

A Pilot, Controlled Skills Training Study of Schizotypal High School Students

Robert P. Liberman · Mary J. Robertson

UCLA Department of Psychiatry and Biobehavioral Sciences, Los Angeles, CA, USA

Key Words

Students · Schizotypy · Skills training · Social competence · Prevention

Summary

Objective: A psychosocial skills training intervention was implemented with high school students who were high on schizotypal traits, using a randomized, controlled design. The immediate aim was to determine if a brief skills training program could reduce schizotypal traits and improve social competence with the longer-term aim of employing a more intensive intervention for protecting against major mental disorders in this high-risk population. **Subjects and Method:** 33 high school students who scored high on schizotypal traits were randomly assigned to 8 weekly sessions of social skills training or to a non-treatment control group. Training was conducted in small groups of 4–8 students in three schools. Measures of schizotypal personality traits, social skills, social competence, and self-esteem were administered before and after the treatment period. **Results:** The students receiving skills training showed statistically significant improvements on eight of ten measures while the control group showed modest, non-significant improvements on most scales. There were time by treatment condition statistically significant differences at post-treatment favoring students above the median on schizotypal traits at baseline who were randomized to the skills training condition on measures of schizotypal disorganization, social anxiety, lack of friends, constricted affect and suspiciousness. Follow-up assessment with a subset of subjects indicated continued reductions in schizotypal traits and maintenance of social competence 12 months following the intervention. **Conclusions:** A brief, educationally-oriented skills training program showed promise in reducing schizotypal traits and enhancing social competence in students initially selected for their being high on schizotypy. With a larger cohort followed over a longer period of time, the intervention might confer preventive protection against emergence of psychiatric disorders.

Schlüsselwörter

Schüler · Schizotypie · Fertigkeitstraining · Soziale Kompetenzen · Prävention

Zusammenfassung

Fertigkeitstraining für schizotype Highschool-Schüler: Eine kontrollierte Pilotstudie

Ziel: Im Rahmen eines randomisierten, kontrollierten Designs wurde mit Highschool-Schülern mit ausgeprägten schizotypen Persönlichkeitszügen ein psychosoziales Fertigkeitstraining durchgeführt. Das unmittelbare Ziel war es zu prüfen, ob ein kurz dauerndes Fertigkeitstraining schizotype Züge reduzieren und soziale Kompetenzen erhöhen kann; das langfristige Ziel ist es, eine intensivere Intervention zur Prävention schwerer psychischer Störungen in dieser Hochrisikogruppe durchzuführen. **Probanden und Methode:** 33 Highschool-Schüler mit hohen Schizotypiewerten wurden nach dem Zufallsprinzip entweder einem sozialen Fertigkeitstraining mit 8 wöchentlich stattfindenden Sitzungen oder einer Kontrollgruppe ohne Intervention zugewiesen. Das Fertigkeitstraining fand in kleinen Gruppen von 4–8 Schülern an drei Schulen statt. Schizotype Persönlichkeitszüge, soziale Fertigkeiten, soziale Kompetenzen und Selbstwert wurden vor und nach dem Trainingsprogramm gemessen. **Ergebnisse:** Die Schüler, die ein Fertigkeitstraining erhielten, verbesserten sich in 8 von 10 Maßen statistisch signifikant. Die Kontrollgruppe erreichte dagegen in den meisten Skalen lediglich geringe, nicht signifikante Verbesserungen. Die Interaktion Zeit × Behandlungsbedingung ergab statistisch signifikante Unterschiede nach der Behandlung bezüglich schizotyper Desorganisation, sozialer Angst, Mangel an Freunden, gehemmtem Affekt und Misstrauen insbesondere bei Schülern, deren Ausprägung schizotyper Züge vor dem Training oberhalb des Medians lag und die der Behandlungsgruppe zugewiesen worden waren. Eine Nachuntersuchung an einer Subgruppe von Schülern ergab eine anhaltende Reduktion schizotyper Züge und stabile soziale Kompetenzen 12 Monate nach dem Training. **Schlussfolgerungen:** Ein kurzes, psychoedukatives Fertigkeitstraining erwies sich als viel versprechend zur Reduktion schizotyper Züge und zur Verbesserung sozialer Kompetenzen bei Schülern, die aufgrund hoher Schizotypiewerte in die Studie eingeschlossen worden waren. Bei einer größeren Stichprobe, die über längere Zeit nachuntersucht würde, könnte sich die Intervention als präventiver Schutz vor der Entwicklung psychiatrischer Störungen erweisen.

Introduction

Evidence from family studies, neurocognitive assessments, brain imaging and psychopathology has suggested that schizotypal personality traits and disorder may be behavioral, phenotypic vulnerability indicators for schizophrenia and other major mental disorders [Raine et al., 1995; Asarnow et al., 2001; Suhr, 1997]. In addition, schizotypal traits and disorder are subjectively distressing and functionally disabling for individuals hampered with symptoms of perceptual aberration, magical ideation, suspiciousness, social anxiety and withdrawal, eccentric behavior and cognitive disorganization [American Psychiatric Association, 1994]. The concurrent presence of paranoid and schizotypal traits adds to the interpersonal and occupational liabilities that many schizotypal individuals must bear [Siever et al., 1991]. Thus, while schizotypy may be a genetic vulnerability marker that could be targeted for preventive intervention, by themselves schizotypal traits offer clinically justifiable reason for treatment.

There have been few controlled treatment studies of persons with schizotypal traits and none of psychosocial intervention for adolescents with these signs and symptoms [Stone, 2002]. The current study was planned as a first stage evaluation of the feasibility and impact of social skills training for high school students whose high levels of schizotypal traits could make them suitable subjects for subsequent, longer-term preventive intervention efforts. High school students were selected because an earlier epidemiological survey of 652 students found more than twice as many high school juniors and seniors within the top decile of schizotypal traits than college students [Lieberman, 1999].

Probands and Methods

After securing approval of consent and assent forms for schools, students and parents through the UCLA Human Subjects Protection Committee, we administered the Raine Schizotypal Personality Questionnaire (SPQ) [Raine, 1991] to 877 junior and senior students in eight high schools in Los Angeles and Ventura Counties. For a non-clinical sample of high school students, it was neither feasible nor ethical to conduct a clinical interview to determine whether schizotypal personality disorder was present. We had been prohibited by both the UCLA human subjects' protection committee as well as administrative personnel at the school sites from conducting any clinical interviews or procedures which could have resulted in emotional distress, diagnostic labeling or stigmatization of students. Furthermore, current thinking about personality disorders indicates traits such as those associated with schizotypal personality disorders are best viewed dimensionally rather than categorically. The SPQ is ideally suited for assessing a range of continuous, dimensional traits rather than 'pigeonholing' based on diagnosis. In fact, plans for DSM-V include incorporation of dimensionality into criteria for personality disorders. The schools and student sample comprised a range of socioeconomic, ethnic and urban-suburban characteristics. Students with total scores above 35 of the SPQ, more than one standard deviation above the mean (M) of the total sample, were invited to participate in the second, intervention phase of the study. 33 students and their parents signed informed consent for random assignment to skills training or control conditions. Subjects were randomized to skills training or control conditions based on a computer-generated list of number for random assignment.

Skills Training Program

Eight, weekly, 2-hour sessions of skills training in groups of 4–8 were offered to the students in designated classrooms after school. The content and format of the training was developed from a series of focus groups of students, school teachers and counselors as well as from the literature on social skills training with adolescents and adults [Albano, 1995; Clark and Davis, 2000; Liberman et al., 1989]. Each session began with a 'warm-up' exercise, which was followed by reports on the previous session's homework assignments, a rationale for the current session's topic and skills, peer modeling of relevant situations for using the skills, behavioral rehearsal by each group member of how to apply the skills to his/her own life, and a homework assignment for generalization into the students' everyday life.

The main topics and skills covered during the eight sessions were basic conversation skills (e.g., learning about 'Go' and 'No Go' signals for initiating conversations, using open ended questions to start conversations, reflecting back in a reciprocal manner, maintaining self-disclosure at appropriate levels, and terminating conversations politely), assertive skills, and problem-solving skills. Examples of the types of interpersonal situations that students practiced, are:

- Asking someone to the Prom
- Interviewing for a job
- Discussing a disciplinary incident with the Vice Principal
- Initiating conversation with other students before class
- Making an informal presentation on the value of a volunteer job
- Responding to teasing by other students
- Expressing interest in parents' and siblings' activities to strengthen family relationships

Group leaders were teachers who had master's degrees in counseling and two teaching assistants who were high school students hired because of their having overcome their own signs and symptoms of schizotypy.

Training techniques included modeling, behavioral rehearsal, coaching, video and verbal feedback, and weekly assignments to practice their newly learned skills in situations which would enable them to attain their personal goals. One orientation and educational session was held with parents, also in the schools. The authors plan to develop a manual for the skills training intervention as the program of research continues.

Assessments

Prior to the start of the intervention and after the final training sessions, the following assessment instruments were administered to students in both the intervention and control conditions: Schizotypal Personality Questionnaire (SPQ), Teenage Inventory of Social Skills (TISS) [Inderbitzen and Foster, 1992], Social Problem-Solving Inventory [D'Zurilla and Nezu, 1990], UCLA Social Attainment Survey (UCLA SAS) [Goldstein, 1978], and Rosenberg Self-Esteem Scale [Rosenberg, 1962].

Results

As depicted in table 1, on almost every scale, the students in the skills training condition showed statistically significant improvements over the semester-long period of the program. While modest pre-post improvements were seen in many of the scales for the control group, none reached statistical significance. Reliable ratings were made of the degree of participation in sessions by the skills training students, the latter's satisfaction with the program, and their homework assignment completion. All ratings were uniformly high.

A mixed model, repeated measures ANOVA revealed a significant time \times treatment interaction for the cognitive-percep-

Table 1. Scores before and after the intervention period on measures of social skills, self-esteem and schizotypy for treatment and control group participants (results of mixed model, repeated measures ANOVA)

	Pre-intervention		Post-intervention	
	M	Std Error	M	Std. Error
<i>SPQ total[†]</i>				
Treatment	44.89	2.52	34.85	2.81
Control	45.36	2.94	42.63	3.04
<i>SPQ Cognitive Perceptual Factor^{*†}</i>				
Treatment	21.11	1.43	16.11	1.56
Control	22.07	1.67	21.62	1.71
<i>SPQ Interpersonal Factor[†]</i>				
Treatment	18.68	1.51	14.38	1.68
Control	17.00	1.76	15.39	1.82
<i>SPQ Disorganization Factor[†]</i>				
Treatment	11.00	0.82	9.12	0.96
Control	10.93	0.95	10.33	0.98
<i>TISS Positive Factor[†]</i>				
Treatment	65.11	2.55	75.75	2.81
Control	69.43	2.97	71.66	3.06
<i>TISS Negative Factor[†]</i>				
Treatment	34.26	3.05	34.50	2.24
Control	32.43	3.55	33.64	3.62
<i>Social Problem Solving[†]</i>				
Treatment	133.61	8.05	164.25	9.04
Control	150.70	9.37	149.43	9.72
<i>UCLA SAS[†]</i>				
Treatment	19.21	0.99	21.64	1.10
Control	21.00	1.15	21.77	1.19
<i>Rosenberg Self-Esteem[†]</i>				
Treatment	24.94	1.31	28.60	1.41
Control	27.39	1.53	28.72	1.56

*Significant time × treatment interaction ($F = 4.11, p = 0.05$).

[†] Results of t test for significance of improvement from pretest to posttest ($p < 0.05$).

tual aberration subscale of the SPQ ($F = 4.11, p = 0.05$). Because control subjects also made modest improvements, with the exception of the cognitive-perceptual aberration subscale the analyses showed no statistically significant time × treatment interactions. When students' baseline scores were cut at the median of the SPQ, we found that the quartile of subjects that were in the high SPQ and skills training condition exhibited statistically significantly greater improvement from before to after training on the SPQ disorganization factor ($p = 0.02$), the SPQ social anxiety subscale ($p = 0.01$), the SPQ constricted affect subscale ($p = 0.003$), and the SPQ suspiciousness subscale ($p = 0.04$).

Follow-up assessment with a subset of subjects (experimental condition, $n = 7$; control condition, $n = 8$) indicated continued reductions in schizotypal traits and maintenance of gains in social competence 12 months following the intervention. For example, the total score on the SPQ was further reduced for the 7 subjects in the experimental condition (Mean SPQ Total scores; pre-treatment = 48.00, post-treatment = 32.00, 12-month follow-up = 21.57); whereas the 8 subjects from the control condition showed no change (Mean SPQ Total scores; pre-assessment = 46.10, post-assessment = 46.38, 12-month follow-up = 46.88).

In a 6-month follow-up survey, program participants indicated that the program had helped them to:

- feel more confident
- communicate their feelings
- open up to people
- find the good in people
- talk with their parents
- talk with friends
- feel comfortable initiating conversation, even with people whom they don't know
- talk to people without feeling shy or embarrassed
- make friends
- articulate problems
- open up about problems instead of keeping them inside
- realize that other people have problems, too
- be assertive and working through problems
- become more active in decision making

A case example is provided below to characterize the experience of the high school program participants.

Case Example

When Chris began the Personal Effectiveness (PE) class, he was extremely distractible and silly. He could not follow a

role-play or stay focused on activities. This behavior was reduced if he sat next to other group members, Joe or Pete. Drawing during lecture and discussion kept him in his seat and he was able to focus on activities. Chris was very hesitant to role-play and seemed uncomfortable discussing personal situations. Coaching easily distracted him. Midway through the course, Chris was able to focus on specific elements in situations discussed and offered suggestions to other students. By the last session, Chris was very attentive and able to express himself well to other students and group leaders. He emphasized how difficult his relationship with his mother was and appreciated the suggestions for improving communication. He said he had learned how to talk to his parents and relate to them. Chris expressed how helpful PE was to him in increasing clear communication. For example, with his older brother, he reported that he was able to communicate more, fight less, and improve the relationship. During the final session, Chris said that he had 'learned so much from everyone here that [he] can use in the real world.' His role-play activities and homework assignments included:

1. asking his mother about going out on Friday night with friends
2. sharing feelings with his mother about difficulty with her anger toward him
3. discussing summer plans with friend, indicating he enjoyed spending time together
4. proactively scheduling a weekly homework review meeting with mom, rather than her checking in with him daily
5. asking a girl out on a date
6. problem solving with his mother about attending friend's concert *and* an out of town family function

Discussion

Based on the experience gained from this pilot study, one must not underestimate the obstacles posed to intervention research with high school students. The study description, informed consent and assent documents for the schools, parents and students required a 6-month period of five repeated revisions before approval was granted by the Human Subjects Protection Committee. It was not a simple matter to prepare documents for informed consent that were both accurate scientifically, non-stigmatizing and comprehensible to lay persons. Obtaining approval for doing such a study in school districts and high schools also was an arduous process with 59 schools initially contacted, 29 that agreed to consider the program and 8 that actually provided the support and assistance required to implement the study. These obstacles were formidable, may limit the external validity of the findings, and reduced the duration of the intervention from an originally planned full year to a single semester. Most notably, high schools are busy places with teachers, administrators and counselors overloaded with state-mandated curricular and

testing requirements and worried about possible adverse effects and publicity from research that could interfere with their educational priorities and responsibilities.

Cultural competence was important in conducting the skills training with the intervention groups. For example, interracial dating, intergenerational disparities in values among Latino families, and the patriarchal norms of certain Asian families required sensitivity by the skills trainers. We did find, however, that there was a great need and desire expressed by students, parents, teachers, counselors and school administrators for a social skills training program such as the one we offered to address the many problems, concerns, and stressors experienced in personal, social, dating, academic and inter-generational realms of life as well as the challenges facing students as they anticipated their transition to college, jobs and adulthood.

One might question how a 8-week intervention could render changes in schizotypal personality traits. While the term 'trait' implies stability over time, the students involved in the present study were only juniors and seniors in high school, typically ages 15–17. At that age, personality is considered to be still developing, rendering the dimensional 'traits' more malleable. Furthermore, the social skills learned and used by students in the program appeared to be effective in modifying the social isolation and unusual behaviors that comprised one dimension of the SPQ. While we are encouraged that these pilot results reveal enough positive findings for us to pursue and extend our work with larger samples and longer follow-up to ascertain the possible effects of skills training in youth as a protection against the development of major mental disorders, it also became apparent to us that one semester of skills training may be insufficient. The next phase of our work will build on this pilot study by increasing the number of training sessions to a full school year, by considering expanding the sample to include community college students as well as high school students, and by a more focal selection process that identifies those students who are among the very highest in ratings of schizotypy. In a recent review, Gur et al. [2005] found that schizotypal personality features including social withdrawal, unusual perceptions, odd behaviors and socioemotional dysfunction have been shown to precede the onset of psychosis among genetically high risk children. In our future work, we will also consider using a two-step selection process in which abnormalities on neurocognitive functions known to be associated with mental disorders would generate a sample of students for skills training that have more than one risk factor for major mental disorders.

Acknowledgements

The authors acknowledge the statistical assistance of Sun Hwang, M.S. and Jim Mintz, PhD and the assistance of Shauna Lehtihalme, M.S. in developing and implementing the curriculum.

This study was supported in part by a NARSAD Distinguished Investigator Award to Dr. Liberman and by grants from the Simon and Nathan Cummings Foundations.

References

- Albano A: Treatment of social anxiety in adolescents. *Cog Behav Pract* 1995;2:271-298.
- American Psychiatric Association (ed): *Diagnostic and Statistical Manual of Mental Disorders*, ed 4. Washington, DC, American Psychiatric Association, 1994.
- Asarnow R, Nuechterlein K, Fogelson D, Subotnik K, Payne D, Russell A, Asamen J, Kuppinger H, Kendler K: Schizophrenia and schizophrenia-spectrum personality disorders in the first-degree relatives of children with schizophrenia – the UCLA Family Study. *Arch Gen Psychiatry* 2001;58:581-588.
- Clark H, Davis M: *Transition to adulthood: A resource for assisting young people with emotional or behavioral difficulties*. Baltimore, Brookes Publishing, 2000.
- D'Zurilla T, Nezu A: Development and preliminary evaluation of the Social Problem-Solving Inventory (SPSI). *Psychol Assess J Consult Clin Psychol* 1990;2:156-163.
- Goldstein M: Further data concerning the relation between premorbid adjustment and paranoid symptomatology. *Schizophrenia Bull* 1978;4:236-243.
- Gur RE, Andreasen N, Asarnow R, Gur R, Jones P, Kendler K et al for Commission on Adolescent Schizophrenia: Prevention of schizophrenia; in Evans D, Foa E, Gur RE, Hendin H, O'Brien C, Seligman M, Walsh B (eds): *Treating and Preventing Adolescent Mental Health Disorders*. New York, Oxford University Press, 2005.
- Inderbitzen H, Foster S: The Teenage Inventory of Social Skills: Development, reliability, and validity. *Psychol Assess* 1992;4:451-459.
- Lieberman R: Variations in prevalence of schizotypal personality traits across educational levels; in: *Seminar of the Research Training Program for Psychotic Disorders*. Los Angeles, UCLA, Department of Psychology, 1999.
- Lieberman R, De Risi W, Mueser K: *Social Skills Training for Psychiatric Patients*. Boston, Allyn and Bacon, 1989.
- Raine A: The SPQ: A scale for the assessment of schizotypal personality based on DSM-III-R criteria. *Schizophrenia Bull* 1991;17:555-564.
- Raine A, Lenz T, Mednick S (eds): *Schizotypal Personality*. New York, Cambridge University Press, 1995.
- Rosenberg M: The association between self-esteem and anxiety. *J Psychiatric Res* 1962;1:135-152.
- Siever L, Bernstein D, Silverman J: Schizotypal personality disorder – a review of its current status. *J Pers Disord* 1991;5:178-193.
- Stone M: Schizoid and schizotypal personality disorders; in Gabbard G (ed): *Treatment for Psychiatric Disorders*, ed 3. Washington, DC, American Psychiatric Publishing, 2002, pp 2237-2250.
- Suhr J: Executive functioning deficits in hypothetically psychosis-prone college students. *Schizophrenia Res* 1997;27:29-35.