal and resistance compared to low adherence youth.

In a real world dissemination of the program, Hill, Maucione, and Hood, (2007) interviewed SFP facilitators to learn more about adaptations to the SFP. From their interview data, Hill and colleagues identified 13 types of adaptations reported by facilitators and 15 categories of reasons facilitators gave for adapting the program curriculum.

They found that four specific reasons (lack of time, clarification, specific group attributes, and disagreement with program content) accounted for the majority of facilitators' explanations for modifying programs delivery. Similarly, four types of deviations (changes to games, specific program content, random program content, and activities) accounted for the majority of adaptation.

The present study used data collected by Cantu (2007). In the same dissemination of the SFP Hill (2007) studied, trained observers attended parent, youth and family sessions on three different nights in each program cycle. Observers rated adherence to all session activities, and each session's lead facilitator completed the same ratings of adherence. In all, Cantu collected data from 25 youth sessions, 29 parent sessions, and 34 family sessions across 11 programs. As in the Spoth et al. (2004), observer and facilitator ratings, which represented percentage of overall adherence to program activities, were highly correlated. Regardless of the informant, ratings of adherence were not related to program outcomes assessed by post-program surveys.

There are several possible explanations of why Cantu did not find ratings of adherence related to outcome. Participants in Cantu's study differ from Spoth et al.'s (2004) participants in age and other demographic variables. It is possible that age or other variables moderate the relation of overall adherence to outcome. Spoth et al. found effects of global adherence one and a

half years after the program but not at posttest, so it may be that global adherence does not immediately affect short-term outcomes but instead has long-term effects. Another possibility is that the range of overall adherence across programs was too narrow for meaningful differences in outcome to emerge. Finally, Cantu (2007) suggested that some components may be more vital for program success than others: Calculating overall adherence treats all components equally, and could wash out influences of important components. Thus, I reanalyzed the data collected in Cantu's study, breaking down to program content and processes components to determine whether adherence to some program components is related to program outcomes.

Research Questions and Hypothesis

The review of literature demonstrates the inadequacy of global assessments of implementation and the need for component analysis. The present study addresses only one of the many gaps and limitations identified in the review of literature. The present study extends Cantu's (2007) work on adherence to SFP in Washington State. The study will calculate adherence to specific process and content components to examine 1) whether facilitators adhere more to some process and content components than to others, 2) to see if adherence to specific process and content components is related to outcome even though overall adherence was not. I hypothesize that adherence to a few key process and content components will be related to outcome.

Youth and Parent Outcomes and Program Process Hypothesis.

One characteristic of effective prevention programs is the use of various processes that encourage active participation from participants (Nation et al., 2003). I hypothesize that adherence to program processes that involve teaching content through active participation of

youth and parents will be related to outcomes. These active processes include Eliciting

Response, Instructions, and Supervising Process.

Parent Outcome and Program Content Hypotheses

The SFP targets family communication, temper management, consistency of discipline,

and opportunities and rewards for prosocial behaviors. Based on my review of the theory behind

the SFP, I hypothesize that improvement in these targeted parenting behaviors and attitudes will

be related to adherence to the content components relevant to Consequences, Communication,

Rules, and Emotional Regulation.

Youth Outcome and Program Content Hypotheses

Based on my review of the theory behind the SFP, I have five specific hypotheses

regarding youth outcomes and content components. 1) The outcome of Opportunities for

Prosocial Involvement will be related to adherence to the content categories of Communication,

Family Unity, and Involvement. Youth must be able to communicate effectively with parents in

order to recognize opportunities for involvement. The Family Unity content area encourages

youth to engage in family activities with parents. Involvement content encourages youth to

participate actively in making family decisions about rules, discipline, and activities.

2) The outcome of Rewards for Prosocial Involvement will be related to the content

categories of Consequences and Family unity. Content regarding consequences helps youth to

recognize rewards they receive for prosocial behaviors. Family Unity content emphasizes the

enjoyment and rewards of family activities.

3) The outcome of Attachment will be related to the content categories of

Communication, Family unity, Emotional regulation, and Empathy. Content regarding positive

communication, emotional regulation, and empathy for parents help youth to develop closer

relationships with parents. Family unity encourages family activities which also strengthen relationships.

4) The outcome of Family Management will be related to the content categories of Consequences and Rules. Content areas regarding consequences and rules encourage youth to see the importance of rules and the consequences of breaking and keeping rules. This content may help youth to recognize the rules and consequences in place in their families.

Finally 5) the outcome of Peer Resistance will be related to adherence to Peer Issues. Program content regarding peer issues teaches youth skills for dealing with peer pressure, how to recognize good and bad qualities in friends. This content encourages youth to resist negative influence from peers.

CHAPTER 2

Method

Sample

My sample included a selection of 11 implementations of the SFP in Washington State. Nested within those programs were 47 facilitators, 133 parent participants, and 144 youth participants. The following paragraphs describe Cantu's (2007) program selection and participant characteristics.

Program Selection.

Cantu (2007) observed 11 program implementations in seven counties in Washington State. One implementation took place in each of the following counties: Benton, Mason, Stevens, Yakima, and Snohomish. Two implementations took place in Whatcom County, and four in Spokane County. Cantu contacted SFP facilitators and program coordinators in fall 2005 and asked them about upcoming programs. Cantu determined which programs were most feasible to observe given budget and time requirements. Locations included local schools (six implementations), local community agencies (four implementations), and one program implementation took place in a church. All 11 implementations Cantu observed were conducted in the English language.

Participants.

This sample of parents and youth was a sub-sample of a larger evaluation of SFP in the state of Washington. The sample consisted of 133 parents and 144 youth. More female parents/caregivers (69%) participated than male parents/caregivers (31%). Parent/caregiver ages ranged from 21-67. The average age was 39 years old. Of parents who reported ethnicity, 74%

reported ethnicity as White, 11% Latino, 9% American Indian, less than 1% Asian/Asian American, and 4% reported another ethnicity. Sixteen parents did not report ethnicity.

Youth participants ranged from six to 17 years old, with an average age of 12 years old. Fifty-one percent of youth participants were female and 49% were male. Parents/caregivers reported youth participant ethnicity. Of the youth for which parents reported ethnicity, 62% were White, 13% Latino, 9% American Indian, 3% Asian/Asian American, 2% Black/African American, and 10% another ethnicity. Ethnicity data were missing for 43 youth.

Sample Used for Analyses

The last section described the entire sample. Various subsamples were used in analyses. Not all participants completed outcome measures. In addition, Cantu (2007) only observed an average of three nights per implementation. Observers did not rate adherence for enough items to calculate adherence scores for all process and content categories for each implementation. For example, only four implementations had adherence observed for enough items to calculate an adherence score for the content area of Rules. Due to incomplete measures and observations, the more variables included in each analysis the more likely the subsample used is smaller.

Procedure

Analytic Approach

As noted in the literature review, program delivery consists of both a program's content and the processes used to deliver that content. I created two coding schemes, one containing categories for program activities (process codes), and another containing categories for program content (content codes). Each element of each program session was examined and category-coded twice: once for process and once for content. Using the fidelity ratings (which indicate whether each program element was covered completely, somewhat, or not at all) from Cantu

(2007), I created summary scores for each category. I used the adherence scores for these categories to determine if adherence to some components was related to outcomes, and to determine for which components adherence was more strongly related to outcomes.

Original Data Collection

Fidelity forms filled out by observers and facilitators (Cantu, 2007) covered all components of each session, including games, activities, and specific content. Fidelity forms asked if each component was covered, with response options of *Yes, Some* and *No* (rated 2, 1, and 0). Observations took place an average of three of the seven nights of the program implementations. Data from checklists were entered into a database, with each program implementation as a subject and the ratings for each individual activity as a separate variable. Although their agreement was 88%, facilitator ratings tended to be about 8% higher. In addition, observer ratings have been found to be more strongly related to outcomes than facilitator ratings (Lillehoj, Goldberg & Spoth, 2004).

Development of Coding Categories and Coding Procedure

Using an inductive coding process described by Thomas (2006), I developed process and content categories together with the undergraduate and graduate SFP research team. The SFP team used an iterative inductive process with the following steps: (1) *Close reading of the text*. The SFP team closely read the curriculum and adherence checklists for multiple parent, youth, and family sessions and identified preliminary process and content areas. (2) *Creation of categories*. The team developed categories after careful reading, and generated category labels, definitions, and key features for each category. (3) *Overlapping coding*. Members of the team independently piloted the coding scheme on adherence checklists from sessions different than the sessions used to develop categories. (4) *Continuing refinement of categories*. The team further

refined categories based on disagreements in coding. Coding and category refinement continued until we obtained acceptable reliability (at least 80% agreement). Tables 2 and 3 show the resulting categories for process and content.

Throughout analyses and discussion, categories are referred to by the label (capitalized) chosen for the category. In addition to the label, categories are also described as a process component or a process, or a content component or content area. For example, process components include Information, Instructions, and Homework. Other processes include Game and Icebreaker. Examples of content categories are Consequences, Communication, and Family Unity. Other Content areas are Rules and Behavior.

Upon completion of the coding systems, an undergraduate research assistant coded adherence checklists for the parent, youth, and family sessions. Material was coded two times, one time into process categories and one time into content categories. For reliability, another undergraduate research assistant coded approximately half of the checklist, and I completed the remainder of the reliability coding. The entire program was independently coded two times for process, and two times for content. The resulting reliability was acceptable, $\kappa = .86$ for process coding, and $\kappa = .72$ for content coding.

Scoring for Component Analysis

Adherence scores for each process and content component consist of the sum of the adherence scores of all of the items in the component category divided by the total possible adherence score for that category. In other words, for each process and content category I calculated a ratio, the observed adherence divided by the total possible adherence.

Demographics

At the time parents completed pre-surveys they also completed a demographics questionnaire. Parents reported age, gender, and ethnicity for themselves, as well as their spouses and children attending the program. Demographic data is summarized above in the description of participants in the Sample section. Although the sample was ethnically diverse, there were not large enough numbers of ethnicities to consider each separately (Hispanic parents, $N = 15$; American Indian parents, $N = 12$; Asian American, $N = 1$). Therefore, for analyses, I collapsed the ethnicity measure into two categories for minority status (0 = White/Caucasian, 1 = any other ethnicity reported).

Youth outcomes

A total of six scales comprised family risk and protective factors assessed as youth outcomes. Five of these scales were Opportunities for Positive Involvement, Rewards for Positive Involvement, Attachment to Adults, Family Harmony, and Family Management. These five scales were rated on a four point Likert-type scale with response options indicating agreement or disagreement with each item. Response values ranged from 4 (*YES!*) to 1 (*NO!*). The items that made up the sixth scale, Peer Social Skills, had a different format. Each youth outcome scale is described below.

Opportunities for Prosocial Involvement is a three item scale (pretest $\alpha = .71$, posttest $\alpha = .68$). These items assessed involvement of youth in family activities. A sample item from this scale is "My parents ask me what I think about family decisions." Youth participants had a mean score of 2.74 *(SD = 0.77)* at pretest, and a mean of 3.04 *(SD = 0.71)* at posttest.

Rewards for Prosocial Involvement is a two item scale (pretest $\alpha = .72$, posttest $\alpha = .78$) which assessed parents' rewards for youths' good behaviors A sample item from this scale is "Grownups in my family notice when I am doing a good job." For Rewards for Prosocial Involvement, youth participants had a mean score of 3.22 $(SD = 0.71)$ at pretest, and a mean of 3.42 $(SD = 0.65)$ at posttest.

Attachment to adults is a two item scale (pretest $\alpha = .67$, posttest $\alpha = .81$) that measures the closeness and connectedness youth feel to parents. A sample item from this scale is "I share thoughts and feelings with grownups in my family." Youth had pretest mean score of 2.80 $(SD = 0.84)$ and a posttest test mean score of 3.09 $(SD = 0.88)$ on the Attachment scale.

Family Harmony is a three item scale (pretest $\alpha = .74$, posttest $\alpha = .77$). The Family Harmony scale is a measure of family conflict that is reverse scored. A sample item from this scale is "We argue about the same things in my family over and over." Youth had a pretest mean score of 2.42 $(SD = 0.87)$ and a posttest mean score of 2.56 $(SD = 0.90)$ for Family Harmony.

Family Management is an eight item scale (pretest $\alpha = .82$, posttest $\alpha = .85$). It assessed clarity of household rules and parental monitoring of youth. An example of an item in this scale is "The rules in my family are clear," "When I'm not at home, my parents know where I am and who I am with." For Family Management, youth participants had a mean score of 3.42 $(SD = 0.59)$ at pretest, and a mean of 3.55 $(SD = 0.55)$ at posttest.

Peer Social Skills (4 items, pretest $\alpha = .63$, posttest $\alpha = .75$) consisted of four vignettes describing situations in which the youth is encouraged to engage in a deviant behavior ("You are at a party at someone's house, and one of your friends offers you a drink containing alcohol. What would you say or do?"). Youth selected one of four response options, ranging from engaging in the deviant behavior to skillfully resisting negative peer influence. Youth

participants had a pretest mean score of 3.23 *(SD* = 0.68) and a posttest mean score of 3.30 *(SD* = .70).

Parenting outcome

For the parenting outcome Cantu (2007) used a measure of intervention-targeted parenting attitudes and behaviors (ITPB) that was also used in the RCT (Redmond et al., 1999). The scale consists of 13 items (pretest α = .84 posttest α = .82) ITPB scale was also used in the original SFP research trial. Items are designed to assess family communication and enjoyment, temper management, consistency of discipline, and opportunities and rewards for prosocial behaviors. The items in these scales were rated on a five point Likert-type scale with response options ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Parents had a pretest mean score of 3.92 *(SD* = 0.53) and a posttest mean score of 4.27 *(SD* = 0.54).

<center>*Analyses*</center>

Descriptive

I calculated descriptive statistics (mean, standard deviation, and intercorrelations) for each individual process and content component and for the overall Process and Content fidelity scores and for parent and youth outcomes.

Correlation analyses

I calculated the correlation of adherence and outcomes. I first calculated the correlation of adherence to process and content in the parent and family sessions and the parent outcome ITPB. I also calculated the correlation of adherence to process and content categories and the youth outcomes Opportunities for Involvement, Rewards for Involvement, Attachment, Family Harmony, Family Management, and Peer Social Skills.

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Adherence to very few of the process and content categories was significantly correlated with youth outcomes. Considering the high number of correlations calculated, and the few significant correlations, Type I statistical conclusion error likely accounts for these findings. In the interest of conservative estimates of adherence effects, I performed no additional analyses on adherence in youth and family sessions and youth outcomes.

Component analyses

I selected components from the parent and family sessions for which observed adherence was significantly correlated with pretest to posttest change on the ITPB scale for additional analyses. Using a multilevel approach (individuals nested within programs) I examined the within-program implementation dependence of observations (intraclass correlation, or ICC) for posttest scores on ITPB. The ICC indicated that program level effects were substantial enough to justify the use of multilevel analyses.

I proceeded with hierarchical multilevel analyses, using ITPB posttest as the dependent variable. The first conditional model includes the level 1 covariate ITPB pretest score and adherence to the component category of interest as a level 2 explanatory variable. I add ITPB Pretest score the first model because I am interested in improvement on ITPB. Without controlling for ITPB Pretest, ITPB Post would indicate individual differences more than changes due to participation in the program.

In the second model, I test for participant characteristics that may be related to outcome. Model two includes age and minority status as level 1 explanatory variables. I also test for an interaction between observed adherence and the participant characteristic of minority status.

Process categories of interest include Set Up, Instructions, and Supervise Process. Content categories of interest include Group Unity, Rules, Emotional Regulation, Goals/Dreams

and Values, Application/Outcome, and Other content. All three models were calculated for each process and content category of interest. I plotted the interactions for components that met two criteria. First, adherence to the component was a significant or marginally significant predictor of ITPB posttest score in the first model. And second, the interaction with minority status in the second conditional model was significant.

Post Hoc Analyses

After considering results of the hierarchical-multilevel analyses I performed *t* tests to check for mean differences between minority and White/Caucasian parents. I compared parent means for both change scores from pretest to posttest ITPB scores and also the ITPB posttest scores.

CHAPTER 3

Results

Descriptive Statistics

Process and Content in Parent and Family Sessions

In Tables 4 and 5 I report means, standard deviations, and ranges for observed adherence to process and content (respectively) for sessions attended by parents (parent and family sessions). The overall mean adherence to process in parent and family sessions was .79 *(SD =* .06). Observer ratings indicate the lowest adherence was to the process components Instructions and Supervise Process, with a mean adherence of .73 (*SD* = .13 for instructions, and *SD* = .15 for Supervise Process). The highest adherence observers reported was to the process component Ritual (*M* = .89, *SD* = .17). Table 6 reports intercorrelations for adherence to process components in parent and family sessions.

For Content adherence in the parent and family sessions the overall mean was .81 *(SD =* .06). The content component Empathy had the lowest observed mean adherence (*M* = .71, *SD* = .16). The highest adherence was to the content component Emotional Regulation (*M* = .94, *SD* = .12). In Table 7 I report intercorrelations for content components in parent and family sessions.

Process and Content in Youth and Family Sessions

In Tables 8 and 9 I report means, standard deviations, and ranges for adherence to process and content (respectively) for sessions attended by youth (youth and family sessions). Overall, the mean for process in youth and family sessions was .72 *(SD* = .14). In Observer ratings of adherence, the content component Ice Breaker had the lowest mean in youth and family sessions (*M* = .34, *SD* = .24). In observer ratings Ritual had the highest adherence

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(M = .84, SD = .18). In Table 10 I report intercorrelations for process components in youth and family sessions.

The overall mean for adherence to content in youth and family sessions was .77 (SD = .10) The lowest observed adherence to process in youth and family sessions was for Family Objectives (M = .61, SD = .19). Emotional Regulation had the highest observed adherence (M = .89, SD = .19). Table 11 reports intercorrelations for content components in youth and family sessions.

Parent and Youth Outcomes

In Table 12 I present descriptive statistics for change scores from pretest to posttest for parent and youth outcomes. Parents and youth showed improvement on all scales. The greatest improvement was on the parenting outcome ITPB (M = .31, SD = .46), and also the youth outcome Involvement (M = .31, SD = .64) The youth outcome of Family Management had the smallest improvement (M = .07, SD = .36).

<div align="center">Correlation Analyses</div>

Correlation of Adherence and Outcome for Youth

Process. In Table 13 I present the correlations of adherence to process in youth and family sessions and improvement on the youth outcomes Opportunities for Involvement, Rewards for Involvement, Attachment to Adults, Family Harmony, Family Management, and Peer Social Skills. Observer ratings of adherence to two process components were correlated with the change from pretest to posttest in Family Management. High adherence to the process component Instructions was related to improvement in Family Management (r = .23, p < .05). High adherence to the component of Supervise Process was associated with less improvement in Family Management (r = -.33, p < .01).

Content. In Table 14 I present the correlations of observer ratings of adherence to content in youth and family sessions and change scores from pretest to posttest. Adherence to the content component of Hopes, Dreams, and Values was associated with improvement in the outcome of Peer Social Skills ($r = .24$) at the $p < .05$ level of significance. As mentioned previously, considering the large number of correlations calculated, Type I error of statistical conclusion likely accounts for the few significant correlations of adherence and youth outcome. For this reason I did not follow up these significant correlations with multilevel analyses.

Correlation of Adherence and Outcome for Parents

In Table 13 I present the correlations of observer ratings of adherence to process component categories in the parent and family sessions and improvement in ITPB scores from pretest to posttest. Adherence to the process components of Instructions ($r = .21$) and Set Up ($r = .31$) was correlated positively with ITPB improvement from pretest to posttest (both $p < .05$). High adherence to the process category Supervise Process was associated with less improvement on ITPB ($r = -.28, p < .01$).

In Table 14 I present the correlations of observer ratings of adherence to content components in the parent and family sessions and improvement on ITPB scores from pretest to posttest. Observer ratings of adherence to Involvement ($r = .21, p < .05$), and Other Content ($r = .29, p < .01$) were correlated positively with improvement on ITPB. Observed adherence to the categories of Rules ($r = -.34, p < .01$), Emotional Regulation ($r = -.32, p < .05$), Goals Dreams and Values ($r = -.32, p < .05$), and Application or Outcome ($r = -.30, p < .01$) was negatively correlated with pretest to posttest improvement on ITPB.

ICC

The ICC is a measure of outcome similarity between participants within each program

implementation. Parents who complete the program together may share more than just the

implementation. It is likely that they live in the same city, they may have children attending the

same school, and they were likely recruited by the same method. Parents with these

characteristics in common are likely to respond to the program in similar ways. Table 15 shows

the unconditional model used to calculate the ICC. The program implementation (second level of

analyses) accounted for a substantial part of the variance, 27.78% (B = 0.05, Z = 1.78, p < .05).

The residual accounted for by within-group differences is 72.22% (B = 0.13, Z = 6.53, p < .01).

The ICC indicated that parents who participated in the program together were similar in

outcomes, justifying the use of multilevel analyses in order to control for within-group similarity

when testing for individual level predictors of outcome.

General results

Observer adherence to several content components that for which adherence was

correlated with improvement in ITPB did not predict ITPB post when entered with ITPB Pretest

as a covariate. These content components include Group Unity, Involvement,

Goals/Dreams/Values, Applications/Outcome, and Other Content. Tables 16-20 present full

results of the multilevel analyses for these content components. The interaction term for Minority

Status and adherence was significant for all of these content components. However, I did not plot

interactions, nor do I report any further results for adherence to these components.

Ratings of adherence to the remaining process and content components were marginally

significant (p < .16) in the first model. These include the process components Set Up,

Instructions, Supervise Process, and the content components Emotional Regulation and Rules. In models where age and minority and the minority status interaction term were entered as covariates, there were no longer main effects of adherence to any component category predicting ITPB Posttest scores. In all analyses ITBP Pretest, Minority Status, and the Interaction with Minority Status were significant predictors. Results for age were inconsistent. Some analyses showed age as marginally significant as a predictor, and for some analyses age was significant as a predictor. Tables 21-25 present results of the multilevel analyses for these components. In the following sections I discuss the results of multilevel analyses for each of these process and content categories more specifically.

Results of Multilevel Analyses for Process Components

Set Up. Table 21 presents results of the multilevel analysis predicting ITPB Posttest scores based on adherence to Set Up and other program implementation level and individual level predictors. Results indicate that participants who scored higher on ITPB Pretest were more likely to score higher on ITPB Posttest, B = 0.50, $t(9) = 7.02$, $p < .01$. Younger parents showed greater improvement than older parents, B = -0.01, $t(81) = -1.89$, $p < .10$. White/Caucasian parents showed greater improvement than minority parents B = -3.59, $t(81) = -6.86$, $p < .01$. The interaction of adherence to Set Up and Minority Status was significant ($p < .01$), B = 4.39, $t(81) =$ 6.33. As shown in Figure 4, adherence to Set Up is associated with improvement in ITPB for minority participants, but is not related to change in ITPB for White/Caucasian participants.

Instruction. Table 22 presents results of the multilevel analysis predicting ITPB Posttest scores based on adherence to Instruction and other program implementation level and individual level predictors. Results indicate that parents who scored higher on ITPB Pretest were more likely to score higher on ITPB Posttest, B = 0.44, $t(9) = 6.05$, $p < .01$. Younger parents improved

more than older parents, B = -0.01, $t(81) = -2.02$, $p < .05$. White/Caucasian participants had greater improvements than minority parents, B = -3.54, $t(81) = -6.97$, $p < .01$. The interaction of adherence to Instruction and Minority Status was significant ($p < .01$), B = 4.90, $t(81) = 6.43$. As shown in Figure 5, adherence to Instruction is associated with improvement in ITPB for minority parents, but is not related to ITPB improvement for White/Caucasian parents.

Supervise Process. Table 23 presents results of the multilevel analysis predicting ITPB Posttest scores based on adherence to Supervising Group Process and other program implementation level and individual level predictors. Results indicate that parents who scored higher on ITPB Pretest were more likely to score higher on ITPB Posttest, B = 0.48, $t(9) = 6.19$, $p < .01$. Younger parents had greater improvement on ITPB, B = -.011, $t(81) = -2.02$, $p < .05$. White/Caucasian parents had less improvement than minority parents, B = 2.26, $t(81) = 4.00$, $p < .01$. The interaction of adherence to Instruction and Minority Status was significant ($p < .01$), B = -3.29, $t(81) = -4.68$. As shown in Figure 6, adherence to Supervise Process is associated with less improvement in ITPB for minority parents, but is not related to change in ITPB for White/Caucasian parents.

Results of Multilevel Analyses for Content Components

Emotional Regulation. Table 24 presents results of the multilevel analysis predicting ITPB Posttest scores based on adherence to Emotional Regulation and other program implementation level and individual level predictors. Results indicate that parents who scored higher on ITPB Pretest were more likely to score higher on ITPB Posttest, B = 0.43, $t(8) = 5.36$, $p < .01$. Younger parents were had greater improvement, B = -0.07, $t(77) = -1.40$, $p < .20$. White/Caucasian parents had greater improvement than minority participants, B = -1.99 $t(77) = -5.60$, $p < .01$. The interaction of adherence to Emotional Regulation and Minority Status was

significant ($p <.01$), B = 2.11, $t(77)$ = 4.86. As shown in Figure 7, adherence to Emotional

Regulation is associated with improvement on ITPB for minority participants, but is not related

to change in ITPB White/Caucasian participants.

    Rules. Table 25 presents results of the multilevel analysis predicting ITPB Posttest scores

based on adherence to Rules and other program implementation level and individual level

predictors. Results indicate that participants who scored higher on ITPB Pretest were more likely

to score higher on ITPB Posttest, B = 0.31, $t(4)$ = 5.53, $p < .01$. Age was not a significant

predictor of ITPB Posttest score. White/Caucasian participants had less improvement on ITPB

than minority participants, B = 2.40 $t(47)$ = 4.71, $p < .01$. The interaction of adherence to Rules

and Minority Status was significant ($p <.01$), B = -3.44, t(47) = -5.70. As shown in Figure 8,

adherence to Rules is associated with less improvement on ITPB for minority participants, but is

not related to change in ITPB scores for White/Caucasian participants.

    In sum, significant interactions of adherence to process and content components and

minority status provide consistent evidence that facilitator adherence influences outcomes

differently for minority and non-minority parents. For minority parents, adherence had

inconsistent effects on outcome. Whereas adherence to some components resulted it greater

improvement in outcome, adherence to other components was associated with less improvement

in outcomes. These inconsistent effects of adherence, coupled with the interaction of adherence

and minority status explain why Cantu (2007) was unable to find significant main effects of

global adherence.

Results of Post Hoc Analyses

    In all but two multilevel analyses, White/Caucasian parents showed greater improvement

in ITPB than minority parents. Post hoc *t* tests revealed a similar main effect of minority status.

White/Caucasian parents had a higher mean change score from pretest to posttest on ITPB, $t(94)$ = 2.54 ($p < .05$). The mean improvement for White/Caucasian parents was .37 ($SD = .42$). The mean improvement for minority parents was .10 ($SD = .53$). White/Caucasian parents also had a higher mean for ITPB posttest scores, $t(94) = 3.54$ ($p < .05$). The mean ITPB posttest score for White/Caucasian parents was 4.32 ($SD = .43$). Minority parents had a mean posttest score of 3.87 ($SD = .74$).

CHAPTER 4

Discussion

The goal of the current study was to determine whether variations in the delivery of specific program process and content components are related to program outcomes. In a previous study which used the observational adherence data as the current study, global ratings of adherence were not related to outcomes (Cantu, 2007). The present study demonstrated that observed adherence to some content and process areas was related to parent outcomes, although the relation was moderated by participant characteristics. I discuss how the results of the current study answer my research questions and whether my hypotheses received support. I include a general discussion of implementation and participant characteristics shown in multilevel analysis to be related to parent outcomes. I discuss implications of my results for SFP facilitators, for evaluators, and also implications for the field of prevention programming. Finally, I discuss the strengths and limitations of the present study, and end with a general conclusion.

Research Questions and Hypotheses

Research Questions

Research Question 1. Do facilitators adhere more to some process and content components than others? To answer this question I examined descriptive statistics. Levels of adherence to process components varied for parents and youth. Not surprisingly, the process components that are highest in adherence are straightforward and discrete. For example, the process category Ritual, which includes activities such as reciting parent, youth, and family creeds, had the highest adherence for parents and youth. Material Utilization, which involves distributing or referencing written materials, was also high in adherence. On the other hand, processes facilitators adhered to less were more involved and difficult. The category of Supervise

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Process, which involves processes in which facilitators ensure activities are done properly, was low in adherence for both parents and youth. When facilitators engaged in program activities of Supervise Process they circulated throughout the group, recognizing participants with needs, and needed to be able to resolve needs so participants could properly complete activities.

For the youth however, Icebreakers and Games had the lowest adherence. It is not likely that low adherence is because of difficulty or complexity of implementing icebreakers and games. Frequently, facilitators run short on time and shorten or eliminate icebreakers and games to make up for lost time (Hill et al., 2007). Facilitators are likely to cut out games because in the program manual many games are listed as optional, if time allows.

Interestingly, adherence to Set Up is different for parents and youth. Adherence to Set Up was high in parent and family sessions, but low in youth and family sessions.

Adherence to content varied for parents and youth. Like adherence to activities in the process categories, adherence to content was similar for parents and youth. For both parents and youth, Adherence to Emotional Regulation and Neutral/No Content was high; adherence to Communication, Group Unity, and Peer Issues was moderate; and adherence to Supportive Content and Family Unity was low.

Adherence to content was not similar for parent and youth in all content categories. Adherence to areas of Family Objectives and Rules was high for parents but low for youth. Adherence to Consequences was moderate for parents, but high for youth. Finally, adherence to Empathy was low for parents but high for youth.

In summary, with a few exceptions adherence to content and process was similar between parents and youth. Adherence to process may be determined in part by difficulty or importance. However, similarities in observed facilitator adherence to content and process between parent

and youth may be due to both parents and youth participating in family sessions. This means that approximately half of the items contributed to adherence scores for both parents and youth.

Research Question 2. Is adherence to specific process and content components related to outcome even though overall adherence was not? Of 66 correlations of adherence to process categories and youth outcomes, two process categories had significant adherence-outcome correlations. Of 66 correlations of adherence to content categories and youth outcomes, one content category had a significant adherence-outcome correlation.

I also considered correlations of adherence to process and content components and the parent outcome ITPB to address this research question. Overall adherence was unrelated to outcomes, but adherence to some content and process components was related to outcome for parents. I followed up significant correlations with further analyses. Results of follow up analyses will be discussed later.

Hypotheses

Youth and parent outcomes and program process hypothesis. I hypothesized that adherence to processes involving active participation of participants (Eliciting Reports or Response, Instructions, and Supervise Process) would be related to outcome. The only support this hypothesis received was the positive association of Instructions and improvement in ITPB. Supervise Process was actually negatively associated with ITPB. Further analyses revealed that adherence to instructions was only associated with improvement in ITPB.

Youth outcome and program content hypotheses. My hypotheses for youth outcomes and program content were not supported. As previously mentioned, significant correlations between adherence to content and youth outcomes are so few that they are likely type I error. Similarly, Cantu (2007) was unable to predict youth outcomes from adherence or other implementation

variables she examined. Spoth and his colleagues (2004) only found a marginally significant affect of adherence at one and half year follow-up. One explanation that accounts for these findings is that the effective elements of the program operate indirectly on youth by changing the family context. Nation et al. (2003) noted that effective programs address contextual as well as individual factors.

Parent outcome and program content hypotheses. I hypothesized that adherence to content components of Consequences, Communication, Rules, and Emotional Regulation would be positively related to improvement in ITPB. This hypothesis received little support. In fact, Rules, and Emotional Regulation were negatively correlated with improvement in ITPB.

Summary and Conclusion

Adherence does vary for process and content components, and the differences appear to be systematic. The similarities between parent and youth for adherence to process and content are not likely to be coincidence. Adherence to process varied by difficulty and importance of process components.

Adherence to some content and process components is related to outcome for parents. Overall adherence was not related to outcomes. Not all program components contribute equally to outcomes, demonstrating the need for and importance of component analysis.

Although my hypotheses received no support, the results of the correlation analyses do not provide the final word on the importance of the processes and content areas investigated. Cantu (2007) found no relation between overall adherence and outcomes. Some significant relationships emerged when investigating adherence to specific content and process components. The relationship between adherence and outcomes may be even more complicated. Adherence may interact with participant characteristics (as demonstrated in multilevel analyses) facilitator

and provider characteristics, or with other aspects of implementation. Replication with a larger sample size, more complete observations, and other types of implementation measures may allow for more sophisticated analyses and reveal more about Implementation quality's relation to outcome.

<center>*Multilevel Analyses*</center>

Predictors of Parent Outcome

In the five analyses for which adherence to a specific component was significant or marginally significant with ITPB pretest in the equation, some explanatory variables consistently predicted ITPB posttest scores. Not surprisingly, when parents score high on ITPB pretest they are more likely to score high on ITPB Posttest. With the exception of the analyses using Supervise Process and Rules, Caucasian parents Showed greater improvement in ITPB. Post hoc analyses of main effects showed White/Caucasian parents more likely to have greater improvement on ITPB and score higher on ITPB posttest. In multilevel analyses younger parents also showed greater improvement. The difference in outcome for younger and older parents was sometimes only marginally significant.

Minority Status as a Moderator

The interaction of adherence to the component of interest and Minority Status was significant in all multilevel analyses. As seen in figures 3-7, adherence was unrelated to outcome for White/Caucasian parents. Figures 3-7 also show that adherence to some content and process components was associated with greater improvements in ITPB for minority parents, but adherence to other process and content areas was associated with less improvement in ITPB for minority parents. Specifically, minority parents who experienced the program with higher adherence to the process components Set Up and Instructions, and the content component

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Emotional Regulation tended to improve more in ITPB.Minority parents in programs with higher

adherence to the process component Supervise Group and the content component Rules tended

to have less improvement in ITPB.

There are two possible reasons for the moderating effects of minority status. First,

minority parents may have received the program delivery differently than White/Caucasian

parents. Second, facilitators may have delivered the program differently to minority parents. That

is facilitators may have changed the way they delivered program material in ways that would not

be easy to measure with an adherence assessment. These possibilities are not mutually exclusive.

Both may have operated to cause the moderating effect. These possible reasons cannot be

addressed by the present study of program adherence. The first possibility is a question of

participant responsiveness, and the second possibility is a question of delivery quality.

If minority parents receive the program differently than White/Caucasian parents, it may

be due to the audience for which the program was intended. Ninety-nine percent of participants

in the original RCT of the SFP were White/Caucasian (Spoth et al., 2002). The program may

have been straightforward and predictable to White/Caucasian parents, making adherence to Set

Up and Instructions less important. Due to cultural differences the program may have been

unclear or difficult to follow for Latino and American Indian parents, in which case adherence to

Set Up and Instruction would be more important for them, and related to improvement in ITPB.

Adherence to Supervise Process may be deleterious to minority parent outcomes because

of how they receive the delivery of the process, or because facilitators engage in the process

differently for minority parents than for White/Caucasian parents. Perhaps minority parents

interpreted high adherence to the process of Supervise Process as intrusive or patronizing. Or, it

is possible that facilitators high in adherence to Supervise Process were more intrusive or offered

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too much assistance to minority parents. Either of these cases could account for the lower ITPB posttest scores associated with high adherence to Supervise Process.

Latino and American Indian parents may also receive program content differently than White/Caucasian parents, or facilitators deliver content differently to these minority parents. It is unclear what cultural difference or facilitator attitudes might cause high adherence to Emotional Regulation to lead better outcomes for minority parents. One possibility is that cultural differences in parental control made minority parents more responsive to the delivery of content regarding emotional regulation. In their review, Halgunseth, Ispa, and Rudy (2006) found Latino and Hispanic parents used higher levels of verbal and physical punishment than White/Caucasian parents. With a few exceptions, the relation of ethnicity and punishment was mediated by socioeconomic status. The content area of Emotional Regulation in the SFP teaches parents strategies to control their tempers in order to avoid harsh parenting. Minority parents may have been more responsive to content of Emotional Regulation because the strategies and practices were new and different than their current practices.

Some facilitators may have paid particular attention to the delivery of Emotional Regulation content more for minority parents. These facilitators may have recognized content regarding Emotional Regulation was novel to minority parents and felt the need to deliver the content with higher adherence and quality. Minority parents may have responded to increased adherence and quality with improved ITPB posttest scores.

It is difficult to speculate why high adherence to the content category of Rules lead to poorer outcomes for minority parents. Again, the moderating effect may be due to cultural differences in parental control. Halgunseth et al. (2006) found that Latino and Hispanic parents scored higher on measures of rule setting than White/Caucasian parents. One possibility is that

when adherence to the content area of Rules is high, minority parents focus on that content. Minority parents may attend more to content regarding Rules because the information and practices are familiar to them and they are already adhering to them. Minority parents may focus too much on the content area of Rules, and become less responsive to other program material, such as Emotional Regulation, that may be less familiar.

If minority parents were less responsive to other content areas because they focused on Rules content, this may have changed the way facilitators delivered the program. Some facilitators may have recognized that parents were less responsive to other content areas and adjusted their delivery to focus more on other content, resulting in lower adherence to the content area Rules, but leading to higher ITPB posttest scores. Alternatively, some facilitators may have altered delivery to adhere more to Rules content if they noticed that minority parents focused on rules, resulting in higher adherence to the content of Rules, but neglecting other content areas. Focus on the delivery of Rules content and neglecting other content may have led to lower ITPB posttest scores.

Exercising caution is important when considering cultural differences in results. Outcome measures are not actual indicators of child well-being, but rather indicators of family risk and protective factors that have been related to child well-being. Measures may have different meanings for participants of different cultures, and risk and protective factors may operate differently on youth of other cultures. In addition, the results reported here are from a limited sample size. The analyses for adherence to the content area Emotional Regulation only included 8 of the 11 programs. The analyses for adherence to the content Rules only included 4 of the 11 programs. It is possible that the findings regarding adherence to content areas Emotional Regulation and Rules were spurious. In addition, there are likely important differences within the

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minority group that could not be explored due to the limited sample. In addition, the minority status variable may represent more than just ethnicity. Minority parents may have had lower socioeconomic status than non-minority parents. Minority parents may have also had less education, and been different in other important ways. Other differences besides culture may have accounted for the moderating effect of minority status. Finally the explanations I offered for the moderating effects of minority status are speculation. Further research on implementation with diverse audiences needed.

Implementation with Diverse Audiences

Castro, Barrera, and Martinez (2004) highlight the need for universal prevention interventions that are responsive to local cultural needs of the intended audience. Appropriate adaptation of prevention programming involves both "top down" (social planning) and "bottom up" (local development) efforts (Castro et al.). The current study provides a good example of collaborative effort of practice (bottom up) and research (top down) collaboration.

In the literature review, I discussed issues that arise due to program-to-audience mismatch. Intended audiences may differ in important ways from audiences of original RCT. Castro, Barrera, and Martinez (2004) recommend addressing issues of mismatch strategically prior to implementation with diverse audiences. Some prevention programs have been adapted as Castro and colleagues suggest. A few examples include cultural variations of the original Strengthening Families Program reviewed by Kumpfer et al. (2002), which I discussed briefly in the literature review. The original Strengthening Families Program was also adapted for rural Appalachian families (Marek, Brock, & Sullivan, 2006). However, programs are also implemented with diverse audiences without undergoing any strategic adaptation.

Implementations included in the current study were not strategically adapted prior to implementation with Hispanic and American Indian participants.

As mentioned in the literature review and demonstrated in the findings of the present study, although not strategically adapted prior to implementation, programs are often adapted during delivery. The rate of adherence for most process and content components was about 80%, indicating that approximately 20% of the program activities were modified or omitted. The adherence checklist used in the present study was not a measure of additions to the program that likely occurred.

Whereas it may be ideal to strategically adapt programs prior to implementation with diverse audiences, the reality is that programs are also delivered to diverse audiences without strategic adaptations. Careful monitoring of implementation and outcomes of strategically adapted programs is essential (Backer, 2001). Evaluation of implementation and outcomes of programs implemented without strategic modifications, such as the current study, may also provide important information. Research of strategically adapted and unmodified programs delivered to diverse audiences should be viewed as complimentary rather than competitive. Both types of research provide information for informing theory and implementation of programs.

Adherence and White/Caucasian Parents

Results of multilevel analyses show adherence was unrelated to outcome for White/Caucasian parents. White/Caucasian parents may have been less sensitive to adherence. The range of adherence in the current study may have been too narrow for significant findings to emerge. It may also be possible that measures were not sensitive enough to capture differences in outcome resulting from higher or lower adherence. In Spoth's (2004) assessment of adherence

and outcome, significant differences between high and low adherence groups did not emerge till a year and a half follow up.

Summary and Conclusion

The multilevel analyses revealed that individual level variables are strong predictors of parent outcomes, and also the importance of program level variables, such as adherence to specific process and content components. Perhaps the most interesting finding of the multilevel analyses was that minority status moderates the relationship between adherence and outcomes. Adherence to some content and process predicts outcome for minority parents but not White/Caucasian parents. Not only do specific program components contribute differently to outcomes, specific components also interact with participant characteristics to influence outcomes.

<div align="center">

Implications

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Implications for Facilitators of the SFP

The present study has important implications for facilitators of the SFP. Fidelity of implementation is important, but 100% fidelity is not the ultimate goal. Some components of implementation are more important than others, and which components are most important may depend on participant characteristics.

Cantu (2007) failed to find a relationship between overall adherence and outcome. The present study demonstrated that for some participants adherence to some components is associated with better outcomes, while adherence to other components appears to lead to poorer outcomes. Modifying some components may lead to improved outcomes for some participants.

Results suggest that facilitators can improve outcomes for minority parents by striving for high adherence to the processes of Set Up and Instructions, and the content component of

Emotional Regulation. Facilitators should use caution and consider adapting the program activities of Supervise Process and the with Rules content for minority parents.

The major implication for facilitators is to consider participant characteristics when implementing programs. Facilitators should exercise caution when modifying program components, even if it is merely because of lack of time. Before modifying program components facilitators should consider the purpose of the components and participant characteristics.

Implications for Implementation Quality Assessment

The study has important implications for the field of implementation quality assessment. A global assessment of adherence is not sufficient for assessing implementation of a complex, multi-component program. Complete assessments of implementation should consider the delivery and receipt of specific program components as well as contextual issues in implementation. The division of program material in terms of both process and content is an advance in implementation assessment, but not without problems.

Global adherence assessment did not reveal a relationship between adherence and outcomes (Cantu, 2007). In the current study, a component analyses revealed relations of adherence to some program components and minority parent outcomes. However, it is not clear whether minority parents receive program material and activities differently than White/Caucasian parents or program facilitators are influenced by participant characteristics and deliver the program differently. The reason for the moderating effect of minority status could only be revealed through implementation assessments that included both measures of the quality of delivery, and participant responsiveness.

In addition to age and minority status, other participant characteristics could be possible mediators and moderators of implementation effects. There may also be facilitator characteristics

or cultural or contextual influences that interact with implementation to influence outcome. A complete assessment of implementation quality should not treat all program components the same and should include adherence, quality, dosage, participant responsiveness measures, and consider structural and environmental issues of implementation.

The content and process coding systems employed in the present study contribute to the field of implementation assessment. Is one method of categorizing program activities more useful than the other? There were more significant correlation between adherence to content categories and outcomes than adherence to process categories and outcomes. However, in multilevel analyses adherence to process categories was significant when entered with ITPB pretest more often than adherence to content. Both process and content should be considered when dividing prevention programs into meaningful components. In the present study, process and content were considered separately. It may be possible, and beneficial to consider content and process together, by dividing programs into kernels. Embry and Biglan (2008) describe kernels as units of behavioral influence, which underlie effective prevention programs. One example of a kernel described by Embry and Biglan is *Choral Responding*, in which participants chant a response to an oral or visual stimulus. Participants in the SFP chant the parent, youth, or family creed at the end of sessions. Reciting the creeds was coded as a Ritual process, and as Group Unity content. Measuring adherence to implementation to the creeds as kernels, and other program activities as kernels could provide useful information regarding the relation of adherence to outcomes.

Implications for Prevention Programming

Theory and program design. The present study demonstrates the complexity of the relationship of adherence to content and process and outcome. The adherence-outcome picture

becomes increasingly complex if participant characteristics, quality, dosage, participant responsiveness, facilitator characteristics, and other contextual issues are considered. Available explanations of program theory are rarely able to account for so complex a picture.

Researching the theory behind the SFP was one of the most difficult parts of the present thesis. The written explanations available typically summarize program activities, themes of program content, and expected results. I was unable to locate a logic model or any representation or explanation of which specific program activities led to changes in behavior, or how changes in behavior lead to reduced substance use and delinquency in youth. This paucity of detail and complexity in explanations of program theory made generating hypotheses for the current study difficult.

Program developers should devise specific, detailed, and explicit theories. Program theories should be detailed enough to specify the outcomes of specific components of programs, and possible interactions of program components with participant, facilitator, or contextual characteristics.

Pilot and advanced testing. A complete and detailed program theory is necessary for effective pilot and advanced testing. Early evaluation of a program should seek to identify vital program components as well as potentially harmful components. Whenever possible, early evaluations should also assess the effectiveness of program components with participants of various ethnicities and cultural backgrounds as well as other participant, facilitator, and contextual variables.

A complete assessment of delivery and receipt of specific components, testing for interactions with participant, provider, and contextual characteristics is not feasible. An evaluation of a complex program including adherence, quality, dosage, and participant

responsiveness to components, testing for interactions with participant, provider, and contextual characteristics would require an impractical amount of measures and a very large sample size.

Complete and detailed program theory could guide pilot and advanced testing. Theory that specifies the importance of specific components and how they influence outcome determines which components are of interest and would also determine which participant, provider, and contextual variables should be measured.

Wide-scale implementation. A complete and detailed program theory, vigorously tested during pilot and advanced testing, could lead to a higher standard of guidelines for program providers. Knowing the contributions of specific components and how delivery and receipt of components interact with participant characteristics could improve program manuals. Vital components, which contribute most to outcomes, could be identified in the manual. Program manuals may contain alternate activities for certain cultural or minority groups for which the original activity may be less appropriate. Manuals could contain guidelines and suggestions for adapting program delivery.

Currently, guidelines for adapting programs are rare. Program providers should exercise extreme caution when modifying programs. On the one hand, program designers would be arrogant to think their programs could not be improved and fit every audience and context. On the other hand, program providers are naïve to think they can improve on programs without an understanding of the theory behind the program.

Strengths and Limitations

Sample

Use of a diverse sample is a strength of the present study. The sample included members of various ethnicities from various communities across the state of Washington. Unfortunately,

the sample size was insufficient for all of the analyses included. Readers must consider the possibility of type I error accounting for significant results.

Frequency of ethnic-minority participants was not sufficiently high to examine specific effects of ethnicity. Differences between White/Caucasian and minority parents provided some of the most interesting results. Considering differences between individual ethnicities would prove interesting if the study were replicated with a larger, even more diverse sample.

Observations

Use of observation adherence data is a strength of the present study. However, the use of observations is not without problems. Observers are not subject to social desirability to the degree that facilitators would be reporting on their own adherence. Observer ratings have been found to be more strongly related to outcomes (Lillehoj et al., 2004). The use of observations may have led to a selection bias. Only facilitators willing to be observed were included in Cantu's (2007) sample. It is possible that facilitators unwilling to be observed were more or less likely to deviate from the program as specified, or different in other ways that may influence program implementation and outcomes. In addition, the mere presence of the observer could have caused anxiety or distress for facilitators, causing them to deliver the program differently than they normally would.

The adherence measure used for observations also has limitations. Observers awarded two points if a program element was delivered as specified, one point if a program element was delivered somewhat as specified, and no points if the element was not delivered. Scoring adherence in this manner does not account for the possibility of improvement through modifying program elements. Blakely et al. (1987) and Dusenbury et al. (2005) demonstrated that adaptations may lead to better or poorer outcomes. The results of the present study showed lower

adherence to some components was related to better outcomes for some participants. The adherence measure used in the present study may have resulted in a facilitator receiving one point for poor delivery of a program element. Another facilitator may have deleted that same element and inserted a more effective activity and received no points for it. Some adaptations may have led to improved outcomes but counted toward lower adherence scores, washing out the relation of adherence to outcome. Measures of the quality of delivery are important along with completeness of delivery so appropriate adaptations can be accounted for.

Coding System

Process and content component analyses contribute to the literature in the field of implementation quality assessment. The coding system that generated the component categories had acceptable reliability but also had some limitations. Not all codes were represented well across all sessions, and in each type of session (youth, parent, and family). Cantu (2007) was only able to observe a few session from each program implementation. Some content and process categories had too few items observed, resulting in limited, missing, and unusable adherence scores for parents or youth.

Missing adherence scores were particularly a problem for program content. The reliability was also lower for content than process. Coding content proved difficult. Some elements seemed to contain content that fit in multiple categories, making reliable coding more difficult. For example, in parent sessions, discussions of adolescent problems could fit under the content area Empathy or the content area Peer Issues.

Conclusion

Despite limitations, the present study contributes to the field of implementation evaluation. It demonstrates the importance of component analyses and the limitations of

considering implementation globally. The present study also demonstrates the importance of considering contextual characteristics such as participant age and ethnicity. Program components influence outcome in different ways depending on participant characteristics and other contextual factors. Finally, the present study also demonstrates the value of using multiple methods to assess implementation. Minority parents are influenced differently by adherence than White/Caucasian parents. It is not clear whether minority parents receive the program differently, or facilitators deliver the program differently. The delivery or receipt question could only be answered through assessing delivery quality and participant responsiveness.

The present study also demonstrates the need for complex and explicit program theory. Several factors influence the relation of implementation quality and outcome. It is not practical or feasible to attempt to measure all of these factors in the same assessment. Complete and detailed program theory could provide guidance to evaluators studying implementation quality. The results of these studies would then provide valuable guidance to program providers as well as important feedback regarding program theory.

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Thomas, D.R. (2006). A general inductive approach for analyzing qualitative evaluation data.

American Journal of Evaluation, 27.

Figure 1 The Preventive Intervention Research Cycle

Information Feedback

| Problem analysis | Information review | Program design and pilot testing | Advanced testing | Dissemination |

Assess Implementation
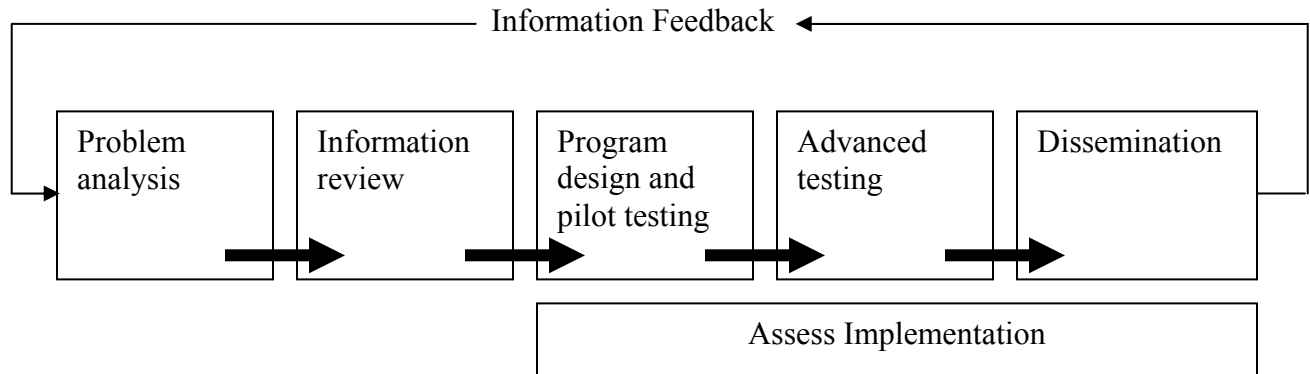
Figure 2 Type III Error, High and Low Fidelity Implementation

Type III Error: Invalid Information Feedback ◄

Information Feedback ◄

| Program Theory | → | Planned Intervention | → | Expected Outcome |

| Low Fidelity Implementation | → | Alternate Outcome |
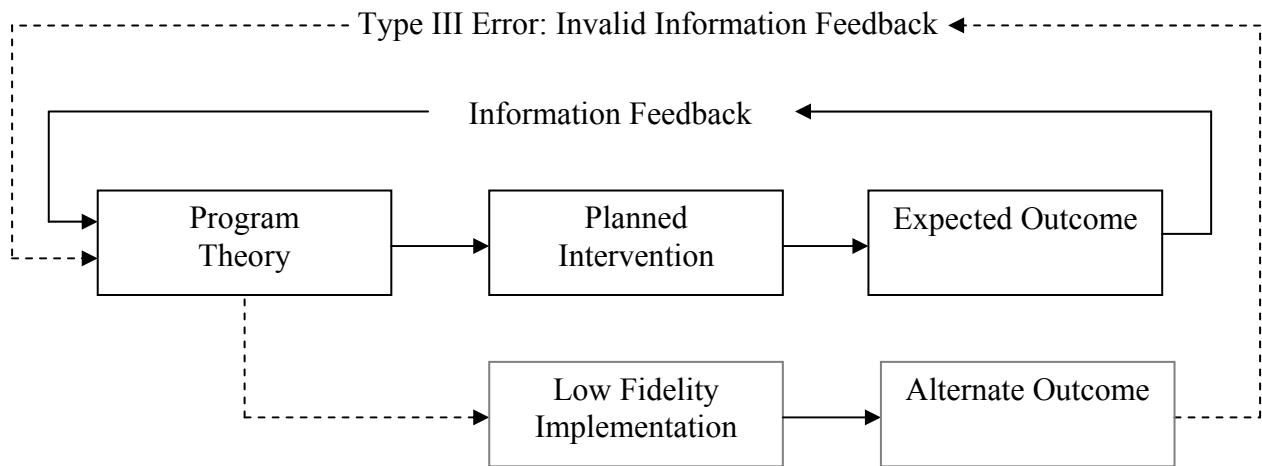
Figure 3 Interaction of Minority Status and Adherence to Set Up
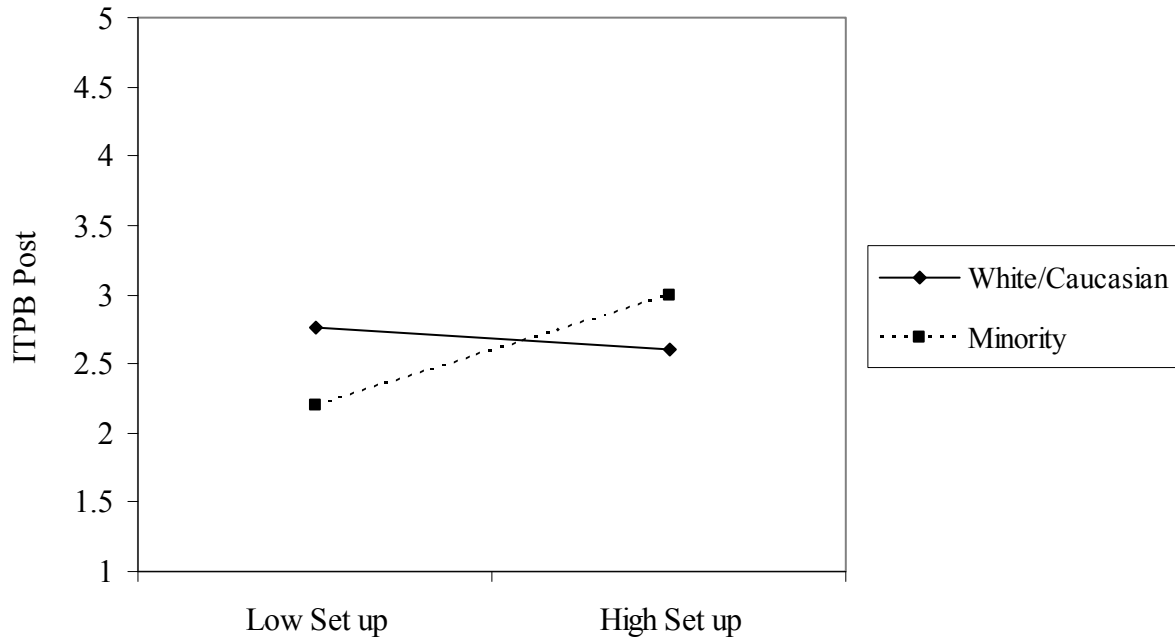
Figure 4 Interaction of Minority Status and Adherence to Instructions
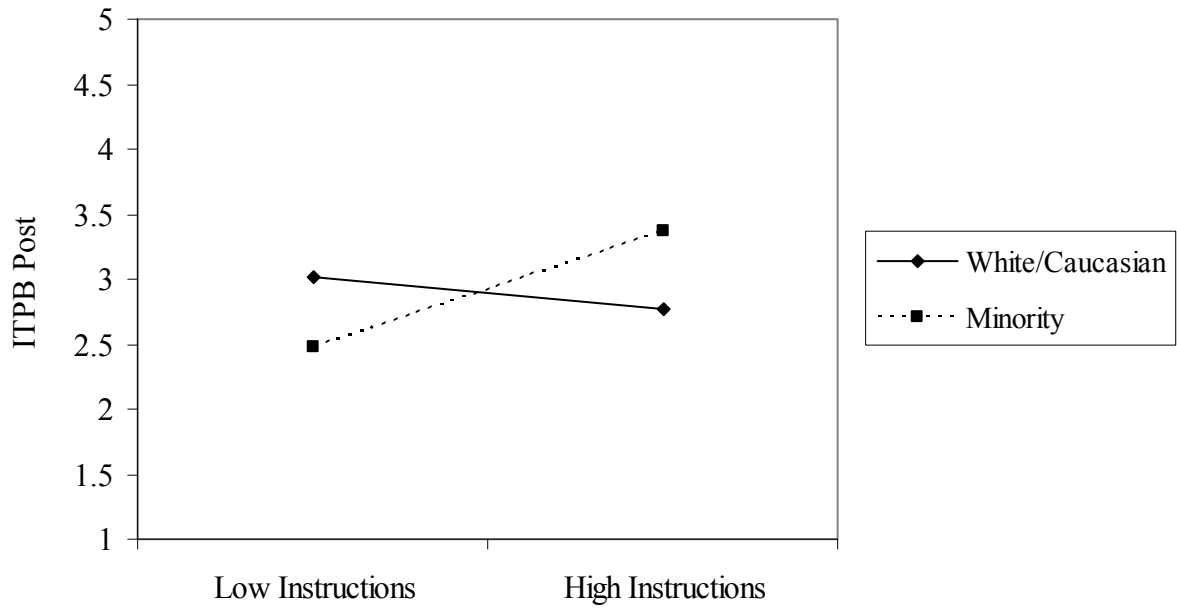
Figure 5 Interaction of Minority Status and Adherence to Supervise Process
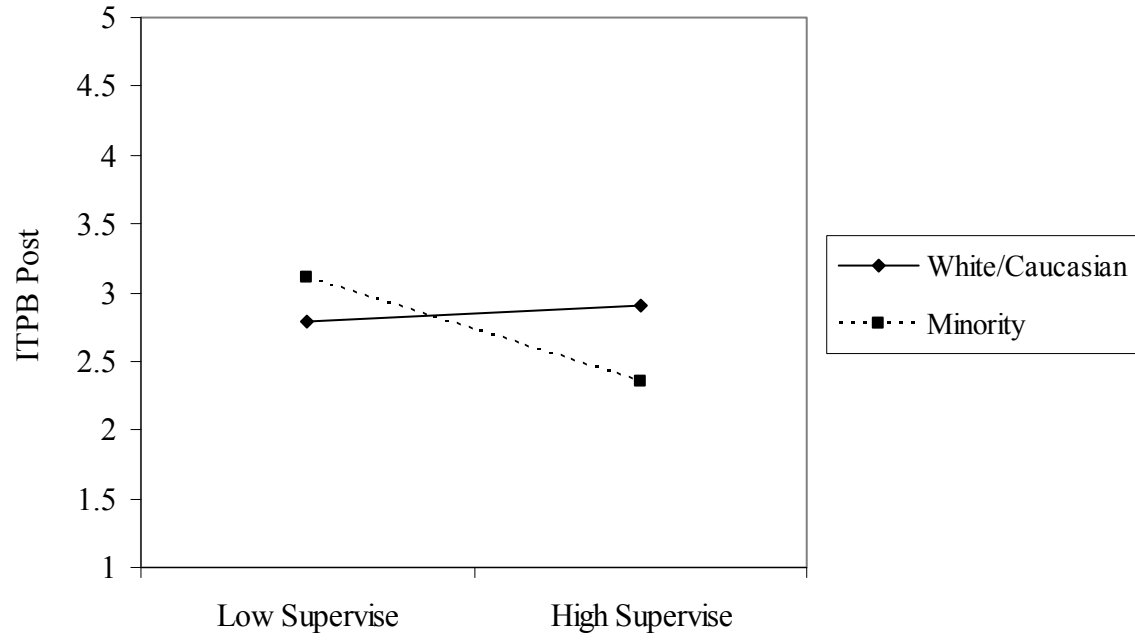
Figure 6 Interaction of Minority Status and Adherence to Emotional Regulation
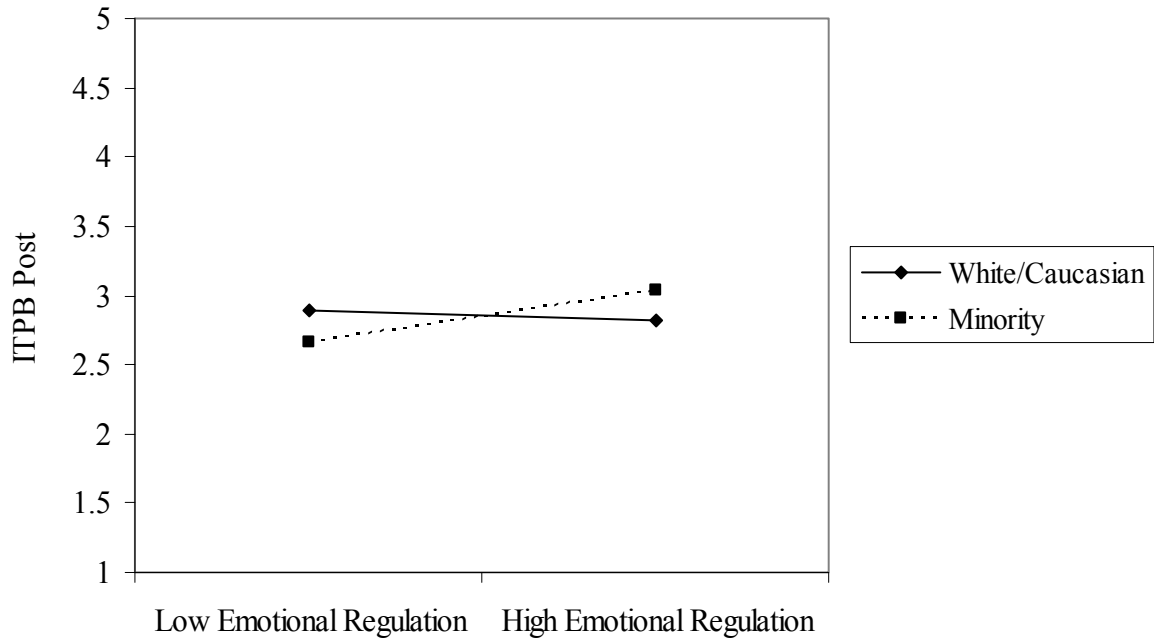
Figure 7 Interaction of Minority Status and Adherence to Rules
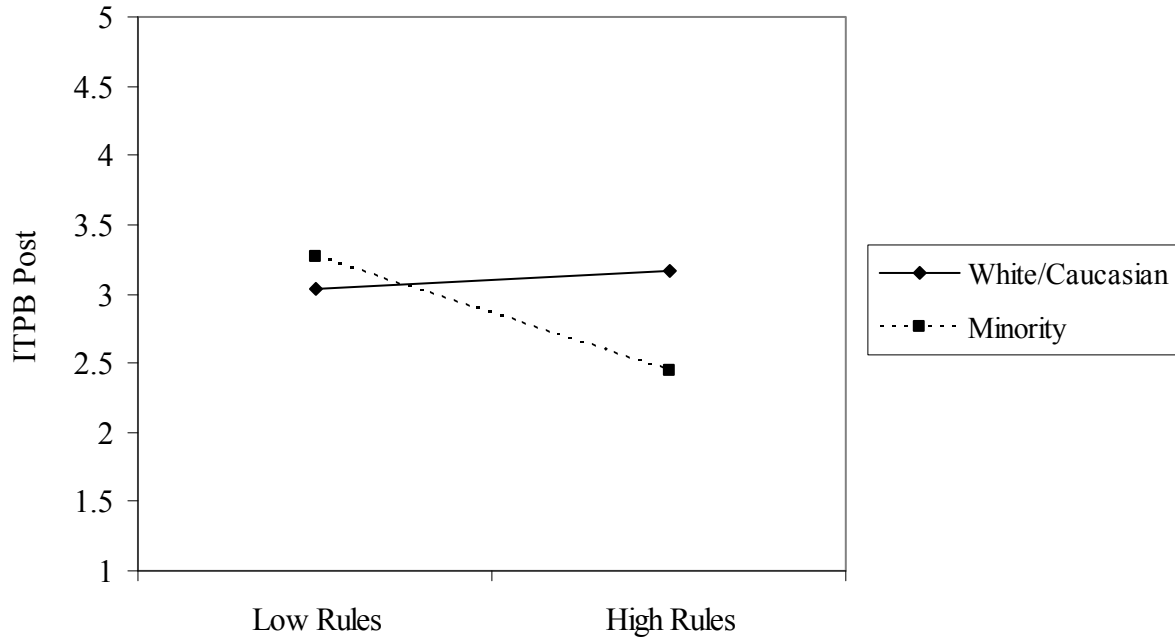
Table 1

Summary of Implementation Quality Assessment

Approach	
Strict Fidelity	The presence of prescribed elements and absence of non-prescribed elements
Adaptation	Focus on how programs are modified and adapted to better suit the needs of participants or implementing organizations
Moderate	The presence of prescribed elements and measurement of additions adaptations with a focus on the appropriateness

Measures		
	Delivery	Receipt
How Much	Adherence	Dosage
How Well	Quality	Participant Responsiveness
Specific Components	Program Differentiation	

Contextual Considerations for Implementation Assessment	
Structural Considerations	Implementer and Participant Characteristics, Mode of Delivery
Environmental Considerations	Micro Context, Macro System

Table 2

Original Process Components for SFP 10-14

Label	Description	Sample Item from Adherence Measure
Information	Facilitator gives information to illustrate or demonstrate a principle. This process excludes items in which the facilitator "discusses."	Did facilitators tell families that family meetings are a good way to make plans?
Overview/Preview	Facilitator introduces, states the purpose of, or explains a topic the group will discuss, or a process or activity the group will engage in. Facilitator may give just previous to a discussion, game, or activity or at the end of a session regarding the next session.	Did facilitators tell the parents about the family session in which they will discuss family values and make a family shield?
Homework	Facilitator encourages group to use skills or reflect on knowledge gained between sessions.	Did facilitators ask youth to notice something a friend does to show he or she is a good friend?
Set Up	Facilitator physically organizes or reorganizes group or prepares group or materials for an activity.	Did facilitators choose a youth to be the first "driver"?

Table 2 Continued

Original Process Components for SFP 10-14

Label	Description	Sample Item from Adherence Measure
Ice Breaker	Facilitator has group engage in an ice breaker activity. Instructions or Supervise Process that occur during an ice breaker will be coded as Ice Breaker.	Did facilitators have youth move through the room making the sound on their card?
Game	Facilitator has group play a game. Instructions or Supervise Process that occur during a game will be coded as Game.	Did facilitators Play the game?
Eliciting Response	Facilitator asks group members to verbally provide answers to questions, examples, or reports of activities, group processes, homework assignments, or to discuss a principle or activity. This may be phrased as facilitator has group "discuss" or "process."	Did facilitators ask several parents to share the "I" statement they wrote?
Instructions	Facilitator tells the group to engage in a certain process or activity, or explains how to participate in an activity. Instructions must provide opportunity for group compliance.	Did facilitators tell the group to show each step to a facilitator before going on?

Table 2 Continued

Original Process Components for SFP 10-14

Label	Description	Sample Item from Adherence Measure
Supervise Process	A facilitator ensures that an activity or process occurs properly, or prevents an activity from proceeding improperly.	Did facilitators make sure every youth had a chance to participate?
Video	Facilitator stops or starts video, or discusses/refers to video content.	Did facilitators stop the video after the family on the video had read the rules?
Ritual	Facilitator leads an activity that is repeated over multiple sessions with special meaning attached to it.	Did facilitators have parents read Parent Creed?
Material Utilization	Facilitator distributes or makes reference to written materials or visual aids.	Did facilitators pass out Gifts worksheet?
Housekeeping	Facilitator sets up for or cleans up after sessions (not specific activities), includes distributing nametags, taking attendance, greeting participants and other similar activities.	Did facilitators take attendance?
Other	Items that do not fit into any of the above categories	Did facilitators pass a container with Jolly Ranchers candy?

Table 3

Original Content Categories for SFP 10-14

Category	Description	Sample Item from Adherence Measure
Consequences	The positive and negative results of behaviors	Did Facilitator ask the youth what consequences they or someone else got when they broke a rule?
Communication	techniques or instances of effective communication or communication of love and warmth	Did Facilitator demonstrate how to summarize and state the speaker's feelings?
Family Unity	Promotion of the family or closeness of family	Did Facilitator tell group that it takes a strong family to ask for help?
Rules	Making, keeping, or characteristics of effective rules	Did Facilitator pass out Rules and Responsibilities for My Youth?
Behavior	Desired and undesired behaviors youth engage in or could engage in	Did Facilitator ask parents to point out things on the list that could help prevent substance abuse?

Table 3 Continued

Original Content Categories for SFP 10-14

Category	Description	Sample Item from Adherence Measure
Alienation	Disconnect in family relations, such as miscommunications, feelings of being taken for granted or unappreciated	Did Facilitator ask them to name something they are taken for granted for?
Emotional Regulation	Importance of or techniques for controlling emotions in potentially volatile situations	Did Facilitator ask parent/caregivers when it's hardest to stay calm?
Peer Issues	Resisting negative influence of peers, positive and negative attributes or influences of peers OR stress and difficulty associated with adolescence	Did facilitators have "parent" team identify and list top 5 reasons it's hard to be a kid?
Involvement	Opportunities for youth to be involved in making rules, consequences, or family decisions	Did facilitators ask parents to leave the "privileges and rewards" blank on their Earning Points for Rewards cards so that youth could have input?
Family Objectives	Discussions or activities regarding desires of youth for their futures	Did facilitators make sure each youth found a value to match his/her scenario?

Table 3 Continued

Original Content Categories for SFP 10-14

Category	Description	Sample Item from Adherence Measure
Empathy	Activities or discussions that promote youth understanding of parents' experiences or perspectives or parent understanding of youths' experiences or perspective	Did facilitators ask the following question: Could you see your youth's point of view?
Application	Review or discussion of specific application of program material, or what is working well for parents in general	Did Facilitators ask parents what is working well at home?
Group Unity	Promote group cohesiveness or encouragement and enthusiasm	Did Facilitators have families read the Family Creed?
Neutral/No Content	Some items are purely process such as situating the group or preparing materials as well as information about the progression of the program	Did Facilitators Distribute the Driving Game and Location cards around the room?
Other	Items that do not fit into above categories	Did Facilitators explain that the object of the game is to proceed to each location and end up at the pizza place, following the directions?

Table 4

Descriptive Statistics for Adherence to Process in Parent and Family Sessions

Process Component Category	*M*	*SD*	Range	*N*
1. Ritual	.89	.17	.44 - 1.00	11
2. Material Utilization	.87	.08	.68 - 1.00	11
3. Set Up	.80	.12	.63 - 1.00	11
4. Information	.78	.14	.54 - .97	11
5. Eliciting Response	.78	.10	.57 - .90	11
6. Overview/Preview	.77	.30	.00 - 1.00	11
7. Homework	.76	.21	.40 - 1.00	11
8. Instructions	.73	.13	.46 - .88	11
9. Supervise Process	.73	.15	.45 - .94	11
Overall	.79	.06	.73 - .89	-

Note: *N* = the number of programs included in calculations. Statistics for adherence are reported by programs because there is no within program variability on adherence.

Table 5

Descriptive Statistics for Adherence to Content in Parent and Family Sessions

Content Component Category	*M*	*SD*	Range	*N*
1. Emotional Regulation	.94	.12	.75 - 1.00	4
2. Family Objectives	.88	.25	.50 - 1.00	4
3. Neutral/No Content	.87	.17	.40 - 1.00	11
4. Rules	.85	.17	.67 - 1.00	6
5.Communication	.84	.10	.73 - 1.00	11
6. Application	.83	.14	.67 - 1.00	11
7. Group Unity	.83	.16	.50 - 1.00	11
8. Behavior	.81	.34	.00 - 1.00	11
9. Peer Issues	.81	.25	.25 - 1.00	8
10. Involvement	.81	.33	.00 - 1.00	10
11. Consequences	.81	.12	.66 - .91	6
12. Supportive Content	.79	.08	.68 - .91	11
13. Other	.75	.09	.63 - .88	11
14. Family Unity	.72	.18	.44 - .95	11
15. Empathy	.71	.16	.40 - .90	10
Overall	.81	.06	.71 - 94	-

Note: *N* = the number of programs included in calculations. Statistics for adherence are reported by programs because there is no within program variability on adherence.

Table 6

Intercorrelations of Adherence to Process in Parent and Family Sessions

Process Component Category	1	2	3	4	5	6	7	8
1. Information	-							
2. Overview/Preview	.03	-						
3. Instructions	.50	.73[*]	-					
4. Eliciting Response	-.07	.26	.36	-				
5. Ritual	-.13	.06	-.01	.75[**]	-			
6. Material Utilization	.45	-.14	.46	.33	.12	-		
7. Homework	.40	.70[*]	.66[*]	.53	.38	.16	-	
8 Set Up	.29	-.01	.40	.46	.23	.35	.34	-
9. Supervise Process	.12	-.12	-.17	-.26	-.35	-.14	.05	-.19

Note: $N = 11$ for all correlations.

Table 7

Intercorrelations of Adherence to Content in Parent and Family Sessions

Content Component Category	1	2	3	4	5	6	7	8
1. Consequences	-							
2. Peer Issues	-	-						
3. Communication	-.23	-.24	-					
4. Family Unity	.44	.02	-.09	-				
5. Rules	-.02	-	.10	-.62	-			
6. Behavior	-.34	-.22	.06	-.02	.47	-		
7. Emotional Regulation	-.48	-	-.26	-.75	.58	.99[**]	-	
8. Involvement	.64	-	-.26	.38	-.09	-.09	.17	-

Table 7 (Continued)

Intercorrelations of Adherence to Content in Parent and Family Sessions

Content Component Category	1	2	3	4	5	6	7	8
9. Family Objectives	.46	-.34	-.41	.28	-.26	.05	-	-
10. Empathy	.23	-.02	-.50	-.06	.60	.31	-	.24
11. Application	.24	.37	-.25	.84[**]	-.69	.10	-.58	.16
12. Group Unity	.48	-.21	.04	.35	-.48	.29	-.33	-.32
13. Neutral/No Content	.31	.01	.18	.77[**]	-.04	.17	-.79	.50
14. Supportive Content	.82[*]	-.50	.66[*]	.05	.08	-.05	-.42	.35
15. Other	-	-.38	.63	.61	-	.24	-	-.09

Table 7 (Continued)

Intercorrelations of Adherence to Content in Parent and Family Sessions

Content Component Category	9	10	11	12	13	14	15
9. Family Objectives	-						
10. Empathy	-.15	-					
11. Application or Outcome	.20	.09	-				
12. Group Unity	-.04	.19	.55	-			
13. Neutral/No Content	.16	-.10	.63[*]	.20	-		
14. Supportive Content	.08	-.45	-.36	-.25	.38	-	
15. Other	-.07	-.31	.49	.39	.69	.52	-

Note: *Ns* vary from 4-11. Correlations calculated from samples smaller than 4 programs are omitted.

Table 8

Descriptive Statistics for Adherence to Process in Youth and Family Sessions

Process Component Category	*M*	*SD*	Range	*N*
1. Ritual	.84	.18	.40 - 1.00	11
2. Material Utilization	.83	.09	.70 - 1.00	11
3. Information	.81	.20	.40 - 1.00	11
4. Homework	.79	.32	.00 - 1.00	10
5. Overview/Preview	.78	.17	.43 - 1.00	11
6. Instructions	.78	.08	.68 - .93	11
7. Supervise Process	.77	.21	.20 - 1.00	11
8. Set Up	.68	.14	.40 - .90	11
9. Eliciting Response	.67	.16	.35 - .91	11
10. Game	.60	.59	.00 - 2.00	10
11. Icebreaker	.34	.24	.00 - .67	11
Overall	.72	.14	.35 - .84	-

Note: *N* = the number of programs included in calculations. Statistics for adherence are reported

by programs because there is no within program variability on adherence.

Table 9

Descriptive Statistics for Adherence to Content in Youth and Family Sessions

Content Component Category	*M*	*SD*	Range	*N*
1. Emotional Regulation	.89	.19	.67 - 1.00	3
2. Group Unity	.80	.19	.40 - 1.00	11
3. Empathy	.80	.20	.50 - 1.00	10
4. Consequences	.78	.34	.00 - 1.00	9
5. Communication	.78	.21	.50 - 1.00	9
6. Neutral/No Content	.76	.10	.51 - .88	11
7. Peer Issues	.75	.09	.63 - .94	11
8. Supportive Content	.74	.14	.45 - .98	11
9. Family Unity	.71	.18	.38 - .91	11
10. Rules	.69	.30	.10 - 1.00	10
11. Family Objectives	.61	.19	.40 - .90	10
Overall	.76	.07	.61 – .89	-

Note: *N* = the number of programs included in calculations. Statistics for adherence are reported by programs because there is no within program variability on adherence.

Table 10

Intercorrelations of Adherence to Process in Youth and Family Sessions

Process Component Category	1	2	3	4	5	6
1. Information	-					
2. Overview/Preview	-.12	-				
3. Instructions	-.33	-.11	-			
4. Eliciting Response	.27	.15	-.20	-		
5. Ritual	-.54	.62[*]	.30	-.13	-	
6. Material Utilization	.28	.21	.01	-.04	.04	-

Table 10 Continued

Intercorrelations of Adherence to Process in Youth and Family Sessions

Process Component Category	1	2	3	4	5	6
7. Homework	.60	.31	-.58	.69[*]	-.20	.45
8 Set Up	-.15	.45	.43	.44	.61[*]	-.06
9. Supervise Process	-.17	.48	-.09	-.51	.31	-.28
10. Icebreaker	-.18	-.06	.24	.30	.28	-.28
11. Game	-.43	.59	-.19	-.18	.54	.59

Table 10 Continued

Intercorrelations of Adherence to Process in Youth and Family Sessions

Process Component Category	7	8	9	10	11
7. Homework	-				
8 Set Up	.03	-			
9. Supervise Process	-.34	-.10	-		
10. Icebreaker	-.43	.49	.01	-	
11. Game	.20	-.11	.29	-.29	-

Note: *N*s vary from 10-11

Table 11

Intercorrelations of Adherence to Content in Youth and Family Sessions

Process Component Category	1	2	3	4	5
1. Consequences	-				
2. Peer Issues	-.42	-			
3. Communication	-.25	-.36	-		
4. Family Unity	-.33	.04	.21	-	
5. Rules	.33	-.03	.36	.33	-

Table 11 Continued

Intercorrelations of Adherence to Content in Youth and Family Sessions

Process Component Category	1	2	3	4	5
6. Family Objectives	.28	-.16	.02	.43	.63
7. Empathy	-.30	-.65[*]	.42	.05	.17
8. Group Unity	-.33	.45	.23	.31	.27
9. Neutral/No Content	-.16	.09	.52	.27	.65[*]
10. Supportive Content	-.11	-.35	.24	-.31	-.22

Table 11 Continued

Intercorrelations of Adherence to Content in Youth and Family Sessions

Process Component Category	6	7	8	9	10
6. Family Objectives	-				
7. Empathy	.06	-			
8. Group Unity	-.08	-.19	-		
9. Neutral/No Content	.35	.25	.80**	-	
10. Supportive Content	-.30	.38	.23	.26	-

Note: *Ns* vary from 8-11. Correlations calculated from samples smaller than 8 programs are omitted.

Table 12

Descriptive Statistics for Change Scores on Outcomes

	Scale Name	*M*	*SD*	Range	*N*
Parent Outcome	ITPB	0.31	0.46	-.85 - 1.38	96
Youth Outcomes	Involvement	0.31	0.64	-.67 - 2.33	78
	Rewards	0.23	0.55	-1.00 - 1.33	78
	Attachment	0.28	0.77	-2.00 - 2.50	77
	Harmony	0.24	0.84	-2.00 - 2.33	77
	Family Management	0.07	0.36	-1.00 - .96	79
	Peer Resistant Skills	0.15	0.56	-1.75 - 1.50	78

Table 13

Correlation of Adherence to Process and Outcomes

Process	Outcome						
	Youth						Parent
	Involvement	Rewards	Attachment	Harmony	Management	Peers	ITPB
1. Information	.15	.06	.11	.09	-.06	-.03	.19
2. Overview/Preview	-.03	.13	.05	.07	-.17	.02	.03
3. Instructions	-.08	-.01	.03	-.03	.23[*]	.11	.21[*]
4. Eliciting Response	.19	-.02	.16	.01	.07	-.15	.02
5. Ritual	.01	-.01	.06	.05	-.13	.09	-.09
6. Material Utilization	-.01	.16	.12	.02	.13	.19	.09

Table 13 continued

Correlation of Adherence to Process and Outcomes

	Outcome						
	Youth						Parent
Process	Involvement	Rewards	Attachment	Harmony	Management	Peers	ITPB
7. Homework	.21	-.01	.11	.10	-.09	-.11	.02
8 Set Up	.01	-.05	.11	.11	.02	-.16	.31**
9. Supervise Process	-.14	.09	-.07	.02	-.33**	.04	-.28**
10. Icebreaker	.04	.06	.17	.00	.04	-.02	-
11. Game	-.03	.08	.030	.01	-.08	.10	-

Note: Ns vary from 71 – 79 for youth and $N = 96$ for parents.

Table 14

Correlation of Adherence to Content and Outcomes

	Outcome						
	Youth						Parent
Content	Involvement	Rewards	Attachment	Harmony	Management	Peers	ITPB
1. Consequences	.01	.10	-.03	.10	.06	.04	.22
2. Peer Issues	-.04	-.03	-.11	-.14	.00	.14	-.12
3. Communication	-.03	-.04	.08	.01	-.19	-.15	.17
4. Family Unity	.13	-.03	.08	-.16	.00	-.02	.13
5. Rules	-.10	.03	-.08	.03	.17	.05	-.34**
6. Behavior	-	-	-	-	-	-	-.20
7. Emotional Regulation	.16	-.03	.22	-.22	.23	-.12	-.32*
8. Involvement	-	-	-	-	-	-	.21*

Table 14 Continued

Correlation of Adherence to Content and Outcomes

	Outcome						
	Youth						Parent
Content	Involvement	Rewards	Attachment	Harmony	Management	Peers	ITPB
9. Family Objectives	.03	.14	.02	-.08	.23	.24[*]	-.32[*]
10. Empathy	.04	-.10	.07	.13	.03	-.19	.01
11. Application	-	-	-	-	-	-	-.30[**]
12. Group Unity	.05	-.01	.12	.09	-.22	-.03	-.04
13. Neutral/No Content	-.06	.05	.12	.13	-.14	-.01	.03
14. Supportive Content	-.04	.08	.18	.18	.01	-.11	.08
15. Other	-	-	-	-	-	-	.29[**]

Note: Ns vary 61 – 79 for youth and from 55 – 96 for parents.

Table 15

ICC Using Multilevel Results Predicting ITPB Posttest from Program Implementation

	Unconditional Model				
Source of Variance	B	*SE*	*Z*	*p*	Variance
Program Implementation	0.05	0.03	1.78	.037	27.78%
Residual	0.13	0.02	6.57	.001	72.22%

Table 16

Multilevel Results Predicting ITPB Posttest using Adherence to Content Component Family Objectives and other Predictors

Level 2 Predictors	Unconditional Model				Model 1				Model 2			
	B	*SE*	Z	*p*	B	*SE*	t	*p*	B	*SE*	t	*p*
Intercept	0.06	0.03	1.7	.05	2.00	0.50	4.01	.004	3.35	0.41	8.25	.001
Goals/Dreams					0.18	0.54	0.33	.750	-0.05	0.32	-1.53	.164
df						8				8		
Level 1 Predictors												
ITPB Pre					0.54	0.09	6.04	.001	0.46	0.08	5.89	.001
Age									-0.01	<0.01	-2.97	.004
Minority									-2.43	0.39	-6.16	.001
df						76				73		
Interaction Term												
Goals/Dreams x Minority									3.31	0.64	5.13	.001
df										73		
-2 Log Likelihood						85.9				49.9		

Table 17

Multilevel Results Predicting ITPB Posttest using Adherence to Content Component Application and other Predictors

	Unconditional Model				Model 1				Model 2			
Level 2 Predictors	B	*SE*	Z	*p*	B	*SE*	*t*	*p*	B	*SE*	*t*	*p*
Intercept	0.05	0.03	1.79	.037	2.25	0.55	4.13	.003	2.92	0.47	6.29	.001
Application					-0.12	0.52	-0.24	.816	-0.59	0.39	-1.51	.165
df						9				9		
Level 1 Predictors												
ITPB Pre					0.53	0.09	6.13	.001	0.53	0.08	6.70	.001
Age									-0.01	0.01	-1.22	.227
Minority									-2.41	0.53	-4.53	.001
df						84				81		
Interaction Term												
Application x Minority									2.47	0.63	3.93	.001
df										81		
-2 Log Likelihood						92.6				69.4		

Table 18

Multilevel Results Predicting ITPB Posttest using Adherence to Content Component Group Unity and other Predictors

	Unconditional Model				Model 1				Model 2			
Level 2 Predictors	B	*SE*	Z	*p*	B	*SE*	t	*p*	B	*SE*	t	*p*
Intercept	0.05	0.03	1.79	.037	1.96	0.53	3.71	.005	2.25	0.51	4.42	.002
Group Unity					0.22	0.48	0.47	.650	0.12	0.43	0.28	.786
df						9				9		
Level 1 Predictors												
ITPB Pre					0.53	0.09	6.12	.001	0.55	0.08	6.52	.001
Age									-0.01	0.05	-1.04	.302
Minority									-1.16	0.61	-1.89	.06
df						84				81		
Interaction Term												
Group Unity x Minority									0.91	0.69	1.32	.192
df										81		
-2 Log Likelihood						92.4				81.0		

Table 19

Multilevel Results Predicting ITPB Posttest using Adherence to Content Component Involvement and other Predictors

Level 2 Predictors	Unconditional Model				Model 1				Model 2			
	B	*SE*	Z	*p*	B	*SE*	t	*p*	B	*SE*	t	*p*
Intercept	0.09	0.07	1.26	.11	2.45	0.80	3.05	.093	2.36	0.83	2.83	.105
Involvement					-0.48	0.64	-0.74	.535	0.44	0.76	0.59	.618
df						2				2		
Level 1 Predictors												
ITPB Pre					0.55	0.16	3.37	.002	0.33	0.12	2.74	.011
Age									0.01	<0.01	1.05	.302
Minority									1.57	0.69	2.27	.030
df						34				31		
Interaction Term												
Involvement x Minority									-2.19	0.76	-2.89	.007
df										31		
-2 Log Likelihood						47.7				25.3		

Table 20

Multilevel Results Predicting ITPB Posttest using Adherence to Content Component Other Content and other Predictors

	Unconditional Model				Model 1				Model 2			
Level 2 Predictors	B	SE	Z	p	B	SE	t	p	B	SE	t	p
Intercept	<0.01	0.01	0.46	.322	2.55	0.51	5.00	.004	2.79	0.48	0.57	.001
Other Content					0.04	0.41	0.10	.922	-0.07	0.37	-0.20	.849
df						5				5		
Level 1 Predictors												
ITPB Pre					0.46	0.11	4.35	.001	0.56	0.10	5.69	.001
Age									-0.01	0.01	-2.18	.035
Minority									-1.66	1.034	-1.60	.118
df						47				44		
Interaction Term												
Other Content x Minority									1.935	1.404	1.38	.175
df										44		
-2 Log Likelihood						43.4				33.1		

Table 21

Multilevel Results Predicting ITPB Posttest using Adherence to Process Component Set Up and other Predictors

Level 2 Predictors	Unconditional Model				Model 1				Model 2			
	B	SE	t	p	B	SE	t	p	B	SE	t	p
Intercept	0.03	0.02	1.34	.09	1.22	0.53	2.31	.05	2.61	0.50	5.27	.01
Set Up					1.11	0.53	2.11	.06	0.06	0.48	0.13	.90
df						9				9		
Level 1 Predictors												
ITPB Pre					0.54	0.09	6.27	.00	0.50	0.07	7.02	.01
Age									-0.01	<0.01	-1.89	.06
Minority									-3.59	0.52	-6.86	.01
df						84				81		
Interaction Term												
Set Up x Minority									4.39	0.69	6.33	.01
df										81		
-2 Log Likelihood						89.3				47.5		

Table 22

Multilevel Results Predicting ITPB Posttest using Adherence to Process Component Instruction and other Predictors

Level 2 Predictors	Unconditional Model				Model 1				Model 2			
	B	*SE*	Z	*p*	B	*SE*	*t*	*p*	B	*SE*	*t*	*p*
Intercept	0.03	0.02	1.47	.07	1.37	0.53	2.59	.029	2.99	0.49	6.06	.001
Instruction					1.09	0.60	1.82	.102	-0.120	0.76	-0.23	.823
df						9				9		
Level 1 Predictors												
ITPB Pre					0.53	0.09	6.04	.001	0.44	.072	6.05	.001
Age									-0.01	>0.01	-2.02	.047
Minority									-3.54	0.51	-6.97	.001
df						84				81		
Interaction Term												
Instruction x Minority									4.896	.761	6.43	.001
df										81		
-2 Log Likelihood						90.0				47.4		

Table 23

Multilevel Results Predicting ITPB Posttest using Adherence to Process Component Supervise Group and other Predictors

	Unconditional Model				Model 1				Model 2			
Level 2 Predictors	B	*SE*	Z	*p*	B	*SE*	*t*	*p*	B	*SE*	*t*	*p*
Intercept	0.04	0.02	1.62	.053	2.80	0.50	5.56	.001	2.93	0.43	6.87	.001
Supervise Process					-0.90	0.49	-1.86	.095	-0.14	0.41	-0.35	.736
df						9				9		
Level 1 Predictors												
ITPB Pre					.054	0.09	6.27	.001	0.48	0.08	6.19	.001
Age									-0.01	0.01	-2.22	.029
Minority									2.26	0.57	4.00	.001
df						84				81		
Interaction Term												
Supervise x Minority									-3.29	0.70	-4.68	.001
df										81		
-2 Log Likelihood						89.6				61.3		

Table 24

Multilevel Results Predicting ITPB Posttest using Adherence to Content Component Emotional Regulation and other Predictors

Level 2 Predictors	Unconditional Model				Model 1				Model 2			
	B	*SE*	Z	*p*	B	*SE*	*t*	*p*	B	*SE*	*t*	*p*
Intercept	0.036	0.03	1.44	.075	1.70	0.44	3.89	.005	2.832	0.44	6.40	.001
Emotional Regulation					0.50	0.32	1.57	.155	0.03	0.29	0.09	.931
df							8				8	
Level 1 Predictors												
ITPB Pre					0.53	0.09	5.94	.001	0.43	0.08	5.36	.001
Age									-0.01	0.01	-1.40	.166
Minority									-2.00	0.36	-5.60	.001
df							80				77	
Interaction Term												
Regulation x Minority									2.11	0.43	4.86	.001
df											77	
-2 Log Likelihood							86.5				57.4	

Table 25

Multilevel Results Predicting ITPB Posttest using Adherence to Content Component Rules and other Predictors

Level 2 Predictors	Unconditional Model				Model 1				Model 2			
	B	*SE*	*t*	*p*	B	*SE*	*t*	*p*	B	*SE*	*t*	*p*
Intercept	0.02	0.04	0.47	.318	3.01	0.61	4.89	.008	3.19	0.58	5.53	.005
Rules					-1.12	0.48	-2.34	.080	-0.15	0.53	-.29	.787
df						4				4		
Level 1 Predictors												
ITPB Pre					0.52	0.11	4.67	.001	0.31	0.08	3.73	.001
Age									>-0.01	0.01	-0.26	.80
Minority									2.404	0.51	4.71	.001
df						50				47		
Interaction Term												
Rules x Minority									-3.44	0.60	-5.70	.001
df										47		
-2 Log Likelihood						52.9				13.2		