Scientific Research Publishing

Psychology, 2019, 10, 1025-1042
http://www.scirp.org/journal/psych
ISSN Online: 2152-7199
ISSN Print: 2152-7180

A Need-Supportive Intervention Delivered to English Language Teachers in Colombia: A Pilot Investigation Based on Self-Determination Theory

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How to cite this paper: Niemiec, C. P., & Muñoz, A. (2019). A Need-Supportive Intervention Delivered to English Language Teachers in Colombia: A Pilot Investigation Based on Self-Determination Theory. *Psychology, 10,* 1025-1042.
https://doi.org/10.4236/psych.2019.107067

Received: February 27, 2019
Accepted: June 23, 2019
Published: June 26, 2019

Abstract

Teachers can be trained to support the basic psychological needs of their students. An important question is whether teachers in economically disadvantaged countries (Colombia, for example) who learn about the principles of need support can facilitate the process of internalization in their students. Using self-determination theory, in the present research we describe several outcomes associated with a pilot study of an intervention that was delivered to English language teachers in and around Medellín, Colombia. Results of this pilot investigation suggested that the students of teachers who were trained to adopt a need-supportive approach to education, relative to students of teachers in a control condition, reported higher levels of autonomy support from their English teacher and autonomous self-regulation for their English studies. Students' experiences of need satisfaction in English class statistically mediated some of the association between autonomous self-regulation for English studies and well-being in English class. These findings provide some initial evidence that English language teachers in economically disadvantaged countries such as Colombia who learn about the principles of need support can modify their pedagogic practice in a way that promotes autonomous (optimal) motivation in their students, with associated benefits for need satisfaction and well-being.

Keywords

Autonomous Self-Regulation, Autonomy Support, Need Satisfaction, Second-Language Learning, Self-Determination Theory, TESOL, Well-Being

1. Introduction

Organismic theorists in psychology (Ryan & Deci, 2002) recognize that by their nature, humans are proactive organisms who seek out opportunities for choice, mastery, and connection with important others. Indeed, such affordances are conducive to integration at the intrapersonal (autonomy) and interpersonal (homonomy) levels (Angyal, 1965), which forms the basis for full functioning and organismic wellness (cf. Niemiec & Ryan, 2013). In the education domain, this proactive nature often manifests as curiosity (Loewenstein, 1994), interest (Silvia, 2008), passion (Vallerand, 2010), and synthesis in knowledge (Ryan, 1995), among other positive experiences (cf. Niemiec & Ryan, 2009). These experiences, which reflect a natural love of learning among children, can be harnessed by teachers to facilitate conceptual understanding and psychological growth in the classroom. Yet all too often, teachers ignore these natural resources and, instead, apply a variety of contingencies to their students in an attempt to "make" learning occur. Thus, it is important to develop interventions through which teachers can learn to be supportive of their students' proactive nature. In what follows, we report outcomes associated with a pilot study of an intervention that was informed by self-determination theory and delivered to English language teachers in and around Medellín, Colombia.

1.1. Self-Determination Theory

Self-determination theory (SDT; Deci & Ryan, 2008; Niemiec, Ryan, & Deci, 2010; Ryan & Deci, 2017; Vansteenkiste, Niemiec, & Soenens, 2010) is an organismic approach to human motivation and emotion that has been applied to the education domain (Niemiec & Ryan, 2009; Ryan & Niemiec, 2009). From the perspective of SDT, there is a universal psychological content to human nature that, when supported, is conducive to health and integrated functioning. More specifically, at the core of SDT is the identification of three basic psychological needs for autonomy, competence, and relatedness that are defined as "innate psychological nutriments that are essential for ongoing psychological growth, integrity, and well-being" (Deci & Ryan, 2000: p. 229). The need for autonomy (de Charms, 1968) refers to the experience of behavior as freely chosen, volitional, and reflectively self-endorsed, rather than pressured and coerced by sources outside the self. The need for competence (White, 1959) refers to the experience of behavior as effective and masterful, rather than ineffective. The need for relatedness (Baumeister & Leary, 1995) refers to the experience of mutual support, care, and concern vis-à-vis important others, rather than disconnection and alienation. Importantly, research conducted within SDT has shown that support for and satisfaction of autonomy, competence, and relatedness confer benefits for all individuals, regardless of their gender, age, culture, or social status, which bespeaks the universal nature of these basic psychological needs (see Niemiec, Soenens, & Vansteenkiste, 2014).

Applying SDT to the education domain, Reeve (2002, 2006) suggested that

students often perceive support for satisfaction of the basic psychological needs when teachers provide learning activities that are consistent with students' inner motivational resources such as interests, values, and preferences. As discussed by Reeve (2009), an autonomy-supportive approach to education is defined as an interpersonal style and set of behaviors through which teachers create conditions for students' inner resources and experiences of volition to flourish. Reeve (2009) suggested that an autonomy-supportive approach to education is enabled by teachers' 1) assuming students' perspectives, 2) eliciting and acknowledging students' experiences, and 3) supporting students' capacities for choice and autonomous self-regulation. Moreover, Reeve (2009) suggested that autonomy-supportive teachers 1) support inner resources to motivate students, 2) provide an explanation for what students are asked to do in the classroom, 3) rely on non-controlling and informational language to prompt students' behavior, 4) allow for students to take time to arrive at the correct solution to a problem, and 5) accept students' expressions of unpleasant affect. Of interest, Reeve and Jang (2006) found that various autonomy-supportive instructional behaviors are positively associated with perceived autonomy among students in an experimental learning context. This finding is important because autonomy was associated with higher levels of student interest-enjoyment, engagement, and performance in that study.

Previous research conducted within SDT has shown that teachers' support for satisfaction of students' basic psychological needs for autonomy, competence, and relatedness is associated with various indices of psychological wellness, physical health, and academic functioning among their students. Early investigations revealed that teacher autonomy support reported by teachers (Deci, Schwartz, Sheinman, & Ryan, 1981) and students (Ryan & Grolnick, 1986) is associated with higher levels of intrinsic motivation, perceived competence, and self-esteem in students. As well, teacher autonomy support has been associated with higher levels of positive emotionality (Patrick, Skinner, & Connell, 1993), well-being (Black & Deci, 2000), engagement (Jang, Reeve, & Deci, 2010), conceptual understanding (Benware & Deci, 1984; Grolnick & Ryan, 1987), and school performance and intention to persist (Hardre & Reeve, 2003), and lower levels of dropout (Vallerand, Fortier, & Guay, 1997). Teacher autonomy support has been associated with higher levels of heart rate and emotional arousal (physiological indicators of positive engagement; Streb et al., 2015) as well as lower levels of salivary cortisol (a physiological indicator of stress; Reeve & Tseng, 2011), too. It is important to note that comparable findings have been observed among medical students (Williams & Deci, 1996; Williams, Saizow, Ross, & Deci, 1997), law students (Sheldon & Krieger, 2007), and students outside the US (Chirkov & Ryan, 2001).

From the perspective of SDT, the reason that need-supportive teachers promote adaptive educational outcomes is that such individuals facilitate internalization among their students (Deci & Ryan, 2000). Internalization is the natural, active process of coming to endorse the value of an important behavior that is

not inherently satisfying or enjoyable (Ryan, 1993), and studies using different methodologies have shown that support for the basic psychological needs is conducive to this process (Deci, Eghrari, Patrick, & Leone, 1994; Niemiec et al., 2006). According to SDT, the value of a behavior can be more or less internalized into the self, and therefore the reason for enacting the behavior can vary along an underlying continuum of relative autonomy. The least internalized (and, thus, the least autonomous) type of motivation is external regulation, in which the behavior is enacted to satisfy some external contingency. For instance, a student might study English to please parents or avoid criticism by others. The next type of motivation is introjected regulation, in which the behavior is enacted to satisfy some internal contingency. For instance, a student might study English to feel pride for being "good" or avoid shame for being "bad" in the classroom. External regulation and introjected regulation are experienced as relatively controlled. The next type of motivation is identified regulation, in which the behavior is enacted for reasons of personal value and importance. For instance, a student might study English because he or she finds the topic to be relevant and meaningful, as English affords the opportunity to communicate when in a foreign country. The most internalized type of motivation is integrated regulation, in which the value of the behavior is synthesized with other endorsed values and aspects of the self. For instance, a student might study English because doing so is necessary to live abroad, which aligns with his or her life goals and aspirations. Identified regulation, integrated regulation, and intrinsic motivation—in which the behavior is inherently satisfying and enjoyable (Ryan & Deci, 2000)—are experienced as relatively autonomous. It is important to note that controlled types of motivation are associated with adverse educational outcomes such as lower levels of engagement and comprehension in academic reading, whereas autonomous types of motivation are associated with adaptive educational outcomes (De Naeghel, Van Keer, Vansteenkiste, & Rosseel, 2012).

1.2. On the "Teachability" of Autonomy Support as a Motivational Strategy in the Classroom

Individuals in positions of responsibility, such as teachers, physicians, and managers, can be trained through intervention to support the autonomy of others, and this effect is particularly pronounced among teachers (Su & Reeve, 2011). In the first investigation of the "teachability" of autonomy support as a motivational strategy in the classroom, Reeve (1998) randomly assigned preservice teachers to training in either autonomy-supportive, controlling, or neutral motivational strategies. Varying by experimental condition, preservice teachers spent 45 minutes reading and working with a training booklet that presented the relevant motivational constructs, discussed the "how-to" of the motivational strategies, and offered scenarios as applications of the strategies to the classroom. Underscoring the malleability of teachers' motivational style, results showed that preservice teachers who received training in autonomy support endorsed such a style more than those in the controlling and neutral conditions, and this effect

persisted for at least one month. In a subsequent investigation, Reeve, Jang, Carrell, Jeon, and Barch (2004) randomly assigned high school teachers to receive training in autonomy-supportive instructional methods or to a delayed-treatment control group. High school teachers in the experimental group spent one hour learning how to be autonomy supportive toward students and additional time with independent study of a website on the principles of autonomy support in the classroom. Results showed that high school teachers who received training in autonomy support were rated objectively as displaying higher levels of autonomy support than those in the delayed-treatment control group. Also, students of teachers who received training in autonomy support were rated objectively as displaying higher levels of engagement than students of teachers in the delayed-treatment control group. Together, these studies suggest that teachers can learn to be autonomy supportive and that students benefit when their teachers are trained in the principles of autonomy support.

In the UK, McLachlan and Hagger (2010) randomly assigned university tutors to receive training in autonomy-supportive instructional methods or to a control group. University tutors in the experimental group spent 40 minutes over two sessions learning the key concepts of SDT, the benefits of autonomy support, and the behaviors associated with an autonomy-supportive style in the classroom, and they demonstrated how to enact these behaviors and received feedback from the researchers. Results showed that university tutors who received training in autonomy support self-reported somewhat higher levels of autonomy support toward their students. Also, university tutors who received training in autonomy support had students who spent more time speaking in class, and issued fewer directives and comments to their students. In a French-speaking province in Canada, Guay, Valois, Falardeau, and Lessard (2016) randomly assigned schools to receive a professional development program based on SDT or to a control group. Second-grade teachers in the experimental schools spent two days learning about inner motivational resources (viz., types of motivation, perceived competence, and perceived relatedness), receiving information on five pedagogical practices that form the basis of the program (viz., collaboration, authentic activities, structure, involvement, and support for autonomy), and focusing on their perceived competence to enact those practices. Results revealed medium-to-large effect sizes of the intervention on four of the five pedagogical practices; that is, second-grade teachers in the experimental schools were rated objectively as using more collaboration, authentic activities, involvement, and support for autonomy. (It is important to note that none of the effect sizes were statistically significant with Bonferroni adjustment, which likely was due to a lack of statistical power.) As well, students of second-grade teachers in the experimental schools reported higher levels of intrinsic motivation and had higher levels of writing achievement. Together, these studies provide further support for the malleability of teachers' motivational style, and suggest that successful interventions can be developed and delivered to teachers outside the US.

1.3. The Colombian Context

One of the more intriguing aspects of the current study is the cultural context in which the research occurred, namely, in and around Medellín, Colombia. According to the Organisation for Economic Co-Operation and Development (OECD, 2016), Colombia is a large, populous country in Latin America that is plagued by poverty and inequality. Across socioeconomic status levels, these factors contribute to inequities in access to and quality of education, as well as school life expectancy. Moreover, those students who remain in the Colombian education system at age 15 perform well below their peers in cross-national assessments. Amid this educational landscape, it is interesting to note that although second-language teachers in Medellín, Colombia understand the educational benefits associated with support for autonomy, competence, and relatedness, this recognition may not translate into a need-supportive approach to education (Muñoz & Ramirez, 2015). Therefore, it is important to develop interventions through which teachers can learn to be supportive of their students' basic psychological needs in order to facilitate adaptive educational outcomes in their students.

Also, an important question is whether teachers in economically disadvantaged countries (Colombia, for example) who learn about SDT and the principles of need support can facilitate the process of internalization in their students. Such a question is important to begin to answer because within SDT, internalization is theorized to be the mechanism by which need-supportive teachers promote adaptive educational outcomes in their students (Niemiec & Ryan, 2009). To be sure, interventions that are informed by SDT have been shown to promote autonomous self-regulation in students (Chatzisarantis & Hagger, 2009; Cheon & Moon, 2010; Cheon & Reeve, 2013; Cheon, Reeve, & Moon, 2012; Moustaka, Vlachopoulos, Kabitsis, & Theodorakis, 2012), yet these studies were conducted solely in the context of physical education. Accordingly, it is important to examine whether teachers of academic subjects other than physical education who learn about SDT and the principles of need support can facilitate internalization in their students.

1.4. The Present Research

In the present research, we describe several outcomes associated with a pilot study of an intervention that was informed by SDT and delivered to English language teachers in and around Medellín, Colombia. The primary aim of the intervention was to train teachers to adopt a need-supportive approach to education and examine students' perceptions of autonomy support from their English teacher and experiences of autonomous self-regulation (or, internalization) for their English studies. The secondary aim of the intervention was to examine a process model whereby students' autonomous self-regulation for their English studies is associated with higher levels of well-being in English class via their experiences of need satisfaction in English class.

We specified three hypotheses based on the literature reviewed above:

Hypothesis 1. The students of teachers who were trained to adopt a need-supportive approach to education, relative to the students of teachers in the control condition, will report higher levels of autonomy support from their English teacher.

Hypothesis 2. The students of teachers who were trained to adopt a need-supportive approach to education, relative to the students of teachers in the control condition, will report higher levels of autonomous self-regulation for their English studies.

Hypothesis 3. Students' experiences of need satisfaction in English class will explain some of the association between autonomous self-regulation for English studies and well-being in English class.

2. Method

2.1. Participants and Procedure

Participants were 14 (5 female, 9 male) teachers and 167 of their students. The teachers worked in 4 different Sislenguas schools located in and around Medellín, Colombia. As a part of Universidad EAFIT, Sislenguas is an outsourcing program for English language teaching in both private and public schools. With more than 90 second-language teachers, Sislenguas serves more than 7300 students from early childhood through high school in 14 educational institutions. With consideration given to demographic similarity, we selected 4 (of 7) private schools in Sislenguas that were comparable in class size (10 - 15 students per class), gender (all female students), age (14 - 16 year old students), approach to teaching language (communicative), level of proficiency (A2; Common European Framework of Reference), and socioeconomic status (middle). Schools and their English language teachers were allocated either to the intervention condition (2 schools with 7 teachers) or to the control condition (2 schools with 7 teachers). This study was approved by the Department of Research at Universidad EAFIT, and informed consent was obtained from both teachers and parents of students prior to study participation.

The intervention, which provided teachers with information on SDT and the principles of need support, consisted of 3 components offered over 3 weeks. The first component was a 6-hour course delivered in English by the second author. Herein, teachers learned the basic principles of SDT, including information on the different types of motivation, need support versus control as approaches to education, and the beneficial correlates of autonomy support in the classroom. As well, teachers learned the definitions (with illustrations) of 3 need-supportive strategies that they would be asked to enact in their instruction, namely, provide choices and meaningful rationales, acknowledge unpleasant affect, and use non-controlling language. Finally, the teachers engaged in discussion on the feasibility and utility of an autonomy-supportive approach to education, as well as anticipated obstacles associated with this approach. The second component was

a 3-hour workshop delivered in English by the first author. Herein, teachers engaged in discussion on the issues of motivation and engagement in the classroom, were presented with an overview of SDT and application of SDT to education practice with specific focus on autonomous self-regulation, and learned ways that educators can provide support for their students' autonomy, competence, and relatedness. Finally, the teachers composed written narratives about their most engaged and their most disengaged students, identified themes that represent support (or lack thereof) for the basic psychological needs in those narratives, and considered ways to provide support for those needs in the classroom. The third component was a 1.5-hour session facilitated in English by the first and second authors. Herein, teachers took turns presenting a 10-minute lesson to the other teachers who represented a mock classroom audience. Members of the mock classroom audience were encouraged to roleplay "typical" students encountered in Sislenguas schools, and following each 10-minute lesson the first author offered constructive feedback on ways through which the teacher could provide support for autonomy, competence, and relatedness to their students (for a similar approach, see Aelterman, Vansteenkiste, Van den Berghe, De Meyer, & Haerens, 2014). The control condition did not receive any training during the study period.

2.2. Measures

All measures were completed by students at 5.5 weeks post-intervention.

Autonomy support. The modified version of the Health Care Climate Questionnaire (Williams, Grow, Freedman, Ryan, & Deci, 1996) assessed students' perceptions of autonomy support from their English teacher (3 items; e.g., I feel that my teacher provides me with choices and options). Responses were made on a 3-point scale from 1 (*not at all true*) to 3 (*very much true*). The reliability for this measure was $\alpha = .71$.

Autonomous self-regulation. The modified version of the Self-Regulation Questionnaire (Ryan & Connell, 1989) presented participants with the following stem: "I am involved with my English class because…" Participants rated preselected responses that assessed external (1 item; Others get mad if I am not involved with my class), introjected (1 item; I feel guilty if I am not involved with my class), identified (1 item; I value being involved with my class), and intrinsic (1 item; I enjoy being involved with my class) types of motivation. Responses were made on a 3-point scale from 1 (*not at all true*) to 3 (*very much true*).

Basic psychological need satisfaction. The Need Satisfaction Scale (La Guardia, Ryan, Couchman, & Deci, 2000) assessed students' satisfaction of autonomy (3 items; I feel free to be who I am), competence (3 items; I feel like a competent person), and relatedness (3 items; I feel cared about by others) in English class. Responses were made on a 3-point scale from 1 (*not at all true*) to 3 (*very much true*). The reliability for this measure was $\alpha = .75$.

Well-being. We operationalized well-being as the presence of vitality and

positive affect, and the absence of negative affect. All analyses were performed using this composite measure of well-being, which was derived from standardized estimates of these variables. Intercorrelations among the measures of vitality, positive affect, and negative affect appear in **Table 1**.

The Subjective Vitality Scale (Ryan & Frederick, 1997) assessed students' experience of positive energy in English class (3 items; I have energy and spirit). Responses were made on a 3-point scale from 1 (*not at all true*) to 3 (*very much true*). The reliability for this measure was $\alpha = .92$.

The Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988) assessed students' experiences of positive emotions (3 items; I feel interested) and negative emotions (3 items; I feel distressed) in English class. Responses were made on a 3-point scale from 1 (*not at all true*) to 3 (*very much true*). The items for the negative affect subscale were reverse scored and combined with the items for the positive affect subscale. The reliability for this measure was $\alpha = .76$.

2.3. Analytic Overview

Independent-samples *t*-tests were used to test for between-group differences in autonomy support and autonomous self-regulation (Hypotheses 1 - 2). The MACRO discussed in Preacher and Hayes (2004) was used to test for an unconditional indirect effect of students' experiences of autonomous self-regulation for English studies on well-being in English class through their need satisfaction in English class (Hypothesis 3).

3. Results

3.1. Preliminary Analyses

Table 1 presents means, standard deviations, and intercorrelations for the study variables.

Correlation analyses confirmed the quasi-simplex pattern of the four types of motivation assessed by the Self-Regulation Questionnaire (Ryan & Connell, 1989), as intrinsic motivation related positively to identified regulation ($r = .65$), was unrelated to introjected regulation ($r = .07$), and related negatively to external regulation ($r = -.16$); identified regulation was unrelated to introjected regulation ($r = .12$) and external regulation ($r = -.09$); and introjected regulation related positively to external regulation ($r = .17$). As has been done in previous research (Ryan & Connell, 1989; Soenens, Vansteenkiste, & Niemiec, 2009), we applied weights of +2, +1, −1, and −2 to intrinsic motivation, identified regulation, introjected regulation, and external regulation, respectively. After doing so, we summed these weighted scores to create a composite measure of autonomous self-regulation for English studies.

3.2. Primary Analyses

Hypothesis 1 stated that students of teachers who were trained to adopt a need-supportive approach to education, relative to students of teachers in the

Table 1. Means, standard deviations, and intercorrelations for the study variables.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1) Autonomy support	-													
2) External regulation	−.09	-												
3) Introjected regulation	.07	.17*	-											
4) Identified regulation	.32***	−.09	.12	-										
5) Intrinsic motivation	.38***	−.16*	.07	.65***	-									
6) Autonomous self-regulation	.35***	−.53***	−.24***	.70***	.86***	-								
7) Autonomy need satisfaction	.56***	−.19*	.09	.26***	.42***	.39***	-							
8) Competence need satisfaction	.27***	−.23**	.16*	.26***	.29***	.30***	.48***	-						
9) Relatedness need satisfaction	.31***	−.13	.02	.26***	.25***	.28***	.42***	.34***	-					
10) Basic psychological need satisfaction	.48***	−.24**	.13	.34***	.42***	.42***	.81***	.75***	.77***	-				
11) Subjective vitality	.58***	.01	.10	.36***	.55***	.42***	.60***	.27***	.34***	.52***	-			
12) Positive affect	.51***	.04	.08	.41***	.56***	.44***	.51***	.25**	.29***	.45***	.85***	-		
13) Negative affect	−.33***	.16*	.07	−.19*	−.44***	−.41***	−.59***	−.31***	−.29***	−.53***	−.47***	−.42***	-	
14) Well-being	.58***	−.02	.06	.38***	.61***	.49***	.66***	.31***	.37***	.58***	.95***	.91***	−.67***	-
M	2.56	1.09	1.26	2.48	2.41	3.86	2.59	2.59	2.42	7.62	2.37	2.38	1.34	−.01
SD	.50	.36	.52	.57	.65	2.04	.49	.46	.54	1.15	.68	.57	.44	1.91

Notes. The following variables are composite measures: Autonomous self-regulation, Basic psychological need satisfaction, and Well-being. *$p < .05$, **$p < .01$, ***$p < .001$

control condition, will report higher levels of autonomy support from their English teacher. This prediction was confirmed, as an independent-samples *t*-test revealed a significant difference between experimental conditions on students' perceptions of autonomy support [$t(162) = 2.13$, $p < .05$; $d = .32$]. The means and standard deviations for this comparison are presented in Table 2.

Hypothesis 2 stated that students of teachers who were trained to adopt a need-supportive approach to education, relative to students of teachers in the control condition, will report higher levels of autonomous self-regulation for their English studies. This prediction was confirmed, as an independent-samples *t*-test revealed a significant difference between experimental conditions on students' experiences of autonomous self-regulation for their English studies [$t(161) = 2.08$, $p < .05$; $d = .33$]. The means and standard deviations for this comparison are presented in Table 2.

Hypothesis 3 stated that students' experiences of need satisfaction in English class will explain (or, statistically mediate) some of the association between autonomous self-regulation for English studies and well-being in English class. This prediction was confirmed, as the MACRO discussed in Preacher and Hayes (2004) revealed a significant unconditional indirect effect (95% bias correction and acceleration confidence interval [95% BCa CI]: {.1000, .2895} with 5000 resamples; Sobel $z = 4.27$, $p < .001$). Autonomous self-regulation predicted need

Table 2. Means and standard deviations for the measures of autonomy support and autonomous self-regulation.

Dependent Variable	Intervention Condition μ (*SD*)	Control Condition μ (*SD*)	Cohen's *d*
Autonomy Support	2.65 (.45)	2.49 (.54)	.32
Autonomous Self-Regulation	4.21 (1.61)	3.55 (2.31)	.33

satisfaction (b = .24, p < .001), which predicted well-being (b = .74, p < .001). Controlling for the mediator, the relation of autonomous self-regulation to well-being was reduced from b = .47 (p < .001) to b = .29 (p < .001). The results testing for simple mediation are presented in **Table 3**.

4. Discussion

Based on SDT, the current study (a pilot investigation) examined whether an intervention delivered to English language teachers can facilitate the natural, active process of internalization in their students. In line with Hypotheses 1 and 2, students of teachers who were trained to adopt a need-supportive approach to education reported higher levels of autonomy support from their English teacher (a small effect size) and autonomous self-regulation for their English studies (a small effect size), relative to students of teachers in the control condition. In line with Hypothesis 3, students' experiences of need satisfaction in English class statistically mediated some of the association between autonomous self-regulation for English studies and well-being in English class. Thus, this research offers very preliminary support for the notion that teachers who learn about SDT and the principles of need support can facilitate internalization in their students. As noted in the Introduction, in the last decade scholars have shown empirical interest in whether or not interventions that are informed by SDT can promote autonomous self-regulation in students (Cheon & Reeve, 2013; Cheon et al., 2012). This question has remained fairly understudied in academic subjects other than physical education, which bespeaks the importance of the current study. In light of the methodological limitations noted below, though, the current study is best thought of as a pilot investigation, and the development of a more methodologically rigorous extension of this work is currently occurring for delivery and evaluation among second-language teachers in and around Medellín, Colombia.

Findings from the current study provide very preliminary evidence that second-language teachers in Colombia can modify their pedagogic practice to adopt a more need-supportive style, and that their students not only may perceive such a modification but also may begin to endorse more autonomous types of motivation with associated benefits for their well-being. Colombia is undergoing major reforms to its education system (OECD, 2016), and we encourage a continued focus on the development, delivery, and evaluation of interventions that are based on SDT and the principles of need support.

Table 3. Unconditional indirect effect of autonomous self-regulation on well-being through basic psychological need satisfaction.

Sample Size = 149				
Number of Bootstrap Resamples = 5000				
Direct and Total Effects	***b***	***SE***	***t***	
b (YX)	.4660	.0680	6.85***	
b (MX)	.2435	.0419	5.81***	
b (YM.X)	.7434	.1195	6.22***	
b (YX.M)	.2850	.0673	4.24***	
Indirect Effect and Significance Using Normal Distribution	**Value**	***SE***		***z***
	.1810	.0424		4.27***
Bootstrap Results for Indirect Effect	**Mean**	***SE***	**95% BCa CI**	
	.1786	.0468	{.1000, .2895}	

Notes. *b* (YX) = the total effect of the independent variable (autonomous self-regulation) on the dependent variable (well-being); *b* (MX) = the effect of the independent variable on the proposed mediator (basic psychological need satisfaction). *b* (YM.X) = the effect of the mediator on the dependent variable, controlling for the independent variable. *b* (YX.M) = the effect of the independent variable on the dependent variable, controlling for the mediator. ***$p < .001$.

The current study complements previous research conducted within SDT demonstrating that teachers in the US (Reeve, 1998; Reeve et al., 2004), the UK (McLachlan & Hagger, 2010), and Canada (Guay et al., 2016) can be trained to support the autonomy of others. To the best of our knowledge, the current study represents the first extension of such work to an economically disadvantaged country in South America. Effect sizes for the between-group comparisons testing Hypotheses 1 and 2 were of small magnitude, and the results from Su and Reeve's (2011) meta-analysis suggest that these between-group differences might be enhanced by the use of objective ratings of need support, training inexperienced and autonomy-oriented teachers, and reducing the training time to 1 - 3 hours. We encourage future research to take these issues into consideration when building upon the methods discussed in the current study.

Several limitations deserve mention. First and of most importance, neither schools nor the teachers in those schools were randomly assigned to the intervention and the control condition. It is not possible, therefore, to infer causality from these data. Second, no data were collected prior to the start of the intervention, and thus it is possible that students of teachers who were trained to adopt a need-supportive approach to education could have experienced higher levels of need support from their English teacher and autonomous self-regulation for their English studies in the absence of any intervention. Third, all data were collected using a self-report methodology based on students' phenomenological experiences. Fourth, all data were collected at one point in time. Taking these limitations under consideration, it is important for future research to build upon the methods discussed in the current study and randomly assign schools or

teachers to experimental condition, collect baseline data prior to the start of the intervention, collect data using both self-report and objective methodologies, and collect data at several points in time.

In the current study, we found very preliminary support for the notion that teachers who learn about SDT and the principles of need support can facilitate internalization in their students. As stated above, this research has important limitations that warrant cautious interpretation of the data. Nonetheless, it is useful to consider how the current study can contribute new knowledge to an understanding of the development and delivery of interventions that are based on SDT and the principles of need support in the education domain. First, this research suggests that teachers in economically disadvantaged countries, in which students underperform relative to their peers in cross-national assessments, are open to learning about SDT and the principles of need support, as all teachers in the intervention condition participated in more than 10 hours of training over three weeks. Second, although caution is warranted in drawing such conclusions, an intervention that presents to teachers information on theory with empirical justification, is interactive, and allows for the development of pedagogic skills with constructive feedback may help teachers facilitate the natural, active process of internalization in their students. Third, it is important for scholars to evaluate more rigorously whether an intervention that is based on SDT can facilitate the process of internalization in students. Indeed, in the current study students' autonomous self-regulation for English studies was associated with higher levels of both need satisfaction and well-being in English class. Previous research conducted within SDT has revealed benefits associated with the experience of autonomy in the education domain. Yet this finding is far from trivial, as students who report more autonomous types of motivation also tend to persist longer and perform better in their academic pursuits, both of which are critical challenges currently faced by the education system in Colombia (OECD, 2016).

5. Conclusion

In conclusion, we encourage schools and teachers to consider ways in which classrooms can be more conducive to their students' satisfaction of autonomy, competence, and relatedness. These basic psychological needs represent the universal psychological content of human nature that, when supported, are conducive to full functioning and organismic wellness (cf. Niemiec & Ryan, 2013). Although preliminary, the findings from this research indicate that teachers may be able to assist students in cultivating autonomous (i.e., optimal) motivation for academic subjects other than physical education, and this type of motivation is associated with adaptive educational outcomes among students.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

Aelterman, N., Vansteenkiste, M., Van den Berghe, L., De Meyer, J., & Haerens, L. (2014). Fostering a Need-Supportive Teaching Style: Intervention Effects on Physical Education Teachers' Beliefs and Teaching Behaviors. *Journal of Sport & Exercise Psychology, 36,* 595-609. https://doi.org/10.1123/jsep.2013-0229

Angyal, A. (1965). *Neurosis and Treatment: A Holistic Theory*. New York: Wiley.

Baumeister, R. F., & Leary, M. R. (1995). The Need to Belong: Desire for Interpersonal Attachments as a Fundamental Human Motivation. *Psychological Bulletin, 117,* 497-529. https://doi.org/10.1037/0033-2909.117.3.497

Benware, C. A., & Deci, E. L. (1984). Quality of Learning with an Active versus Passive Motivational Set. *American Educational Research Journal, 21,* 755-765. https://doi.org/10.3102/00028312021004755

Black, A. E., & Deci, E. L. (2000). The Effects of Instructors' Autonomy Support and Students' Autonomous Motivation on Learning Organic Chemistry: A Self-Determination Theory Perspective. *Science Education, 84,* 740-756. https://doi.org/10.1002/1098-237X(200011)84:6<740::AID-SCE4>3.0.CO;2-3

Chatzisarantis, N. L., & Hagger, M. S. (2009). Effects of an Intervention Based on Self-Determination Theory on Self-Reported Leisure-Time Physical Activity Participation. *Psychology and Health, 24,* 29-48. https://doi.org/10.1080/08870440701809533

Cheon, S. H., & Moon, I. S. (2010). Implementing an Autonomy-Supportive Fitness Program to Facilitate Students' Autonomy and Engagement. *Korean Journal of Sport Psychology, 21,* 175-195.

Cheon, S. H., & Reeve, J. (2013). Do the Benefits from Autonomy-Supportive PE Teacher Training Programs Endure? A One-Year Follow-Up Investigation. *Psychology of Sport and Exercise, 14,* 508-518. https://doi.org/10.1016/j.psychsport.2013.02.002

Cheon, S. H., Reeve, J., & Moon, I. S. (2012). Experimentally Based, Longitudinally Designed, Teacher-Focused Intervention to Help Physical Education Teachers Be More Autonomy Supportive toward Their Students. *Journal of Sport & Exercise Psychology, 34,* 365-396. https://doi.org/10.1123/jsep.34.3.365

Chirkov, V. I., & Ryan, R. M. (2001). Parent and Teacher Autonomy-Support in Russian and U.S. Adolescents: Common Effects on Well-Being and Academic Motivation. *Journal of Cross-Cultural Psychology, 32,* 618-635. https://doi.org/10.1177/0022022101032005006

de Charms, R. (1968). *Personal Causation*. New York: Academic Press.

De Naeghel, J., Van Keer, H., Vansteenkiste, M., & Rosseel, Y. (2012). The Relation between Elementary Students' Recreational and Academic Reading Motivation, Reading Frequency, Engagement, and Comprehension: A Self-Determination Theory Perspective. *Journal of Educational Psychology, 104,* 1006-1021. https://doi.org/10.1037/a0027800

Deci, E. L., & Ryan, R. M. (2000). The "What" and "Why" of Goal Pursuits: Human Needs and the Self-Determination of Behavior. *Psychological Inquiry, 11,* 227-268. https://doi.org/10.1207/S15327965PLI1104_01

Deci, E. L., & Ryan, R. M. (2008). Facilitating Optimal Motivation and Psychological Well-Being across Life's Domains. *Canadian Psychology, 49,* 14-23. https://doi.org/10.1037/0708-5591.49.1.14

Deci, E. L., Eghrari, H., Patrick, B. C., & Leone, D. (1994). Facilitating Internalization: The Self-Determination Theory Perspective. *Journal of Personality, 62,* 119-142. https://doi.org/10.1111/j.1467-6494.1994.tb00797.x

Deci, E. L., Schwartz, A. J., Sheinman, L., & Ryan, R. M. (1981). An Instrument to Assess Adults' Orientations toward Control versus Autonomy with Children: Reflections on Intrinsic Motivation and Perceived Competence. *Journal of Educational Psychology, 73,* 642-650. https://doi.org/10.1037/0022-0663.73.5.642

Grolnick, W. S., & Ryan, R. M. (1987). Autonomy in Children's Learning: An Experimental and Individual Difference Investigation. *Journal of Personality and Social Psychology, 52,* 890-898. https://doi.org/10.1037/0022-3514.52.5.890

Guay, F., Valois, P., Falardeau, É., & Lessard, V. (2016). Examining the Effects of a Professional Development Program on Teachers' Pedagogical Practices and Students' Motivational Resources and Achievement in Written French. *Learning and Individual Differences, 45,* 291-298. https://doi.org/10.1016/j.lindif.2015.11.014

Hardre, P. L., & Reeve, J. (2003). A Motivational Model of Rural Students' Intentions to Persist in, versus Drop out of, High School. *Journal of Educational Psychology, 95,* 347-356. https://doi.org/10.1037/0022-0663.95.2.347

Jang, H., Reeve, J., & Deci, E. L. (2010). Engaging Students in Learning Activities: It Is Not Autonomy Support or Structure But Autonomy Support and Structure. *Journal of Educational Psychology, 102,* 588-600. https://doi.org/10.1037/a0019682

La Guardia, J. G., Ryan, R. M., Couchman, C. E., & Deci, E. L. (2000). Within-Person Variation in Security of Attachment: A Self-Determination Theory Perspective on Attachment, Need Fulfillment, and Well-Being. *Journal of Personality and Social Psychology*, *79,* 367-384. https://doi.org/10.1037/0022-3514.79.3.367

Loewenstein, G. (1994). The Psychology of Curiosity: A Review and Reinterpretation. *Psychological Bulletin, 116,* 75-98. https://doi.org/10.1037/0033-2909.116.1.75

McLachlan, S., & Hagger, M. S. (2010). Effects of an Autonomy-Supportive Intervention on Tutor Behaviors in a Higher Education Context. *Teaching and Teacher Education, 26,* 1204-1210. https://doi.org/10.1016/j.tate.2010.01.006

Moustaka, F. C., Vlachopoulos, S. P., Kabitsis, C., & Theodorakis, Y. (2012). Effects of an Autonomy-Supportive Exercise Instructing Style on Exercise Motivation, Psychological Well-Being, and Exercise Attendance in Middle-Age Women. *Journal of Physical Activity and Health, 9,* 138-150. https://doi.org/10.1123/jpah.9.1.138

Muñoz, A., & Ramirez, M. (2015). Teachers' Conceptions of Motivation and Motivating Practices in Second-Language Learning: A Self-Determination Theory Perspective. *Theory and Research in Education, 13,* 198-220. https://doi.org/10.1177/1477878515593885

Niemiec, C. P., & Ryan, R. M. (2009). Autonomy, Competence, and Relatedness in the Classroom: Applying Self-Determination Theory to Educational Practice. *Theory and Research in Education, 7,* 133-144. https://doi.org/10.1177/1477878509104318

Niemiec, C. P., & Ryan, R. M. (2013). What Makes for a Life Well Lived? Autonomy and Its Relation to Full Functioning and Organismic Wellness. In S. A. David, I. Boniwell, & A. C. Ayers (Eds.), *The Oxford Handbook of Happiness* (pp. 214-226). Oxford: Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199557257.013.0016

Niemiec, C. P., Lynch, M. F., Vansteenkiste, M., Bernstein, J., Deci, E. L., & Ryan, R. M. (2006). The Antecedents and Consequences of Autonomous Self-Regulation for College: A Self-Determination Theory Perspective on Socialization. *Journal of Adolescence, 29,* 761-775. https://doi.org/10.1016/j.adolescence.2007.02.002

Niemiec, C. P., Ryan, R. M., & Deci, E. L. (2010). Self-Determination Theory and the Relation of Autonomy to Self-Regulatory Processes and Personality Development. In R. H. Hoyle (Ed.), *Handbook of Personality and Self-Regulation* (pp. 169-191). Malden, MA: Blackwell Publishing. https://doi.org/10.1002/9781444318111.ch8

Niemiec, C. P., Soenens, B., & Vansteenkiste, M. (2014). Is Relatedness Enough? On the Importance of Need Support in Different Types of Social Experiences. In N. Weinstein (Ed.), *Human Motivation and Interpersonal Relationships: Theory, Research and Applications* (pp. 77-96). Dordrecht: Springer. https://doi.org/10.1007/978-94-017-8542-6_4

OECD (2016). *Education in Colombia*. Paris: OECD Publishing. https://doi.org/10.1787/9789264250604-en

Patrick, B. C., Skinner, E. A., & Connell, J. P. (1993). What Motivates Children's Behavior and Emotion? Joint Effects of Perceived Control and Autonomy in the Academic Domain. *Journal of Personality and Social Psychology, 65,* 781-791. https://doi.org/10.1037/0022-3514.65.4.781

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS Procedures for Estimating Indirect Effects in Simple Mediation Models. *Behavior Research Methods, Instruments, & Computers, 36,* 717-731. https://doi.org/10.3758/BF03206553

Reeve, J. (1998). Autonomy Support as an Interpersonal Motivating Style: Is It Teachable? *Contemporary Educational Psychology, 23,* 312-330. https://doi.org/10.1006/ceps.1997.0975

Reeve, J. (2002). Self-Determination Theory Applied to Educational Settings. In E. L. Deci, & R. M. Ryan (Eds.), *Handbook of Self-Determination Research* (pp. 183-203). Rochester, NY: University of Rochester Press.

Reeve, J. (2006). Teachers as Facilitators: What Autonomy-Supportive Teachers Do and Why Their Students Benefit. *The Elementary School Journal, 106,* 225-236. https://doi.org/10.1086/501484

Reeve, J. (2009). Why Teachers Adopt a Controlling Motivating Style toward Students and How They Can Become More Autonomy Supportive. *Educational Psychologist, 44,* 159-175. https://doi.org/10.1080/00461520903028990

Reeve, J., & Jang, H. (2006). What Teachers Say and Do to Support Students' Autonomy during a Learning Activity. *Journal of Educational Psychology, 98,* 209-218. https://doi.org/10.1037/0022-0663.98.1.209

Reeve, J., & Tseng, C.-M. (2011). Cortisol Reactivity to a Teacher's Motivating Style: The Biology of Being Controlled versus Supporting Autonomy. *Motivation and Emotion, 35,* 63-74. https://doi.org/10.1007/s11031-011-9204-2

Reeve, J., Jang, H., Carrell, D., Jeon, S., & Barch, J. (2004). Enhancing Students' Engagement by Increasing Teachers' Autonomy Support. *Motivation and Emotion, 28,* 147-169. https://doi.org/10.1023/B:MOEM.0000032312.95499.6f

Ryan, R. M. (1993). Agency and Organization: Intrinsic Motivation, Autonomy and the Self in Psychological Development. In J. Jacobs (Ed.), *Nebraska Symposium on Motivation: Developmental Perspectives on Motivation* (Vol. 40, pp. 1-56). Lincoln, NE: University of Nebraska Press.

Ryan, R. M. (1995). Psychological Needs and the Facilitation of Integrative Processes. *Journal of Personality, 63,* 397-427. https://doi.org/10.1111/j.1467-6494.1995.tb00501.x

Ryan, R. M., & Connell, J. P. (1989). Perceived Locus of Causality and Internalization: Examining Reasons for Acting in Two Domains. *Journal of Personality and Social Psychology, 57,* 749-761. https://doi.org/10.1037/0022-3514.57.5.749

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions. *Contemporary Educational Psychology, 25,* 54-67. https://doi.org/10.1006/ceps.1999.1020

Ryan, R. M., & Deci, E. L. (2002). Overview of Self-Determination Theory: An Organis-

mic Dialectical Perspective. In E. L. Deci, & R. M. Ryan (Eds.), *Handbook of Self-Determination Research* (pp. 3-33). Rochester, NY: University of Rochester Press.

Ryan, R. M., & Deci, E. L. (2017). *Self-Determination Theory: Basic Psychological Needs in Motivation, Development, and Wellness*. New York: Guilford Press.

Ryan, R. M., & Frederick, C. (1997). On Energy, Personality, and Health: Subjective Vitality as a Dynamic Reflection of Well-Being. *Journal of Personality, 65,* 529-565. https://doi.org/10.1111/j.1467-6494.1997.tb00326.x

Ryan, R. M., & Grolnick, W. S. (1986). Origins and Pawns in the Classroom: Self-Report and Projective Assessments of Individual Differences in Children's Perceptions. *Journal of Personality and Social Psychology, 50,* 550-558. https://doi.org/10.1037/0022-3514.50.3.550

Ryan, R. M., & Niemiec, C. P. (2009). Self-Determination Theory in Schools of Education: Can an Empirically Supported Framework Also Be Critical and Liberating? *Theory and Research in Education, 7,* 263-272. https://doi.org/10.1177/1477878509104331

Sheldon, K. M., & Krieger, L. S. (2007). Understanding the Negative Effects of Legal Education on Law Students: A Longitudinal Test of Self-Determination Theory. *Personality and Social Psychology Bulletin, 33,* 883-897. https://doi.org/10.1177/0146167207301014

Silvia, P. J. (2008). Interest—The Curious Emotion. *Current Directions in Psychological Science, 17,* 57-60. https://doi.org/10.1111/j.1467-8721.2008.00548.x

Soenens, B., Vansteenkiste, M., & Niemiec, C. P. (2009). Should Parental Prohibition of Adolescents' Peer Relationships Be Prohibited? *Personal Relationships, 16,* 507-530. https://doi.org/10.1111/j.1475-6811.2009.01237.x

Streb, J., Keis, O., Lau, M., Hille, K., Spitzer, M., & Sosic-Vasic, Z. (2015). Emotional Engagement in Kindergarten and School Children: A Self-Determination Theory Perspective. *Trends in Neuroscience and Education, 4,* 102-107. https://doi.org/10.1016/j.tine.2015.11.001

Su, Y.-L., & Reeve, J. (2011). A Meta-Analysis of the Effectiveness of Intervention Programs Designed to Support Autonomy. *Educational Psychology Review, 23,* 159-188. https://doi.org/10.1007/s10648-010-9142-7

Vallerand, R. J. (2010). On Passion for Life Activities: The Dualistic Model of Passion. *Advances in Experimental Social Psychology, 42,* 97-193. https://doi.org/10.1016/S0065-2601(10)42003-1

Vallerand, R. J., Fortier, M. S., & Guay, F. (1997). Self-Determination and Persistence in a Real-Life Setting: Toward a Motivational Model of High School Dropout. *Journal of Personality and Social Psychology, 72,* 1161-1176. https://doi.org/10.1037/0022-3514.72.5.1161

Vansteenkiste, M., Niemiec, C. P., & Soenens, B. (2010). The Development of the Five Mini-Theories of Self-Determination Theory: An Historical Overview, Emerging Trends, and Future Directions. In T. C. Urdan, & S. A. Karabenick (Eds.), *Advances in Motivation and Achievement, v. 16A—The Decade Ahead: Theoretical Perspectives on Motivation and Achievement* (pp. 105-165). London: Emerald Group Publishing Limited. https://doi.org/10.1108/S0749-7423(2010)000016A007

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and Validation of Brief Measures of Positive and Negative Affect: The PANAS Scales. *Journal of Personality and Social Psychology, 54,* 1063-1070. https://doi.org/10.1037/0022-3514.54.6.1063

White, R. W. (1959). Motivation Reconsidered: The Concept of Competence. *Psychological Review, 66,* 297-333. https://doi.org/10.1037/h0040934

Williams, G. C., & Deci, E. L. (1996). Internalization of Biopsychosocial Values by Medi-

cal Students: A Test of Self-Determination Theory. *Journal of Personality and Social Psychology, 70,* 767-779. https://doi.org/10.1037/0022-3514.70.4.767

Williams, G. C., Grow, V. M., Freedman, Z. R., Ryan, R. M., & Deci, E. L. (1996). Motivational Predictors of Weight Loss and Weight-Loss Maintenance. *Journal of Personality and Social Psychology, 70,* 115-126. https://doi.org/10.1037/0022-3514.70.1.115

Williams, G. C., Saizow, R., Ross, L., & Deci, E. L. (1997). Motivation Underlying Career Choice for Internal Medicine and Surgery. *Social Science and Medicine, 45,* 1705-1713. https://doi.org/10.1016/S0277-9536(97)00103-2