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# Impulsive/careless problem solving style as predictor of subsequent academic achievement

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## Abstract

A previous study (D’Zurilla, T. J. & Sheedy, C. F. (1992). The relation between social problem-solving ability and subsequent level of academic competence in college students. *Cognitive Therapy and Research*, 16, 589–599) has shown that social problem-solving ability significantly predicts academic performance in college students after accounting for their academic aptitude. In this study we use a recently proposed five-dimensional model of social problem solving to investigate which social problem solving dimension is responsible for this effect. To further assess the cross-cultural validity of previous findings, our study was performed in a different educational system (that of Spain). Also, we used a measure of previous academic achievement instead of one of academic aptitude. Despite these differences, our results are remarkably similar to previous ones. Furthermore, we found that the dimension responsible for this relationship was impulsive/careless problem-solving. This establishes some interesting links between social problem solving theory and existing research on impulsivity as predictors of GPA. © 2000 Elsevier Science Ltd. All rights reserved.

*Keywords:* Interpersonal problem solving

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## 1. Introduction

Current research on college academic achievement considers that high school academic performance and scores obtained on college admission’s tests, such as the Scholastic Aptitude Test (SAT) are the best predictors of academic competence (Mathiasen, 1984). However, many

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other factors could increase or decrease the chances of academic success of college students such as academic achievement motivation (Edwards & Waters, 1981), study habits (Elliott, Godshall, ShROUT & Witty, 1990; Houston, 1987), and personality variables (Cowell & Entwistle, 1971), among other psychological variables (Kanoy, Wester, & Latta, 1989). The present research addresses the influence of problem-solving dimensions on college academic achievement.

Problem-solving is considered a coping strategy that increases general competence and adaptation (D’Zurilla, 1986; D’Zurilla & Nezu, 1990) in real-world settings. The theoretical framework for the present study is the social problem solving model developed by D’Zurilla and Nezu (1982, 1999). Their model hypothesizes that problem-solving outcomes in real-life settings are determined by two major processes: (1) problem orientation and (2) problem-solving proper. *Problem-orientation* is a motivational process involving a set of relatively stable cognitive-emotional schemas that describe how a person generally thinks and feels about problems in living, as well as his or her own problem-solving ability. *Problem-solving proper* refers to the rational search for a solution through the application of problem-solving skills and techniques that are designed to maximize the probability of finding the ‘best’ or most adaptive solution for a particular problem.

Maydeu-Olivares and D’Zurilla (1995, 1996) empirically found support for this model, although their results suggest that problem solving in real-life environments is best described by five inter-related dimensions: two problem solving dimensions and three problem solving proper dimensions. These dimensions are: (1) *Positive problem orientation* (PPO), a constructive, problem-solving cognitive ‘set’ (e.g. generalized challenge appraisals, self-efficacy, positive outcome expectancies); (2) *Negative problem-orientation* (NPO), a set of dysfunctional cognitive-emotional schemas (e.g. generalized threat appraisals, low self-efficacy, negative outcome expectancies); (3) *Rational problem-solving* (RPS), a constructive problem-solving pattern characterized by rational, deliberate, and systematic application of effective problem-solving skills; (4) *Impulsiveness/carelessness style* (ICS), a dysfunctional problem-solving dimension characterized by active problem-solving attempts that are impulsive, careless, hurried and incomplete; and (5) *Avoidance style* (AS), another dysfunctional dimension characterized by procrastination, passivity or inaction, and attempts to shift the responsibility for problem solving to others.

In a college environment and particularly for first-year students the main indicator of their adaptation is probably their academic success. Thus, according to social problem solving theory, students’ social problem solving should be related to their academic performance. Two studies have reported a modest but significant positive influence of social problem-solving on college freshmen GPA scores (D’Zurilla & Nezu, 1990; D’Zurilla & Sheedy, 1992). These studies found problem solving proper to be significantly related to cumulative GPA, but not Problem Orientation. However, as these studies were performed before Maydeu-Olivares and D’Zurilla proposed a dimensional model of social problem solving, the specific impact of the different problem solving proper dimensions on GPA remains to be studied.

The present study aims at filling this gap. Of the three problem solving proper dimensions, we hypothesize that Impulsivity/Carelessness style will be the best predictor of GPA as impulsivity has been found to be significantly related to poor academic performance in a study by Kipnis (1971).

The present study uses social problem solving to predict academic competence in college students in Spain after controlling for previous academic competence. It differs from previous studies by D’Zurilla and Nezu (1990) and D’Zurilla and Sheedy (1992) in three major points: (1) the five-dimensional model of social problem-solving is used, (2) the educational system is different (Spanish vs. American), (3) a different control variable was chosen, high school academic performance instead of academic aptitude (which was assessed in previous studies by SAT scores). High school academic performance was chosen over academic aptitude because it appears to have a greater influence on first-year college performance (Mathiasen, 1984).

## **2. Method**

### *2.1. Subjects*

A sample of 263 first year college students (234 women and 26 men) enrolled in an introductory Psychology class at the University of Barcelona volunteered to participate in this study. Their mean age was 20.82 years (S.D. = 3.3).

### *2.2. Measures*

The dependent measure was academic competence defined as the first-year second-semester cumulative GPA. In order to control for previous academic performance we used their scores on the Selectivity Exam (SE). This is an achievement test administered to all students graduating from high school which is used as the primary criterion for admission to Spanish universities. In the Spanish educational system, GPA and SE scores range from 0 to 10.

Social Problem-Solving was measured using the Spanish adaptation (Maydeu-Olivares, Rodríguez-Fornells, Gómez-Benito & D’Zurilla, 1999) of the SPSI-R (D’Zurilla, Nezu & Maydeu-Olivares, 1999). The SPSI-R consists of five scales reflecting the five-dimensional model of social problem solving: PPO (5 items), NPO (10 items), RPS (20 items), ICS (10 items) and AS (7 items). The Spanish adaptation of the SPSI-R has shown adequate reliability and factorial convergence with the original scale (Maydeu-Olivares et al., submitted). Alpha coefficients for Spanish SPSI-R are 0.68 (PPO), 0.88 (NPO), 0.91 (RPS), 0.83 (ICS), 0.90 (AS).

### *2.3. Procedure*

The SPSI-R was administered to the participating subjects at the beginning of their second semester in college in a group testing session. They had taken the SE the previous year (approximately eight months before their SPSI-R evaluation). Their GPA scores at the end of the second semester were obtained from the registration office.

### *2.4. Data analysis*

We performed two hierarchical regression analyses. In each case, we introduced SE in the first step. In the first analysis we used a global SPS score in the second step. In the second

analysis we introduced all five SPSI-R scales in a stepwise fashion. The global SPS score is obtained as  $SPS = PPO/5 + RPS/20 + (40 - NPO)/10 + (40 - ICS)/10 + (28 - AS)/7$ .

### 3. Results

Table 1 shows the means, standard deviations and inter-correlations among the measures employed in this study. As can be seen in Table 1 GPA is significantly albeit modestly related to all five SPS dimensions. As expected, of all the SPS dimensions, ICS shows the highest correlation with GPA ( $-0.23$ ). However, the correlation of SE with GPA is substantially larger ( $0.45$ ) and only AS and ICS are significantly related to SE (albeit modestly). All SPS dimensions are significantly (and substantially) inter-correlated in this sample, except for RPS with NPO, and ICS with PPO.

Table 2 gives the  $R^2$  coefficients and associated  $p$ -values for the first hierarchical regression using SE and SPS as predictor variables. SE accounts for 20% of the variance of subsequent academic performance (GPA). As predicted, the SPS score increased significantly the variance explained of GPA after controlling for SE, although only by a modest 2.7%.

Table 3 summarizes the results obtained in the stepwise hierarchical regression analysis using all SPSI-R scales as predictors after controlling for SE. ICS was found to be the only SPS dimension that significantly predicts GPA beyond high school academic performance. Note that the percentage of variance of GPA explained by ICS alone (3.3%) is slightly above what is explained by the overall SPS score.

Table 1  
Means, standard deviations and intercorrelations between the GPA, SE and the scales of the Social Problem Solving Inventory-Revised (SPSI-R)<sup>a</sup>

	GPA	SE	SPS	PPO	NPO	RPS	AS	ICS
GPA	–	0.45**	0.22**	0.10*	–0.11*	0.13*	–0.18**	–0.23**
SE		–	0.12*	0.05	–0.07	0.04	–0.12*	–0.12*
SPS			–	0.69**	–0.68**	0.63**	–0.77**	–0.62**
PPO				–	–0.44**	0.42**	–0.41**	–0.09
NPO					–	–0.04	0.60**	0.16**
RPS						–	–0.21**	–0.62**
AS							–	0.34**
ICS								–
<i>M</i>	6.32	6.14	12.6	12.5	16.1	48.9	9.1	14.0
<i>S.D.</i>	0.89	0.66	1.9	2.8	6.0	10.2	4.4	5.3

<sup>a</sup>  $N = 263$ ; GPA = 2nd semester grade point average; SE = Selectivity Exam grade; SPS = SPSI-R global score; PPO = Positive Problem Orientation, NPO = Negative Problem Orientation; RPS = Rational Problem Solving; AS = Avoidance Style; ICS = Impulsivity/Carelessness Style. \* $p < 0.05$ , \*\* $p < 0.01$ .

Table 2

Hierarchical multiple regression analysis of overall social problem solving on GPA controlling for previous academic performance<sup>a</sup>

Predictor	$R^2$	$\Delta R^2$	$t$	$p$ -value
<i>Step 1</i>				
SE	0.20	0.21	6.34	< 0.01
<i>Step 2</i>				
SPS	0.23	0.03	2.30	< 0.01

<sup>a</sup> SE = Selectivity Exam; SPS = Social Problem-Solving overall score.

#### 4. Discussion and conclusions

The purpose of this study was to replicate previous findings about the impact of social problem solving on academic performance and to clarify the differential influence of its five dimensions in a completely different educational setting. The results obtained support previous findings by D’Zurilla and Nezu (1990) and D’Zurilla and Sheedy (1992), and provide additional empirical support to the theoretical model from which they are derived (D’Zurilla & Goldfried, 1971; D’Zurilla, 1986; D’Zurilla & Nezu, 1990). D’Zurilla and Sheedy (1992) reported that overall SPS explains an additional 3.7% of the variance of GPA over what is explained by previous academic aptitude, whereas our study found that it explains an additional 2.7% of the variance of GPA over what is explained by previous academic performance. Also, the correlations between overall SPS and GPA reported by D’Zurilla and Nezu (1990); D’Zurilla and Sheedy (1992), between 0.20 and 0.24, are comparable those obtained in the present study in a completely different educational system. Also, the correlation obtained between the Spanish Selectivity Exam and GPA was higher than the correlation between SAT scores and GPA reported by D’Zurilla and Sheedy (1992), 0.45 vs. 0.27. This

Table 3

Stepwise hierarchical regression analysis of social problem solving dimensions on GPA controlling for previous academic performance<sup>a</sup>

Predictor	$R^2$	$\Delta R^2$	$F$	$p$ -value
<i>Step 1</i>				
SE	0.21	0.21	6.34	< 0.01
<i>Step 2</i>				
ICS	0.24	0.03	-2.87	< 0.01
AS <sup>b</sup>	0.24	< 0.01	-1.81	0.07
RPS <sup>b</sup>	0.25	< 0.01	1.78	0.08
NPO <sup>b</sup>	0.25	< 0.01	-0.88	0.38
PPO <sup>b</sup>	0.25	< 0.01	0.61	0.54

<sup>a</sup> SE = Selectivity Exam; PPO = Positive Problem Orientation, NPO = Negative Problem Orientation; RPS = Rational Problem Solving; AS = Avoidance Style; ICS = Impulsivity/Carelessness Style.<sup>b</sup> Variables not entered in the equation.

supports Mathiasen's (1984) conclusion regarding the higher degree of relationship of freshmen's academic performance with previous academic performance than with academic aptitude. In sum, there seems to be a strong evidence (see also Elliot et al., 1990) of social problem solving being a consistent albeit modest predictor of academic performance beyond what is explained by previous academic achievements.

A major finding of this study was that impulsivity/carelessness is as effective in predicting GPA as an overall SPS score. This is not surprising in light of the existing literature on impulsivity (Kagan, 1966; Kagan & Kogan, 1970; Buss & Plomin, 1984). For instance, in reviewing the construct of impulsivity, Messer (1976) concluded that impulsive children employ worse problem-solving strategies than reflective children in tasks where the answer is not immediately obvious.

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