Current Psychology (2023) 42:17888–17897
https://doi.org/10.1007/s12144-022-02945-y

The role of problem-solving ability, beyond academic motivation, in college students' psychological adjustment

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Accepted: 21 February 2022 / Published online: 18 March 2022

Abstract

In the changing and demanding university context, various situations are experienced wherein abilities to maintain motivation and activate problem solving could be relevant in students' adjustment. Beyond the widely analyzed role of academic motivation, this study focused on the added value of social problem-solving ability in student adjustment in the academic context. Analyses based on the responses obtained from 253 students (197 women and 56 men) indicated the significant role of social problem-solving ability in student adjustment, with a small additional amount ($f^2 = .09$) 9% of variance in life satisfaction and medium additional amount ($f^2 = .17$) 15% of variance in depressive symptoms, beyond academic motivation. In particular, negative problem orientation was an important predictor of depressive symptoms ($\beta = .41$, $p < .001$) and life satisfaction ($\beta = -.26$, $p < .001$); however, positive problem orientation was only an important predictor of life satisfaction ($\beta = .21$, $p < .01$). This study also showed the predictive role of the value, expectancy, and affection components of motivation in student adjustment. Overall, the findings highlight the relevance of training in problem-solving orientation and motivational components to improve college students' general well-being.

Keywords Social problem solving · Academic motivation · Psychological adjustment · College students

Beyond the widely analyzed role of academic motivation, this study focused on the added value of social problem-solving ability in student adjustment in the academic context. Analyses based on the responses obtained from 253 students (197 women and 56 men) indicated the significant role of social problem-solving ability in student adjustment, with a small additional amount ($f^2 = 0.09$) 9% of variance in life satisfaction and medium additional amount ($f^2 = 0.17$) 15% of variance in depressive symptoms, beyond academic motivation. In particular, negative problem orientation was an important predictor of depressive symptoms ($\beta = 0.41$, $p < 0.001$) and life satisfaction ($\beta = -0.26$, $p < 0.001$); however, positive problem orientation was only an important predictor of life satisfaction ($\beta = 0.21$, $p < 0.01$). This study also showed the predictive role of the value, expectancy, and affection components of motivation in student adjustment. Overall, the findings highlight the relevance of training in problem-solving orientation and motivational components to improve college students' general well-being.

In the current knowledge society where the flow of information is rapid and changing (Moravec, 2008), motivation continues to be highly valued among educational agents in driving constant learning of the student body (Robinson, et al., 2019). This value has been analyzed and corroborated by different researchers in recent decades (Duncan & McKeachie, 2005; Liu et al., 2020; Meece et al., 2006; Osborne & Jones, 2011), who have found that academic motivation (intrinsic and extrinsic) represents a critical variable set to understand learning and performance of students (e.g., grades achieved and learning effectiveness). Using the multidimensional approach of motivation supported in the Motivation for Learning Questionnaire Scale (MSLQ; Pintrich et al., 1991), Pintrich et al. (1993) found that scores assessing components of academic motivation (viz., intrinsic and extrinsic goal orientation, task value, control of learning beliefs, self-efficacy for learning and performance, and

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test anxiety) were significantly associated with final course grades in college students.

However, in a university context that values not only the knowledge acquisition of the student body but also the intrinsic engagement in the learning process (Koenka, 2020), a certain level of adjustment is required from students to maintain motivation when inherent difficulties appear (Broughman et al., 2009; Evans & Kelly, 2004).

In this context, the role of motivational components in the psychological adjustment of students has also been highlighted (e.g., anxiety, depression symptoms, and suicidal risk; Klibert et al., 2011; Tao et al., 2000; Wang, 2012). For example, a study of 537 undergraduate students in North China reported that intrinsic goal orientation was negatively related to depression symptoms and anxiety (Huang et al., 2016) and provided life satisfaction (Garriott et al., 2015).

Nonetheless, whether academic motivational components represent the most robust set of predictors for researchers to consider when attempting to account for adjustment in a university context remains unclear (Baker, 2003). As skills for maintaining an adequate level of engagement are necessary when problems occur in this context, activating adaptive strategies in uncertain situations (Asimopoulos et al., 2018). Findings from studies on social problem solving, defined as a self-initiated cognitive–emotional–behavioral process in which individuals engage to solve real-life everyday problems (D'Zurilla et al., 2004) have also demonstrated a consistent association with psychological adjustment (Chang, 2017; Hasegawa et al., 2015).

This ability to solve social problems comprises two major components, namely, problem orientation and problem-solving skills (Nezu et al., 2013). Problem orientation is the generalized response that an individual applies to new problematic situations, which includes appraisals and expectations of problems. These appraisals have a functional dimension when an individual tends to view a problem as a challenge (positive problem orientation [PPO]) and a dysfunctional dimension when an individual tends to perceive a problem as a threat (negative problem orientation [NPO]).

The second component, problem-solving skills, analyzes the problem-solving styles, such as, rational problem solving (RPS), impulsive/carelessness style (ICS), and avoidance style (AS). The constructive dimension (i.e., RPS) implies a systematic, skillful application of problem-solving techniques. The dysfunctional dimension implies ineffective patterns, such that problem-solving strategies are applied quickly and thoughtlessly in ICS and by procrastination, passivity, and dependency in AS.

Each aforementioned component is related to psychological adjustment. Specifically, the dysfunctional dimensions (NPO, ICS, and AS) are related to psychological distress, including anxiety (Bedel, 2015) and depression (Calvete & Cardeñoso, 2005; Chang, 2017; de la Fuente et al., 2019; Hasegawa et al., 2015; Siu & Shek, 2010). Conversely, the functional dimensions are positively related to life satisfaction (Dreer et al., 2005; Hamarta, 2009).

Because of the diverse problematic situations experienced in academic life, such as academic overload (Evans & Kelly, 2004), preparing for oral presentations, and managing problems that arise in group work (Larruzea-Urkixo et al., 2020), it would be beneficial to know if the problem-solving ability used in the university context affects students' general adjustment, beyond what is accounted for academic motivation. Conceptually, social problem solving (D'Zurilla et al., 2002) and academic motivation (Pintrich et al., 1991) should facilitate individuals' ability to achieve desired goals and adequate solutions. Thus, as an explanatory variable, social problem-solving ability might be tantamount to, or even surpass, academic motivation in the psychological adjustment of college students.

Purpose

Based on those concerns and limitations, this study examines the (1) relationships between academic motivation, social problem-solving ability in the academic context, and psychological adjustment (viz., life satisfaction and depressive symptoms) in a sample of college students; (2) predicting role of each component of academic motivation in psychological adjustment, and (3) incremental utility of social problem-solving ability in predicting psychological adjustment in an academic context, beyond what is accounted for in academic motivation.

We proposed three hypotheses in this study. First, in accordance with previous studies (D'Zurilla et al., 2002; Pintrich et al., 1991), we hypothesized that academic motivation is associated with social problem-solving components. For example, academic motivation involving self-efficacy for learning and performance and intrinsic goal orientation would be positively associated with viewing problems as solvable (PPO), whereas test anxiety would be positively associated with viewing problems as unsolvable (NPO). Similarly, in line with studies on academic motivation and social problem-solving ability (Hasegawa et al., 2015; Tao et al., 2000), we expected that these variables would show significant associations with psychological adjustment in college students.

Second, beyond those foreseeable associations, and according to the findings in the literature (Pintrich & De Groot, 1990; Van Nguyen et al., 2015), we hypothesized that academic motivation could account for a significant amount of variance in psychological adjustment. Although all components of academic motivation were expected to be

significant in predicting such associations, we expected self-efficacy for learning and performance and intrinsic goal orientation to have a crucial role (Pintrich & De Groot, 1990; Pintrich et al., 1991).

Finally, we hypothesized that the inclusion of social problem-solving ability might increase the prediction of psychological adjustment in college students, beyond what is accounted for by academic motivation. Specifically, we expected functional dimensions (PPO and RPS) to be important predictors of psychological adjustment (Dreer et al., 2005; Hamarta, 2009) and dysfunctional dimensions (NPO, ICS, and AS) as predictors of depressive symptoms (Calvete & Cardeñoso, 2005; Hasegawa et al., 2015; Siu & Shek, 2010).

Methods

Participants

The researchers met 421 students pursuing a social education degree from two faculties and four academic courses of the University of the Basque Country, in Northern Spain. Of a sample of 421 participants, 253 participant's answers were valid; the other participants' answers were excluded because of missing data. The final sample size corresponded to the standards for the representation of the total sample with a 5% error margin (Morales-Vallejo, 2008). The final sample included 253 students (197 women and 56 men), aged from 18 to 36 years, with a mean of 21.3 years ($SD = 3.2$).

Measures

Academic motivation To assess academic motivation from a multidimensional approach, we used the concerning section of a self-reported instrument, that is, MSLQ (Pintrich et al., 1991). MSLQ was designed to assess college student motivational orientation and learning strategies on the basis of a general cognitive view of motivation and learning, in which the student represents an active processor of information whose beliefs and cognitions are important mediators of instructional input (Pintrich et al., 1993). This motivational section comprises 31-items based on three general motivational constructs (Pintrich, 1989) that are expectancy, value, and affect. In expectancy components, two subscales were used: *Self-efficacy for Learning and Performance* (expectancy for success and self-efficacy; 8 items, $\alpha = 0.82$) and *Control of Learning Beliefs* (students' beliefs about the positive outcomes of their efforts to learn; 4 items, $\alpha = 0.54$). In the value components, three subscales were used: *Intrinsic Goal Orientation* (motivation based on challenges, curiosity, or mastery; 4 items, $\alpha = 0.64$), *Extrinsic Goal Orientation* (motivation based on grades, rewards, evaluation by others, and competition; 4 items, $\alpha = 0.72$), and *Task Value* (the usefulness of the task for the student; 6 items; $\alpha = 0.84$). Finally, the affect construct was based on *Test Anxiety* (worry and preoccupation with performance; 5 items, $\alpha = 0.82$). The Cronbach's alpha coefficients of each scale in this study were in line with the results obtained when MSLQ was validated (Pintrich et al., 1993), considering each dimension as an indispensable part of the instrument. Participants were asked to rate items on a 7-point Likert-type scale ranging from 1 (*not at all true for me*) to 7 (*extremely true for me*). We used the Spanish adapted version of MSLQ (Ramírez et al., 2013).

Social problem solving To assess social problem-solving ability in the academic context, we used the Social Problem-Solving Inventory-Revised: Short Form (SPSI-R-SF; D'Zurilla et al., 2002) in its Spanish version (Calvete & Cardeñoso, 2001). The students were asked to complete it by focusing only on academic problems, not on any other type of problem in daily life. The SPSI-R-SF is a 25-item measure of real-life problem-solving ability and is based on the original Social Problem-Solving Inventory (D'Zurilla & Nezu, 1990). It comprises two functional scales—(a) *Positive Problem Orientation* (e.g., "When I have a problem, I usually believe that there is a solution to it"; $\alpha = 0.62$) and (b) *Rational Problem Solving* (e.g., "When I have a problem to solve, one of the first things I do is get as many facts about the problem as possible"; $\alpha = 0.69$)—and three dysfunctional scales: (c) *Negative Problem Orientation* (e.g., "When my first efforts to solve problem fail, I get very frustrated"; $\alpha = 0.79$), (d) *Impulsivity/Carelessness Style* (e.g., "When making decisions, I do not evaluate all my options carefully enough"; $\alpha = 0.75$), and (e) *Avoidance Style* (e.g., "I wait to see if a problem will resolve itself first, before attempting to solve it myself"; $\alpha = 0.81$). The Cronbach's alpha coefficient of each subscale was consistent with the results in the validation of the instrument (Calvete & Cardeñoso, 2001; D'Zurilla et al., 2002). Participants were asked to indicate their agreement for each item across a 5-point Likert-type scale ranging from 0 (*not at all true of me)* to 4 (*very true of me*). We used an adapted Spanish version of the SPSI-R-SF (Calvete & Cardeñoso, 2001).

Psychological adjustment To assess the psychological adjustment, we employed the Satisfaction Life Scale (SWLS; Diener et al., 1985) and the Beck Depression Inventory-II (BDI-II; Beck et al., 1996).

SWLS is a 5-item measure of global life satisfaction or personal satisfaction with life as a whole (e.g., "I am satisfied with my life"). We asked participants to rate their level of agreement with the items across a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). We

used the Spanish version of SWLS (Atienza et al., 2000). In this study, in line with the version used, the Cronbach's alpha coefficient reported was 0.83. The higher the score on SWLS, the greater the life satisfaction.

BDI-II is a commonly used 21-item self-report measure of depressive symptomatology. We asked the participants to rate the extent to which they have experienced specific depressive symptoms in the past two weeks across a 4-point Likert-type scale (e.g., "*0 = I am not disappointed in myself*" *to 3 = "I hate myself*"). We used an adapted Spanish version of BDI-II (Sanz & Vazquez, 2011); Cronbach's alpha coefficient was 0.87. High scores in BDI-II are indicative of great depressive symptoms.

Procedures

All procedures performed in the investigation involving human participants were accepted by the Human Research Ethics Committee of the Research and Teaching Ethics Committee of the University of the Basque Country.

As the first step of the recruitment, the researchers contacted the social education teacher to permit us to explain the study to the students during their break. All students interested in participating in the study completed a survey comprising an informed consent form, questionnaires with instructions based on the version of the instrument used (i.e., SPSI-R-SF, MSLQ, SWLS, and BDI-II), and a demographic questionnaire. The written informed consent indicated that all responses would remain confidential and that the participants would have access to the results. The subsequent analysis of the results was performed using SPSS Version 26.

Results

To develop the analyses, we checked the data for the violation of normality, linearity, homoscedasticity, and collinearity (Merino & Díaz, 2005). No evidence was found for the violation of the assumptions.

To fulfill the first objective of this study, we analyzed the relationship between the variables using Pearson correlations (Vargas, 2007). The coefficients, means, and standard deviations for all study measures are presented in Table 1. First, intrinsic goal orientation and self-efficacy for learning and performance positively correlated with the two functional components of problem solving: PPO ($r = 0.29$ and $r = 0.31$, $p < 0.001$) and RPS ($r = 0.32$ and $r = 0.25$, $p < 0.001$). By contrast, that relation was negative with NPO ($r = -0.22$ and $r = -0.32$, $p < 0.001$). Similarly, test anxiety correlated with NPO ($r = -0.46$, $p < 0.001$).

Second, all measures were significantly related to psychological adjustment. NPO had the highest correlation with life satisfaction ($r = -35$, $p < 0.001$) and depressive symptoms ($r = 0.49$, $p < 0.001$). Life satisfaction also positively correlated with intrinsic goal orientation, self-efficacy for learning and performance, task value, PPO and RPS ($rs = 0.17$ to 0.31, $p < 0.001$); this relation was negative with test anxiety and AS ($r = -25$, $p < 0.001$ and $r = -0.20$, $p < 0.01$). Depressive symptoms were positively related to test anxiety and AS ($r = 0.32$ and $r = 0.26$, $p < 0.001$), and the relation was negative with intrinsic goal orientation, task value, self-efficacy for learning and performance PPO and RPS ($rs = -0.14$ to -0.33, $p < 0.05$ and $p < 0.001$).

Beyond academic motivation, is social problem solving a predictor of psychological adjustment in the university area?

To fulfill the second and third objectives of this study, we conducted a series of hierarchical regression analyses to determine the amount of variance of academic motivation in predicting psychological adjustment (viz., life satisfaction and depressive symptoms) and the additional amount of variance of social problem-solving ability in predicting them (Table 2). For each regression model, we controlled for demographic factors, namely, age and sex, in the first step. Next, based on the multidimensional approach of academic motivation, all six dimensions were entered in the second step. Finally, to analyze the incremental utility of social problem-solving ability, beyond academic motivation, we entered the five dimensions of social problem solving in the third step. To determine whether any predictors accounted for a small, medium, or large amount of variance in functioning, we used Cohen's (1977) convention for small ($f^2 = 0.02$), medium ($f^2 = 0.15$), and large effects ($f^2 = 0.35$).

In predicting life satisfaction, independent of demographic factors, academic motivation was observed to have a medium amount ($f^2 = 0.19$) 16% of variance in life satisfaction, $F(6, 244) = 7.62$, $p < 0.001$. This result was driven by intrinsic goal orientation ($\beta = 0.17$, $p < 0.05$), self-efficacy for learning and performance ($\beta = 0.17$, $p < 0.05$), and test anxiety ($\beta = -0.14$, $p < 0.05$). Finally, when social problem solving was entered in the third step, a small amount ($f^2 = 0.09$) 9% of additional variance in life satisfaction, $F(5, 239) = 5.87$, $p < 0.001$, was observed. This result was driven by PPO ($\beta = 0.21$, $p < 0.01$) and NPO ($\beta = -0.26$, $p < 0.001$). The full prediction model including demographic variables, academic motivation, and social problem solving accounted for a large amount ($f^2 = 0.33$) 25%) of variance in life satisfaction, $F(13, 239) = 2.07$, $p < 0.001$.

At the time of predicting depressive symptoms, independent of demographic factors, academic motivation accounted for a medium amount ($f^2 = 0.21$) 18% of variance in depressive symptoms, $F(6, 244) = 8.75$, $p < 0.001$. This result was determined by self-efficacy for learning and performance ($\beta = -0.24$, $p < 0.01$) and test anxiety ($\beta = 0.21$, $p < 0.01$).

Table 1 Correlations between Academic Motivation, Social Problem Solving, and Psychological Adjustment in College Students

Measures	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Intrinsic Goal Orientation	–												
2. Extrinsic Goal Orientation	.11	–											
3. Task Value	.45***	.22***	–										
4. Control of Learning Beliefs	.25***	.27***	.42***	–									
5. Self-Efficacy	.52***	.13*	.40***	.35***	–								
6. Test Anxiety	−.10	.37***	.04	.07	−.31***	–							
7. Positive Problem Orientation	.29***	.00	.02	.10	.31***	−.06	–						
8. Negative Problem Orientation	−.22***	.17**	−.02	−.02	−.32***	.46***	−.08	–					
9. Rational Problem Solving	.32***	.09	.08	.10	.25***	−.09	.38***	−.02	–				
10. Impulsivity/Carelessness Style	−.04	.01	−.06	−.01	−.05	.07	.27***	.20***	−.16**	–			
11. Avoidance Style	−.23***	−.00	−.08	.05	−.15*	.06	−.08	.44***	−.05	.33***	–		
12. Life Satisfaction	.28***	−.12	.17**	.11	.31***	−.25***	.28***	−.35***	.17**	−.05	−.20**	–	
13. Depressive Symptoms	−.23***	.12	−.14*	−.03	−.33***	.32***	−.23***	.49***	−.15*	.04	.26***	−.62***	–
M	21.70	14.21	27.40	18.30	41.75	20.47	12.60	7.42	11.02	6.34	4.16	18.42	28.79
SD	3.81	5.51	6.99	4.05	6.71	7.50	2.47	3.77	3.41	3.89	3.58	3.99	6.73
α	.64	.72	.84	.54	.82	.82	.62	.79	.69	.75	.81	.83	.87

$N = 253$. Self-Efficacy = Self-Efficacy for Learning and Performance

*$p < .05$. ** $p < .01$. ***$p \leq .001$

Table 2 Results of Hierarchical Regression Analyses Showing the Amount of Variance in Psychological Adjustment Accounted for by Academic Motivation and Social Problem Solving, Controlling for Age and Sex

Outcome and Measure	β	R^2	ΔR^2	F	p
Life Satisfaction					
Step 1: Demographic Variables		.00	–	.16	*n.s*
Age	−.04				
Sex	−.02				
Step 2: Academic Motivation		.16	.16	7.62	< .001
Intrinsic Goal Orientation	.17*				
Extrinsic Goal Orientation	−.13				
Task Value	.04				
Control of Learning Beliefs	.03				
Self-Efficacy	.17*				
Test Anxiety	−.14*				
Step 3: Social Problem Solving			.09	5.87	< .001
Positive Problem Orientation	.21**				
Negative Problem Orientation	−.26***				
Rational Problem Solving	.05				
Impulsivity/Carelessness Style	−.02				
Avoidance Style	−.03				
Depressive Symptoms					
Step 1: Demographic Variables		.00	–	.41	*n.s*
Age	−.00				
Sex	.06				
Step 2: Academic Motivation		.18	.18	8.75	< .001
Intrinsic Goal Orientation	−.08				
Extrinsic Goal Orientation	.08				
Task Value	−.06				
Control of Learning Beliefs	.06				
Self-Efficacy	−.24**				
Test Anxiety	.21**				
Step 3: Social Problem Solving		.33	.15	10.60	< .001
Positive Problem Orientation	−.11				
Negative Problem Orientation	.41***				
Rational Problem Solving	−.09				
Impulsivity/Carelessness Style	−.07				
Avoidance Style	.06				

$N = 253$. Self-Efficacy = Self-Efficacy for Learning and Performance
*$p \leq .05$. **$p < .01$. ***$p \leq .001$

Finally, when social problem solving was included, a medium amount ($f^2 = 0.17$) 15% of additional variance in depressive symptoms, $F(5, 239) = 10.60$, $p < 0.001$, was observed. The full prediction model including demographic variables, academic motivation, and social problem solving accounted for a large amount ($f^2 = 0.43$) 33% of variance in depressive symptoms, $F(13, 239) = 8.97$, $p < 0.001$.

Discussion

Considering the importance of academic motivation and social problem-solving ability in the diverse situations inherent in the learning process of college students, we conducted this study to deepen the role of each variable in the academic context, specifically in the social problem-solving ability beyond academic motivation.

First, correlations between all variables were analyzed and found to be consistent with what we hypothesized. The results indicated that intrinsic goal orientation and self-efficacy for learning and performance were positively related to PPO and RPS and negatively to NPO and AS. Additionally, test anxiety correlated with NPO similar to the general anxiety studies (Calvete & Cardeñoso, 2001; Kant et al., 1997).

Second, concerning psychological adjustment in the university context, the patterns of correlations were in line with those in the literature (Dreer et al., 2005; Hamarta, 2009) and with what we hypothesized. Life satisfaction was positively related to the functional dimensions of social problem-solving ability and academic motivation (e.g., intrinsic goal orientation, self-efficacy for learning and performance, task value, PPO, and RPS), while depressive symptoms to the dysfunctional dimensions (e.g., test anxiety, NPO, and AS).

These findings demonstrate the relationship between motivation and social problem solving and the psycological adjustment of university students. Moreover, our findings suggest that social problem-solving ability is important in the adjustment of the university student body.

Is social problem solving, beyond academic motivation, a predictor of psychological adjustment in the university area?

Evidenced has supported the relationships of D'Zurilla's model (D'Zurilla et al., 2002) of social problem solving and Pintrich's multidimensional approach of academic motivation (Pintrich et al., 1991) to psychological adjustment. Our study further analyzes the predicting role of each component in university life, specifically that in the social problem-solving ability role.

In line with the literature and our hypotheses, the outcomes demonstrate that the motivational components have a significant role in predicting the psychological adjustment of college students (Klibert et al., 2011; Wang, 2012). The results demonstrated, as we expected, a significant influence of intrinsic goal orientation and

self-efficacy for learning and performance (Cabanach et al., 2010; Chemers et al., 2001; Garriott et al., 2015; Weinstein & Ryan, 2010). Even if it was not expected, the results of this study have enhanced the important role of test anxiety as an affect that significantly impairs student adjustment to academic tasks (Pintrich & De Groot, 1990). Additionally, these results highlight more than the role of intrinsic and extrinsic goal orientation (Liu et al., 2020; Osborne & Jones, 2011); they emphasize the need to understand motivation from a multidimensional perspective (Pintrich, 2004). From that, the complexity of the role of motivation in student adjustment in the academic context would be accepted, considering the predictive role of the constructs centered on value, expectancy, and affect (Pintrich, 1989).

Beyond what was predicted by the motivational components, in line with expectations, this investigation proved the added value of social problem-solving ability in predicting the psychological adjustment of college students. The results highlight the importance of student's orientation of academic problems to adjust optimally in the university area, unexpectedly not emphasizing the role of the problem-solving style. Similarly, these results are consistent with studies that have proved that the means used to evaluate daily problems, visualizing them as challenges or as threats, altered the overall adjustment of the population (Calvete & Cardeñoso, 2005; Hasegawa et al., 2015; Siu & Shek, 2010). Although NPO is the most robust predictor of student psychological adjustment (de la Fuente et al., 2019; Robichaud & Dugas, 2005), the outcomes indicate the relevant role of the positive orientation of the problem (Dreer et al., 2005; Hamarta, 2009). Notably, in this study, PPO obtained the predictive role in life satisfaction, emphasizing that to see the process as a challenge while learning from it (Nezu et al., 2013) could push the student body toward an adjustment in the university context; however, it would insufficient to minimize the impact of depressive symptomatology.

Assessing these results from an educational perspective highlights the added influence that social problem-solving ability training can have on students' well-being. In particular, train based on PPO can help students cope with problems that may arise during academic activities by approaching such situations from a functional prism wherein the solvable nature of the problems would be accepted (Chang, 2017; Nezu et al., 2013), avoiding the visualization of the systematic threat. The aforementioned prism promotes commitment and control of the resolution process, providing habits and tools for students to avoid dysfunctional tendencies and their psychological consequences (Calvete & Cardeñoso, 2005; Chang, 2017; De la Fuente et al., 2019). Social problem-solving ability training could be enhanced with training involving the motivational components to ensure persistent solving process to achieve an adequate adjustment.

By understanding the university not only as a context in which to acquire theoretical knowledge but also a context to grow personally and socially (Lee et al., 2019) while experiencing constant social change, the influence of the training of variables we studied could be understood in a more global manner. Beyond influencing student adjustment in academic contexts, it could also provide tools for various situations in students' daily life. Skills obtained through academic experiences could provide tools that enhance student well-being, increasing their healthy outlook on future professional and personal challenges (Fortune, 1984).

Limitations

This study provides important findings on the role of social problem-solving ability in college student adjustment, beyond what is accounted for in academic motivation; yet, it has limitations. First, the findings are limited to the convenience sample of college students. Thus, because the results of this investigation might vary across ages, analyzing students in different age ranges (e.g., adolescents in secondary school) could provide further insights. Second, this research focuses on Spanish college students; thus, because some studies have remarked on the variation of results in different cultural groups (Hirsch et al., 2012), it would be beneficial to know if similar findings could emerge from examining other ethnic and cultural groups (e.g., those in the United States, China, and France). Finally, this study focuses on life satisfaction and depressive symptoms in college students; therefore, it would be beneficial to determine whether the predicting results we demonstrated could be replicated with other specific psychological outcomes in the academic area (e.g., anxiety and stress).

Conclusion

The results of this study are the first to imply the role of social problem-solving ability in the academic context while focusing on predicting student adjustment, beyond academic motivation. Broadly, our findings reveal the added predicting role of social problem-solving appraisal in students' adjustment (i.e., life satisfaction and depressive symptoms) to university life. Specifically, college students with a tendency to perceive everyday problems as a threat are at a great risk for depression and have less sense of life satisfaction. By contrast, PPO has been observed to be a relevant component that boosts college students' adjustment. The results of this study demonstrate the importance of social problem-solving ability training and highlight the significance of employing it in conjunction with the value, expectancy, and affect components of motivation to improve students' academic

adjustment. From a general viewpoint, understanding the university as a basis for individual growth, working on the components highlighted in this study could also increase the possibilities of adjustment in different future environments, facilitating the well-being of future professionals.

Funding Open Access funding provided thanks to the CRUE-CSIC agreement with Springer Nature. No funding was received for conducting this study.

Data availability The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Code availability Not applicable.

Declarations

Ethics approval All procedures performed in the study involving human participants are in accordance with the ethical standards of the responsible Committee on Human Experimentation and with the Helsinki Declaration of 1975, as revised in 2000.

Consent to participate Informed consent was obtained from all individual participants included in the study.

Conflicts of interest The authors have no relevant financial or non-financial interests to disclose.

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