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Empirically based decisions: The effect of musical and humanistic activities on self-efficacy and student academic performance☆

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ABSTRACT

In recent years, the Chilean educational curriculum has reduced significantly the hours dedicated to musical, artistic, and humanities activities. However, research shows consistently that performing them enhances psychological processes relevant to the school context. This work provides the evaluation of intervention in music and humanities (MH) on the general self-efficacy (study 1) and qualifications (study 2) of students from different schools in the Maule Region. The first study shows that the intervention generates changes in the participants' perception of efficacy, both over time and relative to a control group. The second study occurs after the activities and shows that participation leads to more favorable grades, mediated by self-efficacy. Results are discussed in curricular terms and the context of educational public policy.

Decisiones con base empírica: El efecto de actividades musicales y humanísticas en la autoeficacia y el rendimiento académico estudiantil

Palabras clave:
Música
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Auto-eficacia
Intervención
Rendimiento académico

RESUMEN

En los últimos años, el currículo chileno de educación ha reducido significativamente las horas dedicadas a actividades musicales, artísticas y de humanidades. No obstante, la investigación evidencia consistentemente que la realización de estas actividades potencia procesos psicológicos relevantes para el contexto escolar. Este trabajo entrega la evaluación de una intervención en música y humanidades (MH) sobre la autoeficacia generalizada (estudio 1) y las calificaciones (estudio 2) de estudiantes de colegios de la Región del Maule. El primer estudio muestra que la intervención genera cambios en la percepción de eficacia de los participantes, tanto a través del tiempo como en comparación con un grupo control. El segundo estudio se desarrolla al finalizar las actividades, y muestra que la participación afecta positivamente las calificaciones de los estudiantes, mediado por la autoeficacia. Se discuten estos resultados en términos curriculares y en el contexto de la política pública de educación escolar.

Introduction

In the last years, the curricular framework in Chile has suffered modifications in the hours dedicated to disciplines such as arts, humanities and social sciences; for example, the Decreto Exento N° 1.363 (2011) reduces the hours for musical teaching from four to two hours; in the same manner, the last adequation to high school education (Decreto Supremo N° 193, 2019), establishes subjects such as Art, Physical Education and Social Sciences as optional for students in the last levels of high school. The reasons for this decision do not seem based on any empirical evidence regarding the effects of these actions on the scholastic context. Rather, one of the apparent causes is related to decisions oriented to improve results of international standardized tests, like PISA and TIMMS, that have maintained a systematic level 2 of performance, which is to say a low performance regarding international standards (Agencia de Calidad de la Educación, 2014, 2017).

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With this in mind, the necessity for a greater time investment in order to strengthen and improve academic results is understandable. However, studies have proven that fulfilling musical and humanistic activities have a positive effect on psychological variables that are relevant to the school environment (Eerola & Eerola, 2014; Robinson, 2013) such as personal beliefs regarding one's own capacities to generate a certain performance, which can be manifested as self-efficacy beliefs (Bandura, 2012). Given these precedents, the present study evaluates an intervention on self-efficacy and grades in the Chilean students, based on the participation and execution of activities of musical and humanistic nature in a scholastic context.

The relation between self-efficacy, academic grades, and activities of musical and humanistic nature

Self-efficacy is the belief that people possess regarding their own capacities (Bandura, 2012; Klassen & Usher, 2010). In an academic context, self-efficacy has a positive effect on learning, effort, persistence, and perseverance in the face of adversity (Pajares, 2003). In this sense, studies propose self-efficacy as a mechanism that explains the relations between the variables of the environment and their posterior results (Bandura, 2012). Research shows that beliefs in self-efficacy have a positive and meaningful association with the overall academic performance of a student (Caprara et al., 2008; Cerezo et al., 2019; Shkullaku, 2013; Zuffiano et al., 2013); while the belief that efficacy in a specific area, for example, math, have a positive effect in the performance in that discipline (Pajares & Kranzler, 1995; Zimmerman, 1995).

These consequences are similar to those that are generated from the fulfillment of musical and humanistic activities, which will be referred to as MH activities for this study. On one hand, musical activities effect the way the brain processes information, improving academic abilities (Cabanac et al., 2013; Kraus et al., 2014). It has also been shown that fulfilling artistic activities during primary cycles improves scores in standardized tests, compared to students that do not engage in them (Kaufman & Gabler, 2004; Winsler et al., 2019). It also improves interpersonal relations, anxiety management and increases the perception of overall self-efficacy in teenagers and adults (Ho et al., 2017; Kaimal & Ray, 2017). On the other hand, when students develop humanistic activities, such as creative writing or narrative, their overall performance is positively affected by said action (Kellogg & Raulerson, 2007; Winsler et al., 2019).

In consequence, it becomes necessary to evaluate the concrete effect of MH activities, now reduced in the mandatory national curriculum. Thus, this study intends to show the impact of fulfilling activities of this nature on the self-efficacy of the student body of primary and secondary level education of the Maule Region, in Chile, as shown in study 1 and 2; and on the grades of the same people, as shown in study 2. In both studies, the analysis incorporates the institutional management perceived by the establishment, as a covariable, which has shown a positive relation to the academic performance in previous investigations (Leithwood et al., 2006; van der Westhuizen et al., 2005). Given that the student body belongs to different schools, whose internal characteristics may affect learning processes and results, this potential effect has been controlled in the statistical analysis.

Study 1

Method

Participants and Design

The sample was composed by 1,311 students, of which 70 do not complete one of the two measures of self-efficacy, withdrawing from the analysis. Thus, the final sample is composed of 1,241 students, of which 50,6% are women and 49.4% are men between 11 and 21 years. The intervention group includes 239 students (M_{age} = 14.3, SD = 1.8), of which 35% belong in the last years of primary education (between 11-15 years old); 45% belong to the two first years of secondary education (between 13-17 years old); and 19% belong to the two last years of secondary education (between 15-21 years old). The control group is composed of 1,002 students (M_{age} = 14.4, SD = 1.7), in which 33% belongs to the last levels of primary education, 56% to the first and second year of secondary education and 26%, to third and fourth year of secondary education. The design elaborated is a mixed quasiexperimental 2 (self-efficacy measure: diagnostic – evaluation) x 2 (intervention: participates – does not participate), with the measure of self-efficacy within subject variable and the intervention as a between subject variable. Students proceed from schools with an Index of Academic Vulnerability[1] (IVE, por its acronyms in Spanish) above 75%. Most of the participating schools are public and, in a less percentage (20%) with mixed financing (private and public).

Instruments

Self-efficacy: The instrument used is the *Scale of Overall Self-Efficacy* in its version adapted to Chile (Cid et al., 2010). It has ten items that are responded on a Likert type scale, with ranges between 1 (strongly disagree) and 7 (strongly agree). Examples of these items are "I can find the way to obtain what I want even though someone is opposed" or "I can resolve difficult problems if I try hard enough". The scale has good indicators of reliability and validity (Cid et al., 2010; Sanjuán et al., 2000, among a Spanish population). For the present study, the reliability by Cronbach alpha (AC) is of .88 and McDonald omega (OM) = .89, while the index of composed reliability (ICR) es of .88 and the average variance extracted (AVE) is of .43. Due to the above, the answers to the different items are averaged to create a composite index of overall self-efficacy. Greater values indicate greater self-efficacy.

Institutional Management: A scale is constructed to evaluate the institutional management based on the criteria indicated by the Framework for Good Teachings, a manual elaborated by the Board of Education of Chile, which orients the educational teams in their academic management and is organized into four dimensions: Educational Management, Leadership, Resources, and School Community (Ministerio de Educación, 2013). For the effects of this study, we will focus solely on the first section: Educational Management, upon which there are eleven items to collect the student perception and are answered on a Likert like scale, with ranges between 1 (strongly disagree) and 7 (strongly agree). Examples of this item are "In this school, test calendars and class activities are met" and "The school has a clear and known educational project". The reliability of the scale is of .88 for all indexes (AC, OM and ICR) and the average variance extracted (AVE) = .41, while a confirming factorial analysis with the MLR method of estimation shows that the model of a factor possesses an adequate adjustment (RMSEA = .056, CFI = .94, $\chi 2/df$ = 5.14, TLI = .92 and SRMR = .04). For instance, the answers to the different items were averaged, creating a composite index of institutional management. Greater values indicate a greater student perception of institutional management.

[1] The index of academic vulnerability (IVE, for its acronyms in Spanish: Índice de Vulnerabilidad Escolar) is an indicator that identifies the level of scholar vulnerability that exists in a school establishment and considers the number of students that belong to three different classifications of priority of attention, divided by the total enrollment, multiplied by one hundred. These classifications are created by the National Board of Academic Aid and Scholarships (JUNAEB, for its acronyms in Spanish: Junta Nacional de Auxilio Escolar y Becas), according to the different variables that define the situation of poverty in Chile.

Procedure

The intervention consists of two activities: musical and humanistic. In the first, students participate in a chorus or orchestra, for approximately five months, with at least two weekly rehearsals during schedules outside of the mandatory school curriculum schedules. The second activity consists of workshops on Creative Writing and Recognition of Regional Historical Heritage, which are carried out in six sessions, three sessions for each theme, one every fifteen days. The people selected for the activities constitute the intervention group, while the students that do not participate, are the control group. In the selection of the participating establishments, the IVE is obtained from all the public and combined schools in the region, that accommodate 90% of the primary and secondary students (Ministerio de Educación, 2017). The schools with an IVE score above 75% are selected and the establishments are contacted, inviting them to participate in this study. If the establishment refuses, the next school in the ranking is contacted until fifteen schools have agreed to participate. Next, a meeting to establish commitment is held with each administrative department of the selected schools and the conditions for the fulfillment of the activities are defined (like schedules), finalizing with the signature of an institutional agreement between the school principals and the University to which the researchers belong.

Once the permissions are obtained, each school carries out an open call to their students to participate in the activities, ensuring that the intervention group, composed of fifteen to twenty-five students, is based on the interest of the students. The first activity (creation of chorus or orchestra) seeks to contribute to the development of musical, social, personal, and value-based abilities in students; of their identity and of the hallmark of their educational establishment; and towards the involvement of the school with its local environment.

For each activity, the participants are convoked and selected by the teachers of Musical Education of their establishments, supported by a teacher at the School of Music from the University. In the case of the orchestra, there is also a free instrument for the student, such as a viola, cello, bass). The reception is made to the student's family, along with a certificate of parental responsibility in a ceremony for families, student body authorities and an ensemble of the orchestra of the University of Talca. The chorus rehearse twice a week for 75 minutes; orchestra, also twice a week for 60 minutes in dependencies of their establishment. Chorus and orchestra alike carry out presentations in instances that are internal and external to the school (e.g., celebrations and religious festivities). The workshops constitute the second activity of the intervention and are oriented towards the promotion of the teaching and valorization of the humanities, enhancing the appreciation of literary activity and cultural heritage as part of individual and social enrichment, such as constructing short stories, analyzing music and text. During a period of three months, students work on six sessions of 90 minutes each, three sessions for each area. Each session is dictated by the same professor in the University of Talca, according to the schedules given by the school establishments. To ensure the transference of results, teachers of each establishment are invited to carry out a course in pedagogical updating organized by the University. The end of the intervention includes a final ceremony of recognition of the students' different achievements. The participation in MH activities constitutes the between-subject factor of the design of this study.

To evaluate the effects of the completed activities, a supervisor is designated for each institution, who renders accounts to a project coordinator and to the general coordination. Before any activity is carried out, and after the participants are defined, an initial measure is applied, as a diagnostic. At the end of the school year, the instruments must again be answered, constituting the measure of evaluation. This variation of the moment of the measure (diagnostic – evaluative) constitutes the within-subject factor in the design of the intervention. On both occasions, a group of trained pollsters applied the instrument, to both the student that participates actively and to the student who does not. All the students that complete the instrument must be authorized to do so by their families, by signing an informed consent form that indicates the ethical terms of work, including voluntariness and use of data for research means. In the same manner, students sign an informed assent form before answering the instrument, which contains the same elements as the consent form. The procedures utilized for the measurements have been approved by the Ethical Committee of the University of Talca.

In the application process, the authorized students are is cited to the school. Most of them answers a paper booklet, while only a minor group, por logistic reasons of application, completes the forms of diagnostic and evaluative measure on a computer. Once the intervention process is finalized, the results are documented and presented in person to the administrative department of the participating schools.

Data analysis

For the analysis of the reliability of the instruments, Alpha Cronbach, McDonald Omega and IFC are used collectively, only being adapted when values superior to .70 are observed (Hair et al., 2017). VME is also evaluated, in which values superior to .50 indicate adequate reliability (Fornell & Larcker, 1981). A Confirmatory Factor Analysis is used to evaluate the one-dimensionality of the management scale. According to recommendations in literature (Brown, 2006; Hu & Bentler, 1999), a set of criteria for adjustment is used: chi square ratio ($\chi 2/df$), (< 5 indicates the adequate adjustment), the index of the comparative adjustment (CFI > .95 indicates adequate adjustment), the root mean square error of approximation (RMSEA < .06 indicates adequate adjustment) and the standardized root mean square residual (SRMR < .08 indicates adequate adjustment).

The sole measure of self-efficacy is submitted to a mixed 2 ANCOVA, (moment of the measure) x 2 (completion of the activities), with the perception of the institutional management as a covariable. The eta[2] statistical coefficient is used for the evaluation of the size of the effect, which can be interpreted as the portion of the total variability attributable to the factor (Cohen, 1973).

Results

ANCOVA shows a main effect of the moment in which self-efficacy is evaluated, $F(1, 1238) = 53.25$, $p < .01$, $\eta_p{}^2 = .041$, which is significantly greater in the diagnostic measure ($M = 5.37$, $SD = .98$) than in the evaluative measure ($M = 5.36$, $SD = 1.01$). A significant interaction effect is observed between the independent variables, $F(1, 1238) = 4.63$, $p = .03$, $\eta_p{}^2 = .004$[2]. As seen in Figure 1, the perception of self-efficacy tends to change positively over time, in the group that participates in the project activities. In this case, there is greater self-efficacy in the evaluative moment ($M = 5.46$, $SD = 1.00$) which, in the diagnostic moment was ($M = 5.33$, $SD = .89$), $F(1, 1238) = 3.55$, $p = .06$, $\eta_p{}^2 = .003$. By contrast, the non-participating group, does not show alterations in their self-efficacy from the diagnostic moment ($M = 5.38$, $SD = .99$) to the evaluative moment ($M = 5.35$, $SD = 1.09$), $F(1, 1238) = 1.12$, $p = .29$. An ANCOVA of repetitive measure, with the institutional management as a covariable,

[2] A post-hoc analysis of the power observed is carried out through the G*Power Software (Faul et al., 2007), introducing eta squared to establish necessary parameters. The analysis indicates that the sample has a power of 0.60 to detect the size of the effect of the interaction.

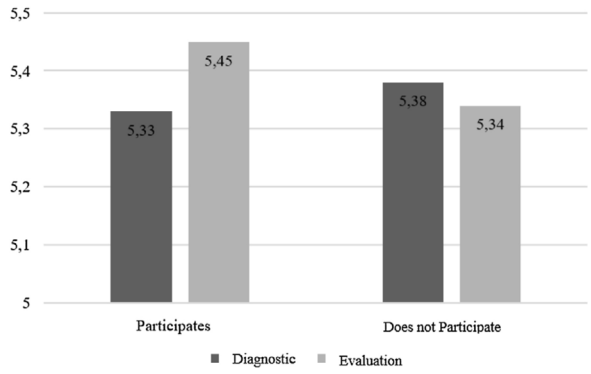

Figure 1. Self-efficacy according to time of measure and participation in MH activities.

evidence that, for the participating group, there are no significant differences in self-efficacy regarding the type of activity carried out, musical or humanistic, $F(1, 227) < 1$.

Discussion

The study demonstrates that fulfilling MH activities can affect positively the overall perception of self-efficacy of participants. To that effect, those actions increase self-efficacy regarding its initial moment and regulate the negative effect that time holds over the beliefs of efficacy. Given the positive consequences that favorable beliefs on self-efficacy holds over the processes of teaching and learning (Cerezo et al., 2019), it is worth questioning whether the decision to reduce the hours of these activities in the mandatory curriculum considers the positive impact of said activities seem to have in students. Even though one of the reasons that supports the decision to reduce the mandatory hours of MH activities is to count with more hours to train students in abilities and contents that are evaluated in standardized tests like SIMCE (Manzi et al., 2014), which might be indirectly affected by self-efficacy (Richardson et al., 2012). Therefore, it is possible that student grades are positively affected by activities that enhance the development of their own capacities, even in areas unrelated to them like, for example, MH activities. Even though this idea has not been evaluated in Chile, there are precedents that suggest that physical activities can have a positive effect on the grades of the student body in Language and Math (Correa-Burrows et al., 2017). If it is considered that this type of activity implies the control of their own capacities (physical, in this case), then it can be expected that the perception of overall self-efficacy can also be affected. In this manner, it is possible that perception of control be partly responsible for the positive effect of physical exercise over grades (i.e., an indirect effect).

Consequently, study 2 evaluates, with a sample of participating and non-participating students, if the tendency of MH activities over the self-efficacy observed in study 1 is replicated after the intervention is complete and, whether participation in MH activities is related positively with grade and other relevant variables in the teaching and learning process. Finally, another factor to evaluate is the indirect effect of self-efficacy over the relation between participating in MH activities and the students' grades.

Study 2

Method

Participants and design

A total of 429 Chilean students participates, between 13 and 19 years of age, of which 46% is women ($M = 15.9$, $SD = 1.36$). The intervention group includes 87 ($M_{age} = 14.3$, $SD = 1.8$), while the control group counts on 339 participants/students ($M_{age} = 14.4$, $SD = 1.7$).

Instruments

Grades of the students: The schools are asked to access the grades of the student body that is to answer the questionnaire, prior consent of the family and assent the students. The grade point average to consider is that of the previous school year in the realms of Language, Math, and overall grade. Grades are evaluated in a range of 1.0 to 7.0, in which the passing grade is 4.0.

Records of positive and negative remarks and absent days: As a way of evaluating potential effects over other relevant variables for the process of teaching and learning, all positive and negative remarks are recollected, as well as the total of absent days from the establishment. Every variable is individually analyzed, and negative remarks are subtracted from positive remarks. In this last case, greater values indicate a greater proportion of positive remarks than negative remarks. In the same manner, the absent days of the participating students from the establishment are analyzed. Both variables are considered, given that they are conducts that are traditionally understood as indicators of student improvement (Alarcón, 2015; López et al., 2019).

Self-efficacy: Self-efficacy is the measure in the same way that it was in study 1 and shows indicators of adequate reliability (AC = .92, OM = .92, IFC = .92, VME = .54). Due to the above, a self-efficacy composite index is created.

Perceived Institutional Management: To reduce the number of items to answer, the institutional management is measured by the five items of most factor loading of study 1; for example, "In this school, schedules are met"; "This school possesses an annual program of activities"; "In this school, all scheduled tests and class activities are met". The indicators of reliability are AC = .66, OM = .68, IFC = .68, VME = .30; and the syndicators of validity suggest one-dimensionality ($\chi 2/df = 3.18$, CFI = .94, TLI = .88, RMSEA = .07, SRMR = .037). The joint analysis of these indicators allows to decide the creation of a composite index of perceived institutional management.

Procedure

In first place, six schools are randomly selected from the fifteen schools participating in study 1. Then, they are contacted and asked for authorization to apply the measures study 2, as well as signing a consent form and an assent form, by students that have participated in the first study. An intentional sample of students that have not participated in MH activities also answers the questionnaire, operating as a control group under the same ethical safeguards as the previous study. To evaluate the impact of the intervention the self-efficacy on the grades of the participants, authorization is requested from family and institution to recollect the grades of the student body corresponding to the previous year. Grades are obtained from different areas such as Language, Math, and overall grade, as well as positive and negative remarks, and the total of absent days.

Data analysis

First, the existent relations are analyzed between the study variables, using the Spearman Rho indicator, adapted for variables with abnormal distribution (such as the participation in MH activities; Pardo & San Martín, 2010). Secondly, a mediation analysis is performed to evaluate the indirect effect of the self-efficacy, utilizing the PROCESS macro SPSS, developed by Hayes (2013). Accordingly, a mediating variable (self-efficacy) must be predicted significantly by a predicted variable (participation, pattern *a*), and the mediating variable must significantly predict the dependent variable (pattern *b*).

To evaluate the statistical significance of the mediational patterns, a bootstrapping procedure (Preacher & Hayes, 2008) is used, which treats the data pattern obtained as the population, extracting randomly (with substitution), five thousand samples. The estimations of the indirect effects on the grades are calculated for every

Table 1
Correlations between variables of the study

Variables	1	2	3	4	5	6	7	8
1 Average in Language								
2 Average in Math	.499**							
3 Overall Average	.681**	.664**						
4 Positive Remarks	-.090	-.013	-.100*					
5 Negative Remarks	-.263**	-.165**	-.330**	.177**				
6 Days Absent	-.094	-.037	-.162**	.046	.268**			
7 Self-efficacy	.093	.184**	.161**	.121*	-.015	-.027		
8 Music plus Humanities	.098*	.024	.104*	-.022	-.025	.033	.119*	
9 Δ Remarks	.125*	.136**	.173**	.634**	-.555**	-.168**	.073	-.006

Note. $^{**}p < .01$, $^{*}p < .05$, Δ = positive remarks – negative remarks.

sample to which the procedure is applies, to be used to generate an interval of confidence (IC) for the indirect effect (pattern *ab*). If the value "zero" is found outside of the IC, it is indicative of the indirect effect of self-efficacy on the relation between fulfilling MH activities and the respective dependent variable.

Results

Correlation analysis

Table 1 indicates the degree of relation that exists between the variables of the study. A positive and significant relation can be observed between the participation in MH activities and grades in Language, overall grade, and the self-efficacy index. It is also noted that, the positive and negative remarks have a positive correlation among themselves and that, separately, they tend to correlate negatively to the grades recollected. Nonetheless, a greater portion of the positive remarks are related in a positive and significant way to the grades recollected and are related in a negative way to the days of absence.

Mediation analysis

The analysis shows that, in the case of grades in Language, the participation in MH activities significantly predicts the scores in self-efficacy (*a*). In the same manner, the scores in self-efficacy significantly predict grades in Language (*b*). The bootstrapping procedure for the indirect effect (*ab* = .022) indicates that the IC is outside of zero value, IC 95% [.001–.072]. In the case of the math grades, it is noted that participation in MH activities significantly predicts the scores in self-efficacy (*a*) and the scores in self-efficacy are significantly related to the scores in math (*b*). An indirect effect is observed (*ab* = .041) of the self-efficacy on dependent variable, IC 95% [.007–.097]. The analysis of the overall grade average presents similar patterns to those mentioned already. In first place, MH activities significantly predict the self-efficacy (*a*) and the latter, significantly predict the overall grade average. Like the dependent variables above, an indirect effect can be observed (*ab* = .018) of the self-efficacy on overall grades, IC 95% [.001–.047]. Finally, by using the positive and negative remarks and the absent days are dependent variables, the analysis does not show a significant relation between self-efficacy and the dependent variables analyzed (pattern *b*). In line with this, the intervals of confidence, for each analysis, contain the value zero among them. The analysis suggests that self-efficacy does not affect the relation between participation in MH activities and said variables. It is also worth noting that the pattern of results previously described, does not modify by incorporating the management as a covariable. Table 2 shows the indicators of the analysis.

Discussion

Study 2 allows for the observation of an increase in self-efficacy as a product of the participation in MH activities and that this is positively related to the grade scores in Language, Math, and overall grade average. A novel result is the adherence of an indirect effect of self-efficacy on the scores recollected, which suggests that the relation between MH activities and global scores is due to the effect that they have on the general perception of personal competence. Conversely, MH activities are not significantly related to the remarks or absent days on student records, nor do they reflect an indirect effect on these factors, through self-efficacy; suggesting once again that, for said variables, the circumstances as well as the underlying mechanisms are of a different character when considered for test scores.

General discussion

Through two studies, this investigation shows that the fulfillment of MH activities can positively affect the general self-efficacy of those who participate in them, compared to those who do not (Study 1), which is coherent with previous research (Ho et al., 2017). Study 2 replicates the pattern of results of participation on self-efficacy and also demonstrates a positive relation with academic grades. While positive effects have been found in previous research on the academic performance of Chilean students during physical activities (Correa-Burrows et al., 2017), this is the first investigation that shows this type of effect in MH activities in Chile. It is also noteworthy that there is not an indirect effect of self-efficacy when the variable of criteria are the remarks and the class assistance. Considering the lack of relation between self-efficacy and the proportion of positive and negative remarks and that the latter are related to grades, it is possible that the underlying mechanism refers to other elements. Thusly, for example, remarks may be related to a strategy of group management that tends to manage the sense of community inside a classroom, to which students respond normatively (López et al., 2019). Altogether, the study results presented suggest the need to evaluate the reincorporation of MH activities in the mandatory curriculum, as they constitute an element of personal growth that goes beyond purely academic requirements.

Despite the above, it is important to take these conclusions with caution. The results show sizes of the effect are small in study 1, same as the pattern of relations in study 2. While this result suggests that the practical implications can be limited, the truth is that a small effect size can implicate important changes on a group and induvial. For example, a post-hoc analysis of the power and effect sizes of study 1 show that approximately 1,200 people are required in a following potential study to find the interaction described. This size is high for an investigation but, in Chile, primary and secondary students exceed three million people, for which it can be assumed that a massive application of these activities, inserted in the mandatory curriculum can generate the indicated change. In the case of study 2, the analysis of the correlations and direct punctuations suggest that the effect size is small. However, a minimal change can signify that a student will enter the career in university of his or her choice or not, given that the grade point average

Table 2
Coefficients for the analysis of mediation

	Language Average (LA)				
	B	ET *B*	*t*	*p*	IC 95%
P→OSE	.255	.108	2.363	.019	.043 – .468
OSE→LA	.086	.036	2.356	.019	.014 – .157
Total Effect	.147	.080	1.846	.066	-.010 – .304
Direct Effect	.125	.080	1.570	.117	-.032 – .282
Indirect Effect*	.022	.017	–	–	.001 – .072
	Math Average (MA)				
	B	ET *B*	*t*	*p*	IC 95%
P→OSE	.251	.108	2.319	.021	.038 – .463
OSE→MA	.164	.045	3.673	<.001	.076 – .251
Total Effect	.015	.099	.149	0.881	-.179 – .209
Direct Effect	-.026	.098	-.269	0.788	-.219 – .166
Indirect Effect*	.041	.023	–	–	.007 – .097
	Overall Grade Average (OGA)				
	B	ET *B*	*t*	*P*	IC 95%
P→M	.219	.110	1.987	.048	.002 – .436
OSE→OGA	.080	.026	3.082	.002	.029 – .131
Total Effect	.109	.059	1.858	.064	-.006 – .225
Direct Effect	.092	.058	1.568	.118	-.023 – .206
Indirect Effect*	.018	.011	–	–	.001 – .047

Note. * Calculated using 5000 samples bootstrapping, P = Project Participation, OSE = Overall Self-Efficacy, LA = Language Average, MA = Math Average, OGA = Overall Grade Average.

in high school is one of the greatest factors considered in college admission. On the other side, the direct effects of mediation are not significant, suggesting that the mediator is not relevant. However, given that the statistical significance of the direct effects can be affected by the sample size, it is possible that these are not observable and there is still mediation due to an underestimation of the parameter (Rucker et al., 2011). New investigations can delve in this discussion by increasing the size of both the intervention and the control groups and incorporating measures of specific self-efficacy and standardized test performance.

This investigation presents some limitations. In methodological terms, the non-random configuration of the intervention and control groups can be considered an area to improve, considering that there are additional variables that, by not being distributed homogeneously among the groups, can account for the results. Nonetheless, there are no significant differences between the students that participated and those who did not in the initial measure of self-efficacy, which does not eliminate the possibility that other non-analyzed variables can be exerting some initial effect. On the other side, the differences found do not allow the clear deduction of possible practical effects in them. However, the objective of this investigation refers less of the magnitude of the effects than the fact of evidencing differences. Future investigations can go from the evaluation of effects to control its magnitude, performing or increasing the number of longitudinal measures of the number of full-time teachers that allow the systematic follow-up of the advances. In a similar way, the scale of perceived institutional management in study 2 presents indicators of reliability under that which is recommended, which can be due to the low number of items used utilized. Nonetheless, the criteria of validity in both studies suggest a single factor, which indicates that the composite measure is adequate. Future studies must use the complete scale to reduce this problem of reliability.

The results of this study suggest that the development of MH activities can serve as a strategy that complements the training of abilities and specific knowledge, especially in circumstances in which these do not generate the change expected in instances such as tutoring (Guill & Bos, 2014). In this sense, more research is needed to know if, for example, the fulfillment of these tasks without a successful result, which is its initial objective, affects the general self-efficacy in comparison to successful situations. MH activities in the mandatory curriculum can facilitate the transit towards learning important content for standardized tests, by strengthening the global perception of competency. It is necessary that future research explore new variables related to the effect of MH activities in school contexts. For example, the investigation shows that MH activities positively affect the development of a positive educational trajectory, along with lower rates of high-risk behavior (Eccles & Barber, 1999). Thusly, a group component of participating in these activities, such as a sense of belonging, can be a relevant factor in understanding academic processes and results. Finally, knowing the impact of the fulfillment of these activities on other educational agents such as teachers, assistants, parents, and guardians would allow for a broader vision not only of institutional consequences of a curricular action but also of ways to intervene, control and predict positive academic results as well as an institutional environment that enhances the trust and the fulfillment of students' capacities.

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