

Impaired Social Problem Solving in Anorexia Nervosa

A Systematic Review and Implications for Future Treatment Interventions

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ABSTRACT. Social problem solving (SPS) is characterized by the ability to cope with social problems and resolve conflicts effectively. SPS deficits are often seen among patients with anorexia nervosa (AN), although there is a gap in knowledge regarding the specific nature of the relationship between SPS and AN. This review will (1) examine the cognitive and social impairments associated with SPS deficits among AN populations, (2) consider other physiological and psychological factors associated with AN, such as weight status and comorbidity, that may affect SPS skills, and (3) evaluate SPS interventions used to treat other psychiatric disorders as a way to garner insight about future SPS interventions on AN populations. The review concludes that SPS interventions present a promising treatment option for individuals with AN, and proposes directions for future research.

1. Introduction

Anorexia nervosa (AN) is a life-threatening psychiatric disorder that is characterized by having a body weight below minimally normal for age and height, an intense fear of becoming fat or gaining weight, and severe body image disturbance (American Psychological Association, 2013). AN is most commonly found in women, although the prevalence of AN in men is on the rise (Mitchison, Mond, Slewa-Younan, & Hay, 2013). In a recent prospective study using new Diagnostic & Statistical Manual-5 (DSM-5) criteria for AN, the lifetime prevalence rate for adolescent females with AN was 0.8%, with a peak onset age between 19-20 years (Stice, Marti, & Rohde, 2013). Although AN is a rare condition, it has the highest mortality rate of any psychiatric disorder, and a notably poor treatment prognosis (Birmingham, Su, Hlynsky, Goldner, & Gao, 2005). Fewer than half of all patients with AN are treated for their disorder, and among patients who receive appropriate treatment, the rate of relapse is great, and improvements may not be seen until many years later (Hoek 2006; Herzog, Schellberg, & Deter, 1997).

Clinical studies of AN have also demonstrated cognitive and social deficits (Roberts, Tchanturia, Stahl, Southgate, & Treasure, 2007; Treasure & Schmidt, 2013; McAdams & Krawczyk, 2011). One clinically relevant attribute is a diminished ability to engage effec-

tively in social problem solving (SPS) (Sternheim et al., 2012; Paterson et al., 2011; Swanson et al., 2010). SPS refers to the ability to cope with and resolve conflicts that arise in social situations, and relies on both cognitive and social processing (D’Zurilla & Chang, 1995). The cognitive component of SPS refers to a person’s ability to think about social problems in a rational way, and to generate a hypothetically effective solution. The social component of SPS, however, refers to an individual’s default problem solving style, or, his or her ability to implement these effective solutions in a real-world setting (D’Zurilla & Chang, 1995).

The relationship between SPS and AN is understudied. This review seeks to evaluate what is currently known about SPS with regards to AN, and what remains to be determined to inform whether SPS interventions would be useful for treating AN. Specifically, the present review will (1) describe commonly used measures of SPS in studies of AN that measure both the cognitive and the social component of SPS, (2) examine SPS skills among weight-recovered patients with a history of AN and patients who have other comorbid disorders (3) consider SPS training as a potentially effective intervention for individuals with AN, and (4) outline gaps in current knowledge of SPS and AN and limitations of current research.

2. SPS Measures

SPS can be assessed using a variety of instruments that measure a person's problem orientation and/or problem solving style. Problem orientation refers to a person's cognitive schema regarding social problems in general, and how confident they feel in solving them. Problem solving style, on the other hand, refers to how the individual actually behaves when a social problem arises in everyday life (D'Zurilla & Nezu, 2010). A number of instruments have been developed to measure SPS. There are only four, however, that measure both problem orientation and problem solving style: the Social Problem Solving Inventory- Revised (SPSI-R), the Social Problem Solving Resolution Task (SPRT), the Problem Solving Inventory (PSI), and the Interpersonal Problem-Solving Assessment Technique (IPSAT). The former two measures (the SPSI-R & SPRT) are the only two that have been used to measure SPS among a population with AN, and will therefore be discussed in further detail.

SPSI-R

The SPSI-R is a 52-item Likert-type inventory that assesses problem solving orientation (the cognitive component) and problem solving style (the social component) (D'Zurilla, Nezu, & Maydeu-Olivares, 1998). Problem solving orientation exists on a dimensional scale from negative to positive. Individuals with positive problem orientation have confidence and agency in their ability to solve problems, whereas individuals with negative problem orientation lack confidence and self-efficacy in their ability to solve problems. In the SPSI-R, problem orientation is measured using questions like "Whenever I have a problem, I believe it can be solved." Participants rate on a scale of 1-5 whether that statement is "Not at all true of me" (1) or "Very true of me" (5).

There are three scales of problem solving style: rational, impulsive/careless, or avoidant. Rational problem solvers engage in effective decision making, solution generation, and implementation when confronted with a problem. Impulsive/careless problem solvers act on the first solution that comes to mind without thinking it through or considering alternative options. Avoidant problem solvers rely on others to solve their problem, or wait for the problem to resolve itself. Questions that measure problem solving style include "When making decisions, I do not evaluate my options carefully enough" or "I wait to see if

a problem will resolve itself first before trying to solve it myself." These are rated on the Likert scale described above.

Both problem orientation and problem solving style are scored dimensionally, rather than categorically. Each of the five following subscales is scored individually: positive problem orientation (PPO), negative problem orientation (NPO), rational problem style (RPS), impulsive/careless style (ICS), and avoidant style (AS). In other words, the SPSI-R accurately reflects the nuanced behavior styles people may have when they approach social problems, and recognizes that individual differences in social problem solving exist on a spectrum.

There are two studies that have used the SPSI-R to delineate the relationship between SPS and AN. Paterson and colleagues (2011) sampled 27 female patients with AN and 62 healthy control females who were evenly matched on age. The AN group scored significantly lower than the healthy control group on the NPO scale and on the ICS and AS scales. Swanson et al. (2010) found similar results. Using a sample of 43 AN patients and 76 healthy control females, who were again evenly matched on age, they found that the AN group scored significantly lower on the NPO scale and the AS scale (but not the ICS scale).

Both of these studies found that AN patients scored higher on NPO scale than healthy controls did. This suggests that their lack of self-confidence in social problem solving hampers their ability to cope when social problems arise. Although conflicting results existed regarding the ICS scale, both studies also found that patients with AN were more likely than healthy controls to exhibit an avoidant problem solving style. Both of these studies excluded men from the sample. Previous research using the SPSI-R on healthy populations has found that women score significantly higher than men on the negative problem orientation scale (D'Zurilla, Maydeu-Olivares, Kant, 1998). This is especially relevant, given that AN is much more commonly found in women than in men (Stice, Marti, & Rhode, 2013).

SPRT

The SPRT is a verbal, interview-style measurement that consists of 10 social problem scenarios. The researcher prompts the participant by asking him/her (1) "What is the best thing to do in this situation?" and

(2) "What would you do if you were in this situation?" (Channon & Crawford, 1999). The first question requires participants to generate an optimal solution to the problem. The second question is more personalized, and requires participants to state how they would actually solve the situation. Responses to both questions are evaluated by one judge using pre-existing criteria on whether the solution is both practically effective and socially sensitive. Answers receive one point if they are effective, and one point if they are sensitive, with a maximum score of two points total for each of the 10 scenarios.

Only one study has examined SPS among individuals with AN using the SPRT (Sternheim et al., 2012). Results indicated that no significant differences exist between AN and healthy controls on optimal solution generation. This somewhat contradicts the findings of studies that have used the SPSI-R, which found that negative problem orientation (which translates to optimal solution generation in this study) is highly associated with individuals with AN (Paterson et al., 2011; Swanson et al., 2010). Instead, this study indicates that these individuals are, in fact, able to generate optimal solutions to solve social problems, but struggle with putting these solutions into action. Regarding personal solution implementation, AN patients produced significantly poorer personal solutions compared to healthy controls (Sternheim et al., 2012). These personal solutions were both less practical and less sensitive compared to the personal solutions of the healthy controls.

The solutions in the SPRT that are "sensitive but not practical" appear conceptually similar to the avoidant problem solving style in the SPSI-R. Similarly, SPRT solutions that are "practical but not sensitive" appear similar to the impulsive/careless SPSI-R problem solving style. Contrary to studies that found avoidant style in AN using the SPSI-R (Paterson et al., 2011; Swanson et al., 2010), a study by Sternheim et al. (2012) using the SPRT found there was no difference between healthy women and women with AN in providing personal solutions that were sensitive but not practical.

Summary

While both the SPSI-R and SPRT have been empirically shown to have good reliability and validity (D'Zurilla & Maydeu-Olivares, 1995; Sternheim et al., 2012), these measures have not been validated

among AN populations. Given the contradictory findings of these two measures with regards to AN populations specifically, it is possible that a new social problem solving measure ought to be developed, with features that are specific to this AN population.

3. Contributing Factors to SPS Deficits in AN

Additional physiological and psychological factors may influence the relationship between SPS and AN. Physical complications associated with chronic starvation and malnutrition likely exacerbate SPS deficits, possibly by impairing executive functioning. Additionally, a high rate of psychiatric comorbidity makes it difficult to determine whether SPS deficits are a feature of pure AN or a trans-diagnostic risk factor (O'Brien & Vincent, 2003). It is not yet well-understood if SPS deficits are a trait or state feature of AN. To begin to clarify these issues, this section will examine SPS skills first in weight-recovered (Wt-R) individuals with a history of AN, and second in patients with psychiatric conditions that are often comorbid with AN.

Weight-Recovered (Wt-R) Populations

AN research typically defines Wt-R as maintaining a normal weight status (90-110% of normal body weight) and having regular menses in the last year (Strober, Freeman, & Morrell, 1998). To date, no studies have examined SPS among Wt-R populations. Previous research, however, has shown that both social and cognitive deficits persist even after AN patients return to normal weight status. For instance, Wt-R individuals scored lower than healthy controls on a social Stroop task, with a significant bias towards negative social stimuli (such as angry/threatening stimuli) (Harrison, Tchanturia, & Treasure, 2010).

Cognitive deficits persist after weight recovery as well. Among these are impaired cognitive flexibility (Holliday, Tchanturia, Landau, Collier, & Treasure, 2014), meaning that these individuals may exhibit a rigid cognitive style and inability to modify their behaviors, even when it is no longer advantageous. Specifically, an individual with AN may be unwilling or unable to generate alternative solutions to a problem, in spite of negative feedback. For example, Wt-R individuals perform significantly worse on healthy controls on tasks like the Wisconsin Card Sorting Test (WCST), a measure of cognitive flexibility (Tchanturia et al., 2012). Given this bias towards rigid and inflexible thinking, it is reasonably assumed that this might

translate into difficulties in engaging in effective SPS. Further research is needed, however, to ascertain if Wt-R populations experience difficulty in SPS with reference groups.

Comorbid Populations

AN has a high rate of comorbidity. Among these disorders, major depressive disorder (MDD), obsessive-compulsive disorder (OCD), and anxiety-related disorders have been shown to have a comorbidity prevalence of 86% (O'Brien & Vincent, 2003), 35% (Kaye et al., 2004), and 55-62% (Kaye et al., 2004; Milos, Spindler, Buddeberg, & Ruggerio, 2003) respectively. AN also has a high rate of personality disorder comorbidity. Obsessive-compulsive personality disorder (OCPD) has a comorbidity prevalence of 22%, while borderline personality disorder (BPD) has a comorbidity prevalence of 25% (Sansone, Levitt, & Sansone, 2004). It is difficult to determine, however, whether SPS deficits are a feature of "pure" AN, or if these deficits are affected by comorbid disorders.

Given the high comorbidity prevalence among patients with AN and MDD (86%; O'Brien & Vincent, 2003), it is conceivable that SPS deficits are partly, or entirely, a function of depressive symptoms. The SPSI-R has been used to evaluate SPS among patients with depressive symptoms, but no history of AN. Results indicated that depressive symptoms were highly correlated with negative problem orientation ($p < .01$) (Haugh, 2006). A study by Giel et al. (2012) demonstrated that impaired set shifting, a deficit typically associated with AN, was actually correlated with severity of depression and not with severity of AN symptoms. Due to the high comorbidity prevalence between these two disorders, it is possible that the overlapping symptomology means researchers do not yet have a complete understanding of what defines "pure" AN. To date, no studies have examined SPS among patients with comorbid AN and MDD.

AN is also often comorbid with various anxiety-related disorders (Kaye et al., 2004). Studies examining SPS among patients with anxiety disorders found that both state and trait anxiety is correlated with negative problem orientation (Belzer, D'Zurilla, Maydeu-Olivares, 2002). This study also found, however, that anxiety was correlated with both rational and impulsive/careless problem solving styles, indicating that anxiety can be either beneficial or detrimental to practical problem solving skills. Neither of

these styles, however, was associated with AN in studies using the SPSI-R. In such studies, the presence of AN was typically associated with the avoidant problem solving style (Paterson et al., 2011; Swanson et al., 2010). This suggests that although anxiety disorders and AN are both associated with negative problem orientation, SPS deficits regarding problem solving style may not be influenced by comorbid anxiety.

There are several traits that are shared across psychiatric disorders, including AN, that may predict SPS deficits. For instance, Chang (2002) demonstrated that SPS deficits mediated the link between perfectionism and suicide ideation. Paterson et al. (2012) found that the presence of self-esteem mediated the association between positive problem orientation among patients with AN. Perfectionism and low self-esteem are often subclinical, accompanying symptoms of many of the comorbid disorders discussed previously (Bastiani, Rao, Weltzin, & Kaye, 1995; Paterson et al., 2011) and could be related to the SPS deficits found in individuals with AN.

Summary

Cognitive deficits persist in Wt-R individuals with a history of AN, but SPS has not been directly investigated in a Wt-R AN population. Moreover, symptoms of AN are often muddled by psychiatric comorbidity. It is therefore likely that not enough information is known about "pure" AN (AN without any comorbid disorder or symptoms) to surmise that SPS deficits are a feature of trait, rather than state, AN.

4. SPS as a Target Treatment Intervention for AN

SPS has been largely successful as a treatment intervention for adults with other psychiatric disorders that are often comorbid with AN, as previously outlined. These interventions have been most widely used among adults with depressive symptoms, and specific protocols are described later in this section (Nezu & Perri, 1989; Klein et al., 2011). SPS has not yet been a targeted intervention area for individuals with AN. Given the high comorbidity prevalence of MDD and AN (O'Brien & Vincent, 2003), these previous interventions of SPS and depression are useful to examine with regards to the potential utility of designing SPS interventions for adults with AN.

Nezu & Perri (1989) designed an SPS intervention study for adults with depression, hypothesizing that SPS deficits are a vulnerability for depression,

and therefore that SPS skills training might combat this vulnerability. Indeed, they found that those participants who underwent this intervention showed significantly decreased depressive symptoms compared to the wait-listed control group who received no intervention. Klein and colleagues (2011) also conducted an intervention study measuring SPS and depression, using medication in conjunction with therapy. In contrast to Nezu & Perri, they predicted that SPS improvement would be a measurable outcome of alleviated depressive symptomology. As predicted, SPS skill improvement was a function of this reduction in depressive symptomology.

Regarding the specific protocols of an SPS intervention for AN, insight may be garnered from these previous interventions. An SPS intervention study for adults with personality disorders (PD) consisted of weekly two-hour, single-sex, 8-member group session for 16 weeks (Huband, McMurrin, Evans, & Duggan, 2007). Participants learned social problem solving skills from two mental health professionals. SPS skills were taught using the "Stop & Think!" social skills program which helps individuals learn interpersonal social skills and conflict resolution tactics (McMurrin et al., 2001).

Nezu & Perri (1989) conducted their intervention for adults with depression over 10 weeks, for 1.5-2-hour sessions every week. Their intervention included two groups that received SPS skills training; one group focused on both changing attitudes about problems in general, and inhibiting the tendency to respond automatically to problems without thinking first. The second SPS group received an abbreviated version, which specifically excluded the cognitive intervention regarding changing attitudes and beliefs about problems, thus solely focusing on the social aspect of solution implementation in a real-world setting.

SPS interventions can also be conducted in a one-on-one session. Though not labeled explicitly as social problem solving, Klein et al. (2011) instructed participants to engage in Situational Analysis (SA) with their study therapist. These sessions consisted of analyzing a recently distressing social encounter, and generating alternative responses and thoughts/feelings that help to inform future interactions. Thus, SPS interventions can be retrospective or prospective in nature, provided that they teach the individual about

ways to engage in more effective SPS in the future.

Summary

SPS has not yet been a target area for treatment intervention for adults with AN. Given the success of SPS interventions for adults with depression, as well as the staggering prevalence rate of AN with MDD (86%; O'Brien & Vincent, 2003), this is likely a worthwhile target for treatment intervention. Both interventions previously outlined that incorporated SPS skills were successful in alleviating depressive symptoms. It is reasonable to infer that SPS interventions for people with AN would be successful at least in alleviating depressive symptoms that so often co-occur with AN, if not in alleviating symptoms associated with AN directly.

5. Conclusion

The present review aimed to highlight cognitive and social impairments associated with SPS deficits among individuals with AN, and illuminate the gaps in understanding SPS in AN. Few measures of SPS accurately measure the cognitive (solution generation) and social (solution implementation) abilities separately, and fewer still have been utilized among AN specifically. It has also considered the potential clinical utility of SPS interventions for people with AN, given its efficacy in alleviating depressive symptoms and treating personality disorders, which are often comorbid with AN symptoms.

SPS among AN represents an important area of research with direct clinical relevance to AN treatment. Further research directions include developing validated measures of SPS among currently ill and Wt-R AN patients, and investigating whether there are SPS differences among subtypes of AN (binge/purge or restrictive). Future studies could also include neuroimaging techniques to identify potential disturbances in neural circuits involved with the cognitive and social components of SPS. Finally, future studies should aim to develop a clinical intervention aimed at improving SPS skills, to determine if this approach can strengthen SPS skills in AN.

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