Thank you for choosing to publish with us. This is your final opportunity to ensure your article will be accurate at publication. Please review your proof carefully and respond to the queries using the circled tools in the image below, which are available by clicking “Comment” from the right-side menu in Adobe Reader DC.*

Please use only the tools circled in the image, as edits via other tools/methods can be lost during file conversion. For comments, questions, or formatting requests, please use . Please do not use comment bubbles/sticky notes .

*If you do not see these tools, please ensure you have opened this file with Adobe Reader DC, available for free at https://get.adobe.com/reader or by going to Help > Check for Updates within other versions of Reader. For more detailed instructions, please see https://us.sagepub.com/ReaderXProofs.

<table>
<thead>
<tr>
<th>No.</th>
<th>Query</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Please note, only ORCID iDs validated prior to acceptance will be authorized for publication; we are unable to add or amend ORCID iDs at this stage.</td>
</tr>
<tr>
<td></td>
<td>Please confirm that all author information, including names, affiliations, sequence, and contact details, is correct.</td>
</tr>
<tr>
<td></td>
<td>Please review the entire document for typographical errors, mathematical errors, and any other necessary corrections; check headings, tables, and figures.</td>
</tr>
<tr>
<td></td>
<td>Please confirm that the Funding and Conflict of Interest statements are accurate.</td>
</tr>
<tr>
<td></td>
<td>Please ensure that you have obtained and enclosed all necessary permissions for the reproduction of artistic works, (e.g. illustrations, photographs, charts, maps, other visual material, etc.) not owned by yourself. Please refer to your publishing agreement for further information.</td>
</tr>
<tr>
<td></td>
<td>Please note that this proof represents your final opportunity to review your article prior to publication, so please do send all of your changes now.</td>
</tr>
<tr>
<td>AQ: 1</td>
<td>Please check whether author affiliations are OK as set.</td>
</tr>
<tr>
<td>AQ: 2</td>
<td>Please check whether the corresponding author details are OK as set.</td>
</tr>
<tr>
<td>AQ: 3</td>
<td>Please check the hierarchy of the heading level.</td>
</tr>
<tr>
<td>AQ: 4</td>
<td>Please suggest whether the phrase “control beliefs-effort-performance-beliefs cycles” could be changed to “control beliefs–effort–performance beliefs cycles” in the sentence “For example, in a time series study . . .”</td>
</tr>
<tr>
<td>AQ: 5</td>
<td>Please insert complete reference details for Fredericks, 2004, or delete the citation.</td>
</tr>
<tr>
<td>AQ: 6</td>
<td>“Chen, F. F. (2008).” is not mentioned in the text. Please insert appropriate citation in the text, or delete the reference.</td>
</tr>
<tr>
<td>AQ: 7</td>
<td>Please check whether the reference “ProjAVI. (2013)” is OK as set.</td>
</tr>
<tr>
<td>AQ: 9</td>
<td>Please check whether the reference “Upadyaya, K., &amp; Salmela-Aro, K. (2017)” is OK as set.</td>
</tr>
</tbody>
</table>
Examining differential trajectories of engagement over the transition to secondary school: The role of perceived control

Marina S. Lemos,1 Teresa Gonçalves,1,2 and Joana Cadima1

Abstract
The present study was particularly interested in identifying resilient trajectories of engagement, and analyzing their association with student’s motivation, specifically, their perceived control. In a longitudinal study following 391 students across three measurement points, encompassing the transition from 9th to 10th grade (from basic to secondary school), students’ beliefs (control, effort capacity, and ability capacity beliefs), engagement, and academic achievement were assessed. Consistent with previous research, an overall decline in levels of engagement was found over this time, associated with perceived control. To uncover alternative pathways, latent class growth analysis was used, and three groups of students were identified based on their distinct engagement trajectories: (1) students whose engagement started high but decreased (high-decreasing engagement), (2) students who started at average levels and declined (average-decreasing engagement), and (3) students whose engagement started low but then increased (low-increasing engagement). Comparison of the three groups demonstrated that control beliefs play a critical role in reducing the normative rate of decline in engagement. The recovery trajectory (low-increasing engagement), which is of particular interest, showed smaller declines in control beliefs. Findings also suggest that effort capacity beliefs seem to protect engagement in the face of the challenges this group of lower performing students are likely to encounter. The emergence of the three distinct engagement groups is of special interest as it shows positive, counter-normative changes in engagement trajectories. The observed changes in engagement, motivation, and achievement of the potentially at-risk students (low-increasing engagement group) suggest that these students may be especially sensitive to a supportive and engaging academic environment.

Keywords
Students’ engagement, differential trajectories of engagement, perceptions of control, motivation, recovery paths

Pathways of Engagement Over Time
Research on academic engagement has consistently shown that, in general, students experience steady declines in engagement from

1 University of Porto, Portugal
2 Polytechnic Institute of Viana do Castelo, Portugal

Corresponding author:
Marina S. Lemos, Faculty of Psychology and Education, University of Porto, R. Alfredo Allen, 4200 Porto, Portugal.
Email: marina@fpce.up.pt
primary school and continuing decreases over the course of high
school, which may be more marked across school transitions (for a
review, see Fredricks et al., 2004; Skinner et al., 2008; Upadyaya
& Salmela-Aro, 2017; Wigfield et al., 2015). Furthermore, indi-
vidual trajectories of students’ engagement tend to persist on the
same trajectory across time. Thus, the steady intraindividual
decreases evidenced in research may be particularly critical for
students who are low in engagement. They risk reaching severe
levels of alienation from learning tasks, which accrues vulnerabil-
ity when dealing with academic demands. For these at-risk stu-
dents, such cumulative disadvantage may contribute to mutually
reinforcing processes of school failure, undermining competence
self-beliefs. Consequently, their relative position may be difficult
to change over time.

Although several cross-sectional and longitudinal studies con-
firm these age-related differences and changes, few longitudinal
studies have investigated whether and how these trajectories of
school engagement may vary among student subpopulations
(Eccles & Wang, 2012; Janosz, Archambault, Morizot, & Pagani,
Studying the course of students’ engagement within subgroups
is of particular interest, because it can provide important insights
into the factors that may mitigate the normative trend of progressive
disengagement or even facilitate recovery from low levels of
engagement.

**Competence Beliefs and Engagement**

One possible factor that may protect students from declines in
engagement is perceived competence, a self-appraisal that is cen-
trally important in the school context. Competence refers to the
need to experience oneself as effective in achieving desired out-
comes (Skinner & Belmont, 1993). Expectancy-value theory
(Eccles, 2004) and self-determination theory (SDT; Deci & Ryan,
2000) both highlight perceptions of academic competence as key
determinants of students’ engagement with academic tasks and
with school.

Expectancy-value theory (Eccles, 2004) proposes that school
engagement derives from an interaction between individual moti-
vational characteristics, such as students’ academic self-concept
(and subjective task values), and the school context. Indeed, Wang
and Eccles (2013) showed that these motivational beliefs (academic
self-concept) acted as a mediating mechanism in the association
between school environment and students’ engagement. Studies
have consistently shown both concurrent and predictive associa-
tions between perceived competence and engagement over the
school years. Research has thoroughly documented students’ con-
fidence in their personal academic ability as a robust predictor of
school engagement, task involvement (Eccles & Wigfield, 2002;
Pintrich, 2003; Pintrich & Schunk, 2002), and students’ learning
and academic success (see Bandura, 1997; Dweck, 2002). This link
may be established very early, starting in the primary grades
(Valeski & Stipek, 2001).

Building on SDT’s integrated conceptualization of basic psy-
chological needs (Connell & Wellborn, 1991; Deci & Ryan, 2000),
the self-system model of motivational development (Connell, 1990)
takes into account how contextual and personal assets may influ-
ence engagement and subsequent learning. Studies based on this
framework have accumulated evidence on the effects of supportive
or non-supportive classroom contexts in promoting or undermining
self-perceptions, which in turn shape the development of engage-
ment or disaffection with learning activities (Skinner et al., 2008).
Conversely, control beliefs can also be affected by performance,
since overall success expectancies and personal beliefs about
access to specific means can be built on perceptions of past per-
formance (Skinner & Greene, 2008; Skinner, Zimmer-Gembeck,
&Connell, 1998). For example, in a time series study, Schmitz
and Skinner (1993) documented reciprocal relationships, show-
ing a sequence of control beliefs-effort-performance
beliefs cycles. Thus, competence beliefs and engagement appear to be closely related, influencing one another over time.
The development of this dynamic motivational system may con-
tribute to self-perpetuating trajectories in motivational resources
and in engagement.

To gain an in-depth understanding of the nature and role of
competence self-perceptions in the dynamics of motivation, mul-
tiple kinds of beliefs have been considered. A multidimen-
sional conceptualization of competence beliefs (Connell, 1990;
Skinner, Wellborn, & Connell, 1990) involves control beliefs
(the general belief that one can succeed), strategy beliefs (inter-
pretations of what it takes to do well), and capacity beliefs
(beliefs about personal access to specific resources). Studies that
used the multidimensional conception have shown that control
and capacity beliefs are more powerful in influencing engage-
ment, based on their regulatory effect on action (see Skinner
et al., 1998).

**The Current Study**

The current study examined normative trajectories of student
engagement over the transition from 9th to 10th grade, and its
associations with trajectories of perceived control. In addition to
the expected normative/typical declining trend shared by a large
number of students, this study also explored unexpected engage-
ment pathways that may be exhibited by subgroups of students. By
identifying differential trajectories and their determinants, this
study contributes to a better understanding of the development
of adolescents’ engagement in school. We were particularly interested
in identifying resilient trajectories, as well as the factors associated
with weaker declines or even recovery from initially low levels of
engagement.

Three goals were addressed. First, we used latent growth anal-
ysis to investigate the engagement trajectories of the overall sam-
ple and to examine whether initial levels and trajectories of
perceived control (control beliefs, effort capacity, and ability
capacity) were associated with engagement growth estimates. A
normative decline in engagement over time was expected, accord-
ing to a large body of previous research (Fredricks et al., 2004;
Skinner et al., 2008; Wigfield et al., 2015). Moreover, both con-
current and predictive associations between students’ perceived
competence and engagement over the school years were also
anticipated, considering that students with higher confidence in
their academic ability show higher concomitant and subsequent
involvement in academic tasks (Eccles & Wigfield, 2002; Pin-
trich, 2003; Pintrich & Schunk, 2002), which in turn promote
positive self-perceptions.

Second, we used latent class growth analysis (LCGA) to address
both the need for longitudinal research explaining changes in
engagement over time and the need to differentiate students who
become more or less engaged (Fredricks et al., 2004). To shed light
upon these interindividual differences, we adopted a person-centered approach aiming to identify subgroups of students based on their distinct engagement trajectories. Based on previous research (Jansz et al., 2008; Li & Lerner, 2011; Upadyaya & Salmela-Aro, 2017), it was expected that non-normative patterns of engagement trajectories might be detected (i.e., subgroups showing slower rates of decline or even recovery).

Third, we tested whether groups of students who exhibited distinct engagement trajectories also differed in their initial levels or growth of perceived control. Based on past research, it was expected that subgroups showing different engagement trajectories would also differ on motivation-related variables such as control beliefs (Skinner et al., 1998, 2008; Wang & Eccles, 2013). Most importantly, this study can help explore the extent to which motivational processes may act as personal resources that buffer students against normative declines in engagement, thereby informing the design for targeted interventions.

**Method**

**Participants**

Participants were recruited from public schools in the north region of Portugal, one of the most populated areas of the country. There was a total of 391 students (50% girls), for whom data from at least two measurement points were available. The number of students who participated at each time point was 387 at T1, 380 at T2, and 321 at T3. Students’ age ranged from 13 to 14 at the first measurement point.

**Measures**

**Academic engagement.** Teachers reported on students’ academic engagement by completing a questionnaire adapted from Skinner, Wellborn, and Connell (1990; Skinner et al., 1998). Engagement was assessed as the quality of students’ participation with learning activities in the classroom (Skinner et al., 1990). We used a 7-item 3-point Likert-type scale capturing an overall aggregate engagement, encompassing behavioral and emotional indicators of engagement, including both positive and negative instances. Behavioral engagement involves students’ effort, attention, and persistence while initiating and participating in learning activities (e.g., “In my class, this student works as hard as he or she can”); behavioral disaffection entails students’ lack of effort and withdrawal from learning activities while in the classroom (e.g., “In my class, this student does just enough to get by”); emotional engagement captures emotions indicating motivated involvement during learning activities (e.g., “In my class, this student is enthusiastic”); emotional disaffection captures students’ emotions indicating motivated withdrawal or alienation during learning activities (e.g., “In my class, this student is bored”).

We used confirmatory factor analysis to test the model fit of a one-factor model aggregating the 7 items. The overall model fit was assessed using the $\chi^2$ statistic, the root mean square error of approximation (RMSEA), the comparative fix index (CFI), the Tucker–Lewis index (TLI), and the standardized root mean square residual (SRMR). Values lower than .05 for RMSEA, greater than .95 for TLI and CFI, and lower than .08 for SRMR indicate good model fit (Hu & Bentler, 1999; MacCallum, Browne, & Sugawara, 1996). A RMSEA value between .05 and .08 indicates fair fit and between .08 and .10 indicates mediocre fit according to this index (MacCallum et al., 1996). The one-factor model provided adequate fit at T1 ($\chi^2(12) = 78.674, p < .001$; CFI = 0.972; SRMR = 0.024), T2 ($\chi^2(12) = 28.522, p = 0.046$; CFI = 0.993; TLI = 0.989; SRMR = 0.011), and T3 ($\chi^2(12) = 29.277, p = 0.036$; CFI = 0.980; TLI = 0.965; SRMR = 0.026). In all models, factor loadings were above .65.

Cronbach’s $\alpha$ coefficients were .94 at T1, .95 at T2, and .91 at T3. Next, we examined the extent to which the factor structure remained invariant across time (Vandenberg & Lance, 2000). Metric invariance was supported ($\chi^2(169) = 358.459, p < .001$; CFI = 0.970; TLI = 0.963; RMSEA = .054; SRMR = .053; $\Delta \chi^2(10) = 13.40, p = .202$) after releasing the factor loadings for one item, which is considered acceptable to establish metric invariance (Van de Schoot, Lugtig, & Hox, 2012). These results confirmed the invariance of the model of classroom engagement across time. Whereas researchers have proposed multidimensional models of engagement, namely, differentiating engagement and disaffection (e.g., Martin, 2013), as well as behavioral, cognitive, and emotional engagement (see Fredericks, 2004), it is plausible that teacher-reported student engagement emerges as a unidimensional construct, since teachers base their judgement of student engagement on more observable indicators, with ratings of student emotional engagement converging with their behavioral engagement.

**Control beliefs.** Control beliefs were assessed using the Portuguese version (Lemos & Gonçalves, 1998) of the Control, Agency, and Means-Ends Interview instrument (Skinner, Chapman, & Baltes, 1988), which was developed based on an action-theoretical framework and focuses on several aspects of control, namely, control expectancies, capacity beliefs, and strategy beliefs. For the purposes of the present study, the scales for effort capacity, ability capacity, and control beliefs were used. Effort capacity (4 items; example item “Do you try as hard as you can in school?”) represents beliefs about the self’s access to effort, and ability capacity (4 items; example item “If you want to do well in school, can you?”) represents beliefs about the self’s access to ability as potentially effective means to positive performance outcomes. Control beliefs (4 items; example item “If you decide to learn something really hard, can you do it?”) represent general beliefs about the capability to obtain positive performance outcomes. Students answered on a 4-point Likert-type response scale ranging from almost never, through not very often and often, to almost always. Internal consistencies at the three time points were acceptable, ranging from .72 to .83.

**Academic achievement.** At each time of measurement, semester grades for Portuguese language and Mathematics were collected and averaged to form an index of academic performance, ranging from 1 to 5.

**Procedures**

After informed consent for data collection was obtained, students answered the school-related control beliefs questionnaire in their classrooms. Teachers reported on students’ engagement, and students’ academic achievement was retrieved from the school records. Data were collected at three time points, at the beginning (T1: 4–5 weeks into the school year) and at the end of the 9th grade (T2: 4–5 weeks before the end of the school year), and at the
beginning of the 10th grade (T3: 4–5 weeks into the school year), following the same procedure.

Analytic Strategy

To address our first research goal, a growth model was estimated to examine normative change in student engagement over time. Latent growth models were also estimated for control beliefs, effort capacity, and ability capacity. A series of conditional models were then estimated in which the slope of each variable was regressed on the initial levels of the other variables to examine whether initial levels and growth of control beliefs, effort capacity, and ability capacity were associated with both the intercept and slope of the engagement trajectories.

To answer our second research question, LCGA was used to identify subgroups of students who exhibited distinct engagement trajectories across the three time points. The LCGA estimates different growth trajectories based on differences in growth parameter means (i.e., intercept and slope) and individuals are classified based on their likelihood of class membership (Nylund, Asparouhov, & Muthén, 2007). No variation in the intercept or slope is allowed within classes. To determine the optimal number of latent classes, LCGA models with varying numbers of trajectory classes were estimated. The optimal number of classes was selected based on several criteria: (1) statistical tests of relative fit, namely, Akaike’s information criterion, the Bayesian information criterion (BIC), the sample-size-adjusted BIC, with lower values indicating a better fit to the data; (2) interpretability and parsimony; and (3) classification quality, using the entropy statistic, which estimates the membership probability for a given class as compared to the other classes. Control beliefs, effort capacity, and ability capacity were positively correlated with concurrent engagement levels at each time point. The relationships between students’ perceived control and engagement could be considered particularly robust given that students’ engagement was rated by their teachers, instead of relying exclusively on students’ self-reports.

Latent Growth Analyses

The latent growth model for engagement fit the data well ($\chi^2(1) = 1.515, p = .218$; CFI = 0.999; TLI = 0.996; RMSEA = .036 (90% confidence interval [CI] = [0.000, 0.145])); SRMR = .035). On average, the intercept was 2.29, $p < .001$ with a negative linear growth over time (slope = –0.106, $p < .001$). There was significant individual variability in intercepts ($\sigma^2 = .377, p < .001$) and slopes ($\sigma^2 = .056, p = .008$). Slopes and intercepts were negatively correlated ($r = -0.498$), indicating that students with higher initial levels of engagement generally had more negative slopes.

The latent growth models testing change in the perceived control subscales over the three measurement points revealed that control beliefs also showed a negative linear slope over time (slope = –0.04, $p < .05$), whereas slopes for effort capacity and ability capacity beliefs were not significantly different from zero (see Table 2). In the next series of models, associations between the trajectory of engagement and trajectories of control beliefs, effort capacity, and ability capacity were estimated. Results are presented...
in Figures 1, 2, and 3, respectively, and summarized in Table 2. Initial levels of control beliefs, effort capacity, and ability capacity beliefs were all positively associated with initial levels of engagement. In addition, ability capacity beliefs were positively associated with the slope of engagement ($\beta = 0.11, SE = 0.04, p = .010$), indicating that students with higher initial levels of ability capacity beliefs also showed a slower decline in engagement over time (see Figure 3). Initial levels of engagement were negatively associated

### Table 2. Model Estimates for Latent Growth Models of Perceived Control Subscales and Change-To-Change Models.

<table>
<thead>
<tr>
<th></th>
<th>Intercept</th>
<th>Slope</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>95% CI</td>
</tr>
<tr>
<td>Latent growth models (unconditional)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control beliefs</td>
<td>3.03***</td>
<td>[2.94, 3.11]</td>
</tr>
<tr>
<td>Effort capacity</td>
<td>3.03***</td>
<td>[2.97, 3.10]</td>
</tr>
<tr>
<td>Ability capacity</td>
<td>2.61***</td>
<td>[2.53, 2.69]</td>
</tr>
<tr>
<td>Change-to-change models</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control beliefs and engagement</td>
<td>12.79</td>
<td>0.993</td>
</tr>
<tr>
<td>Control beliefs</td>
<td>3.03***</td>
<td>[2.94, 3.11]</td>
</tr>
<tr>
<td>Effort capacity</td>
<td>2.29***</td>
<td>[2.21, 2.37]</td>
</tr>
<tr>
<td>Ability capacity</td>
<td>2.29***</td>
<td>[2.21, 2.37]</td>
</tr>
<tr>
<td>Ability capacity and engagement</td>
<td>6.66</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Note. \(N = 391\). RMSEA = root mean square error of approximation; CFI = comparative fit index; TLI = Tucker–Lewis index; CI = confidence interval. *\(p < .05\). **\(p < .01\). ***\(p < .001\).

**Figure 1.** Unstandardized Coefficients From the Conditional Model Testing Associations Between Growth Estimates for Control Beliefs and the Engagement Growth Estimates.

Note. \(N = 391\). *\(p < .05\). **\(p < .01\). ***\(p < .001\).
with control beliefs ($\beta = 0.09$, $SE = 0.03$, $p = .003$), indicating that students with higher levels of engagement at T1 also showed greater decline in control beliefs over the next year (see Figure 1).

**Identifying Subgroups With Different Trajectories of Engagement**

LCGA was used to identify subgroups of students who exhibited distinct engagement trajectories. To identify the optimal number of classes, models with varying numbers of classes were estimated. According to the model-fitting statistics (see Table 3), the four-class model best represented the data; however, we selected the three-class model as the most parsimonious, because the model with four classes had convergence problems, indicating overextraction of classes (Nylund et al., 2007) and signaling that three classes were sufficient to account for heterogeneity in engagement trajectories. Moreover, the additional class only accounted for a small percent of the total sample size. The three-class model had adequate classification quality and the model-fitting statistics indicated improved fit compared to the two-class model.

Figure 4 shows the estimated engagement trajectories from the three-class solution and Table 4 shows the parameter estimates. About half the sample (51.7%, $n = 202$) was characterized by relatively high levels of engagement at baseline, and a significant and negative slope mean indicating a decrease in engagement over time, so it was designated as the high-decreasing engagement group. The second class (27.6%, $n = 108$), designated as the average-decreasing engagement group, was characterized by moderate levels of engagement at baseline, and a significant linear decrease over time, as indicated by the negative slope mean. The third class (20.7%, $n = 81$), designated as the low-increasing engagement group, was characterized by generally low levels of engagement at baseline that significantly increased over time, as indicated by the positive slope mean.

**Students’ characteristics in the three groups.** As depicted in Table 5, the three groups display contrasting levels of engagement at T1 and T2, but show a tendency to greater convergence over time. Importantly, the increase in engagement of the low-increasing group was substantial as these students developed from being low in engagement at the beginning of the 9th grade to moderate at the beginning of the 10th grade, catching up with both the average- and the high-decreasing groups at T3. Thus, students in the low-increasing trajectory seem a truly resilient group, who show increasing tendencies of recovery from low levels of academic engagement when they move from 9th to 10th grade. By contrast, the high-decreasing group suffered a decline in engagement over time, even though these students still ended at a moderate to high level.

Regarding academic achievement, as expected, the high-decreasing group had higher grades compared to the other groups.
Figure 3. Unstandardized Coefficients From the Conditional Model Testing Associations Between Growth Estimates for Ability Capacity Beliefs and the Engagement Growth Estimates.

Note. N = 391.

*p < .05. **p < .01. ***p < .001.

Table 3. Model-Fitting Statistics for the Latent Class Growth Model.

<table>
<thead>
<tr>
<th></th>
<th>Free parameters</th>
<th>AIC</th>
<th>BIC</th>
<th>Sample-size-adjusted BIC</th>
<th>Entropy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two class</td>
<td>11</td>
<td>1,350.411</td>
<td>1,394.067</td>
<td>1,359.164</td>
<td>.810</td>
</tr>
<tr>
<td>Three class</td>
<td>14</td>
<td>1,300.184</td>
<td>1,355.746</td>
<td>1,311.324</td>
<td>.841</td>
</tr>
<tr>
<td>Four class</td>
<td>17</td>
<td>1,270.707</td>
<td>1,338.175</td>
<td>1,284.235</td>
<td>.877</td>
</tr>
</tbody>
</table>

Note. N = 391. AIC = Akaike information criterion; BIC = Bayesian information criterion.

Figure 4. Estimated Values for Each Class Identified in the Three-Class LCGA.

Note. LCGA = latent class growth analysis.
at all data collection time points. Similarly, even though the grades of the low-increasing group increased over time, the average group still had higher grades than the low-increasing group at all three time points (see Table 5). Interestingly, the proportion of girls in each group was similar ($\chi^2 = 0.068, p = .966$).

**Group differences in perceived control.** The last set of analyses examined whether students in the three groups differed in terms of their initial levels and slopes of perceived control. The low-increasing engagement group was used as the reference category because we were particularly interested in investigating how students who show increasing trends in engagement differ from students who show normative declines. The results are presented in Table 6.

For control beliefs, the model had good model fit ($\chi^2(3) = 4.915, p = .178$; CFI = .995; TLI = .985; RMSEA = .040 (90% CI = [0.000, 0.102]); SRMR = .036). The results from the model revealed that the low-increasing engagement group had significantly lower initial levels of control beliefs, compared both to the high group ($\beta = 0.723, SE = 0.075, p < .001$) and the average group ($\beta = 0.315, SE = 0.084, p < .001$). However, the trajectory of control beliefs differed between the low-increasing engagement group and the high-decreasing group ($\beta = -0.111, SE = 0.043$, $p < .001$), indicating that the low-increasing group did not suffer a decline in control beliefs over time, whereas the high group did.

Regarding effort capacity beliefs, model fit was also adequate ($\chi^2(3) = 9.99, p = .019$; CFI = .966; TLI = .897; RMSEA = .077 (90% CI = [0.000, 0.102]); SRMR = .023). Interestingly, the low-increasing engagement group showed higher initial levels compared to the average-decreasing engagement group ($\beta = -0.141, SE = 0.073, p = .499$). No other differences between groups were found. Finally, concerning ability capacity beliefs, the low-increasing engagement group started with lower initial levels of ability beliefs compared to the high-decreasing engagement group ($\beta = 0.510, SE = 0.077, p < .001$). No other differences were found. Model fit was also adequate ($\chi^2(3) = 5.081, p = .166$; CFI = .994; TLI = .983; RMSEA = .042 (90% CI = [0.000, 0.103]); SRMR = .026).

### Discussion

This investigation had three main aims: (1) to map the normative trajectory of students’ engagement over the transition from 9th to 10th grades, and to examine whether trajectories of perceived control were associated with trajectories of engagement, (2) to identify specific groups of students based on their distinct engagement trajectories, and (3) to determine whether students from these differing engagement trajectory groups also differed on their initial levels and growth in perceived control (i.e., control, effort capacity, and ability capacity beliefs).

There are several limitations of this study that should be acknowledged. First, this study is correlational and, as such, causal inferences cannot be drawn. Second, participants were not randomly selected and were from one region of Portugal, thus preventing the generalization of the results. Third, this study used a unidimensional measure of engagement. Although the measure fitted the data well, possibly because it was based on teacher reports, further research using a multidimensional measure of engagement will allow the examination of whether different dimensions of engagement show different normative trajectories, are correlated with different motivational appraisals, or lead to the formation of different subgroups. Finally, considering the exploratory nature of this study, the finding of a counter-normative pattern
of increasing engagement should be replicated in further research. Results should be interpreted in light of these caveats.

In general, students had moderate levels of engagement at each time point, but a statistically significant trend indicating decreases in engagement throughout these school years was observed. These results are in line with previous research findings consistently showing progressive declines in engagement over time (for a review, see Skinner et al., 2008; Wang & Eccles, 2013; Wigfield et al., 2015). The confirmation of this decline is troubling, considering the importance of engagement as a desirable educational outcome in itself. Moreover, engagement is critical to teaching and learning (Wang & Eccles, 2013), given its links with self-regulated learning (e.g., Boekaerts, Pintrich, & Zeidner, 2000), and its predictive value for later school success (e.g., Alexander, Entwisle, & Dauber, 1993; Chase, Hilliard, Geldhof, Warren, & Lerner, 2014; Wang & Eccles, 2013; Wang & Holcomb, 2010).

Multiple Trajectories

However, even though the norm for the entire sample was a decline in levels of engagement over time, three specific trajectories were identified, capturing important differences in student’s engagement: one high-decreasing, one average-decreasing, and one low-increasing trajectory. This finding provided a more nuanced description of the dynamics of engagement at these grade levels, emphasizing the contribution of a person-oriented approach to better understanding of subgroups of students. Specifically, the high-decreasing engagement group represented about half of the students (51.7%) and was characterized by relatively high levels of engagement at T1, and a significant decrease over time. This group closely mirrors the normative decline trajectory described in the literature (Wigfield et al., 2015). It consisted of students who had relatively high grades (higher grades than the other two groups). The average group represented about a quarter of the students (27.6%) and was characterized by moderate levels of engagement at T1, and a significant, but less than normative, decrease over time. It consisted of students who had moderate grades (significantly higher than Group 3 at T1 and T2). Similar to Janosz, Archambault, Morozot, and Pagani’s (2008) findings, most of the students belong to these two moderate to high trajectories of school engagement.

The low-increasing engagement group represented about 20% of the students and was characterized by generally low levels of engagement at baseline that significantly increased over time. We refer to this group of students as resilient in light of their capacity to achieve positive engagement despite previous poor academic experiences, which would theoretically lead to self-perpetuating negative cycles. Instead, this group showed an unexpected positive change in their trajectory, avoiding or even overcoming the negative outcomes associated with their initial engagement pattern. These students had modest grades (significantly lower than both the other two groups at all measurement points), but who recover in engagement, catching up with the average group and even the high-decreasing group at T3. Hence, the current study supports the proposition that school disaffection is not necessarily a process of progressive disengagement that unfolds inexorably over the course of middle and secondary school years. The emergence of the three distinct engagement groups is of special interest as it highlights the possibility of positive, counter-normative changes in engagement trajectories.

The differences observed in academic achievement among the three groups echo the positive relationship between engagement and achievement-related outcomes found in other studies (Christenson et al., 2012; Dotterer & Lowe, 2011; Skinner et al., 2008; Upadaya & Salmela-Aro, 2013). Importantly, recent research has shown that school engagement and academic achievement are reciprocally linked (Chase et al., 2014; Li et al., 2010). The proportion of girls and boys in each group was similar. Although past research has suggested that girls show higher levels of school engagement (Li & Lerner, 2011; Martin, 2004; Wigfield et al., 2015) and less progressive disaffection than boys, no studies had yet examined gender differences in developmental trajectories of engagement. Results suggest that at this grade level, gender does not matter as much as other sources of differences (i.e., control beliefs) for students’ engagement over the transition from basic to secondary school.

Perceived Control

The present study also examined the role of perceived control, and found three kinds of evidence for its centrality, supporting the association between the two variables consistently found in previous research (Connell, 1990; Dweck, 2002; Eccles & Wigfield, 2002; Pintrich, 2003). First, students’ perceived control is correlated with their engagement at each measurement point. Second, control beliefs, effort, and ability beliefs at the baseline are associated with the intercepts of normative engagement trajectories, and ability beliefs uniquely predict normative slopes.

Third, and of greatest interest, the differential engagement trajectories are associated with students’ initial levels and growth of perceived control (i.e., control, effort capacity, and ability capacity beliefs). The results showed significant differences in the initial levels of control beliefs among the three groups—high-decreasing, average-decreasing, and low-increasing. Since the three groups in the present study represent trajectories of engagement over time, the differences found in control beliefs of three groups also demonstrate their role in differentiating long-lasting trajectories of engagement. A chain of reciprocal effects may be in place here. Perceived control likely influences students’ engagement in learning activities and in dealing with difficulties, which will be reflected in academic success and failure (Chase et al., 2014; Lemos, 2002; Li et al., 2010), which in turn shapes students’ perceptions of control (Skinner et al., 1998; Skinner & Greene, 2008).

Results also showed differences in the evolution of control beliefs, suggesting that they may play a significant role in students’ engagement over time, in particular for students who show resilient trajectories (i.e., low-increasing engagement group). Whereas the high-decreasing group, whose trajectories paralleled the normative declines in engagement, showed decreasing scores in control beliefs, the recovery group (low-increasing engagement) showed more steady scores on this variable. That is, students who recover from lower levels of engagement showed less than expected declines in school-related perceptions of control. Previous research (Skinner et al., 2008) suggested that beyond the interindividual stability in engagement trajectories determined by the amplifying effects of the initial levels of engagement itself, slow declines were observed as a function of initial levels of motivation. In contrast, the low-increasing engagement group in the present study, who also showed low initial levels of motivation, demonstrated significant increases in engagement, associated with positive changes in
motivation (i.e., perceived control). These results suggest that control perceptions may be exerting a compensatory effect, one that buffers students from further declines in engagement and achievement.

An additional key difference in control beliefs that distinguishes the low-increasing trajectory group was their effort capacity beliefs. The fact that this group starts with higher initial levels of beliefs for effort compared to the average group may also elucidate their recovery. Students’ beliefs for effort, assessed as their perceived personal ability to exert effort, to pay attention in class and to work hard, seem to fit closely the indicators describing classroom engagement. The role of effort beliefs regulating action by maintaining positive beliefs about the effectiveness of effort has been previously stressed ( Connell, 1990; Skinner et al., 1998). The present study further emphasizes the role of effort beliefs for the group of at-risk students. Beliefs for effort seem to have protected engagement in the face of failure or setbacks that this group of lower academic achievement students most probably frequently encounter. It is worth recognizing the observed changes in the group of potentially at-risk students with regard to motivation, school engagement, and achievement. This finding suggests that these students may be especially sensitive to a supportive and engaging academic environment.

**Stage–Environment Fit Over School Transitions**

It is also worth noting that more marked changes observed in engagement over time seem to occur in the transition from lower to upper secondary school (9th to 10th grade). This finding extends previous research suggesting that students’ engagement may increase after school transitions (Upadyaya & Salmela-Aro, 2017). Upper secondary school is more difficult than lower secondary school (ProJAVI, 2013). When students enter upper secondary school, they usually face a number of academic challenges, including spending more time studying by themselves and testing practices that cover more material, require more effort, and involve more frequent failure and setbacks. From this perspective, it is possible that students in the low-increasing engagement group, who also have a history of lower achievement, may be more resilient and better prepared to face challenges and difficulties by exerting effort and increasing engagement. In contrast, the high-decreasing engagement group (who also had higher achievement) shows a steeper decline in engagement during this transition. Differences in effort capacity and ability capacity beliefs between the two groups help to further explain the opposing patterns of change in engagement found for the two groups over the transition. The resilient group reports an increase in the kinds of effort capacity beliefs that have been associated with a positive pattern of learning behavior and persistence (Chapman, Skinner, & Baltes, 1990; Skinner et al., 1990), showing even higher scores than the average group. These findings may help guide interventions to improve social contextual supports (e.g., teacher involvement) and pedagogical methods (e.g., mastery grading) that highlight the role of effort.

Moreover, the higher scores in ability beliefs of the high-decreasing group also suggest a potential explanation. Having a history of positive academic achievement and high perceived ability, these students may be less prepared to respond with increased engagement in the face of difficulties and new demands. Covichton and Omelich (1979) contend that feelings of personal competency and efforts to preserve a sense of self-worth play a role in the dynamics of achievement behavior. Considering the perceived compensatory relations between effort and ability described by Covington, according to which trying hard increases attributions of failure to lack of ability, these students may react defensively, trying to maintain favorable ability self-perceptions in the face of difficulties, by avoiding exerting added effort.

Finally, these findings seem to invite a contextualized framework for understanding engagement, pointing to the established link between students’ engagement and aspects of the classroom and school context. From this perspective, changes in the school environment associated with the transition to secondary school may be investigated as playing a role in modifying the fit between individual factors, such as individual motivational beliefs, and their school environment ( Jang, Kim, & Reeve, 2016; Shernoff et al., 2016; Wang & Eccles, 2013). Eccles and colleagues integrated models of person–environment fit to understand how age and contextual changes may explain declines in motivation and engagement over school transitions (Eccles, 2004; Eccles & Wigfield, 2002). These frameworks may be helpful in future studies examining changes in engagement and achievement over the transition from basic to secondary school, so researchers can include the assessment of changes in the social context as well.

**Funding**

The author(s) received no financial support for the research, authorship, and/or publication of this article.

**ORCID iD**

Marina S. Lemos https://orcid.org/0000-0001-5259-7935

**References**


