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ΕΜΠΕΙΡΙΚΗ ΕΡΓΑΣΙΑ | RESEARCH PAPER

Individual and social predictors of Greek early adolescents' self-determination: A longitudinal structural equation analysis

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KEYWORDS

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Self-determination,
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Self-esteem,
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Depression,
Anxiety,
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ABSTRACT

Given that early adolescence is a dynamic and vulnerable developmental period, it is important to examine factors that promote adolescents' individual development and, more specifically, the satisfaction of psychological needs within the framework of self-determination theory. In a two-wave longitudinal sample ($N = 218$) of Greek adolescents (eighth grade in autumn 2020 and ninth grade in autumn 2021), we used structural equation modeling to determine which individual and social factors longitudinally predict autonomy, competence, and relatedness. The examination of these psychological needs is regarded as a necessary step in designing school-based prevention and intervention programs for adolescents. Individual factors, such as self-esteem, self-efficacy, and depression or anxiety, foster self-determination through social factors, such as recognition and support from teacher and parents, and social resources. Adolescents with a migration background showed lower levels of social factors. The model was gender invariant and indicated that social agents (teachers and parents) and social resources predict a very large proportion of variance in early adolescents' individual development. These findings support the view that early adolescents' development depends on social factors through the satisfaction of psychological needs.

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Introduction

Adolescence is a turbulent period marked by biological changes, identity development, increased autonomy and independence, transitions to new environments, and evolving peer and family relationships (Feldman et al., 1990). It is also a vulnerable stage of development: 1 in 7 adolescents aged 10–19 years old experience a mental health disorder worldwide (World Health Organization, 2019). Depression is the fourth leading cause of illness and disability in this developmental period, and anxiety is the ninth one (Garber & Weersing, 2010). As such, it is unsurprising that social distancing policies and the closure of public spaces, necessitated by public health precautions during the COVID-19 pandemic, have significantly affected adolescent mental health (Garagiola et al., 2022; Magson et al., 2021). Given the conditions of the COVID-19 pandemic and its effects on adolescent students' development, we expected, in according with existing studies (Chiu, 2022; Holzer et al., 2021, that adolescents would experience lower levels of satisfaction with their psychological needs, namely autonomy, competence, and relatedness. Much like a war, a financial crisis, or a tornado, for example, a pandemic also enormously affects the development and socialization conditions of adolescents, even if these effects might not be direct and may appear later (Ertanir et al., 2021). Given the frustration of adolescent students' psychological needs during the pandemic (Meireles et al., 2022; Šakan et al., 2020) and their resulting vulnerability (Breux et al., 2021; Garagiola et al., 2022; Prime et al., 2020), it is important to examine factors that promote adolescents' development (Yeager & Dweck, 2012). Although the impact of the COVID-19 pandemic on adolescents was not

measured in this study, given that the research was conducted during the pandemic, we assume, based on the findings of the aforementioned studies, that the pandemic had a strong impact on students' vulnerability. Therefore, we place the complex questions about the mediating supportive factors of adolescents' development of self-determination at the center of this study: Which individual and social factors lead to higher levels of self-determination in adolescence?

In rapidly changing educational times, students' needs satisfaction can be easily threatened, rendering students vulnerable to motivational problems, poor adjustment in school, and even psychopathology (Bartholomew et al., 2011; Ryan et al., 2016; Vansteenkiste & Ryan, 2013). Likewise, the worldwide COVID-19 crisis could be perceived as a need-thwarting condition because it can threaten the basic psychological needs of autonomy, competence, and relatedness (Vansteenkiste et al., 2020; Vermote et al., 2022). Costa et al. (2022) assumed that the obligation to stay at home could be perceived as a restriction of individual freedom that compromises personal feelings of choice and volition (autonomy frustration), that the requirement to avoid close contact with people and the prohibition of recreational events and social gatherings could exacerbate feelings of isolation and loneliness (relatedness frustration), and that the sudden shift to distance learning could be associated with inadequacy and unpreparedness in dealing with this change (competence frustration). Although it is challenging for individuals to satisfy their psychological needs during these times, needs satisfaction can still be a key resource of resilience in the face of stress (Weinstein & Ryan, 2011). In contrast, frustration with psychological needs can increase individuals' vulnerability to maladjustment (Vansteenkiste & Ryan, 2013), which is considered a risk indicator.

So far, research on positive development of migrant students in Greece has mainly focused on the comparative interpretation of individual differences in school achievement observed within groups of migrant and nonimmigrant students. Motti-Stefanidi and her colleagues concluded a number of studies that examined a series of individual and contextual factors related to resilient adaptation of immigrant youth, such as acculturation processes (Motti-Stefanidi et al., 2008), generation status, socioeconomic and ethnic composition of the classroom (Motti-Stefanidi et al., 2012), students' self-efficacy belief and family functioning (2014) school engagement (Motti-Stefanidi et al., 2015), peer acceptance (Motti-Stefanidi et al., 2020), perceived discrimination (Motti-Stefanidi & Asendorpf, 2012), even the Greek economic crisis (Motti-Stefanidi & Asendorpf, 2017). Accordingly, Anagnostaki et al. (2016) found significant personal resources, such as high self-esteem belief and internal locus of control, and family resources, such as high family support, parents' level of education, and parental involvement in children's school, influencing students' academic success regardless of their ethnic and social background. They underlined, however, that the supportive role of migrant families is confronted with strong social barriers (e.g., social discrimination), which are difficult to address and control. For this reason, immigration status remains an important risk factor for academic success at school. Social institutions, such as schools, can help to address such barriers by providing migrant students with important resources for academic resilience. A recent relevant comparative study by Gabrielli et al. (2022), which analyzed empirical data from seven European countries, including Greece, shows the existence of a direct correlation between academic resilience and the quality of the school environment, such as the quality of teaching resources, the offer of extracurricular partnerships, and activities. This identifies that Greece, as well as other countries in the European South, has lagged behind northwestern countries in offering quality school resources to migrant students. This is an important finding if we consider the fact that the academic success of migrant students depends to a stronger extent on the quality of the school environment than that of native students (Agasisti et al., 2021).

Self-determination theory (SDT) is a general theory on motivation in a social context that has been applied intensively in the context of education. It assumes that students have a set of inherent psychological needs that require satisfaction to foster deep-level learning, curiosity, and well-being and to promote adaptive coping in response to change (Evans, 2015; Vansteenkiste et al., 2010). In academic contexts, the three basic psychological needs are autonomy (a student's perceived agency over their lived experience), competence (a student's perception of their knowledge and skills regarding an assigned or chosen task), and relatedness (a student's sense of connectedness with peers and teachers), the "satisfaction of which fosters psychological wellness, and the frustration of which conduces to ill-being" (Ryan & Deci, 2019, p. 20).

La Guardia and Ryan (2002) proposed that adolescents' basic psychological needs need to be gratified in two important social contexts: family and school. Consequently, needs satisfaction in early adolescence seems to be a valuable resource for parents and caregivers to maintain reasonable limits and provide optimal challenges

(Wehmeyer & Shogren, 2017) as well as for educators to consider and foster their teaching practices (Niemic & Ryan, 2009).

Migration background also critically affects adolescents' mental health (Viner et al., 2012) because of the effects of ethnic minority status (e.g., experience of exclusion and/or discrimination), the migration process (e.g., forced migration, loss of cultural connectedness, the use of another language, and acculturation), and inferior socioeconomic status (Belhadj Kouider et al., 2014; McMahon et al., 2017). In a latent profile analysis in a German, Greek, and Swiss sample of adolescents, a migration background was associated with an increased probability of being a part of the nonresilient or resilient profile compared to the moderately resilient profile (Janousch et al., 2022). Consequentially, research has shown specific protective factors related to individuals having a migration background: Social resources (having a feeling of connectivity, belonging, and good relationships) are the most beneficial protective factors to preserve and foster the mental health of people with migration backgrounds (Hoi et al., 2015).

Research analyzing the developmental processes and school adjustment of adolescent immigrant students, based on the theory of SDT, has converged on the conclusion that the degree of satisfaction of the basic universal needs of the sense of belonging, competence, and autonomy, in the school environment, is comparatively lower than that of their native peer group, despite any differences between host countries (Alivernini et al., 2019; Chiu et al., 2012; Kunyu et al., 2021a; Manganelli et al., 2021). The incomplete satisfaction of these needs negatively affects their psychological well-being, school engagement, and academic achievement and is mainly due to experiences of discrimination as well as the low degree of development of the qualitative features of the school environment they attend, such as accepting relationships with teachers and peers (i.e., a disciplined and fair learning environment; Kunyu et al., 2021b; OECD 2017). Because adolescents' development at school is understood as a dynamic process that varies over time, cross-sectional (i.e., one-off) studies that account for how adversity-exposed adolescents develop well offer suboptimal explanations of processes of positive adjustment (Masten, 2014b). Along this line, a substantial number of studies have followed cohorts of children to better understand which protective factors are enabling higher levels of SDT. Across these studies, positive outcomes in the face or aftermath of adversity are associated with personal strengths (e.g., impulse control, self-esteem, and being motivated to achieve) and systemic enablers (e.g., supportive family, constructive peer relationships, and quality schooling; see Werner, 2013). Individual resources and systemic supports are likely to inform processes that facilitate positive outcomes in the face or aftermath of adversity (Masten, 2014b).

According to the meta-analyses of Cornelius-White (2007) and Roorda et al. (2011), a high degree of quality in teacher-student relationships require attitudes and behaviors on the part of teachers that are characterized by empathy and respect. In the same direction, recognition theory (Honneth, 1996), adopting the intersubjective view of individual development, defines empathy, moral respect, and social esteem as the key components of the quality of pedagogical relationships, which are also required for students' emotional, cognitive, and social development (Bernard, 2007). Depending on their experiences in school relationships and the potential of recognition (Graham et al., 2017), students develop trusting relationships or feelings of neglect and devaluation (empathy component), self-respect or learning barriers (moral respect component), and self-esteem or low achievement (social esteem component). Specifically, the lack of teachers' recognition of specific groups of students, such as immigrants, is associated with reduced opportunities to participate in the teaching process and poorer learning outcomes (Vieluf & Sauerwein, 2018). The magnitude of the importance of teachers' experiences of recognition for school success is also reflected in the fact that these experiences constitute a stronger predictor of school performance than ethnicity, family educational capital, and gender (Govaris et al., 2021).

Family support is also considered essential for adolescents' psychological adjustment (Anderson et al., 2007) and mental health (Anthony & Stone, 2010). Recent evidence from Dutch adolescents has shown an increase in parental support with a simultaneous decrease of anxiety and depression during a 20-day period of, initially, online and, later, mostly physical school days during the pandemic (Klootwijk et al., 2021). In addition, Ellis et al. (2020) documented that spending more time with family was associated with better mental health among Canadian adolescents. Social support also has a positive relationship with adolescents' individual constructs, such as self-esteem (Ikiz & Cakar, 2010; Veselska et al., 2010), self-efficacy (Iwanaga et al., 2021), and general life satisfaction (Lopez-Zafra et al., 2019), and a negative relationship with emotional distress, such as depression and anxiety (Pössel et al., 2018).

From the social-ecological perspective (Ungar, 2011), adolescents' resilience draws not only on supportive systemic initiatives but also on individual resources (e.g., the capacity to be responsive to support; Düggele et al.,

2021; Theron & van Rensburg, 2018). For instance, self-esteem, the understanding of an individual's capacity and self-value (Pyszczynski et al., 2004), positively predicted students' academic success and mediated the relationship between social support and university students' well-being (Tian et al., 2013). Additionally, general self-efficacy, individuals' beliefs about their ability to perform a specific behavior successfully (Bandura, 1977), positively predicted students' resilience (Kassis et al., 2021) and mediated the relationship between social support and students' positive development at school.

Focusing on supportive factors, psychological needs satisfaction, and the abovementioned empirical background, we adopted a dual (socioecological and individual) perspective on enhancing factors of students' higher levels of SDT. Attempting to examine the effect of social and individual predictors on adolescent students' satisfaction for autonomy, competence, and relatedness, we propose that social support from family and teachers has a direct and indirect effect (through individual factors, such as students' self-esteem, self-efficacy, satisfaction with life, and emotional distress) on psychological needs satisfaction. This dual perspective is important not only from a theoretical point of view but also from an applied perspective because psychological needs are potential targets for interventions aimed at strengthening individuals' SDT in stressful conditions (Weinstein & Ryan, 2011). Given that the pandemic was the context of our research, we assume that it had a strong impact on students' vulnerability, although we did not measure this impact.

Materials and Method

Participants

We collected a convenient two-wave longitudinal sample data of 250 eighth-grade students (in Greece, eighth grade is the second high-school year) in autumn 2020 (Wave 1) and 328 ninth-grade high school students (third high-school year in Greece) in autumn 2021 (Wave 2) from 14 schools and 48 classes in three Greek regions, namely Athens, Larisa, and Crete, and had the participants anonymously complete an online questionnaire twice in 1 year, with 218 students participating in both waves. We collected data from Wave 1 in autumn 2020, just before the second COVID-19-related school shutdown in Greece. We faced no such restriction with Wave 2 in autumn 2021; thus, Wave 1 was smaller. In terms of attrition between Wave 1 ($n = 250$) and Wave 2 ($n = 328$), we found no significant differences in terms of the tested sociodemographic variables between participants: gender, $t(576) = -1.263, p > .05$; and migration background, $t(576) = 0.625, p > .05$. Therefore, we considered the two samples to be comparable.

We obtained consent forms from students and their parents. We provided no incentives. The Ethics Research Committee in Greece, i.e., the General Assembly of the Pedagogical Department of Primary Education of the University of Thessaly and (because of the overall study's international character) in Switzerland, i.e., the Ethics Committee of the University of Zurich, authorized the project. Starting from English, the questionnaire was translated into Greek following the four-eyes principle, a content translation, and, additionally, a culturally sensitive approach (Peña, 2007). On the day of the study, the research team members gave the students a short oral introduction to the survey, and the students completed the questionnaire in about 35–60 min in the respective classroom under the supervision of the research team. The students' mean ages were 12.12 years ($SD = 1.00$) in Wave 1 and 14.00 years ($SD = .81$) in Wave 2. In Wave 1, 52.4% ($n = 131$) of participants were female, and in Wave 2, 51.5% ($n = 169$) were female. In Wave 1, 41.6% ($n = 104$) of the participating students had migration backgrounds, and in Wave 2, 39.0% ($n = 139$) had migration backgrounds.

Hypotheses

Following our theoretical outline, we formulated the following six hypotheses:

Hypothesis 1: Higher levels of social resources (teacher and family) in Wave 1 will lead to higher and more positive levels of individual predictors in Wave 2.

Hypotheses 2: Higher levels of the social predictors (teacher and family) in Wave 1 will have a direct effect on SDT in Wave 2, with higher levels of social predictors leading to higher levels of SDT.

Hypothesis 3: Higher levels of the individual predictors in Wave 1 will lead to higher levels of SDT in Wave 2.



Hypothesis 4: Higher levels of the social predictors (teacher and family) in Wave 1 will also have an indirect effect (through individual predictors) on SDT in Wave 2, with higher levels of social predictors leading to higher levels of SDT.

Hypothesis 5: We hypothesize, that students with a migration background will have lower levels of social support than Greek students.

Hypothesis 6: As the measured concepts are suggested to be general and therefore fit all genders, the applied model will be invariant for gender and therefore apply to both genders.

We established the conceptual measurement model based on these six hypotheses (see Figure 1).

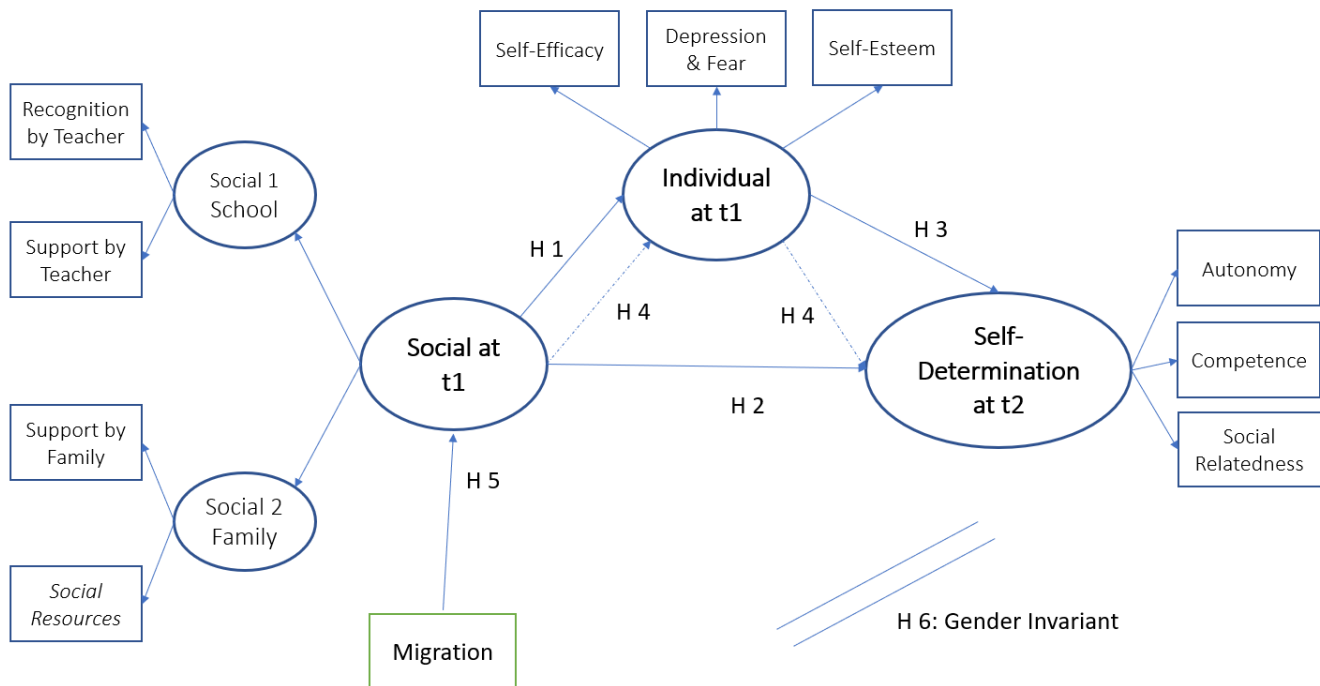


Figure 1. The Conceptual Measurement Model

*Note. H1 = Hypothesis 1; H2 = Hypothesis 2; H3 = Hypothesis 3; H4 = Hypothesis 4; H5 = Hypothesis 5; H6 = Hypothesis 6.

Measures

Social Indicators

Teacher Indicators

Recognition From Teacher. Following Honneth’s (1996) recognition theory regarding teachers’ recognition of students, we measured the three subscales, empathy, solidarity, and law ($\alpha = .90$), by applying a revisited nine-item version of Böhm-Kasper et al.’s (2004) scale on the recognition relations between teacher and student.

Support From Teacher. We measured support from the teacher using a modified scale by Hertel et al. (2014) on the degree of academic support provided and positive teacher–student relationships. We measured the five items ($\alpha = .87$) on a 4-point Likert scale ranging from 1 (*do not agree at all*) to 4 (*strongly agree*; e.g., “When I need additional support, then I receive it from my teachers”).

Family/Social Support Indicators

Support From Family. The Support From Family subscale of the Resilience Scale for Adolescents (Hjemdal et al., 2006; also used in a Greek sample by Kassis et al., 2021) consists of five items and focuses on family support and family cohesion for the adolescent (e.g., “In my family, we support each other”). The participants rated the items on a 5-point Likert scale ranging from 1 (*totally disagree*) to 5 (*totally agree*; Wave 1: $\alpha = .86$).

Social Resources. The Social Resources subscale of the Resilience Scale for Adolescents (Hjemdal et al., 2006; also used in a Greek sample by Kassis et al., 2021) consists of five items ($\alpha = .81$) and focuses on social resources as support from family and friends (e.g., “I always have someone that can help me when I need it”) and is focused on social resources available outside the school. The participants rated the items on a 5-point Likert scale ranging from 1 (*totally disagree*) to 5 (*totally agree*; Wave 1: $\alpha = .81$).

Individual Indicators

Symptoms of Anxiety and Depression. We assessed anxiety and depression indicators using 24 items (e.g., “I feel fear” and “Thoughts of ending my life”) from the Hopkins Symptom Checklist (Derogatis et al., 1974; standardized in Greek population by Donias et al., 1991). From the original 25-item scale version, we omitted one item (“Loss of sexual interest or pleasure”) because of the participants’ youth (approximately 12–14 years). The participants rated the items on a 4-point Likert scale ranging from 1 (*not at all*) to 4 (*extremely*; Wave 1: $\alpha = .96$).

Self-Esteem. The Rosenberg Self-Esteem Scale (1965) assesses an individual’s global worthiness on a 10-item scale, with higher scores indicating higher self-esteem. The participants rated the items on a 4-point Likert scale ranging from 1 (*not at all*) to 4 (*completely true*; Wave 1: $\alpha = .81$; e.g., “I wish I could respect myself more”). The scale was adapted into Greek and has been used in Cyprus by Panayiotou and Papageorgiou (2007) and Fanti et al. (2013).

Self-Efficacy. The General Self-Efficacy Scale is a psychometric scale that Schwarzer and Jerusalem (1995) developed to assess optimistic self-belief regarding coping with various challenging demands in life (e.g., “I am confident that I could deal efficiently with unexpected events”). The 10-item scale (Wave 1: $\alpha = .92$) is measured on a 4-point Likert scale ranging from 1 (*not true*) to 4 (*completely true*). The scale has been adapted to the Greek population by Mystakidou et al. (2008).

The Dependent Variables

Self-Determination. Following Deci and Ryan’s (2017) SDT on human basic psychological needs, we measured the three subscales, autonomy, competence, and relatedness, on short scales with three items each (e.g., “I was free to do things in my own way”). The 18-item scale (also used in the Greek sample by Kassis et al., 2021) was measured (α autonomy_wave 2 = .70; α competence_wave 2 = .71; α relatedness_wave 2 = .70) on a 4-point Likert scale ranging from 1 (*not true at all*) to 4 (*completely true*).

Sociodemographic Indicators

Gender. We assessed the students’ genders with three response options (0 = *boy*, 1 = *girl*, and 3 = *other*).

Migration Background. Not having a migration background meant the student and both of their parents were born in Greece and all three possessed only a Greek passport. Having a migrant background was operationalized such that one or more of the aforementioned conditions did not apply.

Socioeconomic Status. We used parental education status as a proxy for their socioeconomic backgrounds. We gathered information on parental education mainly from questions on the parent questionnaire, with possible responses ranging from 0 (*university degree or higher education*) to 5 (*has not finished primary school*). Primarily, we used the wave 1 data, and in cases of missing values, we also considered wave 2 data.

Analytic Strategy

This study’s aim was to identify how social and individual support aspects affect SDT over time to help aid in prevention and intervention programs.

Therefore, we conducted this study’s statistical analysis in two steps: First, we investigated intercorrelations between the variables, and we presented descriptive analyses as the mean and standard deviation for the 11 applied measures. Second, using structural equation modeling (SEM), we tested for longitudinal effects on the applied measures. For the sample description analyses, we used IBM SPSS Statistics (Version 25). For all conducted SEM analyses, we used Mplus (Version 8.8).

Results

Analytic Step 1: Intercorrelations and Descriptive Statistics of All Measures

By first testing the intercorrelations of all variables (see Table 1), we ensured that no multicollinearity problems existed in our analyses. The mean levels for all observed constructs are presented in Table 2 for girls and boys. We detected gender differences for three constructs: self-esteem, self-efficacy, and depression & anxiety. The girls had higher mean levels of depression or anxiety than the boys. The analysis of gender differences showed that, compared to girls, boys had higher mean levels of self-esteem and self-efficacy.

Analytic Step 2: Testing for Longitudinal Effects Using Structural Equation Modeling

When running SEM to identify the longitudinal effects of social and individual factors on the SDT of adolescent students, we had to consider several tests to examine the model's adjustment. We examined model fit precision for the tested structural equation models (a) using a combination of the comparative fit index (CFI) and the Tucker–Lewis index (TLI) as incremental fit indices that compared the fit of a hypothesized model with that of a baseline model and (b) using absolute fit indexes such as the root-mean-square error of approximation (RMSEA) and the standardized root-mean-square residual (SRMR). CFI and TLI values of .95 or greater indicate an excellent model fit, whereas values of .90–.94 suggest an adequate fit (Kline, 2015; Xia & Yang, 2019). The RMSEA index incorporates adjustments for model complexity so that the evaluation of model precision is not overly influenced by the number of parameters included in the model (Steiger, 1990). RMSEA and SRMR values of .05 or less are considered indicative of excellent fit, whereas values of .06–.08 suggest adequate model fit (Kline, 2015).

The measures of local fit for all five latent variables of the tested model are displayed in Figure 2 and showed great fit for all latent variables.

The overall model (see Figure 2) fits the data adequately: $\chi^2(48, N = 319) = 105.406, p < .001, CFI = .926, TLI = 0.900, RMSEA = .061, \text{ and } SRMR = .057$ (see Figure 2). Additionally, migration background was included in SEM to predict the social support level. Social support significantly and strongly increased levels of individual support. Even when a direct effect of social support on SDT has not been detected, a significant indirect effect over individual support on SDT was identified ($b = .036, p < .01$). In turn, increases in individual support significantly increased levels of SDT ($b = 0.47, p < .01$). In our model, a high proportion ($R^2 = 57.8\%$) of individual support was explained by the second-order factor of social support. The overall model explained 49.5% of the variance in SDT, indicating the model had a very high explanatory strength. We also tested for the effect of SDT at Wave 1 on self-determination at Wave 2 and detected a significant regression path ($b = .029, p < .05$).

Having established the model's overall structure, we then tested for measurement invariance across both genders (female: $n = 117$; male: $n = 101$) in the factor loadings (configural invariance) as in the factorial structure (metric invariance). We performed an invariance analysis for both genders to ensure the reliability of the tested model's structure (configural invariance) and the same relevance of the first- and second-order factors included (metric invariance). Scalar invariance was not required because the specific gender slopes were not central to this specific analysis. Ensuring configural and metric invariance was necessary to establish the model's relevance for both genders. Here we note that when testing for gender invariance, we excluded the two individuals who identified themselves as neither female nor male. When testing for configural, $\chi^2(6) = 10.311, p > .05$, as compared to metric, $\chi^2(12) = 21.334, p = .05$, and scalar $\chi^2(6) = 11.349, p > .05$ measurement invariance, we identified nonsignificant chi-square tests, thereby establishing the same model's relevance for both genders. To summarize the invariance testing results, we found the same factor loadings and factor structures across both genders. In terms of content, this indicated that the introduced and empirically analyzed SEM provided an empirically reliable measure for female and male students.

Table 1
Correlation Between Measures

Measures	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Support by Teacher_wave 1	1									
2.Recognition by Teacher_wave 1	.64***	1								
3.Support by Family_wave 1	.37***	.44***	1							
4.Social Resources_wave 1	.31***	.43***	.60***	1						
5.Self-Esteem_wave 1	.33***	.30***	.39***	.38***	1					
6.Self Efficacy_wave 1	.39***	.38***	.47***	.44***	.40***	1				
7.Depression & Anxiety_wave 1	-.09	-.23**	-.40***	-.25***	-.58***	-.43***	1			
8.SDT_Autonomy_wave 2	0.19	.20**	.28***	0.18	.24**	0.11	-.18	1		
9.SDT_Compotence_wave 2	.24**	.32***	.32***	.29***	.49***	.29***	-.33***	.50***	1	
10.SDT_Relatedness_wave 2	0.19	0.19	0.16	.24**	.23**	0.19	-.32***	.35***	.32***	1

Table 2*Mean Levels (and Standard Deviations) of All Observed Variables by Gender and for the Total Sample*

Variables	Range	Girls (n = 117)	Boys (n = 101)	t(df)	p	Cohen's d	Total (N = 218)
		<i>M (SD)</i>	<i>M (SD)</i>				
Support by Teacher_wave 1	1-4	3.07 (.73)	3.01 (.77)	-1.16 (215)	.249	-.157	3.04 (.75)
Recognition by Teacher_wave 1	1-4	3.17 (.58)	3.12 (.57)	-.73 (203)	.464	-.103	3.14 (.58)
Support by Family_wave 1	1-5	4.05 (.86)	4.16 (.70)	.89 (215)	.372	.121	4.10 (.79)
Social Resources_wave 1	1-5	4.54 (.60)	4.46 (.65)	-1.34 (216)	.182	-.179	4.50 (.62)
Self-Esteem_wave 1	1-4	2.94 (.57)	3.16 (.53)	2.72 (202)	.007	.381	3.04 (.56)
Self-Efficacy_wave 1	1-4	2.95 (.66)	3.21 (.53)	2.61 (188)	.010	.375	3.07 (.61)
Depression & Anxiety_wave 1	1-4	1.96 (.66)	1.71 (.75)	-3.15 (214)	.002	-.419	1.85 (.71)
SDT_Autonomy_wave 2	1-4	2.75 (.56)	2.75 (.53)	.90 (202)	.369	.106	2.75 (.55)
SDT_Compotence_wave 2	1-4	2.70 (.57)	2.73 (.49)	1.54 (204)	.124	.183	2.71 (.53)
SDT_Relatedness_wave 2	1-4	2.96 (.61)	2.90 (.55)	-.68 (204)	.496	-.080	2.93 (.58)

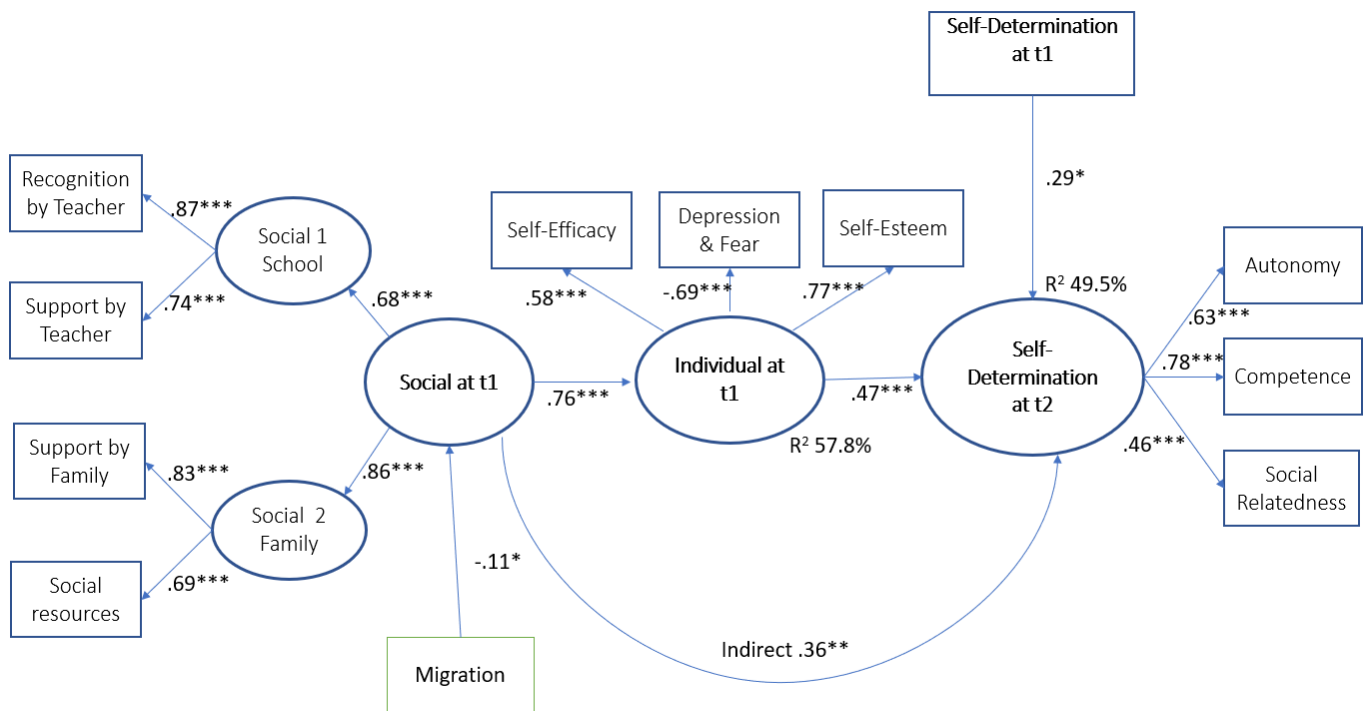


Figure 2. The Overall Structural Equation Model

*Note. Only significant standardized paths are reported.

Discussion

In early adolescence (Hansen & Jessop, 2017), students become self-determined—that is, manifest the dispositional characteristic of SDT—as they learn, refine, and practice knowledge, skills, beliefs, and actions that enable them to respond to contextual and environmental challenges (opportunities or threats) that energize basic psychological needs (Wehmeyer & Shogren, 2017).

We would be leaving young people alone if we were also to postulate that, under pandemic conditions, they are primarily responsible for the satisfaction of their psychological needs. Similar to Masten (2014b), we asked about the social obligations of and responsibilities to the threats individuals are facing. Like La Guardia and Ryan (2002), we proposed that adolescents’ basic psychological needs need to be gratified in the social contexts of family and school.

Our two-wave longitudinal study’s results clearly indicate that parents and teachers are valuable and, in terms of content, significant resources for adolescents’ psychological development. According to our findings, higher levels of the social predictors (teacher and family) lead to higher and more positive levels of individual predictors, such as self-efficacy, and self-esteem. In addition, higher levels of the social predictors lead to lower and more negative levels of depression and anxiety in adolescents.

Understood in this way, psychological stability for adolescent students, cannot be reduced to a purely individual mechanism (Masten, 2014a; Ungar, 2015). This social-ecological understanding tasks social systems such as families and schools with the responsibility of actively coenabling processes (Theron, 2016) toward higher levels of SDT. In this line, positive outcomes arise from the mediation effect that the individual factors had on the social systems such as families and schools (Southwick et al., 2016; Theron, 2016). Considering supportive factors from this perspective, social contexts are crucial to children’s functional outcomes, such as physical and mental health, sense of well-being (Kassis et al., 2021), academic progress, and civic engagement (Masten, 2014a).

In addition, the results of the path analyses revealed that higher levels of the social predictors (teacher and family) had direct and indirect (through individual predictors) effects on SDT, with higher levels of the social predictors effecting higher levels of SDT. Given that SDT facilitated by the dialectic between the active, organizing human beings and their environment (Griffin et al., 2017), healthy psychological growth for students in early

adolescence also involves interactions between individuals and the environment (Ryan et al., 1995). In line with SDT (Deci & Ryan, 2011), we were able to determine that environmental factors, such as family and teacher, do influence, both directly and indirectly, individual adolescents' basic psychological needs (Vallerand et al., 2008). In particular, social factors, such as support from parents or teachers, were identified as having effects on people's needs (Bartholomew et al., 2011) and increasing their motivations (Deci & Ryan, 2000). Given that social support refers to the structural (presence of social relationships) and functional (type of resources) support provided by the social environment (Helgeson, 2003), teacher and parent support are considered important sources of social support that can significantly impact students' self-determination. As far as teachers are concerned, their attitudes, behaviors, and actions significantly influence the degree of quality of their relationships with students, which, in turn, are strong predictors of students' academic and social development (Ansari et al., 2020). Teacher support helps make students feel secure and gives them the confidence to be more active in school, socially and academically (Curby et al., 2013), with fewer mental health problems, even in times of online learning, such as when schools were closed during the pandemic (Ye et al., 2022).

Our results enrich relevant existing studies in Greece about the psychological factors of the pandemic (on general population: Kyriazos et al., 2022; on university students: Kaparounaki et al., 2020; Kokkinos et al., 2022; Konstantopoulou & Raikou, 2020; Patsali et al., 2020; Vasiou and Andriopoulou, 2023; on young people and adolescents: Tentolouri & Papadopoulos, 2022). Also, they highlight the necessity of applying school-specific prevention and intervention programs with a multivariate design to enhance both social and individual factors. Thus, educators, administrators, and policy makers would do well to consider designing classroom practices that promote teacher support through recognition (Van den Bergh et al., 2010) and students' strength characteristics. Such cooperation requires children to utilize the personal and social resources or supports necessary to achieve functional outcomes and to ask for the provision of such resources or supports should they be inaccessible or unavailable, whereas social systems are responsible for actively coenabling success pathways (Theron, 2016).

Furthermore, sociodemographic indicators (e.g., migrant background, parental education level, and gender) were included as predictors in the analysis, but only migrant background had a significant relationship, especially to social support: The students with migrant backgrounds had lower levels of social support than the Greek students. Through this result and according to previous research, students with immigrant backgrounds (e.g., Schachner et al., 2017) are more affected by the quality of social relationships at school than their non-immigrant classmates. A recent study showed that students from immigrant and low-income families experienced the lowest levels of recognition from their teachers (Govaris et al., 2021).

Although we took the first step in longitudinally assessing data on self-determination during the COVID-19 pandemic, we are still cautious about stating causal relations or even arguing about the overall phase of adolescence, as the two waves were only 1 year apart. In middle and late adolescence, school self-determination patterns could change over time, which refers not just to the respective self-determination levels but also to the predictors of self-determination (Deci & Ryan, 2011). We identified self-determination patterns in Greek schools over time. Self-determination in adolescence must also be addressed country specifically and internationally to develop international educational policies. The differences in adolescents' lives are vast and based on their respective cultures (Wehmeyer et al., 2017). Also, we used adolescents' self-perceptions as obtained from questionnaires completed by the students to understand their self-determination at school. It would have been interesting to add teachers' perceptions of the respective students because relationships with teachers play distinct roles in students' self-determination (Govaris et al., 2021).

Finally, it is also important to note that these findings should be considered within the context of the COVID-19 pandemic, even if the actual impact of the pandemic was not measured, because the data from Wave 2 were collected in the later stages of the first COVID-19 wave (Ertanir et al., 2021). Researchers assessing survey data from the earlier stages of the first COVID-19 wave have pointed to an apparent increase in the frequency and severity of mental illness symptoms and a decline in self-determination in adolescents (Kassis et al., 2021) and confirmed that the declines in self-determination and mental health were most pronounced during the pandemic's early stages. Therefore, we believe our conclusions will hold true beyond the COVID-19 pandemic, even when being cautious, because we are still unsure how many COVID-19 waves are yet to come.

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Ατομικοί και κοινωνικοί προγνωστικοί παράγοντες του αυτοπροσδιορισμού σε ελληνικό πληθυσμό στην πρώιμη εφηβεία: Μια διαχρονική ανάλυση δομικών εξισώσεων

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ΛΕΞΕΙΣ ΚΛΕΙΔΙΑ	ΠΕΡΙΛΗΨΗ
Εφηβεία, Αυτοπροσδιορισμός, Ψυχολογικές ανάγκες, Αυτοεκτίμηση, Αυτοαποτελεσματικότητα, Κατάθλιψη, Άγχος, Κοινωνική υποστήριξη	Δεδομένου ότι η πρώιμη εφηβεία είναι ένα αναπτυξιακό στάδιο που χαρακτηρίζεται από δυναμική και ευαλωτότητα, είναι σημαντικό να εξεταστούν οι παράγοντες που προάγουν την ικανοποίηση των ψυχολογικών αναγκών των εφήβων στο πλαίσιο της θεωρίας του αυτοπροσδιορισμού. Σε δείγμα από ελληνικό εφηβικό πληθυσμό ($N = 218$), το οποίο εξετάστηκε διαχρονικά σε δύο φάσεις (Β' Γυμνασίου το Φθινόπωρο του 2020 και Γ' Γυμνασίου το Φθινόπωρο του 2021), εφαρμόσαμε μοντέλα δομικών εξισώσεων, για να εντοπιστούν οι ατομικοί και κοινωνικοί παράγοντες που προβλέπουν διαχρονικά την αυτονομία, την επάρκεια και τη διασύνδεση. Η μελέτη αυτών των ψυχολογικών αναγκών κρίθηκε απαραίτητη για τον σχεδιασμό εξειδικευμένων προγραμμάτων πρόληψης και παρέμβασης στο σχολείο, τα οποία θα απευθύνονται σε μαθητικό πληθυσμό που βρίσκεται στην εφηβεία. Ατομικοί προβλεπτικοί παράγοντες, όπως η αυτοεκτίμηση, η αυτοαποτελεσματικότητα και η κατάθλιψη ή το άγχος, ενίσχυσαν τον αυτοπροσδιορισμό που προέρχονταν από κοινωνικούς παράγοντες, όπως η αναγνώριση και η υποστήριξη από εκπαιδευτικούς και γονείς και οι κοινωνικοί πόροι. Ο εφηβικός πληθυσμός με μεταναστευτικό υπόβαθρο είχε χαμηλότερα επίπεδα υποστήριξης από κοινωνικούς παράγοντες. Το μοντέλο δεν είχε διακύμανση ως προς το φύλο και έδειξε ότι οι κοινωνικοί παράγοντες, όπως οι εκπαιδευτικοί, οι γονείς και οι διαθέσιμοι κοινωνικοί πόροι, προβλέπουν ένα πολύ μεγάλο ποσοστό διακύμανσης στους ατομικούς παράγοντες των εφήβων. Τα ευρήματα αυτά υποστηρίζουν ότι η ατομική ανάπτυξη στην πρώιμη εφηβεία προσδιορίζεται από κοινωνικούς παράγοντες, μέσω της ικανοποίησης των ψυχολογικών αναγκών.
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