

# Academic Procrastination and Perceptions of Academic Success in Israeli High-School Students

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**How to cite this paper:** Dan, O., & Benovich, Y. (2023). Academic Procrastination and Perceptions of Academic Success in Israeli High-School Students. *Psychology*, 14, 1413-1425.  
<https://doi.org/10.4236/psych.2023.148080>

**Received:** May 26, 2023

**Accepted:** August 27, 2023

**Published:** August 30, 2023

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## Abstract

The purpose of his study was to assess the attitudes of Israeli high-school students regarding academic procrastination and the correlation of such attitudes to gender, anxiety, class absence, and academic achievements as given by expected grades. A total of 77 (38 female) students were surveyed, and the results showed that gender does not play a role in attitudes toward procrastination, class absence or school achievements, even though female adolescents showed a significantly stronger tendency towards trait anxiety. Academic procrastination was correlated to class absence, likely because they are driven by similar causes. Academic procrastination was found to be inversely correlated with self-assessment of success in some courses (mathematics, grammar) but not others (literature, foreign language). It was suggested that this is due to the demands of the different topics and the ability to be placed at different levels that match the student's abilities.

## Keywords

Youth, High School, Procrastination

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## 1. Introduction

Academic procrastination, which is defined as the unnecessary delay of tasks related to academics (Xu, 2021), is a characteristic of adolescents and young adults, affecting more than 75% of students worldwide (see, for example, Steel, 2007). Academic procrastination can have severe effects on academic achievement, impacting well-being and resulting in lifelong social, economic and emotional deficiencies (Balkis & Duru, 2016, 2017; Celik & Odaci, 2022; Steel, Brothen, & Wambach, 2001; Tezer et al., 2020; Tice & Baumeister, 1997).

Adolescence is a stressful period of transition that can affect psychological well-being, academic achievements, and social interactions (see, for example, Benner, 2011; Evans, Borriello, & Field, 2018; Simmons, 1987). As a result, adolescents are especially likely to exhibit academic procrastination (Xu, 2021). Studies find that procrastination is linked in adolescents to low self-esteem, failure in self-regulation, impulsiveness, anxiety, task aversion, or distractibility (Hajloo, 2014; Reinecke et al., 2018; Steel, 2007; Steel & Klingsieck, 2016; Xu, 2021). Factors such as socioeconomic status, nationality, family size, or educational background were not found to affect tendencies for procrastination (Lu, He, & Tan, 2022). Interestingly, although gender is associated with self-esteem (Kling, Hyde, Showers, & Buswell, 1999) and anxiety disorders (Lewinsohn et al., 1998; McLean, Asnaani, Litz, & Hofmann, 2011; Van Droogenbroeck, Spruyt, & Kerpens, 2018), it is not clear that it affects academic procrastination: some studies find that males report higher levels of procrastination (see, for example, Balkis & Duru, 2017; Lu, He, & Tan, 2022; Mandap, 2016), while others do not find significant gender difference (Li, Zhou, & Zhang, 2022; Özer & Ferrari, 2011).

The goal of this study is to examine the attitudes of Israeli high-school students to academic procrastination and the correlation between academic procrastination and measures of (self-evaluated) academic success. Specifically, we hypothesize that:

1) Academic procrastination is not correlated to trait anxiety: The effects of anxiety on academic procrastination are conflicted, as noted above. We attribute that to the varied effect of anxiety on behaviors in general: in some individuals, anxiety can lead to fear of failure, resulting in aversion and increased procrastination (see, for example, Milgram & Toubiana, 1999). Yet, in others, the same anxiety can motivate and suppress procrastination. Low anxiety may be linked to well-being and low procrastination tendencies but could also enhance procrastination due to recklessness and the competing attraction of activities outside school. Indeed, it is known that low anxiety can lead to risky behaviors in adolescents (Comeau, Stewart, & Loba, 2001). As a result, we do not expect a clear link between anxiety levels and academic procrastination.

2) Academic procrastination and absences from class are correlated, frequently the result of school disengagement (Fredricks, Blumenfeld, & Paris, 2004): missing classes is, arguably, an extreme case of procrastination and may be driven by the same underlying causes. For example, test anxiety can lead, in moderate cases, to procrastination and avoidance of preparation, and in more extreme cases, to absence during exam time.

3) Academic procrastination is inversely correlated to perceived school success in rigorous subjects (e.g. mathematics), and less so in humanities: academic procrastination has been found to be correlated with self-esteem (Duru & Balkis, 2014). However, less is known regarding the effect of specific academic fields. Regardless of the driver, procrastination is linked to less time invested in learn-

ing. We hypothesize that procrastinating students will feel less prepared and, therefore, less successful in subjects that are based on mastery of fundamental principles and require practice, such as math, when compared to humanities, where reliance on fundamentals is not as strong.

To test these hypotheses, we recruited a group of Israeli adolescents from a high school in Israel. The attitudes of adolescents are known to be cultural and societal-dependent (see, for example, Cortina, Arel, & Smith-Darden, 2017). Israeli society is multi-cultural and based on immigrants from numerous countries (e.g. Russia, Ukraine, Morocco, Iran, Poland, Germany, etc). However, Israeli adolescents in the last two decades are mostly exposed to European and USA-based cultural influences, from music and TV shows to social media. Indeed, Ungvary, McDonald, and Benish-Weisman (2018) find few differences in value profiles between Israeli adolescents, European and American ones. Therefore, our sampling of a group of Israeli adolescents is likely to reflect general attitudes in adolescents worldwide, although some cultural differences may persist.

In addition to filling out validated questionnaires to evaluate their level of anxiety and procrastination, participants provided an estimate of how many class hours of school they missed over the period of a month (defined as hours they were in school but did not go to class. This definition eliminates absences due to illness, travel or other external factors). Self-evaluation of academic success was assessed through the student-provided expected grade in four subjects: mathematics, literature (as a representative of humanities), foreign language (English) and Hebrew grammar. These subjects were chosen because all Israeli high-school students are required to take them. However, it should be noted that while all students study Hebrew grammar at the same level, they can choose between three levels in the other subjects.

## 2. Methods

### 2.1. Participants

The initial student group included 139 adolescents (average age  $15.2 \pm 0.7$ ) from a regional high school in the Meggido council of northern Israel. As the only high school in the region, the students represent the entire normative population of high-school adolescents in this region.

The Meggido region includes 12,200 residents living in 13 small settlements (CBS, 2021), with an average-high socio-economic status (7 out of 10) (CBS, 2022). 97% of the participants were born in Israel and came from families where the parents were married (88%), with 10% divorced and 2% widowed. Most parents had a high-school diploma (fathers: 63%, mothers: 75%).

62 participants were excluded from this study based on incomplete questionnaires and/or a history of neurological or psychiatric disorders as determined through either self-report of diagnosis or more than 5 items in each ADHD assessment scale (inattentive/hyperactive-impulsive).

77 adolescents remained and were included in this study: 39 males (average age  $15.2 \pm 0.6$ ) and 38 females (average age  $15.3 \pm 0.7$ ).

## 2.2. Questionnaires

Students were asked to fill the following tools:

**Trait anxiety:** Trait anxiety was assessed with the Trait Anxiety Inventory (Spielberger et al., 1973). It is a 20 item scale. Respondents indicated how they “generally” felt by endorsing statements such as “I feel nervous and restless”. Endorsements were made on a scale ranging from 1 (almost never) to 4 (almost always). The items were totaled to yield an overall anxiety score, with high scores indicating high trait anxiety. The instrument has demonstrated good internal consistency (coefficient alphas = 0.78 - 0.87), test-retest reliability. In the present study, Cronbach’s  $\alpha$  was 0.87.

**ADHD:** The assessment questionnaire for ADHD (a version of the ADHD Rating Scale-IV; DuPaul, Power, Anastopoulos, & Reid, 1998) included 18 items based on the symptoms listed in the Diagnostic and Statistical Manual of Mental Disorders (Nomenclature, Statistics, & Association, 2008) for ADHD diagnosis. Participants were asked to choose whether each described situation was correct or incorrect with respect to them. These symptoms include measurements of attentiveness, hyperactivity, and impulsivity. In the present study, Cronbach’s  $\alpha$  was 0.85.

**Procrastination:** A questionnaire in Hebrew developed by Milgram and co-workers (Milgram & Toubiana, 1999; Milgram, Batori, & Mowrer, 1993) rating frequency of procrastination on test preparation, paper writing and academic tasks on a scale of 1 - 4. The test was found to be reliable when applied to both high-school and college students. In this study, Cronbach’s  $\alpha = 0.89$ .

**Expected academic achievement:** Participants were asked to list their expected grade in four high-school courses: Mathematics, foreign language (English), literature and Hebrew grammar.

**(Self reported) class absence:** Participants were asked to estimate the number of hours in the last month that they did not go into class even though they were present in school that day. The phrasing of the question excluded school absences due to other factors such as illness, travel, etc.

## 2.3. Procedure

The Israeli Ministry of Education’s chief scientist, the school principal, and the adolescents’ parents approved the study before the students were approached. Participants also provided written informed consent. The research assistant visited the school for two sessions during the academic year, going into the classrooms to explain the research and participation methods. Students whose parents approved and who signed the consent were sent a link to the Qualtrics platform where the questionnaires were posted. Total participation time was approximately 15 min, and the research assistant remained in the classroom during

that time to answer questions.

## 2.4. Data Analysis

To assess the correlations examined here, *t-tests* were calculated. 4 Pearson correlations were conducted. And to assess the mediating effect of trait anxiety on the relationships between gender and the avoidance of negative affectivity as driver 3 regression analyses were conducted.

## 3. Results

The group of participants included 77 healthy adolescents (39 male and 38 female), with an average age of  $15.3 \pm 0.7$ . The group was homogeneous regarding socioeconomic and other family parameters.

The average ( $\pm$ s.d) scores for the different questionnaires are presented in **Table 1**.

Anxiety is the only measure affected by gender. To examine the correlation between anxiety, gender, and academic procrastination we conducted two Pearson correlations. We found that for males the Pearson's *r* coefficient between Academic Procrastination and Anxiety was 0.3, and for females 0.06. Neither values rose to the level of statistical significance.

Since there were no significant differences between male and females regarding all variables excepting anxiety, five Pearson correlations were conducted for the entire sample set (females and males) to determine the associations between the study variables. The results are shown in **Table 2**.

We also analyzed the correlation between expected mathematics grade and expected literature grade. We find that Pearson's *r* = 0.32 ( $p = 0.0042$ ).

**Table 1.** Questionnaire results.

	All (n = 77)	Female (n = 38)	Male (n = 39)	Unpaired t-test <sup>1</sup> (df = 75)
Academic procrastination	2.53 $\pm$ 0.43	2.48 $\pm$ 0.42	2.57 $\pm$ 0.45	ns <sup>#</sup> t = 0.91
Anxiety	2.14 $\pm$ 0.46	2.35 $\pm$ 0.44	1.94 $\pm$ 0.39	$p < 0.0001$ t = 4.33
Hours absence from class	6.5 $\pm$ 6.9	6.7 $\pm$ 7.1	6.2 $\pm$ 6.6	ns <sup>#</sup> t = 0.32
Expected math grade*	81 $\pm$ 13	81 $\pm$ 14	81 $\pm$ 13	ns <sup>#</sup> t = 0.0
Expected English language grade*	85 $\pm$ 10	83 $\pm$ 12	86 $\pm$ 8	ns <sup>#</sup> t = 1.3
Expected literature grade*	89 $\pm$ 13	89 $\pm$ 16	89 $\pm$ 10	ns <sup>#</sup> t = 0.0
Expected Hebrew grammar grade*	87 $\pm$ 10	89 $\pm$ 10	85 $\pm$ 10	ns <sup>#</sup> t = 1.75

<sup>1</sup>Unpaired t-test for male/female; <sup>#</sup>ns-not statistically significant; \*Grades are on a 0 - 100 scale.

**Table 2.** Pearson's  $r$  for correlations between study variables for the entire tested sample (male and female).

	Academic procrastination
Absence from class	0.35** ( $p = 0.002$ )
Expected math grade	-0.25* ( $p = 0.03$ )
Expected English language grade	-0.14 (ns)
Expected literature grade	-0.22 (ns)
Expected Hebrew grammar grade	-0.45*** ( $p = 0.00004$ )

Note:  $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

## 4. Discussion

In this paper, we examine the links between self-reported tendencies to academic procrastination in a sample of Israeli adolescents and self-assessment of academic achievement. 77 healthy adolescents (14 - 16 years old) evaluated their tendency to academic procrastination, estimated the number of class hours they missed (even though they were in school at the time), and assessed their academic achievements through expected grades in mathematics, English language and literature. They also filled out a trait-anxiety questionnaire that enabled the evaluation of anxiety levels. Since the goal of this study was to examine adolescent attitudes, we did not compare the self-reported class absences or expected grades with school-reported data, relying on the perceptions of the participants.

### 4.1. Gender Differences and Anxiety

We find that there are no statistically significant differences between the male and female adolescents on all studied measures except trait anxiety, where females exhibited higher anxiety levels:  $2.14 \pm 0.46$  for females vs.  $2.35 \pm 0.44$  for males. This is in agreement with previous studies that find a higher rate of anxiety disorders in females when compared to males across all school ages and into adulthood (e.g. Lewinsohn et al., 1998; McLean, Asnaani, Litz, & Hofmann, 2011; Van Droogenbroeck, Spruyt, & Keppens, 2018). Gender does not affect academic procrastination, which is contrary to some studies that found that males tend to report higher levels of procrastination (see, for example, Balkis & Duru, 2017; Lu, He, & Tan, 2022; Mandap, 2016), but in agreement with others that did not observe gender effects (Li, Zhou, & Zhang 2022; Özer & Ferrari, 2011). A recent meta-analysis by Lu, He, and Tan (2022) determined that gender differences in procrastination were moderated by the selected measurement scale used, so it is possible that our choice of questionnaire (set by the need for a validated questionnaire in the native language (Milgram, Batori, & Mowrer, 1993))

may have affected the results to some degree. However, we did not find any effects of gender on the other tested measures either, namely, class absence or expected grades in the different subjects. We, therefore, conclude that in this sample of Israeli adolescents, gender does not play a significant role in school attitudes, despite differences in levels of anxiety.

#### 4.2. Expected Academic Achievement

Our finding of no significant gender differences in expected academic achievement in humanities (literature), foreign language (English) and Hebrew grammar is consistent with previous studies where gender was not found to affect academic self-esteem (see, for example, [Gentile et al., 2009](#)). Our finding of no gender effect in expected mathematics grades is more surprising: the prevailing perception is that females consider themselves to be less competent in Science, Technology, Engineering and Mathematics (STEM) than males, especially in high school (see, for example, [Makarova, Aeschlimann, & Herzog, 2019](#)). However, as shown, for example, in the analysis by [Eriksson \(2020\)](#), gender-related interest and achievement in mathematics are dependent on the country and the prevailing culture. Indeed, our result is consistent with an international study by [Goldman and Penner \(2016\)](#) that did not find statistically significant differences in mathematics self-concept between Israeli male and female students.

Another potential reason for the lack of gender effect in expected academic achievement may be due to the Israeli high-school course system. All students are required to study the subjects reported here. However, while all students take the same level of Hebrew grammar, they can choose the course level in literature, English, and mathematics. Therefore, adolescents are likely to be taking these courses at a level suitable to their capabilities. This is also consistent with our finding of a statistically significant correlation between expected grades in mathematics and literature, and could explain the overall expectation for a moderately high grade (where 80 is equivalent to B/B-).

#### 4.3. Correlation between Anxiety, Procrastination, and Class Absence

Our first hypothesis—that anxiety is not correlated to academic procrastination—was verified in our findings for either female or male participants ( $r = 0.3$  and  $0.06$ , respectively). Although some indications of a link between anxiety and procrastination ([Van Eerde, 2003](#)) or test anxiety and procrastination have been observed ([Wang, 2021](#)), previous studies generally do not find a significant link between academic procrastination and trait anxiety (see, for example, [Cetin & Ceyhan, 2018](#); [Yerdelen, McCaffrey, & Klassen, 2016](#)), in agreement with our findings. It should be noted that since trait anxiety was found here to be gender-dependent, the lack of correlation between anxiety and academic procrastination in both genders validates this finding, as well as the gender-independence of procrastination.

Our second hypothesis was that academic procrastination is correlated to class

absences. The participant responses indicate, on average, 6.5 hrs of classes that they did not attend even though they were in school at the time over a period of a month, although the range was fairly large ( $s.d = 6.9$ ). These numbers are in agreement with data collected for schools in Israel by the Program for International Student Assessment (PISA), where 38% of 15-year-olds reported skipping a day of school (7 hrs class/day) at least once in the two weeks period prior to the administration of the PISA test, and more than 10% reported arriving late for school at least five times during that period (OECD, 2019).

As there were no gender-related differences in either academic procrastination or class absences, we applied the Pearson test to the entire participant group. We found that  $r = 0.35$ , which indicates a significant correlation ( $p = 0.002$ ). Surprisingly, we could not find systematic studies that directly link academic procrastination with class absence or school refusal. However, it may be expected that class absences be an extreme limit of procrastination. For example, an adolescent that procrastinates on school work because of online distractions (Reinecke et al., 2018) may also avoid class for similar reasons (Austin & Totaro, 2011; Chen, 2022). Indeed, the four types of procrastinators identified by Grunschel, Patrzek, and Fries (2013) (inconspicuous, successful pressure-seeking, worried/anxious, and discontent with studies) match, to a degree, the four drivers for school refusal (Kearney, 2001; Kearney, Lemos, & Silverman, 2004; Kearney & Silverman, 1993).

Our third hypothesis was that academic procrastination will be inversely correlated to perceived school success in rigorous subjects (e.g. mathematics), and less so in less rigorous ones such as literature. Indeed, we find that academic procrastination is inversely correlated with the expected mathematics grade ( $r = -0.25$ ,  $p = 0.03$ ), in agreement with previous studies (e.g. Bakhshayesh, Radmanesh, & Bafrooe, 2016). The strength of the link between mathematics and procrastination is moderate, likely because the adolescents are placed in a math-class level that matches their capabilities. We did not find a correlation between procrastination and the expected literature grade ( $r = -0.22$ ). This is as we expected: mathematics at the high school level requires strong fundamentals that are acquired through student work. It is practically impossible for students to succeed unless they do work (see, for example, Wieman & Arbaugh, 2014). Procrastination can, therefore, affect preparedness and self-estimation of success. In contrast, literature (as a representative of a humanities course) is a modular subject. Student success is less reliant on previous knowledge, and is, therefore, not correlated to procrastination.

The correlations between the expected grades in English (a foreign language for Israeli students) and Hebrew grammar and academic procrastination are surprising, though. Success in learning a foreign language is associated with practice and repetition, which are expected to be inversely proportional to academic procrastination. Our finding that there is no link ( $r = -0.14$ ) is, therefore, unexpected. This may be due to the placement of students in an English class at a level that matches their capabilities, or to the currently poor level of English teaching in Israel (see, for example, Dattel, 2021).



Even more surprising, however, is the strong inverse correlation between the expected grade in Hebrew grammar and academic procrastination ( $r = -0.45$ ,  $p = 0.00004$ ). However, grammar is a rigorous and challenging topic that requires learning rules. In particular, Hebrew grammar is complex due to a combined biblical origin and modern modifications (Berdichevsky, 2016). More significantly, however, unlike the three other high-school courses, Hebrew grammar is taught in Israeli high schools at a uniform level, namely, students are not placed (or choose) the difficulty level according to their capabilities. Also, all participants in this study were required to take the Israeli national matriculation exam (bagrut) in Hebrew grammar at the end of the school year (10<sup>th</sup> grade), unlike the matriculation tests for the three other topics that are typically taken at the end of the 12<sup>th</sup> year. As a result, the participants in our study were under more pronounced pressure to succeed in this topic.

## 5. Conclusion

In summary, we examined in this study the attitudes of Israeli high-school students regarding academic procrastination and the correlation of such attitudes to gender, anxiety, class absence, and academic achievements as given by expected grades. We find that gender does not play a role in attitudes toward procrastination, class absence or school achievements, even though female adolescents showed a significantly stronger tendency towards trait anxiety. Academic procrastination was correlated to class absence, likely because they are driven by similar causes. Academic procrastination was found to be inversely correlated with self-assessment of success in some courses (mathematics, grammar) but not others (literature, foreign language). We speculate that this is due to the demands of the different topics and the ability to be placed at different levels that match the student's abilities.

## Limitations

The study relied on self-report questionnaires, which are prone to be influenced by various biases. As noted in the Introduction, because of privacy considerations, as required by the Ministry of Education, we did not correlate students' responses on school refusal to their school attendance record. Therefore, the results presented here reflect only the participants' attitudes, and may not represent actions (namely, a student that reports a high score on any driver might not necessarily act on it). Whether they act on it or not, understanding the specific inclination of adolescents towards school refusal is important for the development of effective strategies to combat it.

A recent meta-analysis by Lu *et al.* noted that gender differences in procrastination are moderated by the selected measurement scale used (Lu, He, & Tan, 2022), which may explain at least some of the different findings.

## Authors' Contributions

Y.B. and O.D. conceived the study and developed the relevant tools. Y.B. col-

lected the data. O.D. wrote the manuscript, with input from all authors.

## Funding

There was no funding for this study.

## Acknowledgements

The authors thank the Israeli Ministry of Education for approving this study and Sima Ment from the regional “Megiddo” high school in Israel for facilitating the research.

## Conflicts of Interest

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

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