Family problem solving interactions and 6-month symptomatic and functional outcomes in youth at ultra-high risk for psychosis and with recent onset psychotic symptoms: A longitudinal study

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ABSTRACT

This study prospectively examined the relationship between social problem solving behavior exhibited by youths at ultra-high risk for psychosis (UHR) and with recent onset psychotic symptoms and their parents during problem solving discussions, and youths' symptoms and social functioning six months later. Twenty-seven adolescents were administered the Structured Interview for Prodromal Syndromes and the Strauss–Carpenter Social Contact Scale at baseline and follow-up assessment. Primary caregivers participated with youth in a ten minute discussion that was videotaped, transcribed, and coded for how skillful participants were in defining problems, generating solutions, and reaching resolution, as well as how constructive and/or conflictual they were during the interaction. Controlling for social functioning at baseline, adolescents' skillful problem solving and constructive communication, and parents' constructive communication, were associated with youths' enhanced social functioning six months later. Controlling for symptom severity at baseline, we found that there was a positive association between adolescents' conflictual communications at baseline and an increase in positive symptoms six months later. Taken together, findings from this study provide support for further research into the possibility that specific family interventions, such as problem solving and communication skills training, may improve the functional prognosis of at-risk youth, especially in terms of their social functioning.

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1. Introduction

Impaired social functioning is a diagnostic feature of schizophrenia and is present early in the course of illness (Addington et al., 2008). Many children and adolescents who go on to develop schizophrenia later in life show deficits in social skills from an early age (Schiffman et al., 2004). In a multi-site longitudinal study, greater social impairment was one of five features that contributed uniquely to the prediction of psychosis in youths at ultra high risk (UHR) (Cannon et al., 2008). Relatively little is known, however, about the nature of social deficits evaluated prospectively among UHR youth.

Studies indicate that interpersonal negativity and associated ineffective problem solving are related to poor adolescent social adjustment (McCombs et al., 1988), while prosocial problem-solving strategies and prosocial behavior predict social acceptance among adolescent peers (Pakaslahti et al., 2002). The inability to effectively solve everyday problems creates a significant challenge to healthy adolescent and family development (Coyne and Downey, 1991). Given the importance of interpersonal negativity and ineffective problem solving for adolescent social adjustment, these may be important skills to

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examine in vulnerable adolescent populations, such as UHR youth. Social problem solving skills may be a protective factor in the vulnerability-stress-protective factors model of schizophrenia (Kopelowicz et al., 2006).

Studies have found that individuals with schizophrenia are deficient in their ability to generate solutions to problems, to evaluate the effectiveness of solutions, and to implement solutions when compared to demographically matched healthy controls (Bellack et al., 1994; Stalberg et al., 2008). In turn, problem solving abilities are associated with social skills (Penn et al., 1995; Silverstein et al., 1998), successful functioning in the community (Jaeger and Douglas, 1992) and work performance (Bellack et al., 1999). In one of the few prospective studies of problem solving behavior among disturbed but non-psychotic adolescents, youth who used positive or neutral voice tones during a five minute problem solving discussion with their parent tended to show adequate psychosocial adjustment as young adults, while those using exclusively negative voice tones tended to show sufficient adjustment difficulties in early adulthood to warrant diagnoses within the extended schizophrenia spectrum (Asarnow et al., 1982).

The main goal of the current study was to examine prospectively the relationship between social problem solving behavior exhibited by youths at UHR for psychosis and with recent onset psychotic symptoms, and youths' future symptoms and social functioning. The current study utilizes observations of parent–adolescent interactions rather than relying on self- or other-report, so that youths' current skills can be measured directly in a highly relevant social context. We predicted that youths' social problem solving skills and constructive approach to problem-solving discussions with parents would be positively associated with social functioning with peers and with symptom improvement. Conversely, we predicted that youths' conflictual approaches to problem solving discussions would be associated with poorer social functioning with peers and with symptom exacerbation.

The second goal of the current study was to examine the relationship between parent problem solving behavior and UHR and early onset youths' symptoms and social functioning. Contemporary theories (for reviews see Kavanagh, 1992), as well as research evidence from adoption (Tienari et al., 2004), expressed emotion (Butzlaff and Hooley, 1998), and treatment studies (Pitschel-Walz et al., 2001; Smith and Birchwood, 1987) indicate that family environment plays a key role in the evolution of symptoms of psychosis. Research utilizing the Camberwell Family Interview (CFI) with key relatives of adolescent UHR patients found that positive family characteristics, such as parent warmth and involvement, predict reductions in adolescent negative symptoms and enhanced social functioning three months later (O'Brien et al., 2006). Although informative, these results are limited to attitudes expressed by family members and do not address actual family interactions. Observational methods have been crucial to the development of innovative family therapies for many youth disorders, such as externalizing behavior problems, substance abuse, depression, and ADHD (Patterson, 1982; Liddle, 2004; Danforth et al., 1991). Evaluations of the relationship between parents' problem solving approaches and youths' social functioning and symptom progression could inform early intervention efforts with UHR youth and

their families. Despite the fact that problem solving skills training is included in many early interventions (McGlashan et al., 2007), to the best of our knowledge, this is the first study to examine the relationship between specific UHR/ recent onset youth and parent problem solving behaviors demonstrated during interactions and the progression of youths' symptoms and functional outcome over time. We expected that parents' skillful and constructive approaches to discussions would be positively associated with youths' social functioning and symptom improvement, while parents' conflictual approaches would be associated with poorer social functioning and symptom exacerbation in at-risk adolescents.

Finally, we predicted that parent problem solving skills and constructive communication would be positively associated with adolescent problem solving skills and constructive communication given the large literature on family members' reciprocal influences on each other (Hamilton et al., 1999; Patterson, 1982; Patterson and Fisher, 2002) and previous work on the relationship between warm family interaction style and adolescents' constructive problem solving behavior (Rueter and Conger, 1995). Similarly, we expected positive associations between parent and adolescent conflictual communications.

2. Method

2.1. Subjects

English speaking individuals, aged 12 to 35 years, were recruited to participate in the Staglin Music Festival Center for the Assessment and Prevention of Prodromal States (CAPPS), a clinical research center at the University of California, Los Angeles that identifies youth who are at high risk for developing psychosis, assesses them longitudinally, and offers psychiatric and psychosocial treatment. After anonymous phone screening, parents and patients signed informed consent/assent documents approved by the Institutional Review Board, and then completed the Structured Interview for Prodromal Syndromes (SIPS; McGlashan, 2001; Miller et al., 2002) to determine study eligibility. Exclusion criteria include a DSM-IV diagnosis of schizophrenia or schizoaffective disorder, mental retardation, current drug or alcohol dependence, and/or the presence of a neurological disorder. The sample reported in this paper consists of 33 adolescents and their primary caregivers who completed all baseline family assessments. Follow-up clinical and functional outcome data were available for 27 of these adolescents. Demographic and clinical information is presented in Table 1.

2.2. Instruments

2.2.1. Assessment of clinical symptoms and social functioning

Data on participants' symptoms were obtained by a trained M.A. or Ph.D. level clinical interviewer at baseline and follow-up assessment via the Structured Interview for Prodromal Syndromes (SIPS; McGlashan, 2001; Miller et al., 2003). Psychiatric diagnoses were obtained via the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I; First et al., 1996) for adolescents age 15 and older, while participants 14 years and younger were administered the Kiddie Schedule for Affective Disorders and Schizophrenia (K-SADS; Chambers et al., 1985). Detailed information

Table 1
Characterization of study participants

Variable	Participants (*n*=33)
Age	15.7 (12–24)
Gender ratio (M:F)	(20:13)
Primary caregiver ratio (mother:father)	(27:6)
Wechsler Abbreviated Scale of Intelligence	105 (67–135)
Primary SIPS-defined prodromal syndromes	
Attenuated positive symptoms	25 (75.8%)
Genetic risk and deterioration	1 (3%)
Brief intermittent psychotic symptoms	2 (6.1%)
Psychotic syndrome	5 (15.2%)
SOPS symptom scales — baseline	
Positive symptoms	12.33 (5–22)
Negative symptoms	13.45 (2–30)
GAF	40.91 (17–68)
Race	
Caucasian	19 (57.6%)
African-American	2 (6.1%)
Latino	7 (21.2%)
Asian	2 (6.1%)
Other	3 (9.1%)
Family demographics	
Primary caregiver working	27 (81.8%)
Number of parents in the home	
1 parent	13 (39.4%)
2 parents	20 (60.6%)
Primary caregiver education	
Junior high school and below	1 (3%)
High school	4 (12.2%)
Some college	9 (27.2%)
College degree	13 (32.5%)
Post college	11 (33.3%)

regarding inter-rater reliability and diagnostic consensus procedures is provided in Meyer et al. (2005).

All participants met criteria for one of four SIPS definitions of a prodromal state: attenuated positive symptom, brief intermittent psychotic symptom, genetic risk and deterioration, and recent-onset non-specific psychotic syndrome. The first three categories are described in detail in Miller et al. (2003). Our research group added one additional category, recent-onset non-specific psychotic syndrome, which includes subjects who were experiencing recent-onset (i.e. within past 3 months) psychotic symptoms that did not reach DSM-IV diagnostic criteria for a schizophrenia spectrum diagnosis.

Positive and negative symptoms were rated on the Scale of Prodromal Symptoms (SOPS). The positive scale includes unusual thought content, suspiciousness, perceptual disturbances/hallucinations, grandiosity, and disorganized communication; the negative scale includes anhedonia, avolition, flat affect, decreased role functioning, and decreased comprehension/abstraction. Each item within each scale is rated from zero (absent) to 6 (severe and psychotic), and items are summed to create total scores for that scale.

The Strauss–Carpenter Social Contact Scale (SCOS; Strauss and Capenter, 1972) provides a rating for social contacts with individuals outside of the family. This scale ranges from 0 (does not meet with friends at all under any conditions) to 4 (meets with friends on average at least once a week), with higher ratings indicating a higher level of social functioning.

Follow-up ratings for all clinical and functional outcome scales described above were conducted approximately six months after baseline (average = 177.45 days; range was from 60 to 270 days).

2.2.2. Family assessment

Each adolescent identified the adult in their family with whom they spend the greatest amount of time each week, and those primary caregivers were invited to participate in family baseline assessments. Typically all family assessments were administered on the same day, and in all cases the assessments were administered within one month of each other. Youths participated in two ten-minute interactions with their primary caregivers, and primary caregivers were administered the Camberwell Family Interview (CFI; Vaughn and Leff, 1976). The problem solving interaction is the main focus of this study and the additional family assessment measures (e.g., CFI and the second family interaction task) were utilized to evaluate the convergent validity of the problem solving interaction codes.

2.2.2.1. Problem solving interaction. Following a warm-up discussion of meaningful family experiences, parent and adolescent dyads were read the following instructions by a research assistant: "We would like you to discuss a problem that creates some conflict between the two of you. Is there a topic that you can agree on that causes some tension between the two of you that you would be willing to talk about in here?" The researcher waited until the dyad had agreed on a problem and then said: "Please discuss the issue and attempt to reach a resolution. You have ten minutes for this discussion." The research assistant started the video camera and left the room. This procedure is similar to other behavioral observation assessment strategies used in studies of families of patients with schizophrenia (e.g., Miklowitz et al., 1984; Bellack et al., 1996; Blanchard et al., 2004; Strachan et al., 1986) and has been found to differentiate between families with high and low expressed emotion (Miklowitz et al., 1984; Strachan et al., 1986).

The conversations were later transcribed and coded by graduate student and doctoral level coders. The coding system was based on the Family Problem Solving Code (FAMPROS; Forbes, Vuchinich and Kneedler, 2001), which focuses on the problem-solving process such as how well a problem is defined, and the quality of proposed solutions, as well as positive and negative behaviors from one person to another.

Three main codes were utilized in this study: problem solving, constructive communication, and conflictual communication. Operational definitions of the codes are provided in Table 2. The problem solving code consists of three Likert-scales that were rated by coders after viewing the entire discussion and then summed together. Individuals with high scores on the problem solving code demonstrated skills in defining the problem, generating solutions, and/or resolving the discussion. The constructive and conflictual communication codes focus on communication process, and each code consists of a tally of the number of times a speaker demonstrates constructive and/or conflictual speaking behavior during his or her speaking turns in the discussion. A maximum of one constructive and/or one conflictual code was assigned during each speaker floor switch or conversational turn, rather than rating every single utterance or sentence independently.

Table 2
Codes for problem solving discussion

PROBLEM SOLVING: The Problem Solving code is the sum of the Problem Definition, Proposed Solutions, and Resolution scales. Individuals with high scores on the problem solving scale demonstrate skills in defining the problem, generating solutions, and/or resolving the discussion.

   Problem Definition Scale
     1 = Person interfered with the other's efforts to define the problem without offering some constructive alternative definition.
     2 = No effort was directed toward defining the problem or engaging/organizing the discussion.
     3 = Person agreed with the others' definition.
     4 = Person actively contributed to the problem definition, although contributions were vague and not particularly collaborative.
     5 = Person offered some well specified ideas regarding how to define the problem (for example, some description of when the problem occurs, how often, in what ways the behaviors are problematic, etc.) and/or they offered some vague ideas but were quite skillful in their efforts to be collaborative.

   Proposed Solutions Scale
     1 = No solution proposed.
     2 = Very poor solution(s) proposed.
     3 = Fair solution(s) proposed with a minimum of detail/thought.
     4 = Good solution(s) proposed.
     5 = Very good/excellent solution(s) proposed. Demonstrates engagement with the issue and creativity.

   Resolution Scale
     1 = No effort to bring the discussion to a resolution; total disagreement; or dyad has wandered off topic.
     2 = Offers or agrees with a quickly formulated resolution that seems hard to believe.
     3 = Individual has made some effort to summarize, paraphrase, or reiterate some of the agreements that have been made. However there is no clear "action plan" articulated. If one participant is simply agreeing with the action plan offered by the other, he/she can get no higher than a 3 on this scale.
     4 = Clear "action plan" articulated, or the person made some unique contribution to the action plan; the plan seems pretty realistic in light of the problem discussed.

OVERALL COMMUNICATION PROCESS: A maximum of one constructive and/or one conflictual code can be assigned to each floor switch (conversational turn). All coding is done while viewing the videotaped conversation so that affect can be included in the evaluation.

   CONSTRUCTIVE COMMUNICATION is coded when any of the following is observed:
     1. Displays of affection such as smiling, positive eye contact, mutual laughter, or hugging.
     2. Positive listener behavior such as listening empathically, making efforts to elicit the others' point of view, nodding head in a way that indicates listening, reflecting back to the other person what was heard, asking follow-up questions to gather other's perspective, or voicing understanding of the other's position.
     3. Positive speaker behavior such as agreeing, proposing compromises, bringing up concerns in a neutral manner, offering suggestions in a way that takes the other's viewpoint into consideration, building on the suggestions of another, keeping the conversation on track, making positive remarks about the other person's behavior, clarifying one's own point of view, expressing oneself clearly when asked to do so by the other, or offering a remark that moves the conversation forward in a constructive direction.

   CONFLICTUAL COMMUNICATION is coded when any of the following is observed:
     1. Negative affect such as angry tone of voice, angry criticism of the other, insults, accusations, swearing, leading questions, and sarcasm.
     2. Uncooperativeness and withdrawal — refusing to allow the other person to talk typically by cutting the other person off and/or withdrawing from the conversation. Derailing another's effort to put a problem on the table and discuss it. Refusing to discuss a topic without offering an alternative. Not clarifying thoughts when asked directly to do so. This refusal significantly stalls the conversation.
     3. Inappropriate change of topic and off-task behavior.
     4. Monologue — one person speaks non-stop for a long period of time. Seems like they are speaking "at" rather than "with" the listener.
     5. Speaking for the other; assuming one knows how the other feels without asking.
     6. Illogical, incomprehensible or nonsensical statements.

For example, one teen began the conversation with the following: "I want my lighters back that you took from my room while I was at school." This statement was made calmly and clearly, and was coded as an example of positive speaker behavior and earned one tally for the constructive code. The mother responded by calmly stating "I will tell you why I took those lighters. It is because I don't know why you are using them and I am concerned about the risk that you could burn yourself or cause a lot of serious problems. If you want your lighters back, you are going to have to tell me what you are using them for." The mother's statements earned one tally for constructive communication due to the mother's calm tone of voice and clear response to the problem raised by the teen. The following conversational turns earned one tally for conflictual communication for both mother and teen because of the angry tone of voice used by the speakers and the critical, uncompromising manner in which issues were addressed. The mother states, "I want to talk about how much money you are spending on weekends. You are very selfish and careless with money. I want you to stop being so selfish." The son replies, "I don't care. If I want something, I am going to get it. I told you I should get whatever I want."

A team of three coders evaluated the problem-solving interactions. Every interaction was coded by each of two coders who were randomly assigned interactions and were working independently. Coders viewed the videotaped interaction and read the transcript of the interaction while making coding decisions for each problem solving discussion. Intraclass correlations averaged across rater pairs were the following: .86 for parent problem solving, .79 for adolescent problem solving, .98 for parent constructive communication, .98 for adolescent constructive communication, .74 for parent conflictual communication, and .78 for adolescent conflictual communication. Acceptable levels of inter-rater agreement were achieved for each of the codes. Disagreements on any of the ratings were discussed by the coding teams and resolved to create consensus data. All study hypotheses were tested using consensus data.

2.2.2.2. The Family Interaction Task (FIT). The FIT provided parent and adolescent dyads with an opportunity to talk for 10 min about some of the meaningful experiences they have shared and served as a "warm-up" that was administered before the problem-solving discussion. The conversations

Table 3
Pearson correlations evaluating the relationship between family assessment measures for each respondent

| | Discussion of meaningful family experiences | | | | Camberwell Family Interview | | |
| | Adolescent | | Parent | | Critical comments | Warmth | Positive remarks |
	Constructive	Conflictual	Constructive	Conflictual			
Problem solving							
Discussion							
Adolescent							
Problem solving	.09	−.12					
Communication							
Constructive	.44 *	−.44 *					
Conflictual	−.45 *	.50 *					
Parent							
Problem solving			.22	−.18	−.31 *	.30 *	.36 *
Communication							
Constructive			.20	−.26	−.32 *	.23	.21
Conflictual			−.10	.05	.30 *	−.15	−.02

* $p < .05$; significance is based on one-tailed analyses.

were videotaped, transcribed, and coded by Masters' and doctoral-level researchers. The constructive and conflictual communication exhibited by each speaker was rated, and high levels of inter-rater reliability were achieved. The constructive code captures statements that are on task and/ or supportive and behaviors that are affectionate. The conflictual code captures statements that indicate disagreement, criticism, irritation, distress, and/or intrusiveness. More information regarding the task and codes is presented in O'Brien et al. (2008). We expected the constructive communication codes from the FIT and problem solving discussions to be positively associated and the conflictual communication codes to be positively associated. Conversely, we expected the constructive communication codes from each task to be negatively associated with the conflictual communication codes from the other discussion task.

2.2.2.3. The CFI. Videotaped CFIs were coded by one of two raters who had achieved acceptable levels of reliability (ICCs ranging from .74 to .96 on all indices) using tapes from previously published studies (Vaughn and Leff, 1976; Karno et al., 1987). The three CFI indices used in this study are critical comments, warmth, and positive remarks. More information regarding operational definitions and examples of statements coded on each index is presented in O'Brien et al. (2006). We expected the CFI warmth and positive remarks codes to correlate positively with the problem solving and constructive communication codes of the problem-solving task, and the CFI critical comments code to correlate positively with the conflictual communication code and negatively with the constructive communication and problem solving codes.

3. Results

Pearson correlations were utilized to test hypotheses, and one-tailed tests were selected because all hypotheses predicted a particular direction to the relationship.

First, in order to evaluate the convergent validity of the problem solving interaction codes, Pearson correlations were conducted on the family assessment measures for each respondent. As presented in Table 3, adolescents were consistent in their communication across family interaction tasks. There

was a significant positive association between constructive communication exhibited by adolescents during the problem solving discussion and constructive communication exhibited during the discussion of meaningful family experiences. Similarly there was a significant positive association between adolescent conflictual communications exhibited during the two different discussion tasks. There were significant negative associations between constructive communication during one task and conflictual communication during the other task.

While the patterns of associations among parent codes across the two interaction tasks were similar to those of adolescents, they were not statistically significant. There were significant associations, however, between parent behavior exhibited during the problem solving interaction and parent attitudes and behaviors expressed during the CFI. Parent critical comments during the CFI were positively associated with parent conflictual communication and negatively associated with parent problem solving skills and constructive communication exhibited during the problem solving discussion. Conversely, parent warmth and positive remarks demonstrated during the CFI were positively associated with parent problem solving skills exhibited during the problem

Table 4
Summary of partial correlation analyses evaluating the association between baseline problem solving discussion codes and adolescents' positive and negative symptoms and social functioning assessed at follow-up controlling for each respective symptom/functioning scale at baseline

| Variable | SOPS symptoms | | Social functioning |
	Positive	Negative	
Problem solving interaction			
Parent			
Problem solving	.25	.04	.19
Communication			
Constructive	.27	.06	.36 *
Conflictual	.29	−.05	.21
Adolescent			
Problem solving	−.08	−.03	.43 *
Communication			
Constructive	.27	.15	.38 *
Conflictual	.40 *	−.13	.09

27 participants are included in the follow-up sample.
* $< .05$ (1-tailed).

Table 5
Paired samples *T*-tests and Pearson product moment correlations conducted on parent and adolescent codes

	Mean	SD	Corr	Sig	*T*	*df*	Sig (2-tailed)
Problem solving			.61	.000	5.39	32	.000
Parent	10.62	2.63					
Youth	8.38	2.80					
Constructive communication			.86	.000	2.64	32	.013
Parent	36.81	21.18					
Youth	31.56	21.21					
Conflictual communication			.65	.000	−2.58	32	.015
Parent	6.38	12.77					
Youth	12.56	17.73					

solving discussion. Overall, interaction task codes were positively associated with conceptually similar codes and negatively associated with conceptually different codes in ways that would be expected for both adolescents and parents.

To evaluate the hypotheses regarding the relationship between coded behavior during the problem solving discussions at baseline and youths' symptoms and social functioning six months later, partial correlation analyses were conducted. Follow-up SOPS positive symptoms, SOPS negative symptoms, and Straus–Carpenter Social Functioning measures served as dependent variables and baseline scores on each of the three measures were included as control variables in each of the respective analyses. As presented in Table 4, there was a positive association between adolescents' conflictual communications exhibited during the problem solving interaction with their parents and an increase in positive symptoms six months later. Conversely, adolescents' skillful problem solving and constructive communication predicted enhanced social functioning six months later. Similarly, parents' constructive communication during problem solving interactions was positively associated with youths' enhanced social functioning six months later.

Finally, significant associations were observed between parent and youth problem solving skills, constructive communication, and conflictual communication (Table 5). Parents who demonstrated more skillful and constructive problem solving behavior tended to have adolescents who demonstrated more skillful and constructive problem solving behavior, while parents who demonstrated more conflictual communication tended to have adolescents who demonstrated more conflictual communication. Paired samples *T*-tests conducted on parent and youth problem solving and communication codes indicate that parents demonstrated a significantly higher level of skill in defining problems, generating solutions, and working toward resolution than did adolescents. Parents also demonstrated significantly more constructive communication and significantly less conflictual communication during the problem solving interactions than did adolescents.

4. Discussion

As hypothesized, adolescents' social problem solving skills exhibited during problem solving discussions with their primary caregivers were associated with adolescents' enhanced social functioning six months later. In other words, adolescents'

abilities to define problems, generate solutions, and move toward resolution when discussing issues that create tension between themselves and their parents were associated with more frequent social engagement with friends six months later. Similarly, adolescents' constructive communication, including displays of affection, efforts to listen to another's point of view, and ability to clarify one's own point of view in a calm manner during problem solving interactions with parents, was associated with improved social functioning with peers. Contrary to hypotheses, however, these skills were not significantly associated with symptom improvement. Adolescent problem solving abilities and constructive communication with parents were associated with improved social functioning with peers, but were unrelated to the progression of youths' positive and negative symptoms.

As hypothesized, youths' conflictual communications during problem solving discussions, such as angry criticism of the other, uncooperativeness, withdrawal, and off-task behavior, were associated with an increase in positive symptoms of psychosis six months later. This brief assessment of UHR and early onset youth behavior in the context of problem solving discussions with parents, a scenario commonly observed by mental health professionals, is informative regarding the possible progression of positive symptoms. Contrary to the study hypotheses, however, youths' conflictual behavior during problem solving discussions was not related to their social functioning with peers, nor with the progression of negative symptoms. Taken together these findings indicate that youths' constructive behavior during problem solving discussions with the family was associated with improved social functioning with peers while youths' conflictual behavior was associated with exacerbation of positive symptoms but not negative symptoms of psychosis. It is possible that efforts to improve youths' problem solving skills and constructive communication at this early stage of illness may have the greatest impact on their social functioning.

In line with the study hypothesis, parents' constructive communication during problem solving discussions was associated with an increase in youths' social functioning. This finding is consistent with prior work that identified an association between caregiver warmth expressed during the CFI and improved social functioning among UHR youth (O'Brien et al., 2006), and extends the literature by establishing a link between parents' observed behavior during face-to-face problem solving discussions with youth, and youth's future social functioning.

Positive associations were confirmed between parent and adolescent constructive communication, conflictual communication, and problem solving skills. While parents in general demonstrated more skillful communications during the problem solving interactions than did adolescents, as would be expected based on developmental stage, there were strong links between parent and youth approaches to problem solving and communication. Family system theorists (Minuchin, 1977) as well as research on behavioral reciprocity (Bandura, 1985) speak to the influence of parents' and adolescents' communications on each other, and indicate that intervention in any one aspect of the family system will have ripple effects throughout the entire system.

Despite the inclusion of psychosocial stress in most etiologic models of schizophrenia, frequently conceptualized as a precipitating factor for psychosis in individuals with a

genetic diathesis (Nuechterlein and Dawson, 1984), little is known about the family's potential at the earliest identifiable stage of illness to effectively buffer stress and to contribute to enhanced functional outcome for youth. Questions regarding the degree and type of family involvement that is needed at various stages of a psychotic disorder (Diamond and Siqueland, 2001) require research into family protective factors to inform treatment efforts. Taken together, findings from this study provide support for further research into the possibility that specific family interventions, such as problem solving and communication skills training, may improve the functional prognosis of at risk youth, especially in terms of their social functioning. Prior research indicates that multi-family group interventions focused on problem solving and communication skill enhancement are tolerable to UHR youth and their parents and feasible to administer (O'Brien et al., 2007).

Surprisingly, parents' behavior during problem solving discussions was not related to youths' symptom progression. While work focused on adults with established illnesses has found a robust relationship between high levels of family conflict (e.g., high expressed emotion) and symptom exacerbation (Hooley, 1985), prior work focused on UHR youth has not established a connection between CFI critical comments and youth symptom progression (O'Brien et al., 2006). It is possible that critical attitudes and conflictual behaviors are more predictive once they have become established negative cycles within the family, and that early identification and intervention could eliminate this source of stress.

This study would have benefited from a larger number of subjects, and due to the large number of analyses conducted on a small sample, these analyses must be considered exploratory. Nonetheless, these results expand upon previous findings (Asarnow et al., 1982) by utilizing contemporary assessment instruments to identify those at UHR for psychosis. As this is the first study to our knowledge to examine family problem solving interactions as predictors of clinical symptoms and social functioning in youth at UHR for psychosis and with recent onset psychotic symptoms, these initial findings clearly warrant further investigation in future studies.

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