Revista de Psicología
ISSN: 0716-8039
revista.psicologia@facso.cl
Universidad de Chile
Chile

Sánchez-Rosas, Javier; Esquivel, Silvana
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Revista de Psicología, vol. 25, núm. 2, 2016, pp. 1-20
Universidad de Chile
Santiago, Chile

Available in: http://www.redalyc.org/articulo.oa?id=26449350011

Revista de Psicología
UNIVERSIDAD DE CHILE

2016, *25*(2), 1-20
ISSN impreso: 0716-8039
ISSN en línea: 0719-0581
www.revistapsicologia.uchile.cl

Instructional Teaching Quality, Task Value, Self-Efficacy, and Boredom: A Model of Attention in Class

Calidad instruccional docente, valor de la tarea, autoeficacia y aburrimiento: un modelo de atención en clase

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Abstract: Instructional teaching quality facilitates learning and promotes affective, motivational, behavioral and cognitive development of students. It was analyzed the role that instructional teaching quality, task value, self-efficacy and boredom on attention in class have. Argentinian university students (N = 454, 84% women) completed self-reports that measured the variables under study. The path analysis showed that only one of the four models analyzed showed a good fit to the data and explained 54% of attention in class variance. It was found that instructional teaching quality predicts task value, academic self-efficacy and boredom in class; task value and academic self-efficacy affect boredom and attention in class, while academic self-efficacy influences on task value; and boredom is the strongest predictor of attention in class. Instructional teaching quality, task value and academic self-efficacy added indirect effects on boredom and attention in class. In this way teacher's behavior and student motivation are fundamental in reducing boredom and increasing attention in class.

Keywords: instructional teaching quality, teacher behavior, boredom, attention in class, task value.

Resumen: La calidad instruccional docente facilita el aprendizaje y promueve el desarrollo afectivo, motivacional, conductual y cognitivo de los estudiantes. Se analizó el rol que tienen la calidad instruccional, el valor de la tarea, la autoeficacia y el aburrimiento sobre la atención en clase. Estudiantes universitarios argentinos (N = 454, 84% mujeres) completaron autoinformes que medían las variables en estudio. El análisis de senderos demostró que solo uno de los cuatro modelos analizados evidenció un buen ajuste a los datos y explicó un 54% de la varianza de atención en clase. Se encontró que la calidad instruccional docente predice al valor de la tarea, autoeficacia académica y aburrimiento en clase; el valor de la tarea y la autoeficacia académica afectan al aburrimiento y la atención en clase, a la vez que la autoeficacia académica incide sobre el valor de la tarea; el aburrimiento es el predictor más fuerte de la atención en clase. La calidad instruccional docente, el valor de la tarea y la autoeficacia académica adicionaron efectos indirectos sobre el aburrimiento y la atención en clase. De esta manera, los comportamientos del docente y la motivación del estudiante son fundamentales para reducir el aburrimiento e incrementar la atención en clase.

Palabras clave: calidad instruccional docente, comportamiento docente, aburrimiento, atención en clase, valor de la tarea.

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How to cite: Sánchez-Rosas, J. & Esquivel, S. (2016). Instructional Teaching Quality, Task Value, Self-Efficacy, and Boredom: A Model of Attention in Class. *Revista de Psicología*, *25*(2), 1-20. http://dx.doi.org/10.5354/0719-0581.2017.44966

Introduction

The specialized literature highlights the role of instructional teaching quality on motivation, cognitive processes, emotions and student's performance (Linnenbrink-Garcia, Patall, & Pekrun, 2016). We define instructional teaching quality as the teacher's behavior in the classroom, which facilitates learning and promotes an optimum affective, motivational, behavioral and cognitive student's development. The instructional teaching quality is one of the main modifiable factors that influences the student's achievement (Hattie, 2009), so identifying its role in the development of these processes is a primary goal in order to improve teacher's education and student's learning (Praetorius, Lenske, & Helmke, 2012).

The accumulated empirical evidence shows that students experience a wide range of emotions in the classroom (Pekrun & Perry, 2014) and that boredom is one of the most frequent emotions in classes (Ahmed, van der Werf, Kuyper, & Minnaert, 2013; Daniels et al., 2009; Daschmann, Goetz, & Stupnisky, 2011, 2014; González, Paoloni, & Rinaudo, 2013; Nett, Goetz, & Hall, 2011; Pekrun, Goetz, Daniels, Stupnisky, & Perry, 2010; Pekrun & Perry, 2014; Sánchez Rosas, 2015; Sánchez Rosas & Bedis, 2015; Sharp, Hemmings, Kay, Murphy, & Elliott, 2016; Yazzie-Mintz, 2010). The recent findings show the detrimental impact of boredom on motivation, learning strategies, cognitive resources, self-regulation and academic development of students (Mann & Robinson, 2009; Nett, Goetz, & Daniels, 2010; Pekrun et al., 2010; Pekrun, Goetz, Titz, & Perry, 2002), including absence (Sharp et al., 2016) and school dropout (Bearden, Spencer, & Moracco, 1989), among others. More specifically, boredom along with some contextual and individual antecedents have the ability to influence the student's engagement and, in particular, attention in class (Astleitner, 2000; Daschmann et al., 2011, 2014; Eren, 2013; Pekrun et al., 2010; Pekrun & Perry, 2014; Sánchez Rosas & Bedis, 2015; Sánchez-Rosas, Takaya, & Molinari, 2016a; Tze, Daniels, & Klassen, 2015).

The control-value theory of achievement emotions (Pekrun & Perry, 2014) offers an integrative framework for analyzing the antecedents and effects of emotions experienced in achievement and academic contexts. Based on this theory, we intend to analyze the explanatory power of boredom and some of its contextual and individual antecedents on attention in class. To do this, four models are evaluated and compared, including, direct and indirect effects of instructional teaching quality, task value, self-efficacy and boredom, on attention in class of college students.

The Control-Value Theory of Achievement Emotions

Experimental research has shown that emotions influence a wide range of cognitive processes, including attention, memory storage and retrieval, social judgments, decision-making, convergent problem solving and creative thinking (Lewis & Haviland-Jones, 2000). In addition to cognitive processes, emotions can influence motivational processes and the use of different behavioral repertoires (Pekrun & Perry, 2014).

One of the most promising models in identifying the presence, antecedents and effects of emotions in the academic field, is the control-value theory of achievement emotions from Pekrun and Perry (2014). This theory states that emotions are activated primarily by control-value apprais-

als. Control appraisals refer to the perceived controllability of the activities and outcomes related to achievement, being academic self-efficacy (Bandura, 1997) the most used construct to denote these appraisals. The value appraisals relate to the subjective importance of the achievement activities and outcomes, being task value (Eccles, 2005) one of the most frequently used constructs to address this kind of appraisals.

This theory also contemplates the possibility that such appraisals have a direct impact on processes that affect performance, such as cognitive resources or the use of learning strategies. A further consideration of this theory is that the learning context contributes to the activation of emotions, both directly and indirectly, by affecting these appraisals. Facets of context that are considered important include (1) the cognitive quality of the task and features of instruction, (2) induction of appraisals, (3) support for autonomy, (4) the goal structures and expectations, and (5) feedback on achievement and its consequences.

Based on the scheme of the control-value theory of achievement emotions (Pekrun & Perry, 2014), the relationships between instructional teaching quality, task value, self-efficacy, boredom and attention in class are then reviewed; explanatory models of attention in class are hypothesized.

Instructional Teaching Quality, Task Value and Self-Efficacy

Control-value theory postulates that the emotional impact of social environment is mediated by control and value appraisals (Pekrun & Perry, 2014). This study takes into consideration, as a particular feature of this social environment, the instructional teaching quality, operationalized through the perceived teaching behavior. Teaching behavior would influence motivational aspects like task value and self-efficacy, which in turn would have a role in explaining emotions and attention in class.

Task value, on one hand, refers to the interest, importance and usefulness perceived by a student of the materials and the learning content at class (Pintrich, Smith, Garcia, & McKeachie, 1993). So the enthusiasm that a teacher will dedicate to a subject can arouse the students' perceived interest, as they may consider it relevant as learning academic material or to their daily lives (Hulleman & Harackiewicz, 2009; Hulleman, Godes, Hendricks, & Harackiewicz, 2010; Lee Johnson & Sinatra, 2013). These task features contribute to the increasing or decreasing possibility that an individual gets involved in it (Eccles, 2005). Self-efficacy, on the other hand, refers to the confidence that a person has in the ability to perform certain activities (Bandura, 1997), which is going to depend, in part, of the activity's situations and purposes. Therefore, the way the teacher presents a task (for example, difficult activities or negative feedback) can influence the confidence to do it. In addition, these self-efficacy beliefs influence the emotional reaction and the amount of effort and persistence against the task demands (Bandura, 1997).

An amount of researches support the relationships between instructional teaching quality, task value and self-efficacy. For example, Ahmed, Minnaert, van der Werf and Kuyper (2010) found that teachers support perceived by students facilitated their motivational beliefs and emotions in mathematics study which helped to improve performance. The authors explain these outcomes indicating that, by having teacher support, students could feel safe in class and increase their beliefs that they would be able to carry on the tasks as-

signed. Vélez and Cano (2012) found that verbal and non-verbal proximity showed by the teacher presented modest to slight correlations with students' task value and self-efficacy. In another study, Smart (2014) found that quality interactions between teacher and student favored self-efficacy for science learning and the assigned value to this learning. On the contrary, the perception of a discontent behavior by the teacher decreased self-efficacy for science learning.

In addition, if teachers transmit clear and reasonable expectations, provide instrumental help and support their autonomy, it is more likely that students positively value the task and experience positive feelings towards them (Assor, Kaplan, & Roth, 2002). In this direction, Federici and Skaalvik (2014) found that the instrumental support provided by the teacher was positively related to the utility value, intrinsic value and student's effort in working with mathematics.

Instructional Teaching Quality and Boredom

Although there have been beneficial effects detected in being bored, like becoming more creative after being exposed to this emotion (Haager, Kuhbandner, & Pekrun, 2016; Hunter, Abraham, Hunter, Goldberg, & Eastwood, 2016; Mann & Cadman, 2014; van Tilburg & Igou, 2017), boredom is considered mainly unpleasant and deactivating (Acee et al., 2010; Nett et al., 2010, 2011; Pekrun & Perry, 2014; Pekrun et al., 2010; Tze et al., 2015), because it disturbs the students' ability to concentrate and focus on the activity that they are doing. Boredom has also been associated with school dissatisfaction (Gjesne, 1977), academic dropout (Bearden et al., 1989; Dow, 2007; Farmer & Sundberg, 1986), school absenteeism (Sharp et al., 2016), temporary or permanent abandonment (Farmer & Sundberg, 1986), avoidance coping strategies (Goetz & Nett, 2008; Sánchez Rosas & Bedis, 2015), negative emotions (Goetz, Ludtke, Nett, Keller, & Lipnevich, 2013; Pekrun et al., 2011; Sánchez Rosas, 2015) and low academic performance (Daniels et al., 2009; Mann & Robinson, 2009; Pekrun, Elliot, & Maier, 2009; Pekrun et al., 2010).

Added to this, some factors associated with the teacher, as their features or instructional behaviors (Deveci, 2016; Goetz et al., 2013; Lohrmann, 2008; Mann & Robinson, 2009; Sharp et al., 2016), can act as precursors or antecedents of boredom (Daschmann et al., 2011, 2014). A monotony way of teaching is the main cause of boredom (Bartsch & Cobern, 2003; Hill & Perkins, 1985). In addition, different dimensions of instructional teaching quality were reported by Goetz (2004) (clarity, structure, promoting motivation and engagement, interruption and pace of instruction), Goetz et al. (2013) (supportive presentation style vs. excessive lesson demand), and Daschmann et al. (2011) (practical applications, enthusiasm, variety, student's adapted instruction, autonomy support, positive reinforcement, support after failure) as factors that reduce boredom in class.

Self-Efficacy, Task Value, and Boredom

Control-value theory assumes that boredom is an emotion that emerges when students consider very controllable or less controllable an activity according to their abilities (Goetz, Pekrun, Hall, & Haag, 2006). At the same time, this emotion is experienced from the lack of value perception of the situation or activity, being irrelevant or meaningless for their needs (Pekrun et al., 2010).

The task value is one of the value appraisals most frequently studied in relation to boredom (Goetz, Frenzel, Stoeger, & Hall, 2010; Goetz et al., 2006; González et al., 2013; Nett et al., 2010; Pekrun et al., 2010; Sánchez Rosas & Bedis, 2015; Tze, 2011). When an activity is negatively valued negative emotions like boredom will instigate (Pekrun & Perry, 2014). This statement is supported by Pekrun et al. (2010), who evaluated the correlation between boredom and task value in five studies, finding in all cases negative relationships for these constructs.

The relationship between self-efficacy, as control appraisal, and boredom has also been studied (Artino, La Rochelle, & Durning, 2010; Pekrun et al., 2011; Sánchez Rosas, 2015; Tze, Daniels, & Klassen, 2014; Tze, Klassen, Daniels, Li, & Zhang, 2013), and generally reported a negative and direct effect of self-efficacy on boredom. But also, self-efficacy could have an indirect impact on boredom through the task value. However, the effect of self-efficacy on task value was barely studied (Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015). According to Pekrun and Perry (2014), boredom depends on the perceived control over an activity and its value. For example, if the task demands are too low or high, this would imply an insufficient or excessive challenge and a difficulty to attribute an intrinsic value, which could produce boredom.

Boredom and Attention in Class

While attention can be considered as a cognitive resource, specially affected by boredom presence (Hunter & Eastwood, 2016; Malkovsky, Merrifield, Goldberg, & Danckert, 2012; Meinhardt & Pekrun, 2003; Pekrun, Goetz, Perry, Kramer, & Hochstadt, 2004; Pekrun et al., 2002), its measure generates challenges related to the use of neurological and physiological equipment and/or behavioral trackers in the classroom (Tze et al., 2015). Consequently, other ways of dealing with attention which generate less difficulty for measurement are usually considered.

The focus of this study is attention in class as a particular form of behavioral student engagement (Sánchez-Rosas et al., 2016a). For these purposes, attention in class is defined as the concentration, through the use of a mental effort (Solso, 1995), in the activities and contents presented in class. Listening carefully to what is explained, visually following the teacher, or making an effort to focus are examples of attention in class.

Pekrun et al. (2010) point out that students who are bored tend to pay attention to more interesting stimuli, or to be distracted by unrelated thoughts with the class. According to Pekrun and others studies (Hunter & Eastwood, 2016; Sánchez Rosas & Bedis, 2015; Tze et al., 2015), boredom has a high relationship with attentional problems. Because boredom causes a student to reduce attention to the work that the student feels is of little value, the student will become distracted and will think of something other than the task at hand (Macklem, 2015). The academic task is experienced as aversive and the goal of the student becomes avoidance (Goetz & Nett, 2008; Pekrun et al., 2010; Sánchez Rosas & Bedis, 2015). In brief, students who experience boredom suffer a progressive loss of attention, resulting in a loss of concentration, distraction and irrelevant thoughts for the task.

Self-Efficacy, Task Value, and Attention in Class

Finally, investigations conducted by Pekrun et al. (2010), Jones, Johnson and

Campbell (2015), and Sánchez Rosas and Bedis (2015) state that task value is positively related to a person's attentional level. In this way, the task that is perceived as important, useful, interesting or has some benefit, arouses and focuses attention on it. For example, the more useful doing math exercises to pass a test is perceived, more attention will be on them.

Self-efficacy influences the level of effort, persistence and choice of activities (Bandura, 1997). Thus, a high level of self-efficacy would focus attention in class, strengthening efforts focus on the objective demands of the task and in control of stimuli that interfere with attention.

The Present Study

The present study takes into consideration the theoretical model of Sánchez-Rosas et al. (2016a) in which the effects of the teachers' behavior, motivation and emotions about attention in class are evaluated. That model explained a modest percentage of attention's variance (37%), with direct effects of task value, enjoyment and shame on attention, and without considering the interaction of task value and academic self-efficacy. In spite of what has been demonstrated by this model (Sánchez-Rosas et al., 2016a); the reviewed literature suggests a direct effect of academic self-efficacy on attention. In addition, a preponderant role of boredom on attention can be expected (Hunter & Eastwood, 2016), compared to the role of enjoyment or shame.

In addition, academic self-efficacy could have a direct influence on task value (Chatzistamatiou et al., 2015). Different models of attention in class, that include the role of boredom and that contemplate the inclusion of direct effects (academic self-efficacy and task-value), could be compared. The evidence provided by such models would complement the previous results and allow us to advance in the understanding of the role that some contextual and individual variables have on the students' class attention. Therefore, in this study we decided to assess the fit of four explanatory models of attention in class analyzing the explanatory contribution that instructional teaching quality, task value, academic self-efficacy, and boredom have on attention in class (see figure 1).

The model 1 specifies (1) a positive effect of instructional teaching quality on task value and academic self-efficacy, (2) a negative effect of instructional teaching quality on boredom, (3) a negative effect of task value and academic self-efficacy on boredom, (4) and a negative effect of boredom on attention in class. Model 2 adds to model 1 (5) a positive effect of academic self-efficacy on task value. Model 3 adds to model 1 (6) a positive effect of task value and academic self-efficacy on attention. Model 4 adds to model 3 (5) a positive effect of academic self-efficacy on task value.

Method

Participants

College students participated (N = 454) from different careers of an Argentinian national university. Students of both sexes were included in the sample (women = 84%, men = 16%), aged between 18 and 60 years old (M = 22.84, SD = 5.47). Participants were selected through a non-probabilistic accidental sampling type. All participants agreed to participate voluntarily with permission of the teachers responsible for each class.

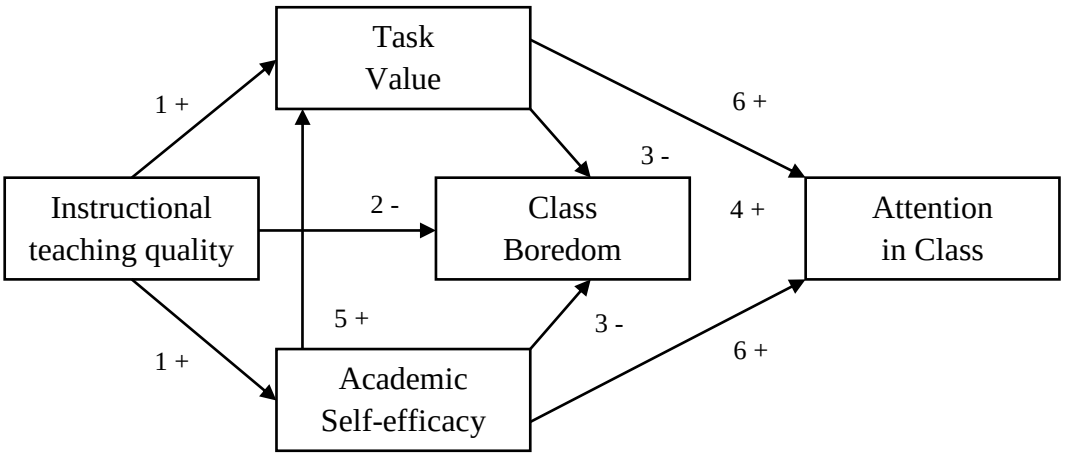

Figure 1. Hypothesized effects for the four models of attention in class.

Measures

Instructional Teaching Quality. A Spanish version (Sánchez-Rosas, Esquivel, & Cara, 2016) of the Teacher Behaviors Inventory (TBI, Murray, 1983) was used to measure teacher's behavior in class. The instrument consists of 36 items (Kaiser-Meyer-Olkin Test [KMO] = .89, χ^2 = 10035; *df* = 630; $p < .001$, 51% explained variance) assessing six teaching behaviors (illustration/interaction, organization, support, enthusiasm, clarity, rhythm). An overall measure of instructional teaching quality that was obtained from the summation of all items (α = .89) was used.

Boredom in Class. A nine-item scale of the Achievement Emotions Questionnaire-Argentine (AEQ-AR, Sánchez Rosas, 2015) that assesses boredom in class was used (e.g., The class is so boring that I want to leave). This scale measures the frequency in which the student experiences this emotion through a Likert scale ranging from (1) *never* to (5) *always.* One-dimensionality and internal consistency yielded acceptable results in this study (KMO = .95, 70% explained variance, and factor loadings > .78, α = .95).

Task Value. The one-dimensional task value scale by Pintrich et al. (1993) was used; this evaluates perceived interest, importance and utility regarding learning materials and contents, and consists of six items (e.g., The material used in this area is useful for my learning, original α = .90). The items are answered using a Likert scale, expressing the degree of agreement, from (1) *strongly disagree* to (5) *strongly agree*. This scale demonstrated criterion validity regarding achievement emotions, in university students from Argentina (Sánchez Rosas, Piotti, Sánchez, Pereira, & Debat, 2011). One-dimensionality and internal consistency yielded acceptable results in this study (KMO = .87, 64% explained variance, and factor loadings > .50, α = .89).

Academic Self-Efficacy. The Academic Self-Efficacy Scale by Pintrich et al. (1993) used assesses students' beliefs about their ability to perform well in the subjects. It consists of eight items (I am able to understand the most difficult con-

cepts presented by the teacher in the class of this subject, original α = .90). The items are answered using a Likert scale, expressing the safety level of (1) *cannot do it* to (10) *totally safe to do so*. One-dimensionality and internal consistency were tested, and optimal results were obtained (KMO = .93, 74% explained variance, and factor loadings > .82, α = .95).

Attention in Class. To measure attention in class it was used a one dimensional designed scale that assesses the ability to concentrate, irrelevant thoughts and attention. It has seven items, four written in reverse (e.g., I lose concentration) and three directly (e.g., I follow closely what is being explained). The items are answered based on a Likert scale from (1) *never* to (5) *always*. When performing the analysis, the first four items were recodified. The scale's one dimensionality was assessed using exploratory factor analysis, and the internal consistency and the results were acceptable (KMO = .90, 67% of explained variance and factorial loads > .71, α = .92).

The total scores of each scale were calculated by adding the values provided to each item and then divided by the number of items in the corresponding scale. In this way, the average values per variable were obtained, they go from 1 to 5 for all scales, in exception of academic self-efficacy that adopts values from 1 to 10.

Procedure

A transversal correlational explanatory study (Montero & León, 2007) was developed. All research procedures were approved by the teacher's staff. In addition, teachers and students were informed that the data derived from this research would be used for scientific purposes under the Argentinian National Law 25,326 that protects personal data. Protocols were designed with consent added to the set of selected scales for this investigation. Full protocols were personally administered during school hours, explaining to participants the purposes of the study and that their responses would be anonymous and used only for research purposes. All agreed to participate voluntarily when filling protocols. Instructions were read aloud to students and it took thirty minutes to complete the administration. Data were analyzed through the software IBM SPSS Amos 19 (Arbuckle, 2010).

Data Analysis

Data were analyzed to ensure compliance with statistical assumptions of (univariate and multivariate) normal distribution, correlations linearity, multicollinearity and absence of outliers, obtaining suitable results (George & Mallery, 2007).

A path analysis was performed to assess the specified different models, and guidelines by Pérez, Medrano and Sánchez Rosas (2013) were followed for the interpretation of the adjustment indexes, significant path coefficients, direct, indirect and total effects, and the percentage of explained variance. The following indexes were used to assess the model's goodness of fit to the data: chi-squared distribution with degrees of freedom (χ^2/df), comparative fit index (CFI), root mean square error of approximation (RMSEA) and global fit index (GFI). The following criteria were implemented to assess the model's goodness of fit: $\chi^2/df \leq 2.0$ (Hair, Black, Babin, & Anderson, 2009), CFI ≥ .90, GFI ≥ .90, (Hu & Bentler, 1998), RMSEA ≤ 0.06 (Arias, 2008).

Results

Table 1 shows the means, standard deviations, skewness, kurtosis, and correla-

tions of the variables evaluated in this study. Significant correlations of all variables with moderate to high magnitudes were obtained. Correlations of boredom with instructional teaching quality, task value, academic self-efficacy and attention were negative, while instructional teaching quality, task value and academic self-efficacy positively correlated attention.

Table 2 shows fit indexes for the four models of attention in class tested. According to the criteria for interpreting the fit indexes, the model 4 has a considerably superior fit compared with other models.

In figure 2, the model 4 of attention in class with the path coefficients and the percentages of explained variance are shown.

As suggested by Edwards and Lambert (2007) it should be considered the direct relationships between the variables of a path model and indirect and total effects will also be analyzed. In table 3 decomposition of different standardized effects is presented.

Table 1
Descriptive statistics and bivariate correlations

	1	2	3	4	5
1. Instructional teaching quality	-				
2. Task value	.32*	-			
3. Self-efficacy	.26*	.34*	-		
4. Boredom	-.40*	-.43*	-.27*	-	
5. Attention	.34*	.44*	.35*	-.70*	-
Mean	3.51	4.08	7.15	1.98	3.61
Standard deviation	0.51	0.79	1.52	0.91	0.74
Skewness	-0.10	-0.88	-0.46	1.01	-0.50
Kurtosis	-0.12	0.25	-0.35	0.36	0.23

Note: N = 454
*$p < .01$

Table 2
Models' fit indexes comparison for the four models of attention in class

Model	χ^2/df	CFI	GFI	RMSEA
1	19.40	0.88	0.93	0.20
2	13.11	0.94	0.97	0.16
3	19.23	0.94	0.97	0.20
4	0.17	1.00	1.00	0.00

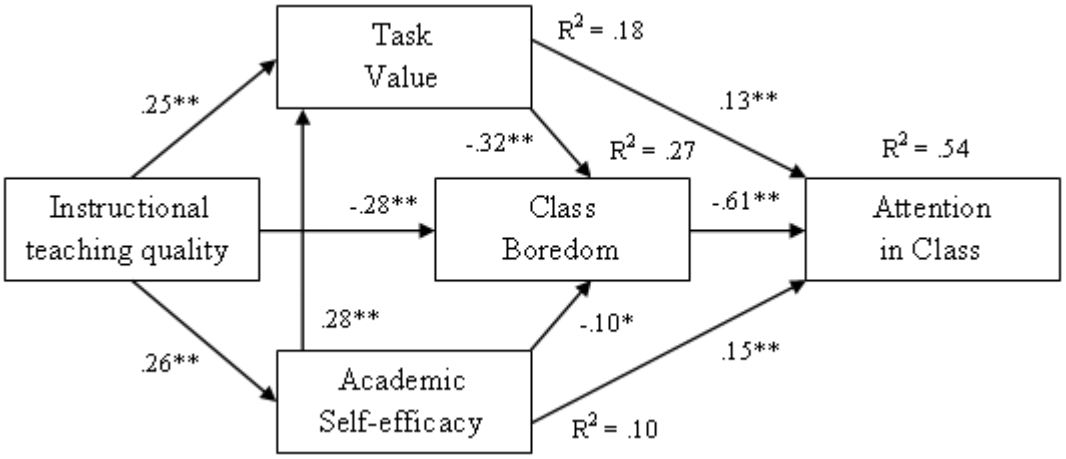

Figure 2. Explanatory model for attention in class.
Note: N = 185.
*p < .01, **p < .001.

Table 3
Standardized effects of the explanatory model of attention in class

Effects	Direct	Indirect	Total
Task value			
Instructional teaching quality	.25**	.07**	.32**
Self-efficacy	.28**	-	.28**
Self-efficacy			
Instructional teaching quality	.26**	-	.26**
Boredom			
Instructional teaching quality	-.28**	-.12**	-.40**
Task value	-.32**	-	-.32**
Self-efficacy	-.10*	-.10*	-.20*
Attention			
Instructional teaching quality	-	.33**	.33**
Task value	.13**	.19**	.32**
Self-efficacy	.15**	.14**	.29**
Boredom	-.61**	-	-.61**

*p < .01, **p < .001.

Discussion

The achievement emotions' control-value theory has proven useful for identifying the presence, antecedents and effects of emotions in the academic field (Pekrun & Perry, 2014). Based on this theory, in this study the viability of four explanatory models of attention in class was compared. It was suggested that boredom with instructional teaching quality, considered an important precedent of boredom, either directly or indirectly affect attention in class. These models also included the role that control and value appraisals of students, studied here as task value and academic self-efficacy, have as activators of boredom and attention in class.

While all models tested proved to have some partial viability, only one model (figure 2) showed a good fit to the data and explained 54% of variance on attention in class, improving much more the percentage explained by another similar model (Sánchez-Rosas et al., 2016a). Specifically, this model, unlike the other models evaluated, involved adding relationships between control value appraisals and attention in class. Specifically, it was found that the instructional teaching quality directly predicts the task value, academic self-efficacy and boredom in class; task value and academic self-efficacy affect boredom and attention in class, while academic self-efficacy impinges on task value; and boredom is the strongest predictor of attention in class. It is worth mentioning that in addition to the direct effects confirmed, instructional teaching quality, the task value and academic self-efficacy added indirect effects on boredom and attention in class. Thus, the teacher behavior and student motivation are fundamental in reducing boredom and increasing attention in class. Next, the results of this model are discussed and some limitations of this research are raised, pointing out some further studies that would be necessary.

Model of Attention in Class: Direct, Indirect, and Total Effects

As expected, a positive impact for instructional teaching quality on task value and academic self-efficacy, and a negative effect on boredom was identified. These effects, as proposed by control value theory (Pekrun & Perry, 2014) and as demonstrated by other studies, show that teaching behavior influences the control value appraisals, as the task value and academic self-efficacy (Ahmed et al., 2010; Assor et al., 2002; Federici & Skaalvik, 2014; Sánchez-Rosas et al., 2016a; Sánchez-Rosas, Takaya, & Molinari, 2016b; Smart, 2014; Vélez & Cano, 2012; Wang & Eccles, 2013), and on boredom (Bartsch & Cobern, 2003; Daschmann et al., 2011, 2014; Goetz, 2004; Goetz et al., 2013; Hill & Perkins, 1985; Lohrmann, 2008; Mann & Robinson, 2009). So, proper interaction, support, enthusiasm, organization, rhythm, and teacher's clarity when developing classes increase the confidence of students to understand and perform well in exams. At the same time, these teachers' behaviors would make students interested in what is taught and what they perceive as important and useful or that they experience less boredom about classroom activities.

On the other hand, a negative task value effect and academic self-efficacy on boredom in class was found. This would mean that when students perceive the class as interesting, valuable or useful for future achievements, they experience less boredom (Goetz et al., 2010, 2006; González et al., 2013; Nett et al., 2010; Pekrun et al., 2010; Sánchez Rosas & Bedis, 2015; Tze, 2011). In addition, the students' confidence in their own abilities to perform well in

class would reduce boredom (Artino et al., 2010; Pekrun et al., 2011; Sánchez Rosas, 2015; Tze et al., 2013, 2014).

As noted by Sánchez-Rosas et al. (2016a), the magnitudes of the relationships between achievement emotions and academic self-efficacy and task value differ depending on the characteristics of each construct. Thus, the academic self-efficacy refers to the control on obtaining results (Bandura, 1997), and task value refers to positive attributions made on activities (Eccles, 2005). The fact that boredom is an emotion related to activities rather than outcomes, could explain the effect of greater magnitude of task value (β = -.34) that the effect of academic self-efficacy (β = -.10) on boredom. On the other hand, since boredom can be experienced under both high and low controls (Goetz et al., 2006), probably the magnitude of the relationship has been attenuated when the associations at both ends of academic self-efficacy values were canceled.

One of the central hypothesis of this research assumed that there would be a detrimental effect of boredom on attention in class. This is because students who are bored tend to pay attention to more interesting stimuli, or to be distracted by unrelated thoughts with the class (Pekrun et al., 2010). The findings of this research confirm what was reported by other studies (Hunter & Eastwood, 2016; Pekrun et al., 2010; Sánchez Rosas & Bedis, 2015; Tze et al., 2015). A strong negative effect of boredom on attention in class was found. Consequently, it is remarkable that when a student is bored, concentration and control of task related thoughts are severely affected.

Moreover, while task value and academic self-efficacy were considered here as background variables necessary for the activation of boredom, they have also been shown to be related to attention (Jones et al., 2015; Pekrun et al., 2010; Sánchez Rosas & Bedis, 2015; Sánchez-Rosas et al., 2016a). Based on it, positive effects on attention in class have been found and hypothesized. Therefore, the confidence of the students to perform academically with the relevance perception of the activities in the classroom promotes concentration and control over irrelevant thoughts for the task. In addition, considering that task value would be affected by setting their own abilities to the demands (Pekrun & Perry, 2014), a direct effect of academic self-efficacy on task value was explored. In this study, as in the investigation of Chatzistamatiou et al. (2015), we found a moderate and positive effect of academic self-efficacy on task value. This implies that the higher perceived trust will be more awareness of the importance, usefulness and interest of the content or classroom activities. These results support previous evidence (Sánchez-Rosas et al., 2016a) and add new data on the role of self-efficacy. Specifically, academic self-efficacy predicts task value and attention in class.

On the other hand, according to the theory of control-value of achievement emotions (Pekrun & Perry, 2014), you can expect that in the teaching and learning process a continued influence that begins with the context surrounding the student, passing then by control value appraisals relating to that context, determining changes in emotions that are generated at the learning situation, and ultimately affecting the attention directed to this situation. In the present study, indirect effects of instructional teaching quality (β = .33), task value (β = .19) and academic self-efficacy (β = .14) on attention in class were found. Thus, it shows that contextual variables such as perceived teaching behavior can

have a positive effect on processes that lead to the development of control, value and emotions beliefs (Ahmed et al., 2010; Assor et al., 2002; Federici & Skaalvik, 2014; Sánchez-Rosas et al., 2016a, b; Smart, 2014; Vélez & Cano, 2012; Wang & Eccles, 2013), affecting the resulting levels of attention in class (Sánchez-Rosas et al., 2016a).

In conclusion, and considering the total effects, all model variables influenced positively on attention in class with the exception of boredom that negatively influenced it. The influence of instructional teaching quality, by direct or indirect way, on boredom and attention is highlighted in the results; even more when it is considered that instructional teaching quality is one of the major modifiable factors that influence students' achievements (Hattie, 2009).

Limitations and Further Studies

Although the reviewed model explained one worthy of consideration percentage of the attention in class variance, much of it is attributable to the direct effects of boredom. Instead, the explained variance of boredom, task value and, most importantly, academic self-efficacy is relatively low. Added to this, although different teachers' behaviors related to instructional teaching quality were evaluated, when making the path analysis it was considered only an overall measure of it. While this overall measure allowed evaluating a parsimonious model, as it was done in other investigations (Goetz et al., 2013), further studies should identify the relative weight of behaviors discriminated in explaining task value, academic self-efficacy and boredom. Such identification would clarify the behaviors with a best predictive ability to be included in subsequent validations of an explanatory model of attention in class that considers instructional teaching quality as a predictor. Furthermore, this identification would allow to design teachers' training programs that include the acquisition of preponderant behaviors in the emotional, motivational and attentional development of students.

In the same line of thought, other dimensions of task value and academic self-efficacy could be considered simultaneously in predicting boredom and attention in class. For example, both the dimensions of task value (importance, utility, interest and cost; Sánchez-Rosas, Lou, Lin, & Larroza, in press) as the dimensions of academic self-efficacy (social academic self-efficacy, self-efficacy for self-regulated learning and self-efficacy for performance; Medrano, 2011) have shown differential effects on motivation, emotions, attention and student achievement (Wigfield & Cambria, 2010).

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Fecha de recepción: 5 de septiembre de 2016
Fecha de aceptación: 17 de noviembre de 2016