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4 RELATIONSHIP OF SOCIAL PROBLEM-SOLVING ABILITY

5

WITH INTERPERSONAL RELATIONSHIPS:

6

A PROSPECTIVE STUDY AMONG JAPANESE WOMEN AND MEN ¹

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1 *Summary.*--The present study of a Japanese sample used a prospective approach to
2 examine the relationship between self-rated social problem-solving ability and quality of
3 interpersonal relationships. The Japanese versions of the Problem-Solving Self-Efficacy Scale,
4 Problem-Solving Skills Scale, and the Interpersonal Relationship Inventory short form were
5 administered to 139 female and 148 male Japanese college students, who participated in two
6 sessions separated by 6-weeks (Time 1 and Time 2). Partial correlations controlling for scores
7 on the interpersonal relationship scales at Time 1 indicated that self-ratings of social problem-
8 solving ability were correlated with aspects of interpersonal relationships assessed at Time 2, and
9 this relationship was stronger for men (five of six correlations were significant) than for women
10 (two of six correlations were significant).

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1 Social problem-solving is defined as the self-directed cognitive-affective-behavioral
2 process through which a person attempts to identify or discover effective ways of coping with
3 problems in everyday living (D'Zurilla, Nezu, & Maydeu-Olivares, 2004; D'Zurilla & Nezu,
4 2007). This ability consists of two major components: (1) problem orientation and (2)
5 problem-solving skills (D'Zurilla, *et al.*, 2004; Nezu, 2004; D'Zurilla & Nezu, 2007). Problem
6 orientation is the motivational aspect of the process, involving the operation of a set of cognitive-
7 emotional schemas which reflect a person's general beliefs, appraisals and feelings about daily
8 problems and one's own problem solving ability. Problem-solving skills refer to the core
9 cognitive-behavioral activities that people engage in when attempting to understand and manage
10 or cope with daily problems.

11 Social problem-solving can affect psychological well-being and adjustment (D'Zurilla, *et*
12 *al.*, 2004; D'Zurilla & Nezu, 2007). One's social problem-solving ability is associated with the
13 ability to handle various problems effectively in everyday living, including interpersonal
14 problems (D'Zurilla, *et al.*, 2004; D'Zurilla & Nezu, 2007). It also has been found that this
15 ability is related to interpersonal competence (D'Zurilla, Nezu, & Maydeu-Olivares, 2002; Sumi,
16 2011). Dealing well with interpersonal problems should be associated with healthier
17 interpersonal relationships (Heppner, Hibel, Neal, Weinstein, & Rabinowitz, 1982; Elliott,
18 Grant, & Miller, 2004), which are themselves associated with psychological well-being and
19 adjustment (Felce & Perry, 1997; Cohen, 2004; Helliwell & Putnam, 2005).

20 Several previous studies have shown relationships between social problem-solving and
21 various aspects of interpersonal relationships (Elliott, *et al.*, 2004; Heppner, Witty, & Dixon,
22 2004; Elliott & Hurst, 2008). Of these aspects, social support has probably received the most

1 attention. Some studies have shown that effective problem solvers are more likely to report
2 higher levels of social support (Elliott, *et al.*, 2004; Heppner, *et al.*, 2004; Elliott & Hurst,
3 2008). Greater social problem-solving ability would therefore predict a better quality of
4 interpersonal relationships (D'Zurilla, *et al.*, 2002), although this possibility requires more
5 research, as the relationship between problem solving and various aspects of interpersonal
6 relationships remain poorly understood.

7 Researchers have pointed out the necessity of examining the temporal relationship between
8 prior social problem-solving and future well-being in order to clarify the role of social problem-
9 solving on well-being (D'Zurilla, Chang, & Sanna, 2004; Heppner, *et al.*, 2004). An
10 understanding of this role would be advanced by research showing a temporal relationship
11 between social problem-solving and subsequent quality of interpersonal relationships. However,
12 most of previous studies looking at a relationship between the two constructs have utilized a
13 cross-sectional design (see Elliott, *et al.*, 2004; Heppner, *et al.*, 2004) that in general is
14 insufficient for examining temporal relationship. In order to examine a temporal relationship, it
15 is necessary to utilize a prospective design where the two constructs are measured at baseline and
16 the quality of interpersonal relationship is measured again after a certain time; such a design
17 would allow for an examination of the temporal relationship while controlling for the variance
18 associated with quality of interpersonal relationships reported at the time that social problem-
19 solving was assessed.

20 Previous research has suggested associations of social problem-solving with demographic
21 variables (D'Zurilla, *et al.*, 2002; Rich & Bonner, 2004). Although there is little agreement on
22 sex differences in social problem-solving that are common across different samples (Heppner, *et*
23 *al.*, 2004; Rich & Bonner, 2004), some studies have reported sex differences in components of

1 social problem-solving ability (e.g., D'Zurilla, Chang, Nottingham, & Faccini, 1998; D'Zurilla,
2 Maydeu-Olivares, & Kant, 1998; Maydeu-Olivares, Rodriguez-Fornells, Gomez-Benito, &
3 D'Zurilla, 2000; Calvete & Cardenoso, 2005) . The results of these studies have generally shown
4 that particularly in adolescents, men tend to be more positively (or less negatively) problem
5 oriented than women. Additionally, it has been commonly assumed that in response to stressful
6 daily problems, men tend to be more problem-solving oriented, while women respond more
7 emotionally (Heppner, *et al.*, 2004; Rich & Bonner, 2004; Helgeson, 2012) . In light of the
8 findings and assumption, social problem-solving ability may be associated with fewer
9 interpersonal problems for men compared with women, which in turn would also be related to
10 better quality of interpersonal relationships.

11 The present study investigated the temporal relationship between social problem-solving
12 ability and the subsequent quality of interpersonal relationships among women and men by using
13 a prospective design. Participants in this study were Japanese college students. The ability was
14 assessed according to the two components, problem orientation and problem-solving skills.
15 Social support, reciprocity in exchange of support, and interpersonal conflict were aspects of
16 interpersonal relationships that were also examined in the present study.

17 Before investigating the temporal relationship, sex differences in social problem-solving
18 ability and interpersonal relationships were examined. Since as mentioned above these
19 differences might be associated with differences between women and men in the temporal
20 relationship, a grasp of sex differences in each construct could promote an understanding of the
21 temporal relationship. On the basis of the foregoing findings and assumption, it was
22 hypothesized that men would have greater social problem-solving ability than women.
23 Therefore, scores for the ability were expected to be significantly higher for men than for

1 women. On the other hand, given that previous studies have been inconsistent on sex differences
2 in the three aspects of interpersonal relationships (Tilden, Nelson, & May, 1990; Sumi, 2003),
3 these differences were not expected.

4 In light of the previously mentioned findings on the association between social problem-
5 solving ability and interpersonal relationships (e.g., D'Zurilla, *et al.*, 2002; Elliott, *et al.*, 2004;
6 Heppner, *et al.*, 2004; Elliott & Hurst, 2008), it was hypothesized that social problem-solving
7 ability would be positively related to the subsequent quality of interpersonal relationships. Thus,
8 it was expected that significant partial correlations would be positive between scores for the
9 ability and subsequent social support and reciprocity in exchange, and negative between scores
10 for the ability and subsequent interpersonal conflict, even after controlling for initial
11 interpersonal relationships scores. Based on the previous studies mentioned above (e.g.,
12 D'Zurilla, *et al.*, 1998; Calvete & Cardenoso, 2005; Rich & Bonner, 2004; Helgeson, 2012), it
13 was further hypothesized that the correlations would be stronger among men than among
14 women. Therefore, compared with women, men's scores for initial problem orientation or
15 problem-solving skills would be expected to more highly correlate with scores for subsequent
16 social support, reciprocity in exchange, and interpersonal conflict when initial aspects of
17 interpersonal relationships level was partialled out.

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Method

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The participants were 139 female (M age, 19.5 yr., $SD = 1.1$) and 148 male (M age, 20.2 yr., $SD = 1.8$) Japanese college students, who voluntarily participated in two sessions separated

1 by a six-week interval. The two sessions were required for administering the interpersonal
2 relationships measure in order to examine partial correlations between scores for initial social
3 problem-solving ability and subsequent quality of interpersonal relationships controlling for the
4 initial quality. The participants completed the social problem solving and interpersonal
5 relationships measures in the first session (Time 1) and the interpersonal relationships measure
6 again in the second session (Time 2).

7 Japanese versions of the seven-item Problem Solving Self-Efficacy Scale and nine-item
8 Problem Solving Skills Scale (Maydeu-Olivares, & D'Zurilla, 1997; Sumi, 2009a) were
9 administered. These two scales were developed through a content analysis of the Problem
10 Solving Inventory (Heppner, 1988), one of the representative measures of social problem-
11 solving. The Problem Solving Self-Efficacy Scale assesses the belief in one's own capability to
12 effectively solve problems (e.g., "I trust my ability to solve new and difficult problems") that is
13 an important component of positive problem orientation. The Problem Solving Skills Scale
14 assesses perceived skills to effectively solve social problem (e.g., "I try to predict the result of a
15 particular course of action"). Items for each scale are rated on a 6-point scale ranging from 1
16 (strongly disagree) to 6 (strongly agree). The three aspects of interpersonal relationships were
17 assessed using the short form of the Japanese version of the Interpersonal Relationship Inventory
18 (Tilden, *et al.*, 1990; Sumi, 2003; Sumi, 2009b) that comprises 3 scales; (1) Support (e.g.,
19 "There is someone I can turn to for helpful advice about a problem"), (2) Reciprocity (e.g.,
20 "Within my circle of friends, I get just as much as I give"), and (3) Conflict (e.g., "Some people
21 I care about are a burden to me"). Each scale has four-item that are rated on a 5-point scale

1 ranging from 1 (strongly disagree) to 5 (strongly agree). All of the Japanese versions used in
2 this study were found to have good reliability and validity (Sumi, 2009a, 2009b).

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Results

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6 The means, standard deviations, and Cronbach alphas for the scores on the measures are
7 presented in Table 1. To begin with, sex differences were examined for the scale scores at Times
8 1 and 2. A MANOVA indicated a significant main effect for sex on the scores for the eight
9 outcome variables, Wilk's Lambda = .65, $F(8, 278) = 18.88, p < .01$. As shown in Table 1,
10 univariate tests indicated a significant sex difference for five out of the eight scores, using a
11 Bonferroni adjusted alpha level of .00625 [.05 divided by 8 (the number of comparisons)] for
12 multiple comparisons. The results showed that men scored higher than women on the two social
13 problem-solving subscales. Thus the hypothesis was supported for the social problem-solving
14 scores. On the other hand, women had higher scores than men on the Support Scale at both
15 Times 1 and 2 and the Reciprocity Scale at Time 2.

16

Insert Table 1 here

17

18 Before testing the hypothesis concerning the temporal relationship between social problem-
19 solving ability and the subsequent quality of interpersonal relationships, zero-order Pearson
20 correlations were calculated between scores on social problem-solving scales at Time 1 and
21 interpersonal relationship scales at Times 1 and 2 separately for women and men. All the
22 correlations were significant ($p < .05$), except those between scores on the Problem Solving
23 Self-Efficacy Scale and the Conflict Scale at Time 2, and between the scores on the Problem
Solving Skills Scale and the Reciprocity and Conflict Scales at Time 2. The significant zero-

1 order correlations were modest ($|rs| = .18$ to $.26$ for women and $|rs| = .21$ to $.32$ for men), but in
2 the same direction as expected for the partial correlations.

3 In order to examine the hypothesis concerning the temporal relationship, Pearson partial
4 correlations were calculated between scores on the social problem-solving scales at Time 1 and
5 the interpersonal relationships scales at Time 2, controlling for all scores on the interpersonal
6 relationship scales at Time 1. As shown in Table 2, for women there were only two significant
7 partial correlations between scores on the Problem-Solving Self-Efficacy Scale and those on the
8 Support and Reciprocity Scales. In contrast, for men, even after controlling for scores on the
9 interpersonal relationships scales at Time 1, all of the partial correlations between scores on the
10 social problem-solving scales and the interpersonal relationships scales at Time 2 remained
11 significant, except for the one between the Problem-Solving Skills Scale and the Reciprocity
12 Scale at Time 2. The significant partial correlations were relatively weak ($|rs| < .18$), albeit in
13 the expected direction in all cases. Thus, the hypotheses regarding the temporal relationship and
14 sex differences in the relationship were partially supported.

15 Insert Table 2 here

17 Discussion

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19 This study examined the relationship between the two components of social problem-
20 solving ability and the subsequent three aspects of interpersonal relationships among women and
21 men, using a prospective design. Overall, the results of this study partially supported the
22 hypothesis that scores for problem-solving self-efficacy and skills at one time should
23 significantly correlate with scores for social support, reciprocity, and interpersonal conflict at a

1 subsequent time. As suggested by theoretical speculation and some empirical results (D'Zurilla,
2 *et al.*, 2002; Elliott, *et al.*, 2004; Heppner, *et al.*, 2004; D'Zurilla, *et al.*, 2004) , social problem-
3 solving ability may improve various aspects of interpersonal relationships. However, since all the
4 significant correlations were weak, social problem-solving ability may be less strongly related to
5 the quality of interpersonal relationships than expected from the previous studies (Heppner, *et*
6 *al.*, 1982; D'Zurilla, *et al.*, 2002; Elliott, *et al.*, 2004) . In sum, the results suggest that social
7 problem-solving ability might have a limited but positive association with the quality of
8 interpersonal relationships six weeks later. The prospective data from this study thus contribute
9 to a better understanding of a temporal relationship that has not been sufficiently investigated.

10 The present results indicated sex differences in the strength of the relationship between
11 prior social problem-solving ability and later aspects of interpersonal relationships. Although
12 men who reported greater social problem-solving ability may tend to provide higher subsequent
13 ratings of interpersonal relationships quality, this tendency may be much less pronounced for
14 women. Therefore, the results generally support the hypothesis of the temporal relationship.
15 However, it is likely that problem-solving self-efficacy and skills are better predictors of the
16 subsequent social support, reciprocity, and interpersonal conflict for men than for women.
17 Moreover, as expected, the observed sex differences on social problem-solving ability seem to
18 support the common assumption that men are more problem-solving oriented (Heppner, *et al.*,
19 2004; Rich & Bonner, 2004; Helgeson, 2012) . For men, this tendency may be one factor that
20 contributes to a stronger relationship between problem-solving self-efficacy and skills and
21 subsequent quality of interpersonal relationships.

22 This study assumed that self-rated social problem-solving ability would be associated with
23 reporting fewer interpersonal problems, which in turn would also be related to higher self-ratings of

1 interpersonal relationships; accordingly, the present findings were based on self-rating responses that
2 may be potentially susceptible to influences from sex differences. In general, there is a tendency for
3 women to underestimate their abilities and performance, while men overestimate theirs
4 (Wilkinson, 1997; Carducci, 2009; Helgeson, 2012). The influence of these tendencies on the self-
5 rating measures used in this study should be recognized as limiting the conclusiveness of the sex
6 differences findings of the present study. Thus, further studies need to include independent ratings
7 of the ability and quality of relationships, to control for the likelihood of people over- or under-
8 estimating their abilities in a consistent way. Also, the correlations here are weak, which may also
9 indicate that there is considerable change in self-ratings, so that they are less trait-like and more
10 akin to state-determined perceptions that might change according to mood or other factors over
11 time.

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Table 1

Means, Standard Deviations, and Cronbach Alphas for Women and Men

| Measure | Women (<i>n</i> = 139) | | | Men (<i>n</i> = 148) | | | Sex effect | |
|---------------------|-------------------------|-----------|----------|-----------------------|-----------|----------|-------------------|----------|
| | <i>M</i> | <i>SD</i> | <i>α</i> | <i>M</i> | <i>SD</i> | <i>α</i> | <i>F</i> (1, 285) | <i>p</i> |
| Problem-Solving | | | | | | | | |
| Self-Efficacy Scale | 24.91 | 5.03 | .85 | 27.11 | 5.20 | .85 | 13.17 | .001 |
| Problem-Solving | | | | | | | | |
| Skills Scale | 34.64 | 6.01 | .81 | 36.94 | 6.38 | .84 | 9.74 | .002 |
| Support Scale | | | | | | | | |
| Time 1 | 17.18 | 2.32 | .88 | 15.19 | 3.12 | .84 | 47.04 | .001 |
| Time 2 | 16.81 | 2.29 | .86 | 14.86 | 3.42 | .91 | 32.28 | .001 |
| Reciprocity Scale | | | | | | | | |
| Time 1 | 15.79 | 2.50 | .76 | 14.95 | 2.82 | .82 | 7.25 | .008 |
| Time 2 | 16.60 | 1.90 | .74 | 14.76 | 2.99 | .84 | 45.23 | .001 |
| Conflict Scale | | | | | | | | |
| Time 1 | 10.37 | 3.79 | .84 | 10.45 | 3.50 | .79 | 0.13 | .722 |
| Time 2 | 10.16 | 3.58 | .82 | 10.49 | 3.60 | .83 | 0.45 | .503 |

Table 2

Pearson Partial correlations for Women and Men

| Measure | Support Scale Time 2 | Reciprocity Scale Time 2 | Conflict Scale Time 2 |
|--|----------------------------|--------------------------------|-----------------------------|
| Women | | | |
| Problem-Solving Self-Efficacy Scale | .17 * | .18 * | .07 |
| Problem-Solving Skills Scale | .08 | .04 | .08 |
| Men | | | |
| Problem-Solving Self-Efficacy Scale | .17 * | .17 * | -.17 * |
| Problem-Solving Skills Scale | .16 * | .07 | -.17 * |

Note.- All partial correlations are controlled for scores on the Support, Reciprocity, and Conflict at Time 1.

* $p < .05$.