THE CONCEPTUAL ADEQUACY OF THE DRUG ATTITUDE INVENTORY FOR
MEASURING YOUTH ATTITUDES TOWARD PSYCHOTROPIC MEDICATIONS:
A MIXED METHODS EVALUATION

by

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proprietary material contained therein.

Dedication

First and foremost, this work is dedicated to the youth and families who were willing to share their experiences with mental illness in the hope that their stories would benefit others. Without them, this work would not exist. I hope to honor their lives in all of my future endeavors.

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The Conceptual Adequacy of the Drug Attitude Inventory For Measuring Youth
Attitudes Toward Psychotropic Medications: A Mixed Methods Evaluation

Abstract

by

LISA DAWN TOWNSEND

Despite the effectiveness of psychotropic treatment in alleviating symptoms of some psychiatric disorders, youth adherence to these medication regimens is low.

However, little is known about youth attitudes toward psychiatric medications or about their subjective experiences of treatment. Gathering information about these attitudes and treatment experiences may shed light on adolescents' low adherence to psychiatric medications.

The purpose of this mixed methods study was to answer the following questions:

1) What is the factor structure, validity, and reliability of the Drug Attitude Inventory (DAI) in youth undergoing psychotropic treatment? (quantitative question); 2) Will qualitative interviews with adolescents about their daily use of psychiatric medication support the dimensions found in the factor structure of the original DAI as used with adults? Will interviews with adolescents reveal new dimensions of youth attitudes toward psychiatric medication which are not measured by the DAI? (qualitative question); 3) Can measurement of youth attitudes toward psychotropic treatment be improved by knowledge about the factor structure, validity, and reliability of the DAI in youth as well as understanding their subjective experiences of treatment? (mixed methods question)

Confirmatory factor analysis, exploratory factor analysis, and parallel analysis were used to elucidate the factor structure of the DAI in adolescents. Qualitative findings were used to delineate dimensions of adolescent medication experience not measured by the existing instrument and to assess differences in the meaning assigned to DAI concepts by adults and youth.

Results indicated that two robust factors (positive” and “negative” feelings toward medication) were supported by all three quantitative techniques. The qualitative data supported the findings that adolescents frame their opinions of medications in positive and negative terms.

Qualitative results also highlighted the presence of eight additional themes not reflected in the original DAI, including concepts such as personal autonomy, inclusion in medication decision-making, experiences of stigma, and personal responsibility vs. external control over behavior. These themes highlight that medication experiences and the formation of attitudes toward pharmacological treatment for youth are complex, rendering it difficult to represent adolescent attitudes toward medication with a single instrument.

CHAPTER ONE: INTRODUCTION

Specific Aims

For this study, I proposed a mixed methods examination of youth attitudes toward psychotropic medications as measured by the Drug Attitude Inventory (Hogan, Awad, & Eastwood, 1983). Our understanding of youth adherence to psychotropic treatment is incomplete at best, yet vital for establishing effective methods for treating youth who suffer impairments from mental disorders. In the adult literature, interventions have been designed to enhance adherence to psychotropic treatment. However, these efforts assume an understanding of adherence behavior that is not supported by empirical evidence. Extant studies define adherence as compliance with provider recommendations. However, these studies did not elicit adult patients' attitudes toward adherence. This may explain some of the difficulties in improving their adherence levels.

Of importance to my study, the literature clearly shows that youth are even less adherent to psychotropic treatment than adults. Interventions to increase youth adherence have been less well studied than interventions with adults and are likely to be more complex given the multiple roles youth occupy in relation to adults and their developmental tasks of achieving autonomy. Little is known about youth attitudes toward psychotropic treatment and there are no consistent guidelines regarding interventions to increase their adherence to psychiatric medications.

Research with parents and youth shows that the nature of parent and youth decision-making impacts the behaviors and values youth adopt in many domains, such as in school and in relations with peers. No studies have examined youth attitudes toward medication management in the family context. Decision-making patterns and the struggle for

adolescent autonomy may be additional constructs relevant to the formation of youth attitudes toward psychotropic treatment. The lack of adequate measures of youth attitudes toward psychotropic treatment is likely to render intervention efforts less effective than they might otherwise be. The current study was designed to remedy these gaps in the adherence literature: namely, that we have not examined the attitudes that youth bring to psychotropic treatment. The specific aims of the study are as follows:

1. To adapt the adult version of the Drug Attitude Inventory (Hogan, Awad, & Eastwood, 1983) for use with adolescents in order to articulate the factor structure, validity, and reliability of this instrument in youth in an effort to develop a measure of youth attitudes toward psychotropic medication that can be used in research and clinical practice.

Background and Significance

Understanding how youth make sense of psychotropic treatment has become paramount given widespread increases in utilization of psychotropic medications to treat children and adolescents. During the past several decades, there has been more recognition that children and adolescents suffer from mental illnesses previously thought to affect only adults; at the same time, prescription of psychotropic medications for youth has increased (Thomas, Conrad, Casler, & Goodman, 2006; Harpaz-Rotem & Rosenheck, 2004). Safer, Zito, and dos Reis (2003) reviewed nationwide studies demonstrating that both psychotropic monotherapy and use of concomitant psychotropic medications have increased substantially over the past two decades. Gadow (1997), Jensen, Bhatara,

Vitiello, Hoagwood, Feil, & Burke (1999), and Zito & Safer (2001) document increases in psychotropic prescriptions across psychiatric disorders. Wong, Murray, Camilleri-Novak, and Stephens (2004) note increased use of psychotropic medications in children across nine countries between 2000 and 2002. The increase in psychotropic treatment of children and adolescents necessitates that we begin to understand youth attitudes toward it and how they make sense of psychiatric medications within the family context. It is likely that youth attitudes toward psychotropic treatment have direct impacts on the ability of youth to utilize treatments that may improve their mental health outcomes.

The effectiveness of pharmacologic treatment for youth psychiatric disorders has been documented extensively. The clinical trials literature on children and adolescents has proliferated, summarizing a wide range of medications and their effectiveness in treating problems such as attention deficit hyperactivity disorder, depression, and bipolar disorder (Swanson, Wigal, Greenhill, Browne, Waslick, & Lerner, et al., 1998; Wigal, Swanson, Regino, Lerner, Soliman, & Steinhoff, 1999; Pelham, Hoza, Pillow, Gnagy, Kipp, & Greiner, 2002; Banaschewski, Roessner, Dittmann, Santosh, & Rothenberger, 2004; Emslie, Rush, Weinberg, Kowatch, Carmody, & Mayes, 1998; Klein, Mannuzza, Koplewicz, Tancer, Shah, & Liang, 1998; Ryan & Varma, 1998; Findling, McNamara, Gracious, Youngstrom, Stansbrey, & Reed, et al., 2005; Findling, McNamara, Gracious, Youngstrom, Stansbrey, & Reed, et al., 2003).

Despite the effectiveness of psychotropic treatment in alleviating symptoms, youth adherence to these medication regimens is low. In a review of existing adherence research, Hack and Chow (2001) concluded that adolescents are among the least adherent subgroup of all other pediatric and adult populations. Adherence rates documented in the

literature range from ten to eighty percent (Swanson, 2003; Cromer & Tarnowski, 1989; Lloyd, Horan, Borgaro, Stokes, Pogge, & Harvey, 1998; Brown, Borden, & Clingerman, 1985; Sleator, 1985). While there is extensive documentation of youth non-adherence to psychotropic treatment, little is known about youth attitudes toward psychiatric medications. Gathering information about these attitudes may shed light on the problem of low adherence to treatments that have been shown to be effective at improving youth mental health.

The consequences of non-adherence are sobering. Non-adherence has a strong association with symptom relapse in adults: according to Fenton, Blyler, & Heinssen (1997), non-adherent patients are 3.7 times more likely to relapse than patients who take psychotropic medications as prescribed. Fortney, Rost, Zhang, and Pyne (2001) found a strong association between adherence to treatment as specified in clinical guidelines and the persistence of major depression. Weiden & Olfson (1995) demonstrated a link between reduced medication adherence and rehospitalization in their study of adult patients with schizophrenia. Weiden & Glazer (1997) showed that increased utilization of expensive inpatient services (“the revolving door phenomenon”) was related to lack of adherence to psychotropic prescriptions. Most concerning are the findings of Muller-Oerlinghausen, Muser-Causemann, and Volk (1992) that premature discontinuation of lithium even under medical supervision was related to completed suicide in adult psychiatric patients. How much more risk applies to those who discontinue psychotropic treatment without mental health supervision?

The role that the family plays has important implications for youth psychotropic treatment. Recent public health advisories from the FDA underscore the complexity of

this issue (United States Department of Health and Human Services, 2005). The FDA strongly encourages close monitoring of youth receiving antidepressants as part of a multi-pronged medication management strategy to lessen the risk of suicide attempts. According to FDA recommendations, close monitoring necessitates ongoing observation of youth by families and physicians. However, little is known about how youth make sense of psychotropic treatment. The FDA recommendations highlight a key component of medication management that is yet unstudied: the process of communication between families and youth regarding the purposes of psychotropic medications, how their effects are evaluated, and how families decide whether pharmacological treatments are effective.

Webb (2003) describes the unique role social work has occupied in serving at-risk or disadvantaged children and their families. Social workers have collaborated with psychiatrists who treat children, offering parent guidance and outlining the impact of social contexts on childhood symptom expression (Webb, 2003). In many circumstances, social workers serve as “case coordinators” (p. 17), facilitating communication between the family and all professional disciplines who are involved with the child. Webb (2003) points out that social workers frequently “synthesize” information and translate it between families and practitioners from multiple disciplines. They occupy multiple roles in this process, serving as monitors of side effects, educating clients about their medications, and consulting with them regarding their treatment (Bentley & Walsh, 1996). Given these roles, social workers must have familiarity with the language of psychotropic treatment as well as thorough understanding of how adolescents and their families experience and negotiate such treatment. Social work research is the foundation for improving this aspect of practice.

Social workers' involvement with youth may have profound impact on longer-term outcomes. Longhofer, Floersch, and Jenkins (2003) identified the "social grid of community medication management" (p. 31) in adult treatment of severe mental illness. They articulate the complex "social grid" that interacts to form interpretations of the effectiveness of psychotropic medications. The grid is comprised of multiple members who perform different functions in helping individuals manage their mental health care. Members include psychiatrists, case managers, friends, relatives, and caregivers. Social workers form an integral part of this grid, helping clients remember to take medications, delivering medications, assisting with prescription refills, and counseling clients about possible consequences of nonadherence.

Social workers' early involvement with youth and ongoing discussions about youth attitudes toward psychotropic treatment may help to define a recovery-oriented trajectory that places youth and their unique personal responses to treatment at the center of treatment efforts rather than leaving them disengaged from a system they perceive as acting upon rather than with them. These potential functions of social work in relation to youth with mental health disorders are consistent with social work values of client empowerment, client self-determination, and effective practice (NASW, 2006).

Efforts that incorporate youth attitudes toward psychotropic treatment are also consistent with a recovery-oriented philosophy for the treatment of mental illness. Torrey and Wyzik (2000) point out that practitioners may play an important role in the recovery process by communicating hope to clients, teaching skills for illness management, and supporting consumer efforts to "move beyond the illness".

Understanding youth attitudes toward medication is a key component of recovery-directed efforts.

The following review summarizes the research that is relevant to the study of youth attitudes toward psychotropic medications. I first review adult adherence enhancement research to understand adherence in populations that have been studied extensively. I propose that adherence research in adults does not incorporate patient perspectives/attitudes toward treatment and thus there are no consistent guidelines to inform work with youth. I also suggest that the adult experience of psychotropic treatment may be very different than that of youth given the embeddedness of adolescents in family social contexts that require continuous negotiation of autonomy. I then summarize clinical perspectives on youth adherence, highlighting the need for broadening our focus beyond side effects and psychiatric comorbidity as predictors of adherence to incorporate youth attitudes toward psychiatric medications.

Subsequently, I use the youth physical health literature to illustrate the relevance of youth attitudes toward treatment and the importance of the family context in shaping youth adherence behavior. I incorporate the adult literature on the subjective experiences of adults with antipsychotic medications to introduce the Drug Attitude Inventory as a potentially useful indicator of youth attitudes toward psychotropic medications.

I then present Reasoned Action Theory and social network concepts to demonstrate the mechanisms that may underlie formation of attitudes toward psychotropic treatment and family negotiations surrounding adherence. These ideas are useful in providing a theoretical framework for understanding the influences on youth attitudes toward medication.

Literature on the development of autonomy in adolescence is presented to illustrate why adult adherence concepts cannot be translated directly into use with adolescents given the continual tension between adolescents and parents in negotiating the adolescents' status as an independent decision-maker. Finally, I describe the literature on family decision-making and why understanding how ongoing negotiations of youth autonomy within the family may have a dramatic effect on formation of youth attitudes toward psychotropic treatment.

CHAPTER TWO: LITERATURE REVIEW

Adherence Enhancement in Adults

Review of the literature was conducted using Medline (1950 to 2008), PsychInfo (1967 to 2008), and Proquest Nursing databases. Searches were conducted using key words such as “adolescent”, “teen”, “child”, “youth”, and “mental health”, “adolescent”; “teen”, “child”, “youth”, and “treatment/adherence/compliance”; “adolescent”, “teen”, “child”, “youth”, and “mental disorders/mental health diagnoses” and other related words. Studies were also identified via contact with psychiatry researchers and via attendance at psychiatric and social work conferences.

Although studies of adult adherence to psychotropics are more widespread than studies in youth, this literature lacks patient-derived definitions of adherence. Of particular concern is the fact that multiple paradigms have been employed to increase adherence levels solely from a clinician-defined perspective. Several systematic reviews in this area highlight the need for broadening these conceptualizations of adherence. Among 164 studies examined in eight systematic reviews (Sajatovic, Davies, & Hrouda, 2004; Dolder, Lacro, Leckband, & Jeste, 2003; Nose, Barbui, Gray, & Tansella, 2003; Vergouwen, Bakker, Katon, Verheij, & Koerselman, 2003; Gray, Wykes, & Gournay, 2002; Macdonald, Garg, & Haynes, 2002; Pampallona, Bollini, Tibaldi, Kupelnick, & Munizza, 2002; Zygmunt, Olfson, Boyer, & Mechanic, 2002), research designs differed substantially in their definitions of adherence and their approaches to enhancing it. Interventions used in the studies reviewed included patient education, family therapy, cognitive-behavioral approaches, and combinations of all three. All adherence measures were defined from a clinical perspective.

The benefit of clinician-defined adherence measures is that they typically provide ease of quantification. Some of the studies reviewed above relied on bottle monitoring devices, pill counts, self-report, clinician report, urine assays, or serum levels. Some studies incorporated a variety of measures into a composite compliance index (Pampallona, Bollini, Tibaldi, Kupelnick, & Munizza, 2002). Some studies conceptualized adherence as a binary outcome (“good” vs. “poor”) (Razali & Yahya, 1995). However, each of the eight reviews concluded that there are no data to support any particular method for improving patient adherence to psychotropic treatment. Considerable debate remains in the literature regarding the reliability and validity of adherence measurements, acknowledging the difficulties inherent in correctly estimating levels of adherence. No work was uncovered in the adult literature linking patients’ definitions of adherence with interventions designed to enhance it. Failure to measure patients’ subjective experiences of medication and the lack of patient-defined concepts of adherence may explain the equivocal results obtained from the adherence enhancement interventions.

While the field of adult adherence intervention requires re-examination of the fundamental concept of adult adherence, no adherence interventions were uncovered that dealt with youth psychotropic treatment. It is likely that the construct of adherence is defined differently by adults and adolescents, necessitating separate investigations into patients’ experience of psychotropic treatment from the viewpoint of both age groups. Without a basic understanding of how youth make sense of psychotropic treatment, it will be difficult to design interventions to enhance their utilization of treatment. This study

takes steps toward developing a measure of youth attitudes toward psychotropic medication that may be used clinically to increase youth adherence.

Clinical Perspectives on Adherence in Youth

The clinical perspective on youth adherence has examined side effects and comorbid psychopathology to explain non-adherence with inconclusive results. Some studies demonstrate that side effects are associated with non-adherence (Sleator, Ullman, & von Neumann, 1982; Efron, Jarman, & Barker, 1998). Others find no relation between side effects and non-adherence (Ghaziuddin, King, Hovey, Zaccagnini, & Ghaziuddin, 1999; Bernstein, Anderson, Hektner, & Realmuto, 2000; Moline & Frankenberger, 2001). Brown, Borden, and Clingerman (1985) suggest that dosage form may impact adherence to methylphenidate therapy. Studies examining psychiatric comorbidity have found that the presence of oppositional defiant characteristics and substance abuse are associated with non-adherence (Bernstein, Anderson, Hektner, & Realmuto, 2000; Lloyd, Horan, Borgaro, Stokes, Pogge, & Harvey, 1998).

Clinical focus on side effects and psychiatric symptoms has generated important practice improvements such as alterations in drug dosing and the development of newer medications with fewer side effects. However, adherence difficulties remain. Studies using side effect or symptom frameworks present only part of the picture of the adolescent experience of psychotropic treatment. The experience of treatment likely represents a more complex, multi-dimensional construct than existing studies allow. This necessitates broadening our research scope beyond side effects and comorbidity to

examine youth attitudes toward psychotropic treatment and how they form within the family context surrounding them.

Youth and the Family Context in Managing Physical Illness and Treatment

Although no adherence interventions focusing on youth and psychotropic treatment were found, a review of the physical health literature uncovered adherence enhancement efforts for youth coping with physical illnesses. This literature was reviewed to examine existing knowledge about youth adherence to treatment regimens for non-psychiatric illnesses and to outline the influence of the family on treatment adherence. As was noted with the adult adherence literature, few conclusions may be drawn from the physical health literature about how to increase youth treatment adherence. None of these intervention studies examined the attitudes of youth toward treatment, how families made treatment decisions, and how families managed medication. However, they do demonstrate that incorporating the family into adherence enhancement interventions provides promising results, emphasizing the relevance of the family to youth adherence.

HIV Treatment

One of the physical illnesses that is most unforgiving of non-adherence is HIV infection. Non-adherence to antiretroviral treatments for this condition heightens the risk of selection for treatment resistant strains of the virus when adherence rates fall below near-perfect levels (Berrien, Salazar, Reynolds, & McKay, 2004; Lyon, Trexler, Akpan-Townsend, Pao, Selden, & Fletcher, et al., 2003). As such, a significant effort has been made to enhance adherence among youth who are HIV-positive. Several paradigms have

been employed, with varying results. Rogers, Miller, Murphy, Tanney, and Fortune (2001) created a stage of change intervention based on the model of change created by Prochaska, DiClemente, and Norcross (1992). Out of sixty-five youths who agreed to participate in the eight week intervention, only eighteen received the intervention as intended, compromising evaluation of the program's effectiveness. Of the participants who received the full program, seventy-eight percent of them progressed toward higher levels of treatment readiness. This study represents a step toward understanding youth attitudes toward treatment by incorporating assessments of individual states of readiness to change.

Promising results have been obtained from family intervention approaches that acknowledge the relevance of the family context to treatment. Lyon, Trexler, Akpan-Townsend, Pao, Selden, and Fletcher, et al. (2003) implemented a twelve-week family group therapy program for HIV-positive adolescents and their family members/treatment buddies. Twenty-three youth participated in the program; however, significance data were not reported for the study. The authors anecdotally reported decreased reports of missed doses, increased beliefs in the efficacy of antiretroviral treatment, and incidental increases in non-medication-related self-care behaviors. This study acknowledged the influence of social context and the importance of involving family members or significant adults (treatment buddies) in adherence enhancement interventions. However, they did not measure the attitudes of youth toward treatment; it is likely that these attitudes exert considerable influence on the formation of youth adherence behaviors.

Berrien, Salazar, Reynolds, and McKay (2004) conducted a randomized, controlled trial of a home-based nursing intervention designed to focus on education and

support for younger children undergoing antiretroviral therapy and their families. Over a three-month time period, nurses visited families at home for a total of eight sessions, educating them about the importance of full adherence to treatment and resolving barriers to adherence. Controls received standard medical treatment. Results indicated that the intervention group increased in their knowledge about HIV when compared to controls; however, there were no significant differences between the groups in adherence based on self-report data. There were differences in adherence levels based on pharmacy refill records, with the intervention group filling significantly more prescriptions than controls. The discrepancy between the pharmacy and self-report data raises questions about our understanding of how youth and their families conceptualize adherence behavior. Specifically, how do families make decisions about adhering to treatment? What underlies the difference between self-report of adherence and prescription-refill data? These questions highlight the need for further explication of how youth view treatment in the family context, how they make decisions about adherence, and how they manage medication in their daily lives.

Diabetes Treatment

The diabetes literature also underscores the need for more thorough understanding of youth attitudes toward treatment and the impact they have on treatment utilization. Silverman, Hains, Davis, and Parton (2003) developed a cognitive-behavioral approach to improving illness management in adolescents with Type I diabetes; however, they did not address youth attitudes specifically. Psychologists administered a six-week intervention program using individual therapy to conceptualize each patient's adherence problems, teach illness management skills, and address barriers to continued utilization of

behavioral techniques to enhance adherence. The study used only six adolescents; moreover, in the authors' multiple baseline design, some adolescents demonstrated improved adherence before the intervention, some exhibited improvement during and after the intervention, and the adherence behaviors of some deteriorated. Of the six youth who began the intervention, only three completed the program, rendering it difficult to draw any conclusions about the efficacy of the intervention. An assessment of these youths' attitudes toward treatment may have helped to explain why they did not remain engaged with the adherence intervention and subsequently with treatment.

The strongest attempts to incorporate the family context in medication management are studies using multi-systemic therapy (MST). MST is a complex paradigm involving therapy with the youth and family incorporating the multiple social contexts in which they are embedded (for example, school and social situations with peers, the workplace for parents). Ellis, Naar-King, Frey, Templin, Rowland, and Gerger (2004) used a randomized, controlled trial to evaluate the impact of MST on adolescent adherence to a diabetes treatment regimen in low income families. Thirteen youth received MST while twelve served as controls. Following the six-month program, the intervention group demonstrated significant improvement in metabolic control versus the control group, an increased frequency of blood sugar testing, and a decrease in hospital admissions. The authors concluded that MST is a promising intervention for low-income families who may need significant extra support from providers to promote adherence.

These studies illustrate the need for examining youth attitudes toward treatment as separate from and part of a family context. While the physical health literature has begun to examine these concepts indirectly, this work has not been translated into the youth

psychiatric literature. It is evident from psychotropic adherence data that adherence remains problematic for many youth. Although studies from the medical literature can enlighten our understanding of the complexities of engaging in treatment and have begun to incorporate the family in efforts to enhance adherence, many of the studies suffer from high attrition rates, which are telling in that study attrition is a dimension of non-adherence. Why did so many youth and families fail to continue their adherence enhancement programs? What are youth attitudes toward treatment for physical illnesses? Importantly for my study, are the perceptions of youth similar or different when treatment involves psychotropic medications rather than treatment for physical illness?

The results of intervention efforts in relation to physical illnesses highlight my contention that we must continue to explore youth attitudes toward treatment for physical and mental illnesses. The physical health literature has made inroads by beginning to represent patient perspectives on treatment and involving family members in adherence enhancement; however, continued exploration of the dynamic interaction between patients' and family members' attitudes is necessary if we are to impact treatment outcomes. Haynes, McKibbin, and Kanani (1996) call for better understanding of patient perspectives on adherence, concluding that existing interventions are too complex to be implemented in clinical settings and that the results of current enhancement programs are inconclusive. I argue that in order to design interventions to improve youth adherence to psychotropic treatment, we must translate the work begun in the physical health field to mental health by examining the nature of youth attitudes toward

psychotropic treatment. Without a fundamental understanding of these concepts, psychotropic adherence interventions are likely to be ineffective.

The Subjective Experience of Psychotropics in Adults

A review of the adult mental health literature demonstrates why understanding adults' subjective experiences of and attitudes toward psychotropic treatment are so important: they are substantial predictors of adherence. A series of studies was conducted to develop quantitative measures of adult subjective experiences of typical antipsychotic medications. The concept of "subjective well-being on neuroleptics" was coined to capture aspects of experience with typical antipsychotic medications in adults with chronic schizophrenia (Naber, 1995). Naber's (1995) "Subjective Well-Being on Neuroleptics" scale and Voruganti and Awad's (2002) "Personal Evaluation of Transitions in Treatment (PETiT) Scale" were designed to quantify subjective aspects of neuroleptic medication experience such as feeling discomfort in one's body or having "dulled" emotional sensations. These instruments have attempted to fill the empirical gap left in the literature that focused singularly on the physical side effects of medication. Naber, Moritz, Lambert, Rajonk, Holzbach, and Mass, et al. (2001) found that ratings of subjective well-being among adults with schizophrenia reliably differentiated between those taking neuroleptics and those taking newer atypical antipsychotic medications, which were formulated to decrease the potentially debilitating side effects of older antipsychotic agents. Similarly, Voruganti and Awad (2002) showed that patients who scored below the median on the Personal Evaluation of Transitions in Treatment (PETiT) scale were six times more likely to be nonadherent to antipsychotic medication. These

studies were the first to explore the relationship between adults' subjective experience of antipsychotic medications and their adherence to pharmacological treatment. However, they were not incorporated into interventions designed to enhance adult adherence.

Of interest to my study is the Drug Attitude Inventory (DAI), the most widely used instrument that measures both the subjective experience of neuroleptics as well as attitudes toward medications (Hogan, Awad & Eastwood, 1983). This measure has predicted adherence in a number of studies of schizophrenia and depression (Hogan, Awad & Eastwood, 1983; Gervin, Browne, Garavan, Roe, Larkin & O'Callaghan, 1999; Rossi, Arduini, Stratta & Pallanti, 2000; Kampman, Lehtinen, Lassila, Leinonen, Poutanen & Koivisto, 2000; Sajatovic, Rosch, Sivec, Sultana, Smith & Alamir, et al., 2002; Pae, Lee, Kim, Lee, Bahk, Lee & Lee, et al., 2003; Brook, van Hout, Nieuwenhuysse & Heerdink, 2003) and is frequently used as a validation standard in the design of other scales (Jeste, Patterson, Palmer, Dolder, Goldman & Jeste, 2003; Chen, Tam, Wong, Law & Chiu, 2005).

The original DAI instrument was validated in a sample of 150 outpatient adults who were diagnosed with schizophrenia and taking typical neuroleptic medications (Hogan, Awad, & Eastwood, 1983). Items used in the instrument were created based on patients' descriptions of their experiences with neuroleptics in clinical interactions with psychiatrists. The instrument discriminated 88% of the time between patients who were adherent vs. non-adherent to their medication prescriptions, highlighting the relevance of patients' attitudes toward and subjective responses to medication in relation to adherence.

Sibitz, Katschnig, Goessler, Unger, and Amering (2005) used the DAI to characterize 110 outpatient adults with schizophrenia or schizoaffective disorder as

“pharmacophilic” or “pharmacophobic”. They then measured the degree to which the two groups differed in their demographic and clinical characteristics as well as their treatment experiences. They found that patients with 2-5 hospitalizations had more positive attitudes toward medication than those with fewer or more hospitalizations; they also found that pharmacophobic patients were more likely to rate medications as disruptive to their daily lives.

Donohoe, Owens, O'Donnell, Burke, Moore, and Tobin, et al. (2001) used the DAI with 32 newly hospitalized adults diagnosed with schizophrenia. They found that the DAI was the best predictor of medication adherence patterns, symptom levels were the best predictors of non-adherence, and a series of memory measures was the best predictor of partial compliance to medication regimens.

Taira, Hashimoto, Takamatsu, & Maeda (2006) used a ten-item version of the DAI to measure subjective response to medication in 210 adult outpatients with schizophrenia or schizoaffective disorder. Half of the patients received an intervention which involved discussing side effects with their psychiatrist; half of the patients received routine care. The DAI was employed to measure attitudes toward medication in the two groups. Results showed that DAI scores were significantly higher for the intervention group at end of study, suggesting that interventions which acknowledge subjective responses to medication may improve attitudes toward medication.

Ritsner, Perelroyzen, Ilan, & Gibel (2004) examined DAI scores in a group of 133 outpatient adults diagnosed with schizophrenia. Half of the patients were prescribed typical neuroleptic medications, whereas half were taking atypical antipsychotics (Risperdal or Olanzapine) which were designed to alleviate some of the debilitating side

effects of the older generation medicines. Results showed significant differences in patients' attitudes toward medication based on medication type – patients taking atypicals had more positive attitudes toward medication than patients on older generation neuroleptics.

The studies described above demonstrate the usefulness of the DAI in measuring attitudes toward medication in adults and in predicting whether or not patients will adhere to their prescribed treatment regimens. There are currently no studies identified that have used the DAI in adolescent psychiatric populations. While the concept of subjective well-being has been an important addition to the adult adherence literature, a review of empirical work with adolescents reveals only one study of adolescent attitudes toward and subjective experience with psychotropics (Schimmelmann, Paulus, Schacht, Tilgner, Schulte-Markwort, and Lambert (2005). That study used Naber's (1995) Subjective Well-Being on Neuroleptics Scale, included only twenty inpatient adolescents, and did not examine adherence. However, the authors found that subjective well-being was related negatively to the presence of side effects the adolescents found to be concerning. The authors note the impact that negative subjective feelings may have on later adherence behavior and call for further research on this topic.

Work conducted by Scott, Lore and Owen (1992) provides preliminary information about how adolescents feel about psychotropic medications. In their study, at least half of the youths studied stated that they did not need medications and the same proportion revealed that they had not told their friends about their psychiatric diagnoses for fear of being labeled "weird" or "psycho". Only a small number of respondents employed reliable reminders to take their prescriptions regularly and sixty-one percent

relied on their mothers to ensure that they followed their treatment regimens. Sleator (1985) notes that youth adherence with psychotropics is far lower than their adherence with medications for physical conditions. What makes the difference between medications designed to target physical symptoms and those which target emotional and behavioral ones? How do youth make distinctions between treatments for physical illnesses and mental health disorders? Unfortunately, this valuable work has not been taken up in the psychiatric literature even though it provides beginning insights into the factors that impact youth psychotropic adherence.

Reasoned Action Theory and Attitude Formation

The theory of reasoned action was described originally by Ajzen and Fishbein (1980). It attempts to explain how individuals make decisions regarding a variety of behaviors that impact health, such as smoking, use of contraceptives, drug use, and high-risk sexual behavior. The theory contains three mechanisms that predict individuals' health-related behavior: 1) the person's attitude toward the behavior, 2) the person's perception of subjective norms held by significant others in their environment, and 3) the person's intention to perform the behavior. Behavior is determined in part by whether the individual values the health-related behavior and its consequences and whether the individual perceives other individuals as approving or disapproving of the behavior. These two components operate to shape the individual's own intention to perform the behavior.

The theory of reasoned action has garnered significant empirical support. In a study of beliefs about cervical cancer screening in young adult Hispanic women, Byrd,

Peterson, Chavez, and Heckert (2004) found that beliefs about need for screening as well as knowing other women who had undergone screening significantly predicted whether or not an individual had undergone screening themselves. In a series of meta-analyses examining condom use, Albarracin, Johnson, Fishbein, and Muellerleile (2001) found that decisions to utilize protection were related to personal attitudes and perceived subjective norms regarding safer sexual practices. Ford, Jaccard, Millstein, Viadro, Eaton, and Miller (2004) showed that young adults' beliefs about the consequences and treatment of curable sexually transmitted diseases were correlated significantly with their willingness to undergo home-based testing.

Riekert & Drotar's (2002) sample of youth with asthma, HIV, or irritable bowel disorder showed that health beliefs accounted for a significant proportion of the variance in treatment adherence. Similarly, Skinner & Hampson (2001) showed that youth who perceived their diabetes treatment regimens as effective were more likely to comply with dietary restrictions. Beliefs about the effectiveness of asthma medication were endorsed by adolescents as a determining factor in adherence to respiratory therapy (Buston & Wood, 1999).

Several studies have examined youth attitudes toward preventive health-related behaviors in the family context. Jaccard, Dodge, and Dittus (2003) found that adolescents who perceived their mothers to disapprove of unintended pregnancy, and whose mothers engaged them in frequent discussions of the negative consequences of such outcomes, held more negative attitudes toward unintended pregnancy than adolescents who saw their mothers as having more permissive attitudes toward it. Similarly, Jaccard, Dittus, and Gordon (1996) demonstrated that maternal attitudes

toward premarital sex in the context of positive mother-child relationships were associated with decreased sexual behavior in adolescents.

Morrison, Spencer, and Gillmore (1998) examined social relationships and their impact on pregnant teens' perceptions of the subjective norms surrounding substance use during pregnancy. They found that girls perceived the attitudes of their social networks as less favorable toward substance use during pregnancy; however, they perceived the attitudes of their social networks to be less unfavorable toward substance use following pregnancy. The data reflected a significant relationship between these perceptions and fluctuations in rate of substance use in this sample.

Pugatch, Bennett, and Patterson (2002) showed that fear of social stigma, family over-involvement, poor knowledge about HIV infection, and reduced quality of doctor-patient relationships were correlated with lower adherence with antiretroviral medications in youth. Stiles and Kaplan (2004) incorporated beliefs about HIV risk with select components of a social network approach in a longitudinal study of youth. Their results showed that beliefs about vulnerability to HIV as well as type of social network membership significantly predicted subjects' use of safety measures to reduce the risk of infection.

Rappaport and Chubinsky (2000) suggest that parental beliefs about psychotropic medications may influence their children's perceptions of treatment. Shikiar and Rentz (2004) noted that adults hold subjective norms about taking psychiatric medication; they argue that patients are rational decision-makers whose treatment adherence is affected by the beliefs of physicians and significant others about the utility of psychotropic treatment. In an interesting questionnaire study, Bastiaens (1995) implemented a parent/youth

education program designed to increase knowledge about psychotropic medications for hospitalized adolescents and their parents. This study used a nurse-rated measure of parent/youth attitudes toward medication, rating degree of adherence to medication while administered in a hospital setting. Results showed that adolescent attitudes toward psychiatric medications correlated with adherence, but that parent attitudes did not. This study is thought provoking, in that it highlights disparities between child and parent attitudes toward psychotropics. It raises questions regarding what processes influence parent/adolescent agreement or disagreement about the value of psychotropic treatment and whether youth attitudes about medication differ in a restricted inpatient setting vs. an outpatient setting.

Social Network Concepts

One of the distinguishing characteristics of adolescence is the emergent struggle for independence in the midst of continued dependence on parental guidance and support. I argue that this provides a unique backdrop for formation of attitudes toward psychotropic medication that is not well understood. Youth undergoing psychiatric treatment are embedded in a network of physicians, family members, teachers, and peers. Beliefs about medications and interpretations about their effectiveness form within this social context, yet little is known about how social environments impact youths' experience of psychotropic medication.

Much of the research conducted on social networks and mental illness exists in the adult literature on the impact of social support on psychological well-being. While there is no unified definition of social network theory, empirical studies exist that

describe the characteristics of and functions served by social networks. Drawing upon this literature provides a helpful framework for developing network models that apply to youth in the context of their social and developmental struggles toward autonomy.

We currently know that adults with severe mental illness usually have very limited social networks (MacDonald, Hayes, & Baglioni, 2000; Brunt & Hansson, 2002; Goldberg, Rollins, & Lehman, 2003; Biegel, Tracy, & Corvo, 1994). Social networks of adults with mental illness often differ in composition from those of healthy adults, containing a large proportion of professional service providers instead of natural social contacts (Brunt & Hansson, 2002; Bates & Toro, 1999).

Social networks in adults with mental illness serve a variety of functions, including emotional support, provision for material needs, intimacy, guidance, professional services, instruction, companionship, and resources (Goldberg, Rollins, & Lehman, 2003; Pickens, 2003). Networks may have positive effects, such as altering the downward trajectory of mental illness (Neeleman, Oldehinkel, & Ormel, 2003) and modulating the impact of stress on physical health (Bates & Toro, 1999). Networks may also have negative impacts on recovery from mental illness, promoting conflict (Hogarty, 2002; Pickens, 2003) and supporting maladaptive behavior such as substance abuse (Mueser, Noordsy, Drake, & Fox, 2003; Biegel, Tracy, & Corvo, 1994).

Several theoretical articles relate social contexts to beliefs about treatment for psychiatric disorders. The “social grid of community medication management” (Longhofer, Floersch, & Jenkins, 2003, p. 31) describes the complex way in which social networks make interpretations about the effectiveness of psychotropic medications for adults with mental illness. The grid’s function is not solely to assist with medication

management; rather, members engage in a far more complex process to promote an individual's well-being. Participants in the social grid make judgments about clients' symptoms, moods, and behaviors and decide how these relate to their course of treatment. At any given time, multiple people, including the client, are interpreting symptoms and deciding what course of action the behavior suggests. Identified patients represent one component of a multifaceted mental health treatment system that makes ongoing interpretations about their progress. Patient attitudes are formed within this complex of social relationships.

Cohen (2003) contributes additional theoretical work suggesting that like other life events, the experience of psychotropic treatment is constructed through social interaction (Cohen, 2003). In effect, perceptions of psychotropic experience are constructed in the context of social interactions with others, including physicians, family members, peers, and others who are important figures in individuals' daily lives. As Shikiar and Rentz (2004) noted, adults hold subjective norms about taking psychiatric medication; patients are rational decision-makers whose treatment adherence is affected by the beliefs of physicians and significant others about the utility of psychotropic treatment.

Although limited work has been done on adolescent social networks and psychotropic treatment, existing studies support the importance of social networks to youths' experience of mental illness. Kashani, Suarez, Jones, & Reid (1999) showed that depressed adolescents showed less satisfaction with their social networks than children with anxiety disorders, implying differences in network interactions (or youth interpretations thereof) operating between the two disorders. Hirsch & Reischl (1985)

showed that youth with a depressed or chronically ill parent utilized social networks less than youth whose parents did not have a physical or mental illness. One outcome study underscores the importance of social networks and their impact on treatment outcomes for youth. Cheng (1998) discovered gender differences in the type of network support associated with remission of depressive symptoms in Chinese adolescents: boys fared better with instrumental support while girls fared better with socio-emotional support.

Both the mental health and the chronic illness literatures demonstrate that the impact of social relationships, especially those between patients and caregivers, is bidirectional. Kyngas, Hentinen, and Barlow (1998) studied social support mechanisms among youth with diabetes. They found that accepting behavior on the part of parents and treatment providers as well as unobtrusive support from friends both were linked with greater adherence with treatment regimens. Exertion of parental dominance was associated with reduced adherence. Similarly, Martin, Miller-Johnson, Kitzmann, and Emery (1998) demonstrated that higher adherence was associated with emotionally supportive parenting and conflict resolution abilities in parent-child dyads.

Biegel, Tracy, & Corvo (1994) suggest that patients may overburden social networks which have limited capacity. Karp (2001) showed that people in caregiving relationships with loved ones with severe mental illness are forced to make significant emotional adjustments to cope with life disruptions. Financial struggles and loss of freedom were highlighted as primary stressors for caregivers of loved ones with chronic physical illness (Ohman & Soderberg, 2004). Charmaz (1991) found that patients with debilitating physical illness continuously negotiated a tension between demanding too much from their caregivers and feeling dependent and constricted by their status as care-

receivers. Timms and Lowes (1999) found that insulin non-adherence was linked with greater autonomy needs in their sample of adolescents with diabetes. This literature highlights the importance of viewing social relationships as bidirectional and dynamic, continuously shaped by the forces of illness and continually shaping attitudes toward treatment.

Floersch (2003) used social contextual concepts to frame questions about the youth experience of psychotropic treatment, acknowledging the heightened importance of parents and family members both in interpreting the effectiveness of psychotropics and in shaping how youth negotiate identity development in the context of mental illness. Managing mental illness and psychotropic treatment is made ever more complex by the natural separation and individuation process that is the primary task of adolescence. Adolescents may not share their symptoms openly with members of their social networks, rendering interpretation of medication effectiveness difficult in the absence of direct communication by the adolescent.

Although little work has been done on the social networks of youth with psychiatric disorders, principles can be drawn from network studies in healthy adolescents. These studies highlight the importance of peer and parent influences on health-related behaviors and risk-taking. Multiplexity (the degree of overlap in membership across settings) between parents and friends is associated with decreased adolescent smoking behavior (Krohn, Massey, & Zielinski, 1988). Peer influences have been highly associated with age of smoking onset (Unger & Chen, 1999) as well as presence/absence of smoking behavior (Kobus, 2003). Ecological analyses of youth social networks indicate that youth tend to distinguish between facets of their social

networks in deciding where to seek social support (Barone, Iscoe, Trickett, & Schmid, 1998). Kinship and social networks have been related to racial socialization in African-American youth samples (Stevenson, Reed, & Bodison, 1996). Additionally, social network theory has been employed to explicate the role of network structure and support in development of the adolescent self-concept (Coates, 1985). These studies underscore the importance of social networks to adolescent development; these social relationships may be even more critical in the context of adolescent mental illness and development of attitudes toward medication.

Adolescent Autonomy

The development of autonomy is of particular relevance to studying youth adherence given the corresponding tension that ensues as parents and youth negotiate levels of appropriate independence from parental control. In this regard, adolescence represents a unique stage in human development that is not adequately captured using principles applied to adults and their social networks. Additional factors, such as the drive for individuation (Erikson, 1950) must be accounted for in theories purporting to explain the influence of social networks on adolescents.

The social network literature has dealt primarily with adults and recovery outcomes; developmental theory supports its application to adolescence, with some important modifications. Social network concepts as applied to adolescence must incorporate the separation/individuation process which is often characterized by a tenuous balance between adolescent autonomy and parental authority.

According to Schlegel and Barry (1991), adolescence is a universal stage of development distinct from adulthood in most societies. In their efforts to derive a cross-culturally valid theory of adolescence, Schlegel and Barry (1991) noted several characteristics common to adolescence across cultures. Adolescence is characterized by a reorganization of social roles and responsibilities, incorporation of new roles, increasing independence from the family unit, and the emerging relevance of work and/or child-rearing. Common cross-cultural markers of adolescence include puberty, chronological age, labor and educational roles, clothing, hairstyle, and ceremonial rituals.

Schlegel and Barry's (1991) work underscores the need to adapt adult social network concepts to fit the unique developmental aspects of adolescence and to examine the dynamic aspects of youth attitudes over time. Given the multitude of new social and developmental roles impacting youth, it is unlikely that concepts applicable to adult social networks will translate directly to adolescent social networks. Adult concepts of social interactions do not account for tensions between simultaneous dependence and emerging independence from primary caregivers. Additionally, adult cognitive and social skills may differ from those of youth, and the relevance of same-age peer groups is likely to differ between adolescents and adults.

Of particular importance is the idea that primary caregivers balance responsibility for their child's development with relinquishment of complete governance of their behavior. Part of the role of the adolescent is to develop self-regulatory skills as a foundation for making the transition to adult work and family roles. Although these tensions may also apply to adults if one considers the responsibility social networks shoulder for adults with mental illness, the fact remains that adults are members of a

clear-cut developmental group with concomitant social expectations, whereas the expectations and roles of adolescents are much more variable.

Taken together, these factors indicate that social networks may subsume different functions and operate according to different rules for adolescents than they do for adults. If we are to understand how this impacts youth who take psychotropic medication, additional work is needed to explore how this context shapes formation of attitudes toward medication. In adults, interventions have been outlined to strengthen, expand, or contract client social networks in order to enhance outcomes (Biegel, Tracy, & Corvo, 1994; Dunst, Trivette, & Deal, 1988). If we are to create interventions for youth who are treated with psychiatric medications, we must begin by understanding youth attitudes toward them as separate from, yet related to, the family context.

Family Decision-Making

Bastiaens' (1995) finding that youth and parents disagreed about the value of psychotropic treatment has not been taken up for further examination in the literature. I propose consideration of a third body of literature that may shed light on the complexity of parent and youth interaction regarding psychotropic adherence: family decision-making. I suggest that the nature of how parents and youth make decisions regarding medications impacts how youth ultimately view their treatment and whether they accept or reject it within their unique struggle for independence.

The literature on joint decision-making shows that the degree of mutual parent and youth participation in family decisions influences whether youth adopt or reject family norms. More importantly, mutuality in family decision-making has important

implications for psychological health in youth. Dornbusch, Ritter, Mont-Reynaud, and Chen (1990) studied the impact of family decision-making processes on academic achievement in high school youth. They found that the degree of joint decision-making was positively related to grades and students' self-rated scholastic effort. Youth who made decisions alone achieved less academically, as did youth who perceived their parents as making decisions autocratically. Fuligni and Eccles (1993) showed that autocratic parenting was related to youth rejection of parental influences in favor of "extreme peer orientation" in sixth and seventh graders. These results were elaborated further in a recent study of African American high school students, providing additional support for the link between joint decision-making and healthy socialization. In their five-year prospective study, Smetana, Campione-Barr, and Daddis (2004) showed that optimal decision-making is done jointly by parents and youth when dealing with issues of social convention and safety (such as decisions about academics and activities that may involve risk of harm), but that youth outcomes were better if they exerted primary control over "personal" issues, such as clothing choices or when to complete homework.

Other studies have examined the roles of parental monitoring and warmth in the parent/child relationship. Raboteau-Saric, Rijavec, & Brajsa-Zganec (2001) demonstrated that parental monitoring was the strongest predictor of adolescent behavior problems and substance use, with increased monitoring associated with fewer problem behaviors. However, Fletcher, Steinberg, & Williams-Wheeler (2004) found that the impact of parental monitoring is mediated by degree of warmth in parent/child interactions. Specifically, parents whose interactions with their adolescents were characterized by a high degree of warmth gained more knowledge about their children's activities and thus

were able to monitor their behavior more adequately. These authors note that during adolescence, parents' ability to monitor their children is largely dependent upon the degree to which youth are willing to disclose their activities to parents. Thus, monitoring by itself is not protective of youth, but is dependent upon the quality of the parent/child relationship.

The role of joint decision-making and the struggle for youth autonomy have been examined in relation to adolescent psychopathology. In multicultural samples, excessive parental control over adolescents' personal issues was associated with higher levels of psychiatric symptomatology (Hasebe, Nucci, & Nucci, 2004). Relatedly, parental behaviors that undermined youth autonomy in adolescence were associated with higher levels of interpersonal hostility in young adulthood (Allen, Hauser, O'Conner, & Bell, 2002). Beyers, Goossens, Vansant, & Moors (2003) found that the degree of youth connectedness with parents was related to the amount of mutual reciprocity and trust characterizing their relationships. These studies are highly relevant to the development of a measure of youth attitudes toward psychotropic medication - a useful measure may need to account for the influence of caregiving relationships on youth formation of attitudes toward medication.

Of particular interest within this subset of literature is work characterizing family relations and non-adherence to psychotropic treatment. Bernstein, Anderson, Hektner, and Realmuto (2000) found that family rigidity and low cohesion were associated significantly with non-adherence in adolescents taking imipramine. Brown, Borden, and Clingerman (1985) demonstrated that families who withdrew their children from

stimulant treatment had significantly greater pathology than families that continued treatment.

Relatedly, parent/adolescent symptom agreement may impact initial decisions to seek treatment (Ferdinand, van der Ende, & Verhulst, 2004). Several studies demonstrate the impact of parent/child interactions on symptom identification, mental health service use, and treatment outcomes (Owens, Hoagwood, Horwitz, Leaf, Poduska, & Sheppard, et. al, 2002). Parental perception of caregiving burden is linked with decision-making regarding seeking mental health treatment for adolescents (Angold, Messer, Stangl, & Farmer, 1998). Parental knowledge about depression and pharmacological treatment options is associated with the type of services received by adolescents with depression (Wu, Hoven, Cohen, Liu, Moore, & Tiet, et al., 2001).

Lack of agreement between parents and youth also impacts clinical evaluations and treatment recommendations. Ferdinand, van der Ende, and Verhulst (2004), as well as Berg-Nielsen, Vika, and Dahl (2003), note that psychiatrists make treatment recommendations based on information gathered from multiple informants, many of whom may not agree on symptoms and their extent. Berg-Nielsen, Vika, and Dahl (2003) found that mothers and their adolescent daughters differed significantly in reporting depressive symptoms. Thapar and McGuffin (1998) found minimal diagnostic agreement between parents and adolescents reporting on depressive symptoms. Similarly, Baruch, Fearon, and Gerber (1999) demonstrated only moderate agreement between multiple informants reporting on internalizing mental health symptoms. Johnson, Grieve, Adams, and Sandy (1999) showed that parents and adolescents had minimal agreement regarding binge eating disorder symptomatology. Bennett, Pendley, and Bates (1997)

call for stricter professional decision rules for assigning relative weights to different informants when assessing the extent of adolescent psychopathology. They argue that youth may be more aware of internalizing symptoms, whereas parents may be more aware of externalizing behaviors.

Not only do parent/child interactions impact treatment-seeking, but they may also impact accurate assessment of treatment efficacy. In the literature, parent-child interactions have been linked to treatment outcomes. In the Multimodal Treatment of ADHD (MTA) clinical trial, parental discipline strategies were predictive of youth response to stimulant treatment at fourteen months post-baseline; it is significant that parental discipline predicted variance unaccounted for by other treatment factors (Hoza, Owens, Pelham, Swanson, Conners, & Hinshaw, et al., 2000). The authors noted that parenting self-efficacy may be related to the consistency of adherence to psychotropic regimens. In the same series of studies, Wells, Epstein, Hinshaw, Conners, Klaric, & Abikoff, et al., (2000) demonstrated that treatments were able to decrease negative parenting strategies that are linked with progression of conduct disorder psychopathology (Patterson, Reid, & Dishion, 1992).

Given the impact that parent/youth relations have on adolescent development and attitudes, it likely has a substantial impact on adolescents' experience of psychiatric symptoms, diagnosis, and treatment. Superimposed upon the difficulties of managing these tasks is the challenge of negotiating separation and autonomy. These are complex issues for families and physicians who are responsible for monitoring treatment response as youth struggle to become independent and parents reduce the scope of their control

over teens' daily lives. The complexity of this issue emphasizes the need for clarification regarding how the family context impacts youth attitudes toward medication.

Summary

Increased understanding of the youth experience of psychotropic treatment is vital for enhancing caregivers' and providers' ability to monitor their adolescents' well-being. As Bennett, Pendley, and Bates (1997) point out, youth are the best sources of information regarding their own internal experiences. A measure of youth attitudes toward psychotropic treatment will improve clinical practice and provide greater opportunities for youth to participate actively in their treatment. The ability to measure youth attitudes toward medication accurately may also increase early detection of barriers to adherence which may precipitate decompensation, suicidal ideation, and the potential for negative outcomes.

The literature reviewed above offers important conceptual links for examining youth attitudes toward psychotropic treatment. The empirical work begun in the adult and youth health and mental health literatures brings forth important questions about our understanding of youth adherence to psychotropic treatment. The research questions proposed by this study constitute a beginning research agenda that serves to provide links between the distinct, yet complementary literatures which have been reviewed above. First and foremost, the field needs a tool that measures youth attitudes toward psychiatric medications in a reliable and valid way. Investigating the utility of the DAI for measuring youth attitudes toward psychotropic medication is a step toward that end.

CHAPTER THREE: METHODS

Introduction to Mixed Methods

Mixed methods have been used in studies of primary care medicine (McVea, Crabtree, Medder, Susman, Lukas & McIlvain, et al., 1996; Kutner, Steiner, Corbett, Jahnigen, & Barton, 1999; Baskerville, Hogg, & Lemelin, 2001; McIlvain, Backer, Crabtree, & Lacy, 2002; Nutting, Rost, Dickinson, Werner, Dickinson, & Smith, et al., 2002), education (Greene, Caracelli, & Graham, 1989), and social work (Mizrahi & Rosenthal, 2001; Baumann, 1999).

Some mixed method studies incorporate a pragmatic epistemological framework (Teddle & Tashakkori, 2003, p. 20). This alternative approach represents an integration of positivist and constructivist philosophical positions. The positivist approach relies on directly observable phenomenon for knowledge generation, typically employing strictly quantitative methods of data collection (Lincoln & Guba, 2000, p. 166). In contrast, the constructivist approach argues that no single reality exists and that everything observed is intertwined with the interpretation of the observer (Schwandt, 2000, p. 197-198). This approach typically relies on qualitative data collection, albeit with the reservation that all experience is unique and invariably reflects the researcher's viewpoint. The pragmatic approach evolved out of the intense philosophical debates between researchers in opposing positivist and constructivist camps. It allows that both quantitative and qualitative methods are each flawed in unique ways, and each offsets the disadvantages of the other method. For example, quantitative measures provide a summary score or set of scores for a given construct. Summary scores are able to be manipulated mathematically and provide a quick, useful summary of complex information.

Quantitative instruments contain a set of pre-derived questions that are assumed to provide a comprehensive measure of some phenomenon. On the other hand, qualitative data is generated from the experience of the research participants, and is not limited to a set of constructs already created by the researcher. Qualitative interviews provide the opportunity for exposure to new ideas or constructs that may not have been considered during the instrument design process. While qualitative interviews provide richness and comprehensiveness, they are not easily reduced to a summary number. Using a quantitative instrument and a qualitative interview together, researchers are able to obtain a richer understanding of the phenomenon under study while also benefiting from an ability to easily summarize data representing characteristics of interest.

The advantage of mixed methods designs is that the use of both quantitative and qualitative measures offsets the weaknesses inherent in either data collection method used alone. Kelle (2001) provides an illustrative example. She employed a mixed methods design to examine how families made employment decisions in the context of changing labor policies in post-1989 Germany. Her findings showed that both macro-structural forces (government employment policy) and individual adherence to proscribed gender roles impacted women's decisions to enter the job market. Through the use of a mixed-methods design, she was able to clarify discrepancies between job availability and labor market entry by capturing qualitative data regarding male and female social role expectations and their impact on women's freedom to become employed outside the home. In her study, women's occupational life-spans were determined partly by structural changes in job availability and partly by negotiations with their husbands regarding appropriate gender roles. Each type of data complemented the other, lending

depth to the inferences drawn from the overall study. Using either quantitative or qualitative methods alone would not have provided information about the conflict between structural policies designed to enhance job opportunities for women and micro-level, individual employment decisions.

Quantitative and Qualitative Data

Tashakkori and Teddlie (2003, p. 674-676) note that one of the functions of mixed methods designs is to provide a more comprehensive understanding of a phenomenon being examined. The juxtaposition of quantitative and qualitative data in this study served this purpose by simultaneously eliciting the factor structure of an existing instrument in adolescents and investigating the adequacy of the instrument in measuring attitudinal constructs relevant to youth who are undergoing psychotropic treatment. This mixed methods study tested whether the Drug Attitude Inventory, as designed for adults, can provide rapid, meaningful assessments of youth attitudes toward psychotropic treatment as well as contributing qualitative information that may reflect aspects of adolescents' attitudes toward medication that were not captured by the DAI, confirming the factors found with the DAI, or shedding light on how youth interpret the constructs measured by the DAI. There is little information about adolescent attitudes toward psychotropic treatment. It is beneficial to both research and practice to examine the utility of the DAI for characterizing youth attitudes toward psychotropic treatment and to examine if the existing DAI concepts adequately describe adolescent experience of psychotropic treatment.

Rationale for a Mixed Methods Design.

An argument can be made that a validation study of the DAI would constitute a valuable enterprise by itself. If the DAI exhibits acceptable psychometric properties in adolescents, this instrument could be used by clinicians whose role it is to measure adolescent adherence to psychotropic treatment. The benefit of using this brief assessment of attitudes toward psychotropic treatment is that clinicians can obtain a summary of patient attitudes toward psychotropics quickly.

The drawback to this, however, is that attitudes are far more complex than can be represented by a single number gathered from an attitude survey. It is likely that groups of adolescents may show similar scores on the DAI, but that the individual experiences underlying those DAI scores may be complex and idiosyncratic. This highlights the benefits of using a qualitative method; employing techniques that elicit the individual, qualitative experiences of adolescents regarding psychotropic treatment allows for thorough understanding of the complex processes that form the basis of their DAI scores. Additionally, the existing DAI may not tap concepts that are unique to the experience of youth with psychotropic medication. The qualitative data aid in the evaluation of whether additional constructs must be added to the DAI in order to adequately measure adolescent attitudes toward medication. Integration of the data generated by quantitative and qualitative methods allows exploration of the conceptual adequacy of the DAI in this population. This mixed methods approach can highlight areas in which the DAI captures youth attitudes toward medication as well as new concepts which may improve the usefulness of the instrument in adolescents.

Priority Assigned to Quantitative and Qualitative Methods

In this study, equal priority was given to quantitative and qualitative methods. This was an exploratory study in which each type of data provided information that informed knowledge about youth attitudes toward psychotropic medication and their experience of the treatment process. Either the quantitative or qualitative data alone would have generated useful information that could lead to practice improvements; in conjunction, however, they promise to expand our understanding of youth psychotropic treatment, by providing an evaluation of the usefulness of a rapid assessment tool which can be used in research and clinical practice.

Justification for Simultaneous Implementation of Data Collection Methods

This study involved evaluating the conceptual adequacy of an instrument designed to measure attitudes toward psychotropic medications quickly. Typically, instrument development using mixed methods is accomplished through a sequential design which uses qualitative data to create a broad conceptual base from which to design a scale. Krause (2002) provides an elegant example of the instrument construction process. Krause employed qualitative methods in order to outline the constructs relevant to assessing religiosity in older adults; he subsequently used these concepts to design a quantitative measure. He used an alternating series of qualitative and quantitative data collection in order to test and refine the religiosity instrument.

In the context of this study, the DAI shows adequate psychometric performance in adults taking neuroleptic medication (Hogan, Awad, & Eastwood, 1983). The present study differs from that conducted by Krause (2002) in that it does not build an

instrument, but instead examines the adequacy of an existing one. One of the roles of the qualitative component of this design was to examine whether the current DAI included an adequate range of constructs that fully captured youth attitudes toward psychotropic medication. Having respondents complete the DAI and reflect on their treatment experiences via qualitative interviews was intended to help them connect DAI concepts with their daily life experiences.

Integration of Results

Integration of the qualitative and quantitative results occurred at the data analysis stage. The factor structure of the DAI was evaluated and expanded by the themes that emerged from the qualitative interviews. The qualitative responses were used to determine whether the factor structure of the DAI indicates a comprehensive coverage of the issues relevant to youth attitudes toward psychotropic treatment.

Research Design

Creswell (1994) conceptualized a mixed-methods design as one in which two study designs (qualitative and quantitative) are implemented using the language and methodological rules applicable to each paradigm, and in which results are integrated within the overall context of the project. This study followed a concurrent, triangulation, mixed-methods design (Creswell, Fetters, & Ivankova, 2004) formulated to describe the factor structure, validity, and reliability of the DAI in adolescents and to use qualitative data to evaluate whether the items in the existing instrument are comprehensive enough to represent youth attitudes toward psychotropic medication. The following questions were examined:

1. What is the factor structure of the Drug Attitude Inventory (DAI) in youth undergoing psychotropic treatment and how valid and reliable is it as a measure of youth attitudes toward psychiatric medications? (quantitative question)
2. Will qualitative interviews with adolescents about their daily use of psychiatric medication support the dimensions found in the factor structure of the original DAI used with adults? Will qualitative interviews with adolescents reveal new dimensions of youth attitudes toward psychiatric medication which are not measured by the DAI? (qualitative question)
3. Can measurement of youth attitudes toward psychotropic treatment be improved by knowledge about the factor structure, validity, and reliability of the DAI in youth as well as understanding their subjective experiences of treatment? (mixed methods question)

These questions reflect the next logical step in a research agenda designed to carry the literature forward in terms of our ability to characterize youth attitudes toward psychotropic treatment by developing a valid and reliable measure which can be used in research and clinical practice.

Sampling

A convenience sample of 122 youth received the quantitative measures.

Adolescents were recruited from the child and adolescent psychiatry unit at University Hospitals of Cleveland and from community mental health settings via physician referrals, flyers posted at each facility, and direct recruitment by the study investigator.

Potential participants were identified by their treating psychiatrists or other mental health providers or through direct contact in the community. Potential respondents were given a brochure describing the study and a number to call if they wanted to participate.

Respondents who contacted the investigator received an explanation of the study, and if they wished to proceed, were scheduled for the interview. Informed consent (primary caregiver) and assent (youth) were obtained prior to performance of study procedures. Participants who were not directly approached by the investigator self-referred for the study via telephone. Community mental health facilities from which participants were recruited included a behavioral health alternative school program and an outpatient counseling center for youth.

Criteria for study participation included: age between 12 and 17 years; an axis one diagnosis for which psychotropic medication was prescribed; ability to read and complete questionnaires, and the availability of a parent/guardian with whom the adolescent resided. Youth with diagnoses of mental retardation, pervasive developmental disorder, seizure disorder, or organic brain injury were excluded from the study. Youth who had not taken psychiatric medication at least once in the past 30 days per parent and youth report were ineligible to participate. Both parent and youth reports of medication adherence (at least one dose taken in the last 30 days) were required to coincide in order for the youth to participate in the study.

Forty-three of the 122 participants in the quantitative sample were part of a simultaneous, separate qualitative study regarding youth subjective experiences of psychotropic treatment (for a description of this study, see Floersch, et al., in press). That study had the same inclusion/exclusion criteria as the present investigation. For the

qualitative sample in the present study, a subset of twenty interviews was randomly selected from the group of forty-three. Data were not collected regarding participants who declined to participate given that many subjects self-referred by telephone, rendering it impossible to compare participants who chose not to self-refer with those who declined participation when approached by the investigator.

Quantitative Measures

Youth attitudes toward psychotropic medications were measured using an adaptation of the DAI (Hogan, Awad, & Eastwood, 1983). The original thirty-item measure was created to predict medication adherence in adults with schizophrenia who were prescribed neuroleptic medications. Reliability and validity assessments for the original study were conducted using a sample of 150 patients with schizophrenia. Factor analytic results showed seven components: positive and negative subjective feelings about neuroleptics, patients' personal models of health, two loci of control components, belief in the ability of the drug to prevent relapse, and concern about potential toxicity of the drug. The original factor structure of the instrument in adults is presented in Table 1.

Table 1
Original DAI Factor Loadings

Factor	Item	Loading
Positive Subjective Feeling	18 – feel more normal	.79
	26 – feel happier	.77
	6 – more aware of what I am doing	.70
	15 – get along better with people	.69
	21 – thoughts are clearer	.64
	9 – feel more relaxed	.60
	29 – in better control	.53
	2 – good things about medication outweigh the bad	.48
Negative Subjective Feeling	3 – feel like a zombie	.71
	25 – things are more difficult to do	.68
	12 – feel tired and sluggish	.67
	16 – cannot concentrate	.66
	11 – unpleasant effects always present	.53
	28 – cannot relax on medication	.42
Health/Illness Model	13 – take only when sick	.65
	20 – unnatural to take medication	.60
	1 – do not need medications once I feel better	.56
Physician (external LOC)	24 – up to doctor when I stop medication	.81
	17 – I know better than the doctor	.57
Control (internal LOC)	5 – pressured to take medication	.63
	8 – take of my own free choice	.49
Relapse Prevention	30 – by staying on medication I can prevent a breakdown	.80
	23 – medication makes no difference to whether I become sick	.62
Harm (toxicity)	7 – taking medication will do me no harm	.63
	14 – medication will damage my body	.48

The DAI successfully discriminated between adherent and non-adherent patients when compared with clinician ratings of adherence in the original study. The overall accuracy of adherence prediction was 88.7%. Internal consistency was assessed using the Kuder-Richardson formula, with a high score of .93. Test-retest reliability was .82. Reliability and validity assessments were conducted on the youth DAI as part of the current study.

For the current study, the response options of the original DAI were changed from dichotomous (true/false) choices to a five-point, Likert-type scale, ranging from 1 (“strongly disagree”) to five (“strongly agree”). True/false response options do not allow respondents to express the strength of their opinions – it is likely that individuals may have ambivalence toward taking psychotropic medications which would not be reflected in forced true/false choices. Using a dichotomized response format required people to endorse one of two polar opposites; it is possible that attitudes toward medication can be characterized more precisely by offering a range of responses that reflect not only polarity (positive or negative attitude toward medication), but also the intensity with which the attitude is held (Spector, 1992, pg. 4). Half of the items were reversed-scored to decrease response set bias. Items were recoded prior to data analysis such that higher scores indicated more positive attitudes toward medication for all items.

Furthermore, factor analysis techniques may provide less valuable information when binary data are used. Although specialized statistical procedures exist for factor analyzing dichotomous responses (Hogan, Awad, & Eastwood, 1983), an incremental response format allows for a greater range of responses (DeVellis, 2003, pg. 78-79), more variability in the data, as well as the ability to represent neutral attitudes. Another benefit

of expanding the dichotomous response options is minimization of acquiescence bias (Spector, 1992, pg. 12; Converse & Presser, 1986, pg. 38-39). Table 2 presents the instrument.

Table 2
Youth DAI Instrument

Youth Drug Attitude Inventory					
(Hogan, T.P., Awad, A.G., & Eastwood, R. (1983)					
1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree					
*1. I don't need to take medications once I feel better.	1	2	3	4	5
2. For me the good things about medication outweigh the bad.	1	2	3	4	5
*3. I feel weird, like a 'zombie' on medication.	1	2	3	4	5
4. Even when I'm not in hospital I need medication regularly.	1	2	3	4	5
*5. If I take medication it's only because of pressure from other people.	1	2	3	4	5
6. I am more aware of what I am doing, of what is going on around me when I am on medication.	1	2	3	4	5
7. Taking medication will do me no harm.	1	2	3	4	5
8. I take medication on my own free choice.	1	2	3	4	5
9. Medication makes me feel more relaxed.	1	2	3	4	5
*10. I am no different on or off medication.	1	2	3	4	5
*11. The unpleasant effects of medication are always present.	1	2	3	4	5
*12. Medication makes me feel tired and sluggish.	1	2	3	4	5
*13. I take medication only when I am sick.	1	2	3	4	5
*14. Medication is slow-acting poison.	1	2	3	4	5
15. I get along better with people when I am on medication.	1	2	3	4	5
*16. I can't concentrate on anything when I am taking medication.	1	2	3	4	5
*17. I know better than the doctor when to go off medication.	1	2	3	4	5
18. I feel more normal on medication.	1	2	3	4	5
*19. I would rather be sick than taking medications.	1	2	3	4	5
*20. It is unnatural for my mind and body to be controlled by medication.	1	2	3	4	5
21. My thoughts are clearer on medication.	1	2	3	4	5
22. I should stay on medication even if I feel all right.	1	2	3	4	5
23. Taking medication will prevent me from having a breakdown.	1	2	3	4	5
24. It is up to the doctor when I go off medication.	1	2	3	4	5
*25. Things that I could do easily are much more difficult when I am on medication.	1	2	3	4	5
26. I am happier, feel better, when taking medications.	1	2	3	4	5
*27. I am given medication to control behaviour that other people (not myself) don't like.	1	2	3	4	5
*28. I can't relax on medication.	1	2	3	4	5
29. I am in better control of myself on medication.	1	2	3	4	5
30. By staying on medication I can prevent getting sick.	1	2	3	4	5

*Item was reverse-scored for data analysis.

Preliminary reliability and validity assessments were conducted on this new measure as part of the current study. The DAI was administered to adolescents at initial enrollment and again three months later for a random subset of twenty-four youth to examine test-retest reliability.

Demographic Variables. In order to describe the sample, parental education, income, and occupational data were gathered as well as gender and ethnicity data for youth. Additionally, data regarding the adolescents' primary and comorbid diagnoses, type and number of primary and concomitant medications, length of time on current medications and involvement in non-pharmacologic treatments were collected. Furthermore, measures of psychiatric symptomatology were collected using the Child Behavior Checklist (CBCL, Achenbach, 1991). Symptom severity data were used to assess the relationship between DAI scores and psychopathology in youth.

Youth adherence was captured via self- and parent-report on a Likert-type scale. For the youth and parent report measures, respondents chose from one of four adherence categories. Categories reflected the degree to which youth follow prescribed medication regimens. The categories were as follows: 1 ("not at all"), 2 ("sometimes"), 3 ("frequently") and 4 ("most of the time"). Parent- and youth-rated adherence were examined in relation to DAI scores to determine if attitudes are predictive of medication compliance.

Qualitative Measures

Qualitative data were gathered from youth regarding their experiences with medication and medication management using the "Subjective Experience of Medication in Youth" semi-structured interview (SEMI) (Floersch, et al., in press). The interview

schedule contained 150 questions, which included nine domains of mental illness and treatment experience: (1) treatment, illness, and medication history; (2) perceptions of medication; (3) managing, monitoring, reporting of medication experience; (4) parent and adolescent interaction regarding medication management; (5) illness and medication stigma; (6) adolescent and school interactions regarding medication management; (7) adolescent and peer interactions regarding medication management; (8) access to mental health services regarding medication experience; and, (9) ethnicity, gender, and religion influences regarding medication experience. Questions were open-ended and neutral, allowing respondents to voice positive, negative, and ambivalent opinions about their diagnoses and treatment. Questions were used to generate responses from the youth and were not able to be answered with “yes/no” responses. The qualitative responses were audiotaped, transcribed, and subjected to thematic analysis using the constant comparative method. Interviews were conducted with the adolescent in a private office located in an outpatient psychiatry clinic or, at their request, in the adolescents’ homes. The semi-structured interview schedule was designed to avoid leading or biasing participant responses and focused on generating dialogue about medication experiences without placing emphasis on any particular aspect of medication experience, such as side effects or adherence. The open-ended design of the interview instrument strengthens the comprehensiveness of the data gathered from the adolescents by not placing limitations on the aspects of medication experience that could be raised by the adolescents. Additionally, it was designed to capture a broad range of medication experiences which would not necessarily be tapped by the Drug Attitude Inventory. The interview instrument is provided in Appendix 1.

Data Analysis

Quantitative Data Analysis Plan

Demographic Analyses. Univariate data analyses were conducted for all variables in order to provide a description of the sample and to assess for missing data. Means and standard deviations for the DAI data were calculated as well as frequency counts for the adherence measure.

Univariate Data Analysis. Each DAI item was inspected to verify that all response options were used and to ensure that the distributions of item responses were not skewed or kurtotic. The data were inspected for missing responses.

Bivariate Data Analysis. The bivariate correlations between individual items were inspected to ensure matrix factorability using the Kaiser-Meyer-Olkin measure of sampling adequacy as a criterion (Spicer, 2005, p. 186). The recommended range for the KMO statistic falls between .8 and .9; the bivariate correlation matrix was examined for the presence of correlation coefficients reaching a minimum of .30 (Spicer, 2005, p. 186).

Internal Consistency. Internal consistency analyses were conducted using Cronbach's alpha for the total 30-item adolescent DAI. The item-total correlation matrix was inspected to evaluate the degree of relationship between each individual item and the total scale.

Convergent Validity. Correlations were computed between average teen DAI score and their self-reported adherence to medication. It was expected that to the extent that teens endorsed a positive attitude toward their medications, they would be more likely to take their medications as prescribed. Bivariate correlations were also computed between average teen DAI scores and the Total Competence and Total Problems scores from the

CBCL (Achenbach, 2001). The Total Competence score is comprised of ratings which measure a youth's hobbies and sports involvement, social activities, and school and academic performance. The Total Problems score reflects the degree of internalizing and externalizing symptoms displayed by the youth. It was expected that a teen's attitude toward medication (represented by their average DAI score) would be positively correlated with their competence scores and negatively related to their problem scores under the assumption that positive attitudes toward medication are associated with greater compliance and resulting social competence. (This hypothesis is based on the youth and adult literature cited previously which indicates that medication adherence is linked with significant reduction in psychiatric symptoms and improved social functioning. It is also based on the assumption that medication works to improve visible symptoms of mental health disorders and that social competence is impacted similarly). Conversely, it was expected that a youth's attitude toward medication would be inversely associated with symptomatology, based on the literature cited above indicating that medication adherence reduces psychiatric symptoms in youth mental health disorders.

Test-Retest Reliability. Test-retest reliability of the DAI was assessed by re-administering the DAI to a random subsample of 24 youth three months after initial administration. A bivariate correlation coefficient was computed in order to evaluate the degree of correspondence between responses at the two time intervals (Cohen, Cohen, West, & Aiken, 2003). Internal consistency of the items was assessed using Cronbach's alpha (Cortina, 1993).

Factor Structure Analyses. Three factor analytic techniques were employed. Structural equation modeling was used to conduct confirmatory factor analysis (CFA), followed by

exploratory factor analysis (EFA) and parallel analysis to elucidate the factor structure of the DAI instrument in adolescents. Parallel analysis was employed within EFA to verify that EFA did not overextract factors which are not conceptually meaningful. The three techniques were used to derive a core set of robust items and to ensure that the final factor structure was not an artifact of the type of analysis conducted. Many of the existing factor analytic techniques (K-G rule, scree plot, exploratory factor analysis (EFA)) force structural solutions and may over-extract factors that are difficult to interpret or which lack theoretical meaning (Kaplan, 2000, p. 301-308). In addition, some techniques, the scree plot in particular, and EFA to some extent, are inherently subjective. Structural equation modeling allows statistical estimations of how adequately a model fits the data.

Structural Equation Modeling. Structural equation modeling was employed using Lisrel 8.0 to evaluate a theory-driven rather than mathematically forced factor structure and to allow statistical evaluation of model fit. The DAI instrument was evaluated using a structural equation model that reflected the original factor structure of the DAI in adults. Figure 1 depicts the SEM conceptual diagram.

Figure 1. DAI Structural Equation Model-Conceptual Diagram

The hypothesized factor structure based on the original DAI consisted of seven correlated components: positive attitudes toward medication [8 items], negative attitudes toward medication [6 items], illness model [3 items], external locus of control [2 items], internal locus of control [2 items], relapse prevention [2 items], and medication toxicity [2 items]). A variance-covariance matrix was computed for the DAI items and used to obtain parameter estimates. Values for missing data were imputed in the PRELIS program using linear interpolation for each item as recommended by Little (2006). Maximum likelihood estimation was employed to estimate the parameters of the hypothesized model. The values of the latent constructs (ψ) were fixed at 1.0 to allow for model identification. All other values were free to vary. Error values for the DAI

items were modeled as uncorrelated. Fit indices (RMSEA, NNFI, CFI, and GFI) were examined to determine degree of model fit. Evaluation of the hypothesized structural equation model was based on the degree to which the model fit the observed data relative to a null hypothesis of complete independence between the instrument items. RMSEA (root mean squared error of approximation) values can range from 0 to 1.0, with lower values signifying better fit. Cutoffs recommended by Browne and Cudek (1993) were used to evaluate model fit, with values less than .05 indicating “close fit”, values between .05-.08 indicating “fair fit”, and values greater than .10 indicating “poor fit”.

Comparative fit indices (non-normed fit index (NNFI), comparative fit index (CFI), and goodness of fit index (GFI)), provide additional estimations of model fit compared to a null model of complete independence. These also range from 0 to 1.0, with recommended ideal standards of $\geq .95$ (Kaplan, 2000, p. 107). Note that current standard in structural equation modeling acknowledge that cutoffs for goodness-of-fit indices are considered to be relative given the sensitivity of various indices to model misspecification, distribution shape, and sample size (Mulaik, 2007; Marsh, Hau, & Wen, 2004). Modification indices were inspected to ascertain whether model fit could be improved by restructuring hypothesized item loadings.

Power. A sample size of 122 youth demonstrated adequate power to evaluate the 32-parameter model based on the original DAI factor structure (Little, 2006).

Exploratory Factor Analysis (EFA). Subsequently, all DAI items were subjected to exploratory factor analysis using maximum likelihood estimation with oblique rotation. Maximum likelihood estimation was used to provide a comparable extraction method to that employed in the structural equation model. Oblique rotation reflected the

expectation that factors would correlate given that they were likely to be related to one another based on a logical relationship between the constructs (for example, positive attitudes would be expected to demonstrate a high inverse correlation with negative attitudes). An eigenvalue greater than 1.0 (DeVellis, 2003, p. 114) was used as a criterion for factor selection. Factor analytic results were inspected for the presence of Heywood cases (factors loadings ≥ 1.0). Analyses were re-conducted excluding Heywood cases. SPSS version 14.0 was used to conduct the analyses.

Parallel Analysis. Parallel analytic techniques provide alternative ways to evaluate the factor structure of an instrument that are less vulnerable to over-extraction problems. This method compensates for the propensity of the eigenvalue great than 1.0 rule to generate too many factors that are not conceptually meaningful. The technique involves generating multiple random data sets and comparing the number of factors extracted from the actual data to those which can be extracted from the random data sets. Factors are retained to the extent that they account for greater variance than factors extracted from the random data (O'Connor, 2000). For this study, a series of 2000 random data sets was generated and compared to the eigenvalues of the actual data set calculated by SPSS.

Factor Selection. Three criteria were used to determine whether to retain factors and individual items resulting from the factor analyses.

1. A factor was retained if it contained four or more items
2. A factor was retained if it contained fewer than four items, but the items differentiated well from other items (i.e., had no substantial cross-loadings).
3. A factor or individual item was retained if qualitative data

supported the concept represented by the factor.

Given that there is no existing instrument to measure adolescent attitudes toward psychiatric medications, factor/item retention criteria were inclusive in order to retain the largest number of items possible for future analysis.

Qualitative Data Analysis Plan

Thematic Analysis using the Constant Comparative Method. For the qualitative sample, audio data were transcribed and subjected to qualitative analysis. Transcripts were imported into Atlas TI (Version 5.67), where they were subjected to thematic analysis (Riessman, 2008; Bryman, 2004; Braun & Clarke, 2006) using the constant comparative method (Boeije, 2002). The analytic strategy used here produces general thematic categories of the adolescent's attitudes, perceptions, and experience of psychiatric medication. The results were compared with the factors which emerged in the original DAI study: positive subjective feelings about medications, negative subjective feelings about medications, illness model, external locus of control, internal locus of control, relapse prevention, and concerns about toxicity to determine whether or not the adolescents endorsed those a priori factors. Thematic categories that did not match the original DAI dimensions were labeled non-DAI-related themes. These were categorized as additional concepts that were not measured by the original instrument.

In the first analytic step, each entire transcript was read word for word and quotations were selected if they made any reference to mental illness, medication, or treatment experience. Each quotation initially was given an in vivo code name which was rooted in the actual content of the responses (for ex., "prevents grouchiness" was a code applied to the statement "My medicine prevents me from being grouchy"). The

analytic strategy assigned code names that used the actual words of the adolescent. Linking words and phrases actually used by the respondents assured that higher level concept codes could be traced downward to the actual respondent voices.

Second, in vivo codes were compared with one another and those with similar content were subsequently grouped under intermediate concept codes (for ex., “Emotional Effects of Medication”), which were defined by the common conceptual content of the in vivo codes included in the group. For example, in vivo codes which referenced the experience of being labeled “psycho” or “crazy” were grouped under the intermediate concept code “Crazy Identity”.

During the next phase of analysis, intermediate concept codes were sorted by their group characteristics to derive the highest level of thematic categories of medication experience. These superordinate themes were compared to the seven DAI dimensions to determine if the a priori instrument assumptions about attitudes toward medication were indeed how adolescents described their experience. For example, “prevents grouchiness” would fall under the category “Emotional Effects of Medication” which would be subsumed under the superordinate theme “Positive Subjective Feelings toward Medication”. Alternatively, the code “labeled psycho” was applied to the quotation “My friends think I’m a psycho”. This code was subsumed under the intermediate category “Crazy Identity”, which was subsumed under a non-DAI-related dimension called “Stigma”. Figure 2 shows a conceptual diagram of this coding process.

Figure 2. Conceptual Diagram of Thematic Analysis using the Constant Comparative Method

Validity of the final data set was evaluated by having the investigator and her faculty advisor: (1) double-check to assure the codes referring to quotations were consistently applied across all twenty interviews; (2) assure that codes were appropriately grouped under the thematic categories; and, (3) verify that themes were appropriately grouped under DAI-related and non-DAI-related themes.

Human Subjects Protection

There was minimal risk to participants beyond those encountered in typical daily life for a person with mental illness. Respondents who experienced emotional discomfort when discussing mental illness and the circumstances that surrounded it were encouraged to tell the interviewer, who gave them the option of discontinuing the interview if they so desired. None of the respondents opted to discontinue the interview process.

Interviewers also encouraged respondents to discuss their feelings with their mental health care providers following participation in the study.

There was no direct benefit to participants other than the positive feelings they may have gained from furthering research that may help other families deal with mental illness and the opportunity they had to voice their feelings about psychotropic treatment. Parent and youth respondents in the DAI-only sample were compensated \$15.00 each for their time. Youth in the qualitative sample were reimbursed \$65.00 for their time and parents received \$50.00. This \$15.00 difference reflected additional questionnaires that the youth completed as part of the larger study in which this one was embedded.

Potential participants were identified by their treating psychiatrists or other mental health providers or through direct contact in the community. Potential respondents were given a brochure describing the study and a number to call if they wanted to participate. Respondents who contacted the investigator received an explanation of the study, and if they wished to proceed, were scheduled for the interview. Informed consent (primary caregiver) and assent (youth) were obtained prior to interview completion. Respondents were informed that they could withdraw from the study at any time without consequence.

Confidentiality was maintained by storing transcripts and completed data forms in a locked storage cabinet in a secured office to which only the investigators have access. Transcripts and data forms were identified by subject number and date; a master list containing respondents' identifying information was kept in a separate file until data were entered into the analysis software and de-identified. Families were informed that confidentiality will be maintained between parent and adolescent respondents in order to ensure the quality of data collection. There were two exceptions to confidentiality:

1. if parent or youth respondents presented a danger to themselves or others
(suicidality/homicidality)
2. if a youth reported abuse or neglect

In the event that either of these conditions were met, the youth and parent were brought together with the investigator and appropriate referrals made. If a respondent exhibited suicidality/homicidality, arrangements were made for transport of the individual to the nearest emergency room for further evaluation. In the event of neglect or abuse of the youth, the family was encouraged to contact the department of Child and Family Services with the investigator present; if they were unwilling to do so, the investigator contacted CFS herself with the family present and available to speak to the intake worker if they wished to do so. None of these events occurred during the course of the study.

CHAPTER FOUR: QUANTITATIVE RESULTS

Introduction

This chapter presents the results of the quantitative analyses of the teen DAI. Demographic information for the quantitative sample is presented first. Data are presented that describe the test-retest reliability, convergent validity, and internal consistency of the teen DAI, associations between the instrument and medication adherence and clinical outcome variables. Results of the confirmatory factor analysis are presented next, followed by the exploratory and parallel factor analytic results. Parallel analysis was used within exploratory factor analysis (EFA) as a way to verify that EFA did not overextract factors which are not conceptually meaningful. Comparisons are then made between those results and the factor structure of the original DAI in adults. Finally, preliminary conclusions are drawn about the factor structure of the adolescent DAI, summarizing the results of each of the three analytic procedures.

Sample Demographics

One hundred and twenty-two adolescents completed the DAI instrument. Their demographic characteristics are presented in Table 3 below. Their average DAI scores were slightly above neutral at 3.61 ($SD=.60$). Their average rating for how often they take their medications as prescribed was 3.60 ($SD=.63$), midway between “usually” and “all of the time”. The sample was comprised of mostly Caucasian teens, although roughly one quarter of the participants was African-American. The most common primary psychiatric diagnoses per parent report were bipolar disorder, major depressive disorder, and ADHD.

Table 3
Demographic Characteristics of Teen DAI Sample (N=122)

<u>Gender</u>	<u>n</u>	<u>Average DAI Score</u>
Male	58	3.61 (<i>SD</i> =.60)
Female	64	
<u>Ethnicity</u>		<u>Avg. Self-reported Adherence</u>
Caucasian	79	3.60 (<i>SD</i> =.63)
African-American	37	
Hispanic	3	<u>Avg. Age</u>
Other	2	14.49 (<i>SD</i> =1.70)
<u>Diagnosis</u>		<u>Avg. No. of Psychiatric Medications</u>
Bipolar	40	1.99 (<i>SD</i> =1.12)
Depression	33	
ADHD	22	
Other	27	

Univariate Data Analysis

Each DAI item was inspected to ensure that all response options were used by respondents. Results showed that each response option was used for all thirty items. All DAI items fell within a normal range of skewness and kurtosis (± 2.0 for skewness and ± 7.0 for kurtosis [Ferguson, 1976]). The range of skew for the items was -1.561 to .124 and kurtosis values ranged from -1.151 to 1.971. Inspection of missing data revealed that four percent of items were left unanswered (150 missing data points out of a possible 3600). Values for missing data were imputed in the PRELIS program using linear interpolation for each item as recommended by Little (2006).

Bivariate Data Analysis

Bivariate correlations between DAI items were examined to ensure matrix factorability. As Appendix 2 shows, there were a substantial number of low to moderate (.2 to .3) correlations between many of the items as well as a small number of higher correlations (.5 to .7). There were no correlations above .72, indicating that no items were multicollinear with any other items using a standard of $\geq .80$ (Cohen, Cohen, West & Aiken, 2003). There were a substantial number of correlations above the minimum standard of .30 recommended by Spicer (2005).

Additionally, the Kaiser-Meyer-Olkin measure of sampling adequacy was evaluated (Spicer, 2005, p. 186) as another measure of the degree to which items were correlated enough to be factorable. The KMO statistic for the DAI items was .788, falling below but close to the recommended .8-.9 value. Observation of the correlation matrix for the individual items suggested that the presence of a substantial number of low to moderate correlations (.2 to .3) may have decreased factorability of the matrix given that many of the items are correlated with many other items to a similar degree. This would affect the emergence of factors if there were a large number of factors with few items, thus making interpretation of the factor loadings and their separation onto individual factors more difficult.

Internal Consistency of the Adolescent DAI

Internal consistency analyses were conducted using Cronbach's alpha for the total 30-item adolescent DAI. Results indicated high internal consistency ($\alpha = .889$). The item-total correlation matrix indicated moderate correlations among the thirty items; the

average item-total correlation for was .211. Inspection of the individual items indicated that Cronbach's alpha would decrease by .01 - .10 if any of the items were removed.

Convergent Validity of the Teen DAI

Correlations were computed between average teen DAI score and their self-reported adherence to medication. It was expected that to the extent that teens endorsed a positive attitude toward their medications, they would be more likely to take their medications as prescribed. Results indicated a significant, albeit low, positive correlation between the two variables ($r = .205, p < .05$).

Bivariate correlations were also computed between average teen DAI scores and the Total Competence and Total Problems scores from the CBCL (Achenbach, 2001). The Total Competence score is comprised of ratings which measure a youth's hobbies and sports involvement, social activities, and school and academic performance. The Total Problems score reflects the degree of internalizing and externalizing symptoms displayed by the youth. It was expected that a teen's attitude toward medication (represented by their average DAI score) would be positively correlated with their competence scores and negatively related to their problem scores under the assumption that positive attitudes toward medication are associated with greater compliance and resulting social competence. (This hypothesis is based on the youth and adult literature cited previously which indicates that medication adherence is linked with significant reduction in psychiatric symptoms and improved social functioning. It is also based on the assumption that medication works to improve visible symptoms of mental health disorders and that social competence is impacted similarly). Conversely, it was expected that a youth's attitude toward medication would be inversely associated with

symptomatology, based on the literature cited above indicating that medication adherence reduces psychiatric symptoms in youth mental health disorders. Results indicated no significant correlation between average teen DAI score and either CBCL scale (Total Competence, $r = .081$, $p = .417$; Total Problems, $r = -.119$, $p = .214$), suggesting that youth attitudes toward psychiatric medication are not linked significantly with parent reports of children's internalizing or externalizing problems or parent reports of youth school functioning, participation in group activities, or relationships with others.

Test-retest Validity of the Teen DAI

Bivariate correlation coefficients were computed for DAI scores from a subsample of 24 teens who completed the DAI at the initial study visit as well as three months later. Univariate analyses of variance demonstrated no significant differences in age, number of psychiatric medications, years of education, CBCL-rated Total Problems scores, or average DAI score between youth who completed the DAI for test-retest reliability and those who did not. Chi-square tests revealed no significant psychiatric diagnosis or gender differences between the two groups. The correlation between these two measures was significant ($r = .71$, $p < .01$), indicating a high degree of stability in youth attitudes toward medication over the three-month time period.

Confirmatory Factor Analysis Results

The structural equation model evaluated for this study measured the fit of the original factor structure of the DAI (used with adults) (Hogan, Awad, & Eastwood, 1983) to the data gathered from adolescents. As described in chapter three, this model hypothesized seven correlated factors (positive attitudes toward medication [8 items], negative attitudes toward medication [6 items], illness model [3 items], external locus of

control [2 items], internal locus of control [2 items], relapse prevention [2 items], and medication toxicity [2 items]) and was evaluated using LISREL version 8.0. Psi values for each factor were set at 1.0. Each item was allowed to load on a single factor; measurement error was modeled for each item; error was assumed to be uncorrelated across items. Half of the DAI items were reverse scored to minimize response set effects. All items were re-coded such that higher scores represented more positive attitudes toward medication prior to data analysis.

Results indicated that the factor structure obtained by Hogan, et al (1983) was a “fair fit” for the adolescent DAI data (Browne & Cudeck, 1993). The RMSEA for the teen DAI Model was .061, indicating “fair fit” compared to the null model of independence, yet not achieving the “close fit” standard of .05. Comparative fit indices were close to the recommended ideal of .95 (NNFI = .938, CFI = .948) (Kaplan, 2000), suggesting a reasonable fit between the adult DAI model and the adolescent data. These indices suggest that the original factor structure of the DAI provides a relatively good fit for the adolescent DAI data. The GFI values were much lower at .803, suggesting that there is room for improvement in model fit. Table 4 presents the factor loadings for each latent construct in the model. The top row of numbers represents the parameter estimate for how highly the item loaded onto the hypothesized latent construct. For example, item 18 had a loading of .762 on “Positive Feelings toward Medication”. The middle value represents the standard error of the parameter estimate, whereas the bottom value represents the t-value for testing whether each parameter’s significant was greater than zero. The bolded numbers are the factor loadings which emerged from the adult factor analysis in the original Hogan study.

Table 4
Lambda-Y (Factor Loading) Estimates for DAI Factor Model

Positive	Negative	Illness	ExtLOC	IntLOC	Relapse	Toxicity
item18 0.762 (0.080) 9.552 .79	item 3R 0.609 (0.095) 6.403 .71	item 13R 0.147 (0.093) 1.573 .65	item 24 0.566 (0.108) 5.239 .81	item 5R 0.595 (0.147) 4.040 .63	item 30 0.562 (0.097) 5.818 .80	item 7 0.375 (0.110) 3.408 .63
item26 0.774 (0.079) 9.770 .77	item 25R 0.605 (0.095) 6.346 .68	item 20R 0.492 (0.120) 4.102 .60	item 17R 0.537 (0.106) 5.042 .57	item 8 0.361 (0.115) 3.136 .49	item 23 0.767 (0.101) 7.585 .62	item 14R 0.619 (0.137) 4.530 .48
item6 0.606 (0.086) 7.048 .70	item 12R 0.517 (0.098) 5.295 .67	item 1R 0.396 (0.111) 3.577 .56				
item15 0.672 (0.084) 8.043 .69	item 16R 0.405 (0.100) 4.045 .66					
item21 0.829 (0.077) 10.840 .64	item 11R 0.379 (0.101) 3.765 .53					
item9 0.473 (0.090) 5.264 .60	item 28R 0.620 (0.095) 6.538 .42					
item29 0.801 (0.078) 10.288 .53						
item2 0.506 (0.089) 5.687 .48						

Inspection of the factor loading table shows that there were two marker items (Pett, Lackey, & Sullivan, 2003, p. 208); item 21 (“My thoughts are clearer on medication) and item 29 (“I am in better control of myself on medication) which loaded onto the factor “Positive Feelings toward Medication). Items 18, 26, 6, and 15 also loaded highly on this factor. Items 9 (“Medication makes me feel more relaxed”) and 2

(“For me the good things about medication outweigh the bad”) had the lowest loadings for this factor.

For the “Negative Feelings toward Medication” factor, items 3R (“I feel weird, like a zombie, on medication”, 25R (“Things that I could do easily are much more difficult when I am on medication”), and 28R (“I can’t relax on medication”) loaded at .60 or higher. Items 16R (“I can’t concentrate on anything when I am taking medication”) and 11R (“The unpleasant effects of medication are always present”) had the lowest loadings, with item 12R (“Medication makes me feel tired and sluggish”) falling in the middle of the range of loadings for this factor.

The factor “Health and Illness Model” showed a range of factor loadings, with item 13R (“I take medication only when I am sick”) demonstrating a very low loading of .147. The other two items – 20R (“It is unnatural for my mind and body to be controlled by medication”) and 1 (“I don’t need to take medications once I feel better”) showed moderate loadings on this factor.

The two items loading on “External Locus of Control” demonstrated moderate loadings and were similar in range to one another. “Internal Locus of Control” demonstrated high variation in the two items loading onto it, with item 5R (“If I take medication, it’s only because of pressure from other people”) showing a high-moderate loading of .595 and item 8 (“I take medication on my own free choice) showing a lower loading of .361.

“Relapse Prevention” consisted of two items. Item 23 (“Taking medication will prevent me from having a breakdown”) demonstrated a high item loading with a value of

.767. Item 30 (“By staying on medication I can prevent getting sick”) had a moderate loading of .562.

“Harm/Toxicity” showed high variation in the loadings of its two items; item 14R (“Medication is slow-acting poison”) had a loading of .619, whereas item 7 (“Taking medication will do me no harm”) had a loading of .375.

Factor Correlations. Table 5 provides a summary of the correlations between the factors represented in the structural equation model. The majority of the factors had moderate to high correlations (.50 or higher), with the exception of the correlation between External Locus of Control and Negative Subjective Feelings toward Medication ($r = .341$). Note that some correlations were greater than 1.0 (External Locus of Control and Health/Illness Model; Toxicity and Health/Illness Model). These values are an artifact of the maximum likelihood estimation method used to evaluate the model. The iterative process of finding the best solution to fit the data at times results in such “out of bounds” values (Little, 2006). Unfortunately, the Hogan, Awad, & Eastwood (1983) study did not present a table of factor intercorrelations, making it difficult to compare these results with those of the original study.

Table 5
Factor Correlation Matrix for the DAI SEM Model

	Positive	Negative	Illness	ExtLOC	IntLOC	RelapseP	Toxicity
Positive	1.000						
Negative	0.542 (0.088) 6.148	1.000					
Illness	0.751 (0.165) 4.540	0.728 (0.182) 3.995	1.000				
ExtLOC	0.684 (0.119) 5.744	0.341 (0.152) 2.247	1.174 (0.256) 4.588	1.000			
IntLOC	0.611 (0.156) 3.930	0.563 (0.170) 3.304	0.788 (0.268) 2.939	0.739 (0.219) 3.376	1.000		
RelapseP	0.754 (0.082) 9.146	0.577 (0.111) 5.200	0.566 (0.192) 2.949	0.664 (0.149) 4.462	0.416 (0.178) 2.338	1.000	
Toxicity	0.630 (0.144) 4.368	0.615 (0.160) 3.848	1.046 (0.276) 3.784	0.674 (0.204) 3.309	0.713 (0.237) 3.007	0.582 (0.170) 3.430	1.000

Modification Indices. A cutoff of 10.00 was used as a criterion for making alterations to the model based on the modification indices (Little, 2006). Inspection of the modification indices revealed that item 26 (“I am happier, feel better, when taking medications”) had a modification value of 13.678, which was the largest value reflected in the modification table. However, the expected change in the factor loading estimate was low at .352 if the item was allowed to cross-load onto “Negative Feelings toward Medication”. Additionally, there is no theoretical justification for making this change in the model. There were no other modification indices with values of 10.00 or greater.

Comparison of Adult and Adolescent Factor Structures. Table 4 above also presents a comparison of the adult DAI factor loadings and the adolescent structural equation model/EFA loadings. The adolescent data are presented in regular font, whereas the

adult loadings are presented in bold. Table 4 presents areas of similarity and difference in the factor loadings of DAI items for adults and adolescents. Regarding “Positive Feelings toward Medications”, items with similar loadings for adults and adolescents included questions 18, 26, 15, and 2. The content of these items reflected good things about medication outweighing the bad, getting along better with others on medication, feeling more normal, and feeling happier and better on medications. Items 6 and 9 had stronger loadings for adults than they did for adolescents. These items reflected content having to do with awareness, feeling relaxed, and having more awareness of one’s surroundings. Items 21 and 29 had stronger loadings for adolescents than for adults – item 21 reflected having clearer thoughts, while item 29 referenced being in better control of self on medication. Possible reasons underlying these differences in factor loadings will be presented in the discussion chapter.

Upon examination of the “Negative Feelings toward Medication” factor, the only item with similar loadings for adults and adolescents was item 25 (“Things that I could do easily are much more difficult on medication”). Items 3, 12, 16, and 11 demonstrated stronger loadings for adults than for adolescents. The conceptual content of these items dealt with feeling like a “zombie” on medication, sedation, lack of concentration, and continual unpleasant effects of medication. Item 28 had a stronger loading for adolescents than for adults – the content of this item reflected the inability to relax on medication. Again, hypotheses regarding these differences in factor loadings will be presented in the discussion chapter.

For the “Health and Illness Model” factor, all items had stronger factor loadings for adults than for adolescents. In particular, item 13 stood out as having a substantially

stronger loading for adults than for adolescents. The item wording is as follows: “I take medication only when I am sick”. It is quite likely that differences in illness definition underlie the lack of salience of these items for adolescents; this will be explored further in the discussion.

Regarding “External Locus of Control”, item 17 (“I know better than the doctor when to go off medication”) showed similar factor loadings for adults and adolescents. Item 24 (“It is up to the doctor when I go off medication”) showed stronger loadings for adults.

In relation to “Internal Locus of Control”, item 5 (“If I take medication it’s only because of pressure from other people”) showed similar loading strength for adults and adolescents. Item 8 (“I take medication on my own free choice”) showed stronger loadings for adults than for youth.

The “Relapse Prevention” factor loadings demonstrated no similarities between adults and adolescents. Item 30 (“By staying on medication I can prevent getting sick”) showed stronger loadings for adults; however, item 23 (“Taking medication will prevent me from having a breakdown”) showed stronger loadings for adolescents.

Finally, the “Toxicity” factor showed dissimilar item loadings between adults and adolescents. Item 7 (“Taking medication will do me no harm”) showed stronger loadings for adults than for youth, whereas item 14 (“Medication is slow-acting poison”) showed stronger loadings for teens.

A number of differences between the characteristics of the adults in the Hogan study and their medications may underlie the disparities between the two groups in the factor loadings of various items in the DAI. Of particular interest, a number of items

reflected similar factor loadings, suggesting that some items may tap common experiences of adults and adolescent who take psychiatric medication, despite differences in cohort, diagnosis, and medications. These topics will be covered in greater detail in the discussion section.

Summary of CFA Results. To summarize the structural equation model results, the model based on the adult DAI data showed fair fit to the adolescent data; it did not meet the $\leq .05$ RMSEA criterion, although an RMSEA value of .061 indicates a reasonable degree of fit. The NNFI and CFI values nearly approximated the standard of .95; the GFI value was much lower than the ideal at .803. The variation in the fit indices suggests that the original factor structure of the adult DAI may not provide the optimal representation of adolescent attitudes toward medication. However, it provided a better fit to the data than assuming complete independence between the DAI items, suggesting that there is room for improving the fit of the adult DAI model to the adolescent data.

Exploratory Factor Analyses-Analysis One

Subsequently, all DAI items were subjected to exploratory factor analysis using maximum likelihood estimation with oblique rotation. Factors were allowed to correlate given that they were likely to be related to one another based on a logical relationship between the constructs (for example, positive attitudes would be expected to demonstrate a high inverse correlation with negative attitudes). An eigenvalue greater than 1.0 (DeVellis, 2003, p. 114) was used as a criterion for factor selection.

Results of the 30-item factor analysis were not interpretable due to the presence of two Heywood cases (see Table 6), which are items with factor loadings on the structure matrix greater than or approaching 1.0 (Little, 2006). Items 8 ("I take medication on my

own free choice”) and 13R (“I take medication only when I am sick”) demonstrated factor loadings of 1.033 (on factor 1) and .996 (on factor 2) and were the first two factors to emerge. The presence of Heywood cases makes further interpretation of the factor structure difficult. Interestingly, these items were among those with the lowest factor loadings in the CFA analysis, suggesting that they are unique from the other items. Given these conditions, a second exploratory factor analysis was conducted, omitting items 8 and 13.

Table 6
Heywood Cases from EFA Analysis One

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
8-take on own free choice	<u>1.033</u>	-.107	-.034	.110	-.079	-.014	-.066	-.132
13R-take only when sick	-.129	<u>.996</u>	-.114	.180	.018	.036	-.033	.036

Exploratory Factor Analyses-Analysis Two

A second exploratory factor analysis was conducted using the same specifications as the first exploratory factor analysis, omitting items 8 and 13. Seven factors emerged; Table 7 presents the pattern matrix and factor loadings from the 28-item analysis. Items with loadings of .30 or greater were considered to relate significantly to a factor. The pattern matrix is presented below – this shows items according to how they loaded onto each factor.

Table 7
Pattern Matrix Factor Loadings for 28-item analysis

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
Positive Feelings							
2-good outweighs bad	.474	.230	-.083	-.023	.214	.078	.011
21-thoughts are clearer	.789	.015	-.048	.125	.081	-.068	-.164
26-happier on meds	.487	-.027	-.249	.217	.150	-.209	-.013
29-in better control	.598	.324	-.066	.143	-.026	.006	-.131
Negative Feelings							
5R-take b/c of pressure from others	.074	.315	-.201	.015	.132	-.137	.113
14R-slow acting poison	.034	.714	.106	-.010	-.020	-.036	-.079
17R-know better than doctor when to go off	-.080	.485	.047	.194	.269	.096	.036
18-feel more normal	.268	.502	-.214	.217	-.076	.114	-.359
19R-rather be sick	.170	.658	-.097	.031	-.116	-.124	.003
27R-control behavior others don't like	-.269	.347	-.230	-.127	.105	-.054	.342
Emotional Reaction to Medication							
16R-can't concentrate when on meds	.138	.061	-.359	-.231	.053	-.217	.016
28R-can't relax on meds	.048	-.133	-.817	.062	-.058	-.179	-.149
Perceived Need							
1R-don't need once better	.077	.080	.133	.593	-.053	-.224	.058
4-need med even when not in hospital	.368	-.051	-.130	.377	.056	.116	.127
22-should stay on even if feeling well	-.038	.075	.014	.674	.302	-.003	-.078
23-prevents breakdown	.135	-.027	-.283	.554	.001	.002	-.100
Factor 5							
6-more aware on meds	.319	.149	.172	-.135	.482	-.234	-.288
9-feel more relaxed	.142	-.144	-.291	.039	.408	-.031	-.177
24-up to doctor when to go off	.001	-.035	-.099	.195	.589	.093	-.044
Side Effects							
3R-feel like zombie	.029	.277	-.117	.224	-.286	-.496	-.079
12R-tired and sluggish	-.108	-.059	-.071	-.016	.014	-.738	-.086
25R-things more difficult on meds	.225	.022	-.067	.188	.105	-.434	.344
Factor 7							
7-meds will do me no harm	-.012	.078	-.132	-.037	.073	-.092	-.372
15-get along better with others	.327	-.064	.026	.261	.294	.080	-.376
No Substantial Loadings							
10R-no different on or off	.287	.165	-.249	-.012	.084	.049	.129
11R-unpleasant effects always present	-.287	.145	-.067	.178	.190	-.253	.011
20R-meds are unnatural	.062	.315	.082	-.045	.399	-.110	.146
30-prevent getting sick	-.082	.193	-.291	.244	.106	.140	-.124

Parallel Analysis

To compensate for the tendency of EFA to overextract factors, parallel analysis was conducted to identify the most robust factors which emerged from the data. A set of 2000 random data sets was generated and compared to the eigenvalues of the adolescent DAI data set calculated by SPSS. Factors were retained to the extent that the eigenvalues of the actual data were greater than those generated from random data. As can be seen in Table 8, parallel analysis suggests that two factors should be retained from the adolescent DAI data as well as the presence of an equivocal third factor. The first two eigenvalues from the actual data set were distinctly larger than the random eigenvalues; the third value was similar in magnitude to the random data eigenvalue, which makes it a less robust factor than the first two. The eigenvalues of factors 4-7 were clearly smaller than the random eigenvalues and were not retained.

Table 8
Results of Parallel Analyses

Factors from 28-item DAI	Actual Eigenvalues	Parallel Eigenvalues (2000 random data sets)
1	7.722	2.027
2	2.530	1.861
3	1.758	1.740
4	1.553	1.639
5	1.421	1.549
6	1.260	1.467
7	1.190	1.389

Comparing these results to those of the exploratory factor analysis suggest that the first three factors emerging from that analysis are robust (“Positive Feelings toward Medication”, “Negative Feelings toward Medication” and “Emotional Reaction to Medication”).

As Table 7 shows, the first factor to emerge corresponded in content to the “Positive Feelings toward Medication” factor hypothesized in the structural equation model analysis. Items 21 (“My thoughts are clearer on medication”) and 29 (“I am in better control of myself on medication”) were the strongest items loading onto this factor. This was the first factor to emerge in the analysis. Items 2 (“For me the good things about medication outweigh the bad”) and 26 (“I am happier, feel better, when taking medications”) loaded less strongly on this factor, yet differentiated well from the other factors. This factor appears to be robust in the adolescent data, as suggested by its strong cohesion in the CFA, its emergence as an initial factor in the EFA, and its strength as supported by parallel analysis.

The second factor to emerge from the analysis consisted of six items referring to negative aspects of medication, such medication acting as poison (item 14R - .714), the preference of being sick rather than taking medication (item 19R - .658), and feeling more normal (item 18 - .502). Items referencing controlling behavior at the request of others (5R and 27R) loaded less strongly (.315 and .347, respectively). This factor contained items which demonstrated “Negative Feelings toward Medication” and was labeled accordingly. Item 27R (“I am given medication to control behavior that other people (not myself) don’t like”) also cross-loaded onto factor 7 (.342). This factor also appears to be robust, and is supported by the CFA, EFA, and parallel analyses.

The third factor to emerge contained only two items (16R – “I can’t concentrate on anything when I am taking medication” and 28R – “I can’t relax on medication”). This factor consisted of only two items, each of which demonstrated varying degrees of the strength of their loadings. Item 28R was a marker item (Pett, Lackey, & Sullivan,

2003, p. 208) with a loading of $-.817$. Item 16R loaded less strongly, but differentiated well from other factors ($-.359$). This factor appeared to reflect the emotional experience of anxiety (not being able to relax) and inability to concentrate; it was labeled “Emotional Reaction to Medication”. The robustness of this factor was not strongly supported by any of the three analytic techniques.

Non-Robust Factors Emerging from EFA. The following factors were those that emerged from the EFA analysis, but were not supported by the parallel analytic results and were not hypothesized groupings of items in the CFA.

The fourth factor to emerge from the EFA results contained items referencing whether or not medication is needed. For example, items 1R (“I don’t need to take medications once I feel better”), 22 (“I should stay on medication even if I feel all right”), and 23 (“Taking medication will prevent me from having a breakdown”) loaded strongly on this factor ($.593$, $.674$, and $.554$, respectively). A fourth item (4 – “Even when I’m not in the hospital I need medication regularly”) had a loading of $.377$. This four-item factor differentiated well from the other factors and was labeled “Perceived Need for Medication”. It was not supported by parallel analysis and was not a hypothesized grouping of items in the CFA.

The fifth factor to emerge contained three items. Item 6 (“I am more aware of what I am doing, of what is going on around me, when I am on medication”), item 9 (“Medication makes me feel more relaxed”), and item 24 (“It is up to the doctor when I go off medication”) had moderate loadings of $.482$, $.408$, and $.589$, respectively.

Conceptually, these items did not hold together well, although they differentiated well

from the other items. Item 6 had a cross-loading of .319 onto Factor 1 “Positive Feelings toward Medication”.

The sixth factor to emerge contained three items which loaded negatively and related conceptually to specific side effects such as sluggishness and sedation. Item 3R (“I feel weird, like a zombie, on medication”) had a loading of -.496; item 12R (“Medication makes me feel tired and sluggish”) had a loading of -.738, and item 25 (“Things that I could do easily are much more difficult when I am on medication”) had a loading of -.434. Item 12R referenced tiredness and sluggishness and was the strongest item loading onto this factor, which was labeled “Side Effects”.

The last factor to emerge contained two items which had weak negative loadings and which did not hold together well conceptually. Item 7 (“Taking medication will do me no harm”) had a loading of -.372, whereas item 15 (“I get along better with people when I am on medication”) had a loading of -.376. Item 15 had a cross-loading of .327 with factor one, “Positive Feelings toward Medication”.

Items 10R (“I am no different on or off medication”), 11 (“The unpleasant effects of medication are always present”), 20R (“It is unnatural for my mind and body to be controlled by medication”), and 30 (“By staying on medication I can prevent getting sick”) did not load strongly on any factor.

Factor Correlations. The factors that emerged from the 28-item analysis demonstrated weak correlations with one another (see Table 9). Positive Feelings about Medication demonstrated a low negative correlation with Emotional Reaction ($r = -.263$), a low positive correlation with Perceived Need ($r = .252$) and a low positive correlation with Factor 5 ($r = .230$). Negative Feelings demonstrated a low negative correlation with

Emotional Reaction ($r = -.261$), a low positive correlation with Perceived Need ($r = .232$) and a somewhat higher positive correlation with Factor 5 ($r = .318$). Interestingly, Negative Feelings showed a low negative correlation to Side Effects ($r = -.285$). This result is unusual, in that it reflects an inverse relationship between Negative Feelings and Side Effects. This may result from the variety of items loading onto the factor “Negative Feelings” and may suggest that the underlying concept tapped by this group of items requires a different conceptual label. This group of items was difficult to label in a way that represented the content of each item. Emotional Reaction showed a low negative correlation with Perceived Need ($r = -.204$), a low negative correlation with Factor 5 ($r = -.247$) and a low positive correlation with Side Effects ($r = .248$). Perceived Need demonstrated a low positive correlation with Factor 5 ($r = .239$). This pattern of relationships suggests that there is a complex relationship underlying the DAI items such that opinions on items relating to one factor may not relate to opinions on items underlying another factor. The groupings of many of the non-robust factors do not point to a strong unifying conceptual domain for any of the factors, rendering the item groupings difficult to explain. Future research may be helpful in elucidating why these items did not emerge strongly in the factor analytic results. Data from the qualitative responses of the adolescents will be presented which may shed light on why some items did not perform well in this sample.

Table 9
Twenty-eight Item Factor Correlation Matrix

	Positive Feelings	Negative Feelings	Emotional Reaction	Perceived Need	Factor 5	Side Effects	Factor 7
Positive Feelings	1.000	.171	-.263	.252	.230	.062	-.200
Negative Feelings		1.000	-.261	.232	.318	-.285	.049
Emotional Reaction			1.000	-.204	-.247	.248	.097
Perceived Need				1.000	.239	-.088	-.138
Factor 5					1.000	-.099	-.102
Side Effects						1.000	-.025
Factor 7							1.000

Comparison of Factor Analytic Methods. A comparison of factors which emerged as robust following structural equation modeling and exploratory factor analysis is presented in Table 10. Parallel analysis is not presented in the table given that its purpose is to determine the appropriate number of factors and does not present factor loading results. Its role in this study was to determine the number of factors which would be retained from the exploratory factor analysis given that parallel analysis compensates for the tendency of EFA to overextract factors.

Table 10
Comparison of factor loadings in SEM and EFA Models

SEM Positive Feelings	EFA Positive Feelings	SEM Negative Feelings	EFA Negative Feelings	EFA Emotional Reaction
Item 18 (.762)	--	--	Item 18 (.502)	--
Item 26 (.774)	Item 26 (.487)	--	--	--
Item 6 (.606)	--	--	--	--
Item 15 (.672)	--	--	--	--
Item 21 (.829)	Item 21 (.789)	--	--	--
Item 9 (.473)	--	--	--	--
Item 29 (.801)	Item 29 (.598)	--	--	--
Item 2 (.506)	Item 2 (.474)	--	--	--
--	--	Item 3 (.609)	--	--
--	--	Item 25 (.605)	--	--
--	--	Item 12 (.517)	--	--
--	--	Item 16 (.405)	--	Item 16 (-.359)
--	--	Item 11 (.379)	--	--
--	--	Item 28 (.620)	--	Item 28 (-.817)
--	--	--	Item 5 (.315)	--
--	--	--	Item 14 (.714)	
--	--	--	Item 17 (.485)	
--	--	--	Item 19 (.658)	
--	--	--	Item 27 (.347)	

Factors presented in this table included those from the structural equation model which matched the first three factors that emerged from the exploratory factor and parallel analyses. These included “Positive Subjective Feelings toward Medication” and “Negative Subjective Feelings toward Medication”. In the table, factors are juxtaposed against one another. Items which loaded similarly across analysis method are bolded.

Note that all of the items which loaded onto the “Positive” factor in the exploratory factor analysis also loaded onto the “Positive” factor in the structural equation model.

Interestingly, none of the items from the “Negative” factor in the exploratory factor analysis loaded onto the “Negative” factor in the structural equation model. However, if one observes the items loading on to the “Emotional Reaction” factor in the EFA, those items also load onto the “Negative” factor in the structural equation model. It can be seen clearly from the table that items from the “Positive” factor were robust across analyses, whereas items from the “Negative” factor did not have consistent loadings across factor analytic method.

Summary of Teen DAI Quantitative Analyses

To summarize the quantitative results for the teen DAI, the factor structure found in the adult DAI demonstrated a “fair fit” to the adolescent data (Browne & Cudeck, 1993). Exploratory factor analysis provided a different factor structure, with retention of seven factors and a different pattern of factor loadings for the items. Seven factors emerged from the exploratory factor analyses: positive feelings toward medication, negative feelings toward medication, emotional reaction to medication, perceived need for medication, side effects of medication, and two factors which were difficult to label conceptually. Parallel analysis indicated that the seven factors which emerged from the EFA was likely to represent overextraction and suggested that the first two factors (positive feelings toward medication and negative feelings toward medication) should be retained. Comparison of the item loadings across structural equation and exploratory factor analyses highlighted that similar items loaded onto the “Positive” factor, whereas different items loaded onto the “Negative” and “Emotional Reaction” factors depending

on analysis method. Comparison of the factor loadings of the adult and adolescent structural equation models indicated areas of both similarity and difference in the salience of particular items to each group. These results suggest that there are areas of common experience in taking psychiatric medication between the adults in the Hogan study and adolescents as well as significant disparities in their experience as reflected in their responses to the DAI items.

It is important to note that while the parallel analysis suggested that only the first two factors from the EFA should be retained, other factors held together well and successfully differentiated from other factors, such as “Perceived Need for Medication” and “Side Effects”. There may be conceptual reasons to retain items loading onto these factors. This will be discussed along with final evaluation of factors and items to be retained in the last chapter. Application of the criteria for item retention will be completed in the final chapter as well, ending with a summary of items which are robust as well as items which may require alteration in order to be useful in an instrument used with adolescents.

The teen DAI demonstrated a low yet significant correlation with self-reported adherence; however, the strength of the association was relatively weak. There was no significant association between the teen DAI and CBCL Total Competence or Total Problems scores, indicating that attitudes toward medication are not significantly linked with symptoms or social achievement.

CHAPTER FIVE: QUALITATIVE RESULTS

Sample Demographics

A subset of twenty qualitative interviews with youth was randomly selected from a group of forty-three adolescent participants in a simultaneous qualitative study regarding youth experiences with psychotropic treatment. The twenty respondents were selected using the “random case selection” function in SPSS version 12.0. Their demographic information is presented in Table 11. Caucasian and African-American youth were evenly represented. Seven were diagnosed with bipolar disorder, four were diagnosed with major depression, six were diagnosed with ADHD, one was diagnosed with schizophrenia, one was diagnosed with an eating disorder, and one had an undetermined diagnosis. Eight of the teens had an Individualized Education Plan, whereas 12 did not. Six of them were attending alternative schools for children with severe emotional disturbances; 14 attended regular schools.

Table 11

Demographic Characteristics of Teen Qualitative Sample (N=20)

<u>Gender</u>	<u>n</u>	<u>Average Age</u>
Male	7	14.2 (<i>SD</i> =1.70)
Female	13	
<u>Ethnicity</u>		<u>Average Education</u>
Caucasian	10	8.65 (<i>SD</i> =1.50)
African-American	9	
Hispanic	1	
Other	0	
<u>Diagnosis</u>		<u>Avg. No. of Psychiatric Medications</u>
Bipolar	7	1.8 (<i>SD</i> =.77)
Depression	4	
ADHD	6	
Schizophrenia	1	
Eating disorder	1	
Undetermined	1	

Univariate analyses of variance revealed a statistically significant difference [$F(1,40) = 4.331, p > .05$] between the interviewees whose data were randomly selected for qualitative analysis in this study and those who were not selected in the number of psychiatric medications they were taking. The average number of medications taken by interviewees not included in the study was 2.59 ($SD=1.53$) and 1.80 ($SD=.77$) for interviewees included in the study. There were no other significant differences between the groups on age, years of education, CBCL Total Problems scores, or average DAI scores. Chi-square tests revealed no significant differences between the groups on psychiatric diagnosis or gender.

As described in the qualitative data analysis plan in chapter three, the adolescent responses were analyzed for themes by using the constant comparative method of analysis. Results of the analysis are grouped into two sections: DAI-related themes and additional themes not represented by the original DAI constructs. Three major findings are represented by the qualitative data: 1) youth responses did reflect the seven dimensions of the original DAI, 2) youth responses also reflected additional themes not present in the DAI, and 3) some of the words used in the original DAI items appear to be conceptualized differently in youth than they are in adults.

Overall, a total of fifteen themes were distilled from the adolescent responses. Seven of these reflected the original seven DAI dimensions - results indicated that adolescents did reference themes similar to the original seven-factor structure of the DAI in adults. However, youth responses contained the most references to “positive

subjective feelings” and “negative subjective feelings” toward medications as well as concern about harm/toxicity.

Eight new dimensions emerged from the data: ambivalence, autonomy, change over time, treatment duration, expectations of medication, stigma, inclusion in medication decisions, and unpleasant aspects of taking medication (such as difficulty swallowing pills). The fifteen themes are discussed in detail below. Figure 3 provides an example of how the constant comparative method was employed to derive the themes from the qualitative data. The code for “Stigma” represents a non-DAI-related theme. Underneath the “Stigma” code are three intermediate concept codes distinguished by an ampersand prior to their code names. Underneath the intermediate concept codes are the in vivo codes.

Figure 3. Example of In Vivo Codes, Intermediate Concept Codes,, and Thematic Coding of Stigma Responses.

DAI-Related Themes

The following section presents qualitative data that reflected concepts found in the original factor structure of the DAI: positive subjective feelings toward medication, negative subjective feelings toward medication, health/illness model, internal locus of control, external locus of control, harm/toxicity, and relapse prevention. These data show that the factors found in the original DAI are salient to teens as evidenced by the presence of the same concepts in their responses. Table 12 summarizes the frequency with which DAI-related themes were endorsed by each subject. This table is a pictorial representation of how the DAI-related themes were distributed across respondents. Note

that positive and negative subjective feelings toward medications were the most frequently endorsed DAI-related themes across respondents along with concerns about harm/toxicity.

Table 12
Number of DAI-Related Quotations by Respondent

Positive subjective feelings toward medication. Examples of positive themes referenced by youth are presented in Table 13. For positive subjective feelings about medications, youth tended to evaluate their medication experiences according to five themes represented by the following intermediate concept codes (Floersch, et al. in press): physical/body effects, emotional effects, changes in cognition or thoughts, intersubjective effects, and “other”, which is a category comprised of statements that did not correspond to the other categories.

Table 13

Examples of adolescent responses linked to the theme “Positive Subjective Feelings Toward Medication”

Body (intermediate code)	Emotion (intermediate code)	Cognition (intermediate code)	Intersubjective (intermediate code)	Other (intermediate code)
able to sit still	controls suicidal thoughts	improved schoolwork	improved relationships with family	stabilization
gives energy	controls moods	self-respect	improved relationships with friends	decreases flashbacks
improves sleep	prevents grouchiness	improved focus and attention	able to make more friends	cost benefit analysis – positive effects outweigh the negative
improves appetite	being calmer	decreases worries	improved social behavior	absence of side effects
	controls anger	helps pay for college; got scholarship	no negative things on permanent school record	helps to feel normal
	feeling whole	improved attitude	help others more	provide courage and achievement
	feeling happy	able to listen more	controls fighting	maintain sanity
	improved self-esteem	like classes more	controls talking back	
	trusting the medicine	improved outlook	prevents legal trouble	
	loving life		can give 110% effort	
	feeling better		people are proud of behavior	
			spending more time with family	

In relation to positive feelings about medication, youth responses often reflected emotional, cognitive, and intersubjective themes. Some responses referenced the

physical effects of medication. Table 14 shows a sampling of quotations teens made about the positive aspects of medication. In the emotional domain, adolescents discussed feeling better about themselves, having fewer mood swings, and feeling calmer and less angry than without medications. In the cognitive domain, they noted primarily improved focus and attention, which resulted in improved schoolwork and grades, and, subsequently, greater opportunities to attend college. Intersubjectively, youth emphasized that medication helped them to have better relationships with their families and friends, to make more new friends, and to exhibit better social behavior. Youth also noted that important people in their lives became proud of them once their behaviors improved.

In the “other” category, youth discussed a diverse array of benefits, including reference to cost-benefit analyses in which the positive effects of medication were perceived as outweighing the disadvantages. Youth endorsed feeling that medication can prevent a host of negative outcomes, including poverty and homelessness. Youth also talked about disorder-specific improvements, such as “decreased flashbacks” noted by one youth diagnosed with post-traumatic-stress disorder. Other youth referenced feelings of “stability” and “sanity” which did not fit solely in a cognitive or emotional domain.

Table 14
Examples of youth quotations reflecting “Positive Subjective Feelings Toward Medication”

Emotional	<p>“I can either not take it and be a grouch, or take it and be happy. So I would much rather take it and be happy.”</p> <p><u>(Caucasian female, age 17, major depression, antidepressant)</u></p>
Cognitive	<p>“Sitting down, paying attention to the teacher, not talking. Just paying attention and doing what I need to do.”</p> <p><u>(African-American male, age 13, ADHD, stimulant)</u></p>
Intersubjective	<p>“...it improves my social life, cause it makes friends, makes friends wanna be around me cause I don't have, I don't have a bad attitude.”</p> <p><u>(Hispanic male, age 16, bipolar disorder, mood stabilizer)</u></p>
Physical	<p>“I gain energy to want to do my work and listening and focus and try to do my best and give 110%.”</p> <p><u>(African-American male, age 12, ADHD, antipsychotic)</u></p>
Other	<p>“I can control my anger and focus more. It's like telling me to do the right thing instead of the wrong thing. And, it's giving me benefits for my life so I don't get locked up or stuff like that. Like go to a foster home or somewhere that I don't want to be...Can't support yourself, got to live with somebody. Ain't got no money...”</p> <p><u>(African-American female, age 13, ADHD, antidepressant)</u></p>

Negative subjective feelings toward medication. Youth tended to evaluate the negative aspects of their medication experience according to the same five themes represented by the intermediate concept codes discussed above (physical/body, emotion, cognitive, intersubjective and other). Table 15 summarizes the codes referencing negative experiences about medication.

Table 15

Examples of adolescent responses linked to the theme “Negative Subjective Feelings Toward Medication”

Body (intermediate code)	Emotion (intermediate code)	Cognition (intermediate code)	Intersubjective (intermediate code)	Other (intermediate code)
too slowed down	sadness	Disagree with need for meds	Lack of social benefit	dependence
too much energy	nervousness			Don't want to take medication
stomach upset/stomachache	anger			Cost benefit analysis – negative outweighs the positive
appetite problems	annoyance			ineffective
dizziness	hate going to doctor			Not able to be myself
sedation	unwanted emotional reactions			Active non-adherence
weight gain				
movement problems				
shaking				
headaches				
blurry vision				
increased heart rate				
out of body feeling				
spacing out				

When discussing the negative aspects of medication, youth noted a variety of physical effects that they deemed undesirable. These were categorized as side effects of medication. This side effects category is conceptually similar to the harm/toxicity

category reflected in the original DAI. In the analyses conducted for this study, side effects were analyzed both as a separate construct (harm/toxicity) and were also included in the category “negative feelings toward medication”, given that side effects were deemed by the youth as undesirable. Youth reported stomach upset, weight gain, appetite changes, and feeling “spaced out” or not “like themselves” when they discussed side effects/negative experiences with medication.

In addition to their present experience of side effects, youth also talked about their fears of future harm as a result of taking medication. Youth made specific references to “messing up brain cells”, getting diabetes, memory loss, the possibility of seizures, strokes, or heart attacks, and fear of accidental overdose prescribed by the doctor.

References to negative emotional experiences with medication ranged from annoyance at the medication regimen to psychological side effects of medication such as sadness, nervousness, and anger. The “other” category again was comprised of diverse references such as “not being able to be myself” and active non-adherence to medications. Interestingly, youth also endorsed a cost-benefit analysis which was the inverse of that found in the positive feeling responses: “The negative aspects of medication outweigh the positive”. These youth indicated that they engaged in a cognitive process of summing up the advantages and disadvantages of medication and, for them, the disadvantages were greater than the benefits. “ provides examples of quotations reflecting teens’ negative feelings about medications.

Table 16

Examples of youth responses reflecting “Negative Subjective Feelings Toward Medication”

Emotional	“I don’t like sometimes I feel like out of my body or just like not myself, more anxious sometimes.” <u>(Caucasian female, age 15, major depression, antipsychotic)</u>
Cognitive	“Well I had it told me the Topamax or whatever causes short-term memory loss, so I assume it’s the Topamax or whatever.” <u>(Caucasian male, age 14, bipolar disorder, antipsychotic)</u>
Intersubjective	“Well actually my mom won’t stop bugging me, then my peers and then my P.O. It’s like I need to go so I won’t get into any more trouble. You know, it’s like “Fine, I’ll just go.” <u>(African-American male, age 16, bipolar disorder, antipsychotic)</u>
Physical	“Make me sick. Make me get the bubble guts and stuff. And I wish that there was a medicine that didn’t have side effects.” <u>(African-American male, age 12, ADHD, antipsychotic)</u>
Other	“Yeah, it does, but then I’m hesitant, because I feel really strongly about I do not want to be like I can’t do work without Aterol because I don’t have power over myself.” <u>(Caucasian female, age 15, major depression, antipsychotic)</u>

Health/Illness Model. Youth presented a variety of interpretations regarding the problems for which they were treated. Five illness models emerged from their qualitative responses: disease model, genetic non-disease model, transient sickness model, non-problematic model, and a behavior/attitude problem model. In the disease model, youth appeared to believe that mental health disorders are considered to be diseases comparative to diabetes or other physical illnesses. These youth tended to view their problems as long-standing if not lifelong and had a greater understanding of the need for continued adherence to medication.

“At first I thought it was a disease and I kind of got scared.”
(African-American male, age 12, ADHD, antipsychotic)

Youth who endorsed a “genetic non-disease” model acknowledged that mental health problems were prevalent in their families and referenced specific relatives who were diagnosed with the same difficulties they were facing. However, these youth did

not view their “genetic problems” as a disease or sickness, but more as a trait that would not be debilitating.

“...as long as it wasn't like a disease or something it just, it's just that, it was genetic I guess.”

(Hispanic male, age 16, bipolar disorder, mood stabilizer)

Some youth endorsed a “transient sickness” model, comparing their mental health issues to a cold or the flu. These youth tended to view the use of medication as temporary and needed only as long as they remain symptomatic. Some youth spoke of treatment duration in limited terms, stating that they would discontinue medications when they “became stable” or were “feeling better”.

“Abilify is basically just like taking your medicine to get you, to get your from having, being sick to being better like having the flu to being normal.”

(Hispanic male, age 16, bipolar disorder, mood stabilizer)

Some youth referred to their mental health diagnoses as “non-problematic” because they did not consider mental illnesses to be diseases because they are not fatal.

“It really don't matter if it goes away or not, 'cause I don't even look at it as a problem anymore.”

(African-American male, age 12, ADHD, antipsychotic)

Some youth referred to themselves as having a “behavior” or “attitude” problem and did not view their diagnoses as being a sickness, illness, or disease. They viewed medications as enabling them to have better behaviors rather than correcting a physical or biochemical problem.

“Well I actually at first I mean I didn't really know, and then I felt “Well maybe because of my behavior...”

(African-American male, age 13, ADHD, stimulant)

Patient internal control. Youth responses reflected consideration of a balance between internal and external control over medications and behavior, rather than responsibility for medications in particular. Some youth endorsed that it was their idea to seek treatment

for their mental health problems – “I evolved that in my head”, whereas other youth rejected the efforts of significant others and professionals to provide assistance – “Their opinions are worthless”. Some youth invoked the idea that their own efforts are responsible for their recovery – “You have to change your own life” and “I want to handle my behavior problems myself”; in contrast, others stated that they are afraid of becoming dependent on their medications.

An important finding in the qualitative data relevant to this question were the youths’ references to “losing the self”, endorsing fears that they no longer controlled their self-definition but that their personalities and emotional responses were determined by medication. Youth expressed fears about “emotional numbness”, being “robotic”, or wondering if they were still themselves. When asked to elucidate further what these experiences were like, youth were unable to offer detailed descriptions. Their usual response was to point out that “it’s something you have to experience; it’s hard for me to describe”.

External locus of control. In the original DAI study, external control was linked to physician authority. Patients who endorsed high levels of external control were viewed as depending upon the expertise of their physicians to guide medication decisions. While youth in this sample often endorsed the belief that their doctors know best about how to prescribe and manage medications, they also referenced significant others such as mothers, fathers, and other relatives when asked who has the best knowledge about medication (“Dad knows best about medications”; “Mom and the doctor know best about medications”). Other youth appeared to relinquish total responsibility for their recovery

to medication – “I need someone to fix me”; “I don’t have the willpower to fix myself; “I can’t function without pills”.

Relapse prevention. The theme of relapse prevention shared the least conceptual similarities to youth responses (see Table 17). The original DAI questions referenced the degree to which patients acknowledged having a chronic mental illness that requires medication in order to remain stable (“Taking medication will prevent me from having a breakdown” or “I should stay on medication even if I feel all right”). Youth did not appear to define the concept of “relapse prevention” in the context of chronic illness; rather, they used short-term time markers (“I will take the medicine for another month”), event markers (“I will stop medication in high school”) and symptom markers (“I’ll stop medication when my symptoms go away”). Table 9 presents exemplars of time, event, and symptom markers from the youth responses.

Table 17

Examples of youth responses linked to the theme “Duration of Treatment”

Time Marker	Event Marker	Symptom Marker
not for more than five years	until out of school	stopped because not having problems
won’t take medication for long	stop when in ninth grade	stop when illness goes away
will stop next year	stop when in high school	stopped because symptoms went away
for another month		
for a couple more years		
will stop as soon as I can		
stop in the next two months		
for the rest of this year		
stop when I’m 18		

Teens who used specific time references for discontinuing medication tended to believe their treatment would be short in duration, measured in terms of months or, at most, through the high school years. Those who used event markers referenced school milestones such as grade levels; those who used symptom markers endorsed that they would discontinue medications when their symptoms remitted and did not reference concepts relating to symptom recurrence.

Some youth articulated the knowledge that their mental illnesses likely would be chronic, requiring a lifetime of medication treatment (“I will take medication for the rest of my life”). Others appeared to have the knowledge that absence of symptoms does not always equate to recovery from the illness (I will still take medicine even if I’m doing good”). Still others believed they would need medication for a long time, but held out hope that they could become medication-free at a later point in their lives (“If I can control myself when I’m older, I’ll stop taking medicine.”)

Summary of DAI-Related Concepts

Of particular importance to this analysis, the positive subjective feeling category contained the most quotations (103) out of all seven original DAI coding categories. Table 18 lists the seven original DAI factors and the number of quotations linked to those themes in the adolescent responses. The next most populated category of the original factors was “harm/toxicity”, containing 48 quotations, followed by “negative subjective feelings” which contained 31 quotations. If these two categories are summed based on the assumption that fears of harm and side effects are part of a negative experience with medication, 79 references are made which indicate negative feelings about medications. This results in 182 quotations falling along the dimension of positive vs. negative, and a

total of 85 additional quotations distributed among the remaining four DAI-related categories.

Table 18

Number of quotations derived from adolescents' qualitative responses that were linked to themes associated with the original DAI factor structure

Positive Subjective Feeling	Negative Subjective Feeling	Health/Illness Model	External Locus of Control	Internal Locus of Control	Harm/ Toxicity	Relapse Prevention
103	31	21	20	10	48	34

Additional Concepts not Found in the Original DAI

The youth responses reflected eight additional themes not found in the factor structure of the original DAI: balanced responsibility for behavior, ambivalent feelings about medications, change in attitudes toward medications over time, adherence if medications are effective, expectations of medications, inclusion in medication decisions, personal autonomy, and feelings of stigma. Each of these themes is presented in turn below. Table 19 summarizes the distribution of non-DAI-related themes endorsed across respondents. Note that stigma and autonomy were the most frequently endorsed non-DAI-related concepts across respondents.

Table 19
Number of Non-DAI-Related Quotations by Respondent

Balanced responsibility for behavior. Youths whose responses described a balance of responsibility between their own efforts and medication appeared to acknowledge that recovery is achieved through both avenues. These youth acknowledged that medications helped in symptom reduction but that they also had to make behavioral efforts. One youth stated that “Medications help me to make changes”. Another said that recovery is “half my effort, half medication”. Still another youth endorsed a change in mindset in relation to effort and medication (“I thought I could recover by myself but decided I needed medication”).

Ambivalence about medications. This category contained a variety of responses that reflected youths’ uncertainty about the benefits of medication. American Heritage Dictionary (2008) defines ambivalence as 1) “the coexistence of opposing attitudes or feelings, such as love and hate, toward a person, object, or idea”; 2) “uncertainty or indecisiveness as to which course to follow”. Adolescents reflected such feelings in their

qualitative responses. Some youth reported that medication helps minimally with symptoms but that they do not perceive a substantial benefit (“it helps, but not much”). Others stated that medications work at times, but not reliably (“medicine doesn’t always work”). Still other adolescents talked about waiting or hoping to gain some benefit from medication but not currently seeing improvement (“I hope for the best but expect the worst”).

Change in attitude toward medication over time. One youth out of the twenty directly acknowledged that he initially disagreed with having to take medications but that he doesn’t now and that he sees the benefit of adhering to his medication. Although no other teens brought up this topic, it would be of substantial research and clinical benefit to assess this directly in future studies.

Adherence if effective. Several youth talked about adhering to medications as a result of seeing positive benefits from taking them. These youth typically referenced relief from negative feelings due to taking medications (“I’d rather take medication than be a demon”; “I’m grouchy if not taking medication”; “I’d rather take medication and be happy”). Some adolescents discussed receiving positive consequences for being adherent to medication rather than perceiving direct symptom relief (“I have a choice to take it, a choice not to take it, but my choice is if I take it, some positive things will come out of it. But then if I don’t take it, if I choose not to take it, some negative things will come out of it”).

Expectations of medication. Youth demonstrated surprisingly realistic expectations of their medications. Some youth had no initial expectations of medications, saying that they did not know what the medications would do. Other youth talked about the things

that medication can't do for them, such as shielding them from disappointment, preventing all anger, giving them immunity from grief, or bringing them new friends ("Medicine can't bring me friends"; "It can't prevent all anger"). Some acknowledged that medication can't change their core selves or their views ("It doesn't change my feelings about things"). Youth did expect that medication would help them to feel better, to help them regain control of their behavior, and to achieve positive outcomes ("Medication will help me become something in life").

Inclusion in medication decisions. The concept of inclusion appeared in some youth responses regarding decisions about medication. Some youth stated that they want to be included in discussions about medication and that they struggle when the rationales for treatment decisions aren't explained to them. One youth expressed the need for understanding about her diagnosis ("They never explained the diagnosis to me"). Some youth appreciated that their parents and doctors actively included them in medication decisions ("I like the doctor because she listens"). One youth stated that her opinion is vital because ("The doctor doesn't understand what I'm going through").

Autonomy. Adolescents talked about the need for autonomy from the control of significant others and spoke of the desire to take responsibility for their own medication regimens ("I want to be responsible for my medications"; "I have no influence"). Others said that they want the freedom to feel their own thoughts and feelings and viewed medication as making them artificial ("Medications rule how I think"). Quotations reflecting concern about artificiality reflected the view that one's own thought processes are not natural or spontaneous on medication. These youth struggled more with the perception that they were under the control of medications than with the notion that they

were monitored or controlled by parents or doctors (“I don’t want to not have power over myself”; “Medications have control instead of me”). Of particular relevance to the concept of autonomy, some youth preferred to relinquish control of their behavior to medications, noting that they feared what would happen if they were nonadherent (“I don’t know what would happen if I didn’t take my medication”).

Feelings of stigma. Youth expressed several concerns about the stigma of taking medications. Some youth feared that their peers would view them differently because of their medications, whereas others told their friends openly about their mental health diagnoses and treatment. The adolescents’ responses covered a range of stigma topics, including the desire for social acceptance, the need to feel “normal”, fear of being labeled as “bad”, “psycho”, or “stupid”, and providing education to their peers and receiving understanding in return. Table 20 summarizes the issues teens raised about stigma and medication.

Table 20

Examples of quotations linked to the theme “Stigma”

Desire for social acceptance	Wanting normality	Bad or crazy identity	Identified as unintelligent	Understanding from friends	Education Strategies
feel like an outsider	don't want to be different	they are “crazy” pills	makes me look stupid	all my friends know	I like explaining my medication to people
look like a coward in front of friends	I thought I was the only one	viewed as “nuts” or “crazy”	don't want teachers to know	knowing others who take medication	did a bipolar slide show at school
fear of being teased	different from other people	they thought I was schizophrenic	medications are for stupid people	my friends want me to take medication	I tell them straight out about my medication
get bullied because of medication	want to live normal life without medication	medication means I'm a bad person		medications viewed as cool by friends	I don't keep medication a secret
embarrassed about taking medication	others don't take medication	being labeled		half of my class takes it	

Adolescents used a variety of strategies to communicate or hide the fact that they take medications. Some youth said that they keep their medications secret, arranging to take them at home and avoiding taking them at school if possible. Others whose regimens required them to take medications away from home would lie about the purpose of their medication, typically telling their friends that the medications were for asthma, allergies, or another physical health problem. Some youth openly discussed their mental health problems and medications with friends; one youth even educated her health class about medication by providing a slideshow presentation about bipolar disorder. It is clear

from the qualitative data that youth perceive mental health medications as an issue with important impact on their social lives.

Chapter Summary

In summarizing the findings of the adolescent qualitative and quantitative analyses, it is apparent that the seven dimensions found in the original DAI employed with adults are present in teens' conceptualizations of their views of medication. However, adolescents may think about those dimensions, such as side effects and relapse prevention, differently than adults do. These findings are supported by both the EFA and qualitative results. EFA findings indicate that side effects differentiated into specific cognitive effects as well as other harms for youth. Adolescents did not appear to view relapse prevention as the adults did, instead evaluating their perceived need for medication in relation to their symptom stability in forming their attitudes toward medication. The teen DAI was associated significantly with adherence, although the correlation was low. Evaluations of convergent validity indicated that the DAI did not coincide with measures of social competence or problem scores reflecting symptom levels; this may be because this association was predicated on the fact that medications are effective at relieving symptoms, which itself is an empirical question.

The qualitative data highlighted the presence of eight additional themes not reflected in the original factor structure of the DAI, including important themes such as personal autonomy, inclusion in medication decision-making, the experience of stigma, and level of personal responsibility vs. external control over behavior. These themes highlight that medication experiences and the formation of attitudes toward

pharmacological treatment for youth are complex and multiply-determined, rendering it difficult to represent adolescent attitudes toward medication fully with a single instrument. These findings point to the potential value of creating individualized, qualitative assessment tools to capture youth experiences with medication rather than relying on a single quantitative measure or set of subscales. This may be valuable for eliciting youth attitudes toward medication, educating them about treatment options so that they can be included more fully in decision-making processes, and developing understanding of the clinical results they hope to see as well as barriers to treatment.

CHAPTER SIX: IMPLICATIONS OF FACTOR ANALYTIC AND QUALITATIVE FINDINGS FOR EVALUATING THE ADOLESCENT DRUG ATTITUDE INVENTORY

The previous two chapters presented data in relation to the first two study questions: 1) what is the factor structure, validity, and reliability of the adolescent Drug Attitude Inventory? 2) Will qualitative interviews with adolescents about their daily use of psychiatric medication support the dimensions found in the factor structure of the original DAI used with adults? Will qualitative interviews with adolescents reveal new dimensions of youth attitudes toward psychiatric medication which are not measured by the DAI? This chapter synthesizes the quantitative and qualitative results in order to address the overall mixed methods question: Can measurement of youth attitudes toward psychotropic treatment be improved by knowledge about the factor structure, validity, and reliability of the DAI in youth as well as understanding their subjective experiences of treatment?

The backdrop for these questions was reasoned action theory (RAT), which proposed that individuals' attitudes toward health-related behavior serve as important indicators of their likelihood of engaging in the behavior. This study investigated the utility of the DAI as a tool for measuring adolescent attitudes toward medication and its association with adherence to psychotropic treatment.

Evaluation of the Teen DAI

In this final chapter, the quantitative and qualitative results will be synthesized to provide a comprehensive evaluation of the factor structure, validity, and reliability of the

DAI and suggestions made regarding how the DAI may be improved for use with adolescents. As summarized in chapter four, confirmatory factor analysis using structural equation modeling techniques was employed to determine if the factor structure found when the DAI was used with adults provides an adequate reflection of the salient dimensions comprising youth attitudes toward medications. The adult DAI model consisted of seven components when used in adults who took typical neuroleptic medications (positive attitudes toward medication, negative attitudes toward medication, illness model, external locus of control, internal locus of control, relapse prevention, and medication toxicity). As indicated in chapter four, this model provided a relatively good fit to the data but left room for improvements.

Subsequently, the adolescent DAI data were subjected to exploratory factor analysis to evaluate the factor structure without applying a pre-determined theoretical model. Parallel analysis was used within EFA to compensate for the tendency of EFA to overextract factors. Results of these analyses suggest that two robust factors emerge from the adolescent data: positive feelings toward medication and negative feelings toward medication.

The qualitative data presented in chapter five demonstrated that adolescents do indeed reference many of the concepts reflected in the original adult factor structure, but that some modifications are required to make the concepts more relevant to youths' experience with medications. Additional concepts were uncovered in the qualitative data which suggest other dimensions that are important to adolescents that are not reflected in the content of the original DAI.

The next component required to analyze the applicability of the DAI for adolescents is to synthesize the quantitative and qualitative results to provide overall recommendations for how the DAI should be constructed in order to create a more optimal measure of adolescents' attitudes toward medications. To this end, an analytic strategy was employed combining the quantitative and qualitative data to form conclusions regarding the existing DAI, as well as potential modifications to the instrument that will improve its measurement capacity. A set of explicit criteria were used to determine which factors and items in the existing DAI are suited for use with adolescents. Qualitative findings were used to delineate dimensions of adolescent medication experience not measured by the existing instrument and to elucidate differences in the meaning assigned to various concepts by adults and youth.

As chapter four demonstrates, confirmatory factor analysis suggests that the factor structure that emerged from the adult data provides a substantial degree of fit to the adolescent data, implying that the instrument taps similar constructs for the two populations. However, model fit was not optimal for the adolescents, suggesting the need for changes in the model to best reflect adolescent attitudes toward medication and highlighting the presence of differences in what the DAI measures for adults vs. adolescents. As outlined in the methods chapter, three criteria were used with the EFA results to determine whether to retain factors and individual items resulting from those analyses. A factor was retained if it: 1) contained four or more items, 2) differentiated well from other items (i.e., had no substantial cross-loadings), or 3) if qualitative data supported the concept represented by the factor. Each factor from the EFA results will be described individually. In some cases, individual DAI items will be presented when the

data suggest that an item was particularly salient to youth experience or problematic in its construction.

The two most robust factors supported by all three analytic techniques were “positive feelings toward medication” and “negative feelings toward medication”. A number of criteria support the value of these factors in measuring adolescent attitudes toward medication; each factor consisted of four or more items and each factor differentiated well from the other factors. Additionally, the qualitative data support the idea that adolescents do frame their opinions of medications in positive and negative terms; the qualitative results showed that the greatest number of references to medication was subsumed under positive and negative feeling codes.

Of particular interest, five items comprising the “positive” factor in the youth exploratory analyses also comprised the “positive” factor for adults in the confirmatory analyses. The content of these items was also reflected in the qualitative responses of the youth, who endorsed improvement in thinking and concentration, feeling happier (or having reduced anger/sadness) on medication.

The items comprising the “negative” factor in the EFA did not correspond as well to the “negative” factor in the CFA results. The “negative” factor in the EFA covered a range of concepts, such as taking medication due to pressure from others, acting as a “slow poison”, and controlling behavior others don’t like. The qualitative data suggest that the youth place strong emphasis on side effects of medications, such as sedation, weight gain, and stomach upset, and that these reactions are of particular salience because they impact daily functioning. This may reflect an important distinction between the adults for whom the DAI was originally designed, and youth being treated in today’s

psychiatric environment. The adults in the original DAI study were taking typical neuroleptic medications, which are linked with specific side effect profiles such as extrapyramidal side effects, which include involuntary twitching and muscle movements (Gao, Kemp, Ganocy, Gajwani, Xia, & Calabrese, 2008). Tolerability studies examining the side effect profiles of typical neuroleptics and atypical antipsychotics indicate significant differences in the physical effects of the medications (Karow, Schnedler, & Naber, 2006). The adolescents in this study were taking atypical antipsychotics rather than neuroleptics. These important distinctions may underlie the lack of overlap between many of the items that loaded into a “negative” factor for adults and adolescents and suggest that DAI items may need to be altered to reflect the side effect profiles of medications that are typically prescribed to adolescents today.

Additionally, some of the items loading onto the “negative” factor for adolescents reflected the perception of being “controlled by others” through medication. For adults, the “negative” factor and “external locus of control” represented two distinct dimensions, suggesting that negative effects of medication reflected a different construct than being controlled by external forces in the adults’ view. Adolescents exist within a different developmental context in that they are under the control of their parents and other authority figures; simultaneously, they are engaging in a process of normative differentiation from adult caregivers, seeking independence and autonomy. The composition of the “negative” factor for youth indicates that being controlled by others represents a disadvantage of medication and is conceptualized as a problematic aspect of taking medication. This developmental struggle may not have been relevant for the adults in the original DAI study, who were past the age at which emancipation from

parents typically occurs. The DAI may be improved for use with adolescents by creating or re-wording items to reflect independence/autonomy constructs that are relevant to their developmental stage.

The third grouping of items to emerge from the EFA analyses consisted of two items reflecting inability to concentrate and relax on medications. Item 28R, reflecting the inability to relax on medications, was a marker item with a factor loading of $-.817$ (Pett, Lackey, & Sullivan, 2003). This factor does not meet the retention criteria of containing four or more items, and only item 28R differentiated substantially from other factors. The qualitative data suggest that while negative emotional reactions to medication, such as agitation, did occur in youth, many of the negative reactions to medication were experienced as physical rather than emotional. Additionally, most youth who discussed cognitive impacts of medication reflected the experience that medications improved their concentration. Again, this finding may reflect differences between the types of medications taken by the adults in the original study and the youth in this study. Akathisia is a side effect with substantial emotional and physical correlates, and is typically experienced as agitation or the inability to stop moving and is usually associated with typical neuroleptics (Gao, Kemp, Ganocy, Gajwani, Xia, & Calabrese, 2008). The content of these two items may reflect the clinical experience of the authors in dealing with akathisia in their adult patients with schizophrenia; akathisia is experienced much less commonly with the types of medication taken by the adolescents in the study.

The fourth grouping of items was comprised of four items with similar loadings and which differentiated well from other factors. This grouping of items reflected the concept of “relapse prevention” in the adult literature and referenced whether medication

is needed in order to stay well, prevent breakdown, or maintain symptom improvement. The concept of relapse prevention was interpreted very differently by youth than by the creators of the DAI. The idea behind the question on the DAI was to examine whether adults viewed medication as helpful in alleviating symptoms of an illness (schizophrenia) that was known to be long-term and which had been experienced by the research participants for the majority of their adult lives. The qualitative data, however, show that many adolescents conceptualized relapse prevention much differently than how the term is used in the adult clinical literature. In contrast to that interpretation of relapse prevention, many youth in this study, coincident with their conceptualization of their illnesses as transient, did not think of relapse prevention as it is traditionally understood by practitioners. Instead, they talked about specific markers based on time, symptom remission, or events which signified when they would discontinue medication. Few teens indicated that they plan to take medication for the rest of their lives, although some did so. Whereas adults in the original study were in their forties and fifties and had suffered from chronic, lifelong schizophrenia, youth in this study had a variety of diagnoses with different symptom presentations, and had not experienced mental illness for the same length of time. This may underlie differences in how adults conceptualize their mental illnesses and the role of medication in prevention breakthrough symptoms. These findings suggest that DAI items referencing “relapse prevention” should be altered to reflect content more relevant to youth’s view of their mental health symptoms as temporary.

The fifth group of items to emerge reflected content about being more aware and feeling more relaxed on medications. The third item in this grouping reflected the notion

that it is up to the doctor (rather than oneself) when medications should be discontinued. This item did not correspond conceptually to the other two items. This factor contained only three items, although they did differentiate relatively well from the other factors. The qualitative data reflected content specific to each item, although they did not link together conceptually in the qualitative responses. Youth who endorsed positive aspects of medication talked about feeling calmer and having greater awareness of what is occurring around them on medications. These concepts reflected positive emotional and cognitive responses to medications. The item regarding physician decision-making about duration of treatment was not reflected as such in the qualitative data; some of the qualitative responses indicated that adolescents perceive the doctor as one collaborator in a multi-faceted approach to treatment but that they also viewed themselves as having important knowledge about their symptoms and desired to have input into treatment decisions. This suggests that the DAI items referencing physician knowledge/control may be changed to differentiate better between youth feelings toward medication and their feelings about their treatment relationship with the doctor.

The sixth grouping of items to emerge retained three items, all of which referenced side effects (“feeling like a zombie” or “feeling tired and sluggish”) or general difficulty getting things done on medications. Although this factor was the second to last to emerge from the EFA and retained only three items, it differentiated well the other factors and was strongly supported by findings in the qualitative data. Youth often referenced sedation and feeling like a “zombie” in their responses; it is of particular interest that youth actually used the word “zombie” in their responses during the semi-structured interviews. Although this factor emerged late in the EFA, it does reflect

content which is perceived to be significant by adolescents because these side effects affect their capacity to carry out daily activities, such as waking up for school and staying awake during class. Based on the qualitative data, this group of items warrants further exploration; it is likely that the complex factor structure of this instrument may have impacted the emergence of this group of items and that its late emergence in the EFA is an artifact of this complexity.

The last factor to emerge was comprised of two items reflecting concepts of harm from medication and getting along better with others. This factor did not differentiate well from other factors. It also varied in its conceptual content, subsuming notions of harm/toxicity as well as interpersonal relationships. Again, harm/toxicity was reflected in some youth qualitative responses regard side effects, especially in their discussions regarding long-term consequences of taking medication (“messed up brain cells”, “seizures”, “strokes”). The impact of medications on interpersonal relationships was also reflected in the adolescent qualitative data; however, the impact of medication on interpersonal relationships was viewed as a positive benefit of treatment. Conceptually, this grouping of items does not appear to reflect one particular construct and further exploration/modification of these items to reflect adolescent experience is warranted.

Four items did not load onto any factor. Item 10R reflected not feeling different on or off medications; item 11R referenced the continual presence of unpleasant side effects; item 20R reflected the notion that medications are unnatural; item 30 talked about the role of medication in preventing “getting sick”.

Item 10R may not have loaded because the majority of adolescents reported that they did notice the effect of taking medications, whether these effects were positive or

negative. Sometimes adolescents reported presence of side effects but lack of symptom remission; nevertheless, they reported an impact of the medication. Item 11R referenced continual side effects; in the adolescent responses, they often discussed side effects as transient, for example, feeling sedated in the morning but improving at midday. Very few side effects were continually present per the youth responses. Item 20R referenced medications as being “unnatural”. It is possible that youth did not attach strong connotations to words such as “unnatural” or “natural”. In their qualitative responses, youth talked about not wanting their feelings to be artificial as a result of taking medication; however, the qualitative data didn’t reference differences between pharmaceutical treatment and more “natural” interventions, such as homeopathic treatments. Item 30 used the term “sick”; this is an interesting word choice which may have impacted adolescent responses. The adults in the original DAI study were ill in an era where chronic schizophrenia was deemed a sickness (see Parsons’ “sick role” writings). For these adults, “getting sick” meant symptom relapse and risk of hospitalization. Some adolescents in the current study may not have conceptualized their mental health problems as a sickness; support for this hypothesis can be found in their discussions about health and illness models in relation to mental health symptoms. Many youth conceptualized themselves as having a “behavior or attitude problem” for which medications are taken. Adolescents completing the DAI may have viewed the word “sick” as referencing physical illness, thereby not linking it with their mental health symptoms. The qualitative data provides insights into why each of these items may not have loaded onto any factor. For items 10, 11, and 30, alterations in wording to reflect adolescent experiences with medication and side effects may make these items more

relevant to their experience and thus more salient in the overall factor structure of the DAI. For item 20, the reference could be altered to discuss the concept of natural vs unnatural in reference to emotional experience rather than the drug itself; this would reflect more fully adolescent concerns about the quality of their emotional experiences.

Non-DAI Related Concepts Endorsed by Youth and their Implications for Altering the DAI

There were eight themes identified from the teen responses that did not reflect concepts covered in the DAI. Many of these themes may be highly relevant to medication adherence and their incorporation into the DAI may improve its ability to measure attitudes toward medication.

Balanced Responsibility for Behavior

Teens endorsed a division of responsibility for symptom improvement, assigning some responsibility to medications and the rest to themselves. Some youth expressed the desire to defeat symptoms on their own, or having attempted to do so in the past before resorting to medication. Others reflected a sense of helplessness and emotional dependence on medication to control their behavior. The concept of balanced responsibility is important to recognize in teens because it may lead to discontinuation of medication as a result of the desire to exhibit personal control over symptoms. It may also lead to a sense of dependence on medications to the detriment of personal agency and self-confidence. Alternatively, it may lead to a continued relationship with medication in the context of personal efforts to remain stable. Items that reflect internal

and external control as existing on a continuum rather than as dichotomized opposites may improve measurement of youth attitudes toward medication on the DAI.

Ambivalence about Medication

The concept of ambivalence emerged from the qualitative data, in which youth noted several areas of tension between side effects and potential benefits of medication, being unsure about how medication fit into their self-definitions, and seeing positive effects yet also resenting the medication. Ambivalence is reflected to some degree by the quantitative DAI scores, with the sample average falling at 3.61 (.60), which is just slightly more positive than neutral. The concept of ambivalence may reflect either an undecided stance toward medication or the integration of competing positive and negative attitudes toward it (such as seeing social and behavioral benefits to medication yet tolerating its side effects). There are currently no items in the DAI which measure ambivalence as an independent construct; the existing DAI dichotomizes attitudinal statements into positive vs. negative and may not reflect the complexity of adolescent attitudes toward medication.

Change over Time

While only one youth reported that his attitude toward medication had changed over time, it seems likely that this attitudinal shift may occur for the majority of adolescents as a function of maturation. Youth who take medication throughout their teenage years may find themselves confronting issues about whether or not to continue their medications once they become adults and what this means for their developing identities. Of course, any measurement instrument is itself a static, cross-sectional

measure and must be administered over time to detect changes in attitudes longitudinally. However, items may be devised that will help to address the concept of attitude change.

Adherence if Effective

The indication that some teens adhere to their medications if they deem them to be effective represents another important site for instrument modification. This theme suggests the presence of very personal interpretations of whether medications meet a need as defined by the adolescent. This becomes especially important when one considers the youth and parent symptom reporting literature which shows that not all participants in the treatment process agree regarding the desired outcomes of treatment. Some youth reported in the interviews that they took medication because they obtained rewards from external sources; it remains unclear whether these rewards are improvements in interpersonal relationships or merely concrete gains awarded for medication adherence. The DAI may be improved with the addition of items directly assessing the cost/benefit analysis; indeed one item (“For me, the good things about medication outweigh the bad”) exists in the current DAI and was among the items in the first and most robust factor to emerge from the analyses.

Expectations

Many youth responses indicated that adolescents held expectations of their medications. They noted that medication did not have the power to alter their opinions against their will or change their emotional reactions to things about which they felt strongly. For example, one youth noted that medication could not take away the pain one feels when one sees a disadvantaged child who doesn’t have enough winter clothing to

protect her from the elements. Teens also reflected that medications could not bring them friends, although this is interesting in light of their intersubjective statements about improved relationships. The youth may have meant that medications would not win them more friends without efforts to get along with and seek out others. Youth seemed very realistic in their expectations of medications; they also reported that they adhered to medications if they perceived a benefit from doing so. Items may be added to the DAI which reflect the degree to which medications are currently meeting adolescents' expectations or the degree to which medications are treating symptoms that the adolescent wishes to be treated.

Inclusion in Medication Decisions

Adolescent responses discussed the importance of being informed about what the medication they take will do and having their opinions sought about dosage increases and decreases. Being included in decisions about medication may have a substantial impact on the expectations that youth develop about medication and how long they plan to stay on the medication. Some youth felt that the process of taking medication was made more difficult when conversations included only the psychiatrist and their parents. Youth wanted to have a say in decisions about medication and desired the chance to express how they felt their medications were impacting them. It is likely that those youth who feel uninvolved in these discussions may experience more trepidation about side effects and increased confusion about what to expect and how to prepare themselves. Lacking complete information about the treatment process, they may form their own conclusions or seek information from other sources rather than parents or doctors (Timlin-Scalera, Ponterotto, Blumberg, & Jackson, 2003). Incomplete information may lead to fears that

interfere with treatment, as reflected in the response of one adolescent who feared that he would have a stroke if he discontinued his medication. These myths and fallacies based partly in truth and partly in speculation could be straightened out readily by including teens in medication discussions, answering their questions, and providing them with realistic expectations of treatment. This is consistent with studies showing that youth value trusting relationships with their mental health providers and prefer to be included in treatment decisions (Buston, 2002). The utility of the DAI may be substantially improved if item content reflects the degree to which youth are included in treatment decisions.

Treatment Duration

The majority of youth responses regarding how long they plan to take their medication indicated a stopping point, whether that be defined in terms of years, symptom remission, or an event, such as graduating from high school. A few teens stated that they would probably have to take medication for the rest of their lives, but these expectations regarding treatment were not found in the majority of the qualitative responses. These references to stopping medication are consistent with the findings of Conrad (1994), who interviewed people taking medications for epilepsy. Conrad found that many individuals with seizure disorders periodically stopped their medication in order to “test” whether they still had an illness that they considered to be stigmatizing (p.156). Similar results have been found in adults undergoing treatment for depression (Bollini, Tibaldi, Testa, & Munizza, 2004). DAI measurement capacity could be improved potentially with the addition of items asking about whether youth plan to continue their medications.

Unpleasant Aspects of Taking Medication

Some teens noted that the act of taking the medication was unpleasant for them, noting that medication can taste and smell bad or be difficult to swallow. Additionally, youth noted that dosing regimens requiring that medication be taken at school increase their feelings of stigmatization and being singled out as different from peers. These aspects of medication are highly relevant to teens' likelihood of adhering to treatment and are being addressed with extended release formulations of medication (Rynn, Riddle, Yeung, & Kunz, 2007; Anderson & Keating, 2007), and transdermal skin patches (Mays & Findling, 2005). The DAI could be amended to reflect these concrete aspects of taking medications and whether these serve as barriers to adherence.

Autonomy

The adolescent autonomy literature characterizes the striving for independence as the ability to take greater responsibility for one's actions and moving from dependence on parents and family to a state of mutual interdependence with significant others (Sutton, 1997). Autonomy is described as a highly individualized process that has holistic impact on the individual as well as families and society (see review by Spear & Kulbok, 2004). In this review, Spear and Kulbok (2004) summarized the ways in which the concept of autonomy has been used in theoretical and empirical work with adolescents. They describe autonomy as a process in which youth become cognitively, behaviorally, and socially more independent of governance by parents and note that socio-contextual factors (family cohesion, environmental resources and opportunities) impact the degree of autonomy which youth can achieve. They also note that

achievement of autonomy is developmental, characterized by both progress and regression.

In the physical health literature, autonomy refers to concepts such as independent self-care, personal knowledge about physical illness, and the ability to utilize treatment to improve physical symptoms (Wysocki, Taylor, Hough, Linscheid, Yeates, & Naglieri, 1996; La Greca, Follansbee, & Skyler, 1990). The disability literature also focuses on autonomy in relation to adolescents' ability to take over self-care for illnesses.

Crittenden (1990) presents an adolescent self-care model which proposes that youth who develop an internal locus of control, adopt a variety of flexible coping strategies for environmental challenges, and sustain a supportive social network are more likely to become autonomous despite their illnesses than those who do not achieve these developmental tasks.

The adolescents in this study referred to autonomy differently than the concept appears in the health literature. There were several levels of autonomy references in their responses: independence from being monitored by physicians and parents, assumption of responsibility for taking medications, and maintaining personal control over feelings and thoughts. Of particular clinical interest, the majority of adolescent references to autonomy and control in this study concerned personal control over their own feelings and thoughts rather than governance of behavioral aspects of taking medication. Many adolescents expressed the desire to know that their feelings were their own rather than artificially created by medications. This differs from how autonomy is used in the physical illness literature because physical illnesses and their treatments are not perceived

as rendering youth thoughts and feelings as artificial and unnatural. Youth in this study perceived psychiatric medications as making their feelings “not their own”.

The item content reflected in the existing DAI distinguishes between self control and physician control and knowledge. It does not address aspects of shared responsibility between adolescents and parents or other authority figures. Item content may become more relevant to adolescents if it is altered to reflect these nuances of emerging independence from caregivers.

Stigma

Adolescents spoke about their fear of stigma in several different ways. Each of these coping styles impacts the taking of medication and likely influences how teens feel about their medications and identities. Some teens spoke of medication as interfering with their ability to be accepted socially by their peers. Peers expressed their negative attitudes toward the adolescents’ illnesses and/or medications by teasing, bullying, or excluding them from social interactions. Some teens spoke of their desire to be viewed as “normal”, representing medication as a barrier that rendered them “different” from other people. Teens expressed concern about being viewed as “bad” or “crazy”, even stating that “taking medication means I’m a bad person”. Others feared that being in special behavioral classes or taking medication discredited their intelligence, stating that other people often could not separate emotional problems from intellectual capability. The fears expressed by the teens in this study are supported by empirical literature; in a study measuring pre-adolescents’ attitudes toward peers with ADHD, over half of the youth described a hypothetical peer with ADHD as “crazy” and “stupid”. Scott, Lore and

Owen (1992) noted that in their study, at least half of the youths studied stated that they did not need medications and the same proportion revealed that they had not told their friends about their psychiatric diagnoses for fear of being labeled “weird” or “psycho”. It is likely, then, that the negative attitudes held by some peers regarding mental illness or medication get communicated to youth who have diagnoses and take medication, creating an environment which is inhospitable to medication adherence. This fear of being stigmatized even affects teens’ decisions to seek treatment at all (Timlin-Scalera, Ponterotto, Blumberg, & Jackson, 2003).

Concerns about stigma prompted teens to adopt secretive medication management strategies, sometimes obscuring the purpose of the medication (“I tell them it’s an allergy pill”) or skipping the medications altogether. The relationship between stigma and teens’ medication management is an important one to consider given the power of the desire for normalcy to drive medication-taking behavior. This relationship is not addressed in the DAI and is an important area for intervention and education when providers talk to adolescents about their medications. It is also relevant to initial decisions to seek treatment. Stigma was a significant predictor of willingness to seek mental health services among eighth-graders in a study about attitudes toward mental health (Chandra & Minkovitz, 2006).

Not all teens felt stigmatized by their illnesses or medications. Some youth acknowledged that they knew of several peers who also took psychiatric medications. Others commented that their friends supported their use of medications. These teens did not report the need to hide or skip their medications because there was no threat to their self-esteem or identity.

Other teens used educational strategies to talk to their peers about medications. One student gave a presentation on bipolar disorder to her health class. Others explain about their medications to peers or simply acknowledge why they take them. Interestingly, these students may have developed a strategy that ultimately decreases stigma. School-based interventions promoting education about mental illness have been shown to decrease stigmatizing attitudes among adolescent students (Essler, Arthur, & Stickley, 2006). The existing DAI contains no content relating to stigma experiences; measurement of the degree to which stigma or fears of stigma affect attitudes toward medication may be a highly relevant construct to measure in adolescents.

Intention

Some of the qualitative data gathered from youth provided support for the third tenet of reasoned action theory, which states that one of the predictors of health behavior is a person's expressed intention to perform that behavior (Ajzen & Fishbein, 1980). In this study, results showed that youth had clear opinions regarding how long they planned to take their medications, implying that the concept of intention is relevant to medication adherence. Youth expressed a range of intentions about their medications, with some stating that they would take medication for life and others stating that they wished to discontinue their medications "now". The existing DAI items ask whether individuals believe they need to stay on medications to remain out of the hospital or to prevent breakdowns. These questions do not assess whether individuals intend to continue taking their medication. Association of medications with preventing hospitalization or breakdown is a different construct from intending to take it. DAI items could be

improved by adding items which measure specific intent to take medications rather than respondents' associations of medication with hospitalization or breakdown.

Utility of the Teen DAI for Clinical Practice

The results presented in chapter four indicate that the teen DAI significantly predicts youth adherence to psychotropic medications, although the association was low. In this respect, it provides a somewhat useful measure of whether or not teens are likely to take their medications – the higher the DAI score, the more likely it is that a teen will take his or her medication; conversely, the lower the DAI score, the less likely it is that a teen will be medication-adherent. It is important to note that the teen DAI was the only significant correlate of youth self-reported adherence. No other clinical or demographic variables such as age, gender, ethnicity, diagnosis, medication type, or parent DAI scores were significantly related to youth adherence ratings. As shown in chapter four, responses to the teen DAI remain relatively stable across the three-month time period used to assess test-retest reliability.

However, this single-score measure does not provide information about why teens choose to adhere to their medications or not, rendering it difficult to know how to intervene for teens who exhibit negative attitudes about medications. Although the teen DAI does provide some information related to youth adherence, it does not tell the entire story about the complex processes youth employ to make decisions about their psychiatric medications.

The “fair fit” of the adult DAI model to the adolescent data as well as the complexity of the adolescent DAI factor structure in the EFA results suggests that the

measurement utility of the existing DAI may be improved by modifications that reflect adolescent medication experience to a greater degree. The qualitative data provide support for altering the wording of many DAI items to represent more fully the distinct differences in adolescent and adult experiences of psychiatric illness and medication treatment. The presence of eight additional dimensions in the youth responses beyond those captured by the original DAI factor analysis also supports modification of the instrument or use with adolescents. Specific constructs that emerged from the qualitative data which were not assessed by the existing DAI items included perception of stigma, desire for autonomy, perceived duration of treatment, degree of inclusion in medication decisions, balanced control over behavior, ambivalence toward medications, adherence if benefit is perceived, and expectations of medications. The DAI instrument may demonstrate increased utility and a stronger association with adherence if a broader range of constructs relevant to adolescents are incorporated.

Reasoned Action Theory

Reasoned action theory provided the backdrop for framing the research questions that formed the basis of this study. RAT posits that attitudes are important determinants of whether an individual will engage in a health-related behavior such as taking medication. The theory has been used extensively in the physical health domain, but has not been applied to adolescents who are prescribed medications to treat mental illness. RAT also suggests that, in addition to individual attitudes toward behavior, their perception of the subjective norms held by significant others with regard to that behavior are important indicators of whether they will perform the behavior. These two tenets of

RAT framed the study by demonstrating the need for measures of youth attitudes toward medication as well as the need to characterize the subjective norms about medication to which youth are exposed in the family context.

Study results demonstrated that further work needs to be done to refine the DAI as a measure of youth attitudes toward medication. Results demonstrated a small yet significant association between youth attitudes toward medication and their self-reported adherence.

The data gathered in this research also demonstrate potential limitations of RAT theory. One of the key underlying assumptions of RAT is that the individual in the treatment process has some degree of independence in decision-making and that they can choose whether or not to engage in a health-related behavior. In this respect, RAT may be more applicable to adult populations or groups of people who have more autonomy than adolescents. Some of the adolescents in this study noted that they wished to discontinue medication or that they disagreed with the need to take medication. Some indicated that if they had the power to choose, they would not take their medication. They acknowledged being mandated to do so by their parents or, more rarely, by judicial forces. A strong theme among adolescents was the desire for inclusion in treatment decisions rather than having decisions made for them. Parentally “mandated” medication treatment may have clouded the study results because youth were not allowed to act on their desire to stop taking medication. These youth may have expressed negative attitudes toward medication while simultaneously being adherent because they had no other choice. In this respect, RAT may be contextual; one of the foundations for the relationship between attitudes and health-related behavior may be the ability to say “no”.

A second critique of RAT theory is that while it suggests that individuals make rational, cost-benefit decisions about health-related behaviors, it does not account for the subjective experiences attached to performing the behaviors. For example, some youth in this study talked about their difficulties coping with losing their identity or feeling like their personalities were no longer their own on medication. While it could be argued that this “cost” might be categorized appropriately under RAT’s proposition about attitudes, there may be aspects of subjective experience that are not easily defined as an advantage or disadvantage. Future efforts are needed to ensure that attitude measures capture the subjective experience of medication sufficiently for adolescents.

Lastly, although parsimonious, RAT does not specify the boundaries to be drawn around “subjective norms” and the relative influence of proximal (i.e. family and friends) and distal (i.e., culture) sources of information on the performance of health-related behavior. For example, are youth and parent attitudes influenced by direct-to-consumer pharmaceutical marketing? There may be some evidence that this influence exists, given anecdotal reports that parents and even youth at times self-diagnose and request particular medications from their doctors (National Public Radio, January 8, 2008). To what degree does culture persuade or dissuade an individual to take medication? How does culture interact with the subjective norms created by parents and friends to influence adolescents’ decisions about medication? Which culture, proximal or distal, carries more weight in these decisions? These questions may be important to include in future modifications of the DAI for optimal applicability to adolescents.

Just as this study raised questions about the applicability of RAT, it also provided support for the theory. Several themes appeared in the youth responses which

underscored the impact of subjective norms on attitudes toward medication and emphasized the degree to which individuals actually seek to discover what subjective norms exist around medication. The responses reflecting concern about stigma provide the most compelling evidence that adolescents care what significant others in their daily lives think about medication and mental illness. Youth described several ways in which they experience stigma and talked about their efforts to disguise their medication to avoid social consequences. The concept of stigma was absent from the DAI and was clearly present in the youth responses, underscoring its importance in formation of attitudes about medication.

Recommendations for Future Research

Several recommendations can be made regarding the existing DAI and alterations to items which may improve its ability to measure adolescent attitudes toward medications. Many of the differences in responses between adults and adolescents may stem from the variety of diagnoses of the youth in this study, the type of medications they take and their side effect profiles, as well as their unique developmental context. The adults in the studies described in the literature review had diagnoses of schizophrenia or other psychotic spectrum disorder. The studies did not include adults diagnosed with affective or other mental illnesses. The youth in this study were diagnosed with a variety of mental health disorders; a substantial proportion of them suffered from affective illnesses such as bipolar disorder or major depression. These diagnostic differences may underlie differences in how illnesses and treatment are perceived; for example, psychotic spectrum illnesses tend to be continuous and lifelong, whereas affective illnesses are

episodic with inter-episode remission in many cases. Additionally, the medications of choice when the original DAI was created were typical neuroleptics with very unique side effect profiles. The gold standard treatment for many psychotic and affective illnesses today include atypical antipsychotic medications which are associated with a different profile of side effects; this may dramatically alter attitudes toward medication as measured by the existing DAI. Finally, adolescents are situated in a unique developmental context; they are not afforded the opportunity to refuse medications as easily as adults. Thus, they may be more similar to “mandated” patients than the adults in the original DAI studies. The inability to refuse medication may impact the expression of attitudes toward medication or at minimum, cloud the association between attitudes as expressed on the DAI and adherence measures given that adherence may be enforced by parents whether the youths agree or not. These contextual differences between the adults in the original DAI studies and the adolescents in this study may underlie the differences in factor structure which emerged.

The one robust factor for adolescents across all factor analytic methods which also held for adults was “positive subjective feelings toward medication”. It is clear that the items which tapped positive responses to medication reflected similar constructs across adults and adolescents despite the differences in diagnosis, medications, and treatment context. These items are clearly relevant to adolescents’ experience of medication and should be retained.

The following are suggestions for alteration of the DAI to reflect more fully adolescents’ experience of their illness, medication treatment, and the social and developmental context in which they are situated.

Items that were postulated to load onto the “Negative Subjective Feelings toward Medication” may be altered to reflect the diagnostic and medication experience of youth. Specifically, the qualitative responses of the youth reflected concerns about sedation, weight gain, and stomach upset. There are no items on the existing DAI which assess this content. Additionally, none of the current DAI items tap frustrations with the discomfort of taking daily medications, such as having difficulty swallowing pills and tolerating the “nasty” taste of medication.

Items that were postulated to load onto “Internal” and “External” loci of control may be altered to reflect a non-dichotomized view of these constructs. The qualitative responses of the adolescents in this study reflected acknowledgement of a balance between internal and external sources of control over behavior and a balance between personal agency and medication in controlling their mental health symptoms and behavior. Currently, there are no DAI items which acknowledge this complexity; indeed, adolescents may be forced to divide their responses between external and internal loci of control on the current DAI, resulting in a more confusing factor structure which is difficult to interpret.

Items that tapped into the concept of “relapse prevention” for adults clearly must be modified to provide a better measure of intent to take medication for adolescents. A strong finding in the qualitative data was that youth do not tend to conceptualize their illnesses as lifelong. In fact, they frequently referenced time, event, or symptom markers as gauges for discontinuing their medication. This differs markedly from the experience of the adults who completed the original DAI, all of whom were diagnosed with chronic schizophrenia which is not characterized by significant periods of remission without

medication. Items which directly ask about youth intention to continue/discontinue medication may be fruitful for measuring attitudes toward treatment. Additionally, elimination of the word “sick” from the items and replacing it with words such as “symptoms” or “behavior” may be helpful for increasing the measurement utility of the DAI.

Adolescent expectations of medication were relevant to their personal judgments about taking their medication in their qualitative responses. There are no items in the DAI that measure whether or not medications are meeting youth expectations regarding outcomes that are important to them. General content may be added to the instrument to reflect whether current medication regimens are meeting adolescent needs and expectations.

Lastly, a significant area in which the DAI is lacking with regard to adolescent experience of psychotropic treatment lies in the area of stigma and social responses to their illness and medications. Stigma was a significant topic for youth in this study as reflected in their qualitative responses. There are no items on the existing DAI which measure stigma. The degree to which youth experience stigma vs. support may have dramatic impacts on their attitudes toward their medications.

A final recommendation for improving the DAI is to consider using cognitive interviewing techniques in order to improve understanding of how each item is interpreted by adolescents as they complete the measure. Cognitive interviewing involves asking respondents for qualitative descriptions of their thought processes as they are completing a quantitative instrument so that problematic items may be altered to reflect the constructs of interest more accurately (see Beatty & Willis (2007) for a review

of cognitive interviewing techniques). Cognitive interviewing techniques could be employed with the existing DAI as a useful next step toward making alterations to existing items and in testing new item content to improve the comprehensiveness of this measure.

Once changes are made to the DAI, consideration may be given to whether the DAI has different utility depending on diagnostic characteristics (affective vs psychotic illness, for example) or medications (i.e., atypical antipsychotics vs antidepressants). It would be useful to determine whether one instrument can provide adequate measurement of attitudes toward medication in a diverse psychiatric population or whether different instruments would be more useful for distinct subgroups of mental disorders or medications.

Study Limitations-Quantitative

The final section of this discussion provides an evaluation of the strengths and limitations of the study and how these impact the conclusions that may be drawn from the data. Both quantitative and qualitative standards are highlighted as well as an integrated discussion of how mixed methods research strategies contributed to the quality of the final results.

Internal Validity

There are several limitations pertaining to validity that stem from the methods used to collect data for this study. Among these are: ambiguous temporal precedence, instrumentation, and reactivity (Shadish, Cook, & Campbell, 2002, p. 55 and 73).

Ambiguous temporal precedence. One of the major assumptions underlying the use of reasoned action theory in this study is that adolescents' attitudes toward psychotropic medications cause adherence or non-adherence. Due to limitations of time and funding, it was not possible to conduct a prospective study which would allow attitudes and adherence to be followed over time. This study measured attitudes and adherence simultaneously, raising the issue of ambiguous temporal precedence (Shadish, Cook, & Campbell, 2002, p. 55). Given that the quantitative portion of the study was correlational in nature, it is impossible to determine whether youth attitudes toward medication caused adherence or whether adherence to medication caused particular attitudes to occur. Conclusions drawn from the study must acknowledge this inability to establish causal direction unequivocally.

Instrumentation. The concept of instrumentation suggests that individuals' responses to study questions may differ based on the measures used to gather them. In this respect, the methods used in this study promote validity in that both survey and qualitative data were triangulated to provide a more complete picture of adolescent attitudes toward medication. The data from the survey instrument, which reflected comprehensive use of all response options by respondents was corroborated by the qualitative data, which indicated a range of positive, negative, and ambivalent attitudes toward medication. This lends to the credibility of the conclusions drawn from both types of measures.

Reactivity. The third threat to validity in the quantitative part of the study is reactivity, or the tendency of respondents to provide answers consistent with what they believe is expected of them in the setting in which they are interviewed. For example, youth in this study presented themselves as highly adherent to medication. This may be because this

group of respondents actually is highly adherent, or because they were interviewed in a department of psychiatry setting, in which adherence to medication is highly valued and encouraged. Again, the dual quantitative and qualitative nature of data collection promotes validity in that while youth rated themselves as highly adherent to medication, their responses also reflected times when they did not adhere, lending credibility to the veracity of their current self-ratings as highly adherent.

External Validity

The ability of this study to generalize to other populations of people is limited by the characteristics of the respondents. Inclusion criteria for the study required that youth were between the ages of 12-17, have an Axis I mental health diagnosis, have taken medication at least once in the past 30 days, and live with a primary caregiver who took responsibility for medication administration and doctor's appointments. The sample consisted of mostly middle-class families all of whom had some form of health insurance. As such, results of the study may not apply to younger children, children who live in foster care or group homes, or children of parents who are uninsured. Most of the interviews were conducted in a psychiatry clinic where adolescents received their treatment. Results may differ for youth who are interviewed in a different context. Given that youth with a variety of Axis I diagnoses were represented in the study, results may differ if the DAI is used with youth with homogenous diagnoses. Of particular importance, adolescents who had refused psychotropic medication for longer than 30 days were excluded from the study. This represents an important population of youth to study, in that the views of youth who have rejected medication entirely may differ from those who actively take medication or who opt for homeopathic remedies.

Study Limitations-Qualitative

The criteria for “validity” and “reliability” in qualitative research differ significantly from those used to evaluate quantitative studies. A variety of strategies for deciding whether qualitative results are rigorous have been debated in the methodological literature (Lincoln & Guba, 1985; Hammersley, 1990; Creswell, 1998; Denzin & Lincoln, 2000). Four standards were chosen for this study: Lincoln & Guba’s criteria of credibility, transferability, dependability, and confirmability. Each of these will be discussed in turn, as well as strategies employed to enhance the rigor of the qualitative component of the study (Creswell, 1998, p. 202-203).

Credibility

Credibility refers to the degree of confidence a consumer of research has in the veracity of the study results. In other words, does the study truthfully represent the concepts it set out to measure? Rigor in this study was enhanced by using triangulation techniques (using multiple means to investigate the concept of attitudes toward medication). Although triangulation does not require using both qualitative and quantitative methods to assess credibility, the use of both methods adds to the credibility of this study in that it highlighted differences in attitudes toward medication based on method of data collection. For example, attitudes toward medication were slightly above neutral on the quantitative measure, yet encompassed a range of valences in the qualitative data. While these disparate results indicate a discrepancy based on measurement method and do not necessarily indicate credibility or lack thereof (Tashakkori & Teddlie, 2003), they provide a rich, comprehensive picture of the

construct of attitudes toward medication, which is the main criteria meant to be satisfied with respect to credibility.

Transferability

This concept refers to the degree to which study findings apply to other contexts. In this respect, study findings were carefully presented to reflect the wide array of characteristics about respondents and their circumstances that emerged from the qualitative data. Effort was made to provide detailed analyses of responses in their entirety and to present disparate views or anomalous experiences alongside themes that were commonly reflected across respondents. In this way, the full range of respondent experiences and viewpoints were presented, even aspects of experience that may have been raised by only one interviewee. Priority was given to fully describing all experiences rather than giving more weight to commonly held views.

Of particular importance to an evaluation of the mixed methods results is the finding of a significant difference in the number of psychiatric medications taken between the group selected for the qualitative interviews and those adolescents whose interviews were not chosen. Although random selection was used to choose which interviews were included in the qualitative analysis, the youth whose interviews were chosen took an average of .79 fewer medications than the youth who were not included in the qualitative analysis. Although this difference was statistically significant, it is not necessarily clinically meaningful. However, this difference must be borne in mind when deciding whether the qualitative findings would be different based on these differences in number of medications.

Dependability

This term refers to the degree to which the study findings are consistent and could be repeated in other analyses. In the qualitative portion of this study, there was no mechanism for conducting external audits of the data (asking an outside researcher with no connection to the study to evaluate results); however, a team of researchers familiar with the study but not involved in the data analysis or writing reviewed preliminary study results and provided feedback regarding the findings. Alternative interpretations or methods of analysis were suggested during the data analytic phase (positive/negative/ambivalent profiling and variable coding) which adds to the dependability of the coding and conclusions drawn.

Confirmability

This concept refers to the degree to which the investigator held a neutral stance toward data analysis and findings, acknowledging potential sources of bias shaped by his or her own personal experiences and theoretical leanings. Reflexivity (open acknowledgment of bias), negative case analysis, and peer debriefing were used to enhance the confirmability of this study. The investigator's early training in the pharmacological treatment of childhood mental health disorders predisposed her to believe that medication is helpful to alleviate psychological suffering in children and adolescents. The investigator had had less exposure to experiences of stigma and other negative aspects surrounding the daily experience of taking medication. The investigator openly acknowledged this bias to colleagues (reflexivity) and sought feedback regarding interpretations of the data that may have been colored by her bias toward medication (peer debriefing). Additionally, negative case analysis was frequently employed in the

data analytic phase; specifically, cases in which respondents were overwhelmingly against medication or felt they experienced negative consequences from medication were presented in order to fully represent the range of attitudes toward medication.

Conclusion

This mixed-methods study set out to evaluate the factor structure of the Drug Attitude Inventory in adolescents and whether it comprehensively assesses aspects of medication treatment that are salient to youth. Results indicated that while the DAI does cover aspects of medication treatment that are salient to youth, it does not represent their experience fully. Qualitative results highlighted that the personal experience of stigma, the desire for inclusion in treatment decisions, and the types of side effects experienced are important to adolescents. Adolescents spoke about a wide range of medication experiences, and many commented that the questions asked in the study are not raised in typical treatment visits.

The study both provided support for and underscored the limitations of Reasoned Action Theory, raising questions like whether something as complex as an attitude toward medication can be measured using one research method. Most importantly, the study gave voice to topics important to adolescents who take medication and provides a foundation for further study of how youth deal with mental illness and its treatment in their everyday lives.

Appendices

Appendix 1.

Teen Subjective Experience of Medication Interview (Floersch, et al., in press)

Teen Subjective Experience of Medication Interview (TeenSEMI)

Introduction

We would like to talk with you about your life, the types of concerns you get help for, and your experience with the medication you are taking now. We're interested in understanding these things from your point of view, from your perspective.

Everything we talk about for our research is confidential, with the exception of situations in which you may be at risk of harm to yourself or someone else or someone is harming you. We will not discuss this interview with anyone except other members of the interviewing team, not even your doctor. We hope to learn more from you about your experiences with mental health medications. Please try to be as honest and open as you can.

Before we go on, do you have any questions?

Treatment History and Medication Experience

1. At present you see Dr. [name the doctor _____], would you describe in your own words what you see him\her for?
2. Were you concerned enough about what you just mentioned that you yourself wanted to seek help from Dr. [name doctor _____]? [if yes, skip to #]
3. [if no to #] who else was concerned that you seek help for the things you just mentioned?
4. How differently did others[(name the friends, teacher, parent, brothers...)] see your concerns?
5. Before getting help from Dr. [name doctor _____], were there any other times in your life where you or someone else got help for you?
6. How did you feel about going to the first appointment to seek help?
[_____ anchored to either question # or question #],

7. What went well in that first appointment?
8. What did not go well in that first appointment?
9. What was the first treatment help suggested?
10. Who made this suggestion?
11. What was the first treatment help you recall actually doing?
12. Have you ever been given a diagnosis or name for the concerns we have been talking about? [If no, skip to # , if yes, go to #]
13. [If yes to #], do you recall what it was called? [listen for a history of diagnoses...probing for their perception of the current diagnosis and past ones]
14. How did you feel about [name the diagnosis given] the first time your heard that it applied you? [if appropriate, probe for what it was like to change from one diagnosis to another]
15. Had you heard of this [name the diagnosis given] before? [If so, where; now skip to #]
16. Without a medical term or diagnosis for your concerns, what did you think it was?[skip to #]
17. What do you recall [psychiatrist\doctor, clinician, teacher, family member...] being told about the diagnosis of [name it if one give]?
18. Where did you turn to find out about your concerns [or name the diagnosis if one given]?
19. What do you think caused you to have these concerns [or name the diagnosis of one given]?
20. Who was the first person to suggest the use of medications to help with your concerns [or diagnosis]?
21. What went through your mind when medication was first suggested?
22. When did you first start taking medications?
23. Do you recall what that first medication was called? [if yes, probe by getting a list]
24. Do you recall the first time you talked with your parent(s) about the use of medication? [probe by asking what they talked about]

25. Do you recall conversations with others [e.g., family, doctors, teachers, friends] about your first use of medication? [probe about what they talked about]
26. What are you taking now? [probe]
27. What does your doctor call this medication? [probe for a list and note if drug name or drug category is used or if they have their own made up names]
28. What is the name on the medication bottle?
29. What does your mother\father call this medication?
30. What do you call this medication?
31. What are your thoughts about how things will change with your concerns\diagnosis as you grow older?

Perceptions of Medication

32. If a medication could do anything you wanted for the concerns you have mentioned [or say diagnosis if they refer to themselves having a diagnosis], what would you wish it could do for you?
33. What do you think medications actually do for your concerns? [or say diagnosis if they refer to themselves having a diagnosis]
34. You just said that [_____ drug name, or category, or their own made up name] was for your [_____ list the items suggested, like, mood, thought, memory, emotion, concentration, motivation, energy, sleep, etc.], can you give me an example(s) of how that works? [probe for as many examples as they give for what meds are for]
35. Of the things you listed that medications do for your concerns [or say diagnosis if they refer to themselves having a diagnosis], which is the most important to you?
36. What do you not want a medication to do for you?
37. What do you gain by taking your medication?
38. What do you give up by taking your medication?
39. If you tried to explain to a friend who does not take these [this] medication[s] what the experience is like, what would you tell them? [list each medication and go through each one]

40. What scares you about taking medication? [probe what makes something scary or not preferable]
41. What do you like about the medication?
42. What don't you like about the medication? [probe for a complete list that is related to side effects]
43. What does medication do in your body?
44. What are some things that medication can't do for you?
45. What do you think your current doctor wants the medication to do for you?
46. What does your mother want medication to do for you? Father?
47. What do your teachers want the medication to do for you?
48. Some people use cigarettes, alcohol, and marijuana when they have the kinds of concerns you have talked about, what is your experience? [if answer implies no use of substances, skip to #]
49. [If yes to #], can you give me examples of what [name of drug] does for you?
50. What do you think the differences might be between taking an illegal drug and your prescription mental health medication?
51. How long do you think you will need to take your current medication(s)?
52. How long do you think others [probe from a list they have mentioned] believe you should take medications?
53. Who knows best about your medication needs?
54. What role does medication play in your staying well?
55. Have you heard of anyone say that medication has side effects? [if yes, probe for their definition or what they think the term means]

Management, Monitoring, Reporting

56. Some people believe that we should not take medication and fix ourselves, what do you think about that?
57. Can you give examples of times when you decided not to take your medications?

58. It is common that people miss a dose, what do you do if you miss a dose?
59. Do others remind you not to miss a dose? [if yes, probe who and how]
60. Have you every felt pressure from other people to take your medication? [if yes, probe how was handled and who?]
61. Has anyone ever told you not to take medication? [probe who and ask for an example]
62. How would you answer somebody who told you not to take medication?
63. What choices do you feel you have in taking your medications?
64. While on medications, what things in your life do you think are improving?
65. What tells you that these things are improving?
66. While on medications, what things in your life do you think are not improving?
67. What tells you that these things are not improving?
68. How do you tell if you have had too much or too little medication?
69. How do you tell if the medication is just right?
70. How do you remember to take your medication?
71. What happens when you run low or out of medication?
72. At what times or situations (like for example, riding bicycles, driving cars, going out with friends, homework, playing sports) do you think that taking the medication gives you an advantage? [probe which times and situations and ask for examples]
73. At what times or situations (like for example, ride bicycles, drive cars, go out with friends, homework, play sports), do you think that taking the medication puts you at a disadvantage? [probe which times and situations and ask for examples]
74. You said that medication does [_____ from list of what meds for them, e.g., slows you down] for you, if you find yourself _____[give the opposite, e.g. speeding up], what do you do? Give me example.
75. People who have the concerns you have and take [_____ name the drug or category], aren't always home to take the medication, is that true for you? [if no, skip to #]

76. [If other locations, where?]
77. How is it when you take your medication at _____ [name the location]?
78. When you go on vacation or take a holiday, do you sometimes take a break from your medication? [probe for examples]
79. When you notice something about the medication that is not working or worries you, who do you tell? Give me an example.
80. What kinds of things have you told your doctor about what happens to you on medication? [probe for examples]
81. What is it like for you when someone [like a parent, teacher, etc.] suspects you are not taking your medication as your supposed to?
82. What influence do you have with the doctor about your medication?
83. What influence do you have with your parent(s) about your medication?
84. You listed that you are aware of side-effects [go over the list they gave you], how do you tell when you are having a side-effect? [probe for examples]

Parent and Youth Interaction

85. How did you and your parents get along before you started having the concerns we have been talking about [or name the diagnosis]? [probe for examples]
86. How do you and your parents get along when your concerns are at there worst?
87. How do you get along now? [probe for examples]
88. Are there things about being on medication that make it easier to get along with your parents? [probe for examples]
89. Are there things about being on medication that make it harder to get along with your parents? [probe for examples]
90. All teenagers at one time or another have disagreements with parents, what types of things do you disagree about? [probe for examples]
91. Medication can be one of those things that you might disagree with your parents, how is that for you? [Probe for examples]

92. Are there things that your parents understand well about your concerns [____ illness or diagnosis]?
93. Are there things that they don't understand very well about it?
94. What kinds of things do they do that help you with your concerns [____ illness or diagnosis]? [probe for examples]
95. What things do they do that you find less helpful? [probe for examples]
96. When you do something that your parents don't allow you to do and they find out about it, how is it handled? [probe for examples]
97. If there was something you wanted to improve about your relationship with your parents, what would it be? [probe for examples]
98. Do your parents sometimes make deals with you to get you to take your medication? [probe for examples]

Stigma

99. What do you tell people about your concerns [____ illness or diagnosis] that we have been talking about? [probe for: What do you say? To whom have you told?; What was their response? [probe for examples]
100. What do you tell people about your medication? [probe for: What do you say? To whom have you told?; What was their response?; if answer is none, "you keep quiet then, is that difficult for you?"]
101. Are there things you keep secret about your concerns? [____ illness or diagnosis] or Your medications? [skip # if answer is no to either]
102. So you are quiet about some concerns and medication [____], how do you keep it a secret?
103. How would people in your life who do not know about your concerns [or ____ illness or diagnosis] and of your medication use react if they found out about it?

Youth and School

104. Do you take your medication at school?
105. Do your teachers and school nurse know that you take medication?
106. What is your routine for taking medication at school?

107. Have you ever been told by a teacher that you should be on medication?
108. Have you ever been asked by a teacher if you have missed your medication?
109. What at school has been helpful with any issues related to your _____ concerns? [probe any accommodations made at school...]
110. What at school has not been helpful?
111. How does medication improve your life at school? [probe for grades, sports, relationships]
112. Are there things medication does not improve at school? [probe for grades, sports, relationships]
113. What do you think your teachers believe your medication is for? School Nurse?

Youth Peer Interaction

114. Do you know other people your age who take medication?
115. Have you told your friends that you take medication? [probe for examples and what they talk about]
116. What do you tell your friends the medication is for? [probe for examples]
117. How do your friends feel about your taking medication?
118. Has anyone your age ever teased you about your medication? [probe for examples]

Access to Mental Health Services

119. Who gets your prescription filled?
120. Where do you get your prescriptions filled?
121. Has it ever been difficult to get your medication prescription filled?
[probe transportation...time.....money...insurance....no prescripton...]
122. What happens when you run out of medication?
123. Medications cost money, has having the money to buy medications ever been an issue?
[probe, ask for example]

124. There are many types of help for your concerns [____ illness or diagnosis] so what kind(s) do you get right now? [probe how often clarify individual, family....]
125. What do you think these types of help do for you?
126. How do you remind yourself about appointments? Do others help to remind you?
127. Going to appointments for help and medication check ups can take time away from other activities like sports and hanging out with friends, how is that for you?
128. How do you get to appointments?
129. Is it sometimes hard to get transportation for appointments?
130. Other than transportation, what are other reasons you may have missed an appointment? [probe for examples]

Ethnicity, Gender, Religion

131. There are many diverse racial, ethnic, or cultural groups in the world, do you self-identify with any particular group? [probe to have them name one]
132. At school and at places you hang out, are your friends mostly from the same group(s) you identify with?
133. Do you think being a member of [name ethnicity group_____] is important to how you view the world? [probe for examples]
134. Do you think being a member of [name ethnicity group_____] makes the concerns you have [illness or diagnosis] special or different? [probe for examples]
135. Do you think being a member of [name ethnicity group_____] gives you a different view of your medications? [probe for examples]
136. Do you think being [male or female] is important to how you view the world? [probe for examples]
137. Do you think being [male or female] makes the concerns you have [____ illness or diagnosis] special or different? [probe for examples]
138. Do you think being [male or female] gives you a different view of your medications?
139. There are many diverse religions and spiritual practices in the world, do you self-identify with any particular group? [probe to have them name one]

140. At school and at places you hang out, are your friends mostly from the same religious group you identify with?
141. Do you think being a member of [name religion] is important to how you view the world? [probe for examples]
142. Do you think being a member of (name religion) makes the concerns you have [illness or diagnosis] special or different? [for example..]
143. Do you think being a member of [name religion] group gives you a different view of medications?
144. Has identifying with either your [ethnicity] _____, [gender] _____, [religion] _____, ever lead to negative experiences when seeking help and medication?

Wrap up

[Instructions: We want some feedback from you about what it was like to be interviewed. We would also like to get suggestions from you about how we could improve]

145. How was it to be asked all of these questions?
[probe negative and positive responses]
146. Is there anything we did not ask that you feel is important to tell us?
147. Are there any things about the interview you would do differently?

Appendix 2.
Bivariate Correlations between DAI Items

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1.00	.141	.254**	.227*	.279**	.128	-.014	.137	.008	.163	.160	.178	.349**	.175	.301**
2		1.00	.149	.337**	.289**	.373**	.179	.338**	.367**	.226*	.064	-.022	.169	.214*	.321**
3			1.00	.156	.220*	.146	.146	.151	.048	.108	.258**	.441**	.171	.319**	.012
4				1.00	.059	.188	.077	-.133	.169	.218*	-.069	-.060	.189	.077	.308**
5					1.00	.260**	.077	.262**	.139	.228*	.172	.174	.066	.284**	.144
6						1.00	.217*	.066	.334**	.171	.037	.206*	.183	.266**	.478**
7							1.00	.136	.200*	-.027	.055	.154	.125	.179	.205*
8								1.00	.297**	.129	.078	.084	-.163	.154	.062
9									1.00	.236*	.163	.134	.027	.083	.360**
10										1.00	.034	.056	.018	.142	.302**
11											1.00	.274**	-.067	.108	.033
12												1.00	.052	.053	-.057
13													1.00	.006	.072
14														1.00	.136
15															1.00

	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	-.020	.213*	.288**	.266**	.066	.266**	.502**	.324**	.154	.329**	.256**	-.014	.141	.280**	.074
2	.219*	.385**	.441**	.311**	.251**	.555**	.276**	.242*	.266**	.212*	.467**	.017	.234*	.551**	.171
3	.171	.172	.335**	.394**	.189	.217*	.236*	.263**	-.033	.317**	.364**	.103	.345**	.292**	.163
4	-.022	.193*	.324**	.167	.134	.472**	.339**	.437**	.315**	.261**	.406**	-.073	.242*	.382**	.335**
5	.178	.271**	.309**	.422**	.267**	.239*	.218*	.190	.241*	.316**	.283**	.296**	.316**	.317**	.140
6	.211*	.278**	.411**	.238*	.345**	.494**	.287**	.183	.362**	.237*	.397**	-.002	.166	.448**	.135
7	.089	.034	.253**	.132	.100	.201*	.110	.241*	.181	.001	.200*	-.084	.240*	.184	.169
8	.129	.146	.181	.201*	-.044	.148	.037	.090	-.042	-.045	.215*	.217*	.121	.190	-.019
9	.201*	.101	.303**	.121	.191	.399**	.378**	.370**	.349**	.071	.473**	-.013	.387**	.370**	.178
10	.211*	.185	.295**	.310**	.256**	.330**	.157	.156	.147	.183	.367**	.173	.287**	.420**	.194*
11	.102	.328**	.136	.231*	.209*	-.004	.274**	.062	.147	.191	.145	.200*	.138	-.002	.178
12	.188	.033	.035	.231*	.103	.054	.021	.101	.018	.316**	.183	.140	.283**	.069	.088
13	.039	.061	.131	.080	.047	.122	.366**	.051	.074	.035	.026	-.147	.051	.321**	-.101
14	.159	.345**	.425**	.523**	.341**	.165	.200*	.121	.090	.235*	.240*	.245*	.017	.288**	.191

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