**IPA**
International Journal of Psychology
Vol. 18, No. 2, Summer & Fall 2024
PP. 131-152

**I**ranian **P**sychological
**As**sociation

# Effectiveness of Intervention Program Based on Cognitive Dissonance Theory on Procrastination in Procrastinating Students

***Article Type:*** *Research Article*

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Received: 2025/09/12 Revised: 2025/10/21 Accepted: 2025/11/22
Doi:10.61882/ijpb.18.2.131

This study aimed to determine the effectiveness of an intervention program based on cognitive dissonance theory on reducing academic procrastination in junior high school students. Research method was quasi-experimental single-case experimental design and research population consisted of procrastinating students from a girls' high school in Isfahan city, selected via convenience sampling. From this group, four individuals who expressed the highest willingness to participate were selected as the sample. The used instrument was Solomon and Rothblum Academic Procrastination Questionnaire (1984), administered to the subjects across three phases: pre-test, intervention, and follow-up. Results indicated that the obtained Reliable Change Index (RCI) for the first, second, third, and fourth subjects regarding academic procrastination was significant in the post-intervention and follow-up phases. This means that, the procrastination scores of the first, second, third, and fourth subjects

significantly improved (decreased) after the intervention and follow-up. On the whole, the results indicated the success of the intervention program based on cognitive dissonance theory in decreasing the academic procrastination of female junior high school students.

***Keywords:*** cognitive dissonance, academic procrastination, students.

One of the challenges students face in their studies, which plays a significant role in their academic lives, is procrastination. Academic procrastination is one of the important topics that has received considerable attention from researchers in recent years and is referred to as a bad habit. Procrastination regarding academic tasks is a common problem among students and is one of the primary causes of failure or lack of success in learning and achieving academic progress programs, as well as a factor affecting students' academic decline (Hershberger & Jones, 2018). Research by Kandemir (2014) found that academic procrastination among students leads to low grades, course withdrawal, academic decline, academic failure, dropping out of school, and avoidance of school assignments. Research by Grunschel et al. (2016) showed that approximately 40 to 60% of students experience academic procrastination, which delays achieving academic goals to the extent that optimal performance becomes nearly impossible for them. Furthermore, a study by Ahmed et al. (2023) indicated that procrastination in this area almost always affects their education, as 55% of the studied respondents reported that procrastinating on studying for exams was problematic for them. According to conducted reviews and broader literature on academic procrastination, between 70% and 95% of students admit to engaging in procrastination at least at moderate levels. Rushing to meet deadlines at the last minute often leads to feelings of guilt and shame about one's behaviors,

which negatively impacts self-efficacy and self-worth (Chen & Chung, 2025).

Solomon and Rothblum (cited in Park & Sperling, 2012) studied 291 university students and the frequency of their procrastination in performing academic tasks such as studying for exams, completing assignments, and administrative duties, along with the reasons for their procrastinating behavior. The researchers administered the Procrastination Assessment Scale-Students (PASS) and self-assessment tests to analyze this behavior. They found that fear of failure and task aversiveness was the main reasons for procrastination. Academic procrastination is generally defined as "the deliberate delay or postponement of work that must be completed" (Milgram, 1988). Procrastination is also defined as the voluntary but irrational delay of an intended course of action, with counterproductive outcomes (Steel, 2007). Academic procrastination is considered a pervasive and persistent tendency among students to postpone academic activities, usually accompanied by anxiety (Solomon & Rothblum, 1984). Researchers divide it into personal and social procrastination. Personal procrastination occurs when an individual is late for appointments set for them, which can only affect that individual. Examples include doctor's appointments, submitting assignments, etc. In contrast, social procrastination is defined as procrastination that causes distress to others. Examples include delays in completing group tasks, being late for meetings, etc. (Knaus, 2000).

Procrastination occurs when an individual is passive in performing study-related tasks such as studying for an exam. No research has provided a definitive answer as to why an individual procrastinates despite not wanting to delay tasks, although

reasons such as fear of failure, perfectionism, laziness, and overconfidence have been identified as root causes. It has also been found that students procrastinate to avoid criticism (Barratt, 2010). Also, active and passive procrastination have been used to describe academic procrastination. Passive procrastination, the standard type, occurs when participants are passive in performing tasks and experience negative emotions while doing the task. However, active procrastination is when an individual delays their task but it may not negatively impact the individual's effectiveness (Chu & Choi, 2005). Procrastination in an academic setting carries negative consequences such as stress, guilt, poor academic performance, and low self-esteem (Goroshit, 2018). According to theories, this disorder arises due to deficits in self-regulation, the inability to exert control over thoughts, feelings, impulses, and task performance in relation to preferred standards (Vohs & Baumeister, 2004).

Multiple study models and real-world examples have shown that if procrastination is not effectively addressed, it leads to decreased self-confidence, negative attitudes towards learning, feelings of depression and anxiety, and increased unhealthy and self-destructive behaviors such as poor eating and sleep deprivation. Therefore, identifying the prevalence of procrastination among students and addressing it is essential to know how best to modify and resolve this problem (Kohama, 2012). Although procrastination is not classified as a psychological disorder, it can still affect many aspects of student life, including reduced academic performance, severe stress, decreased overall well-being, career prospects, or long-term mental health outcomes (Abed & Shamohamadi, 2025).

Given the mentioned points that being a procrastinator can affect students' individual and social, academic, and professional lives, and considering that junior high school students are at the beginning of adolescence, a period of personality formation and identity development, due to their physical and cognitive changes and being influenced by their peers; therefore, they might pay less attention to their studies and focus more on other issues, including identity formation. Since this period shapes the adolescent's personality, and this formed personality affects youth, adulthood, and academic success in high school and university, it is necessary to reduce procrastination in students during this time. If procrastination persists, it may impact their social, academic, and professional lives. Therefore, investigating and reducing procrastination is a major issue for students, especially in junior high school. Hence, interventions and trainings should be used to improve these problems in them.

Therefore, given the importance and necessity of the issue, investigating effective interventions for this problem has attracted the attention of educational psychology scholars and practitioners. Considering the cognitive nature of academic procrastination, appropriate psychological interventions can largely play a preventive role in procrastination. One of these interventions is cognitive dissonance. Cognitive dissonance is the conflict between different beliefs and attitudes in a person's mind, or the conflict and inconsistency between a person's belief and reality. Typically, the mind resorts to perceptual errors (cognitive biases) to resolve such conflicts and the unpleasant feelings arising from them (Festinger, 1957). Indeed, cognitive dissonance is a psycho-cognitive model referring to ideologies and mental structures that show fundamental empirical structures of path

dependence and emphasis on balance. When our actions conflict with our prior cognitions, we often change our cognition or action in a way that makes them consistent with each other. Aronson (2019) defines cognitive dissonance as a state of tension resulting from simultaneously holding two psychologically inconsistent cognitive processes (thought, belief, attitude, and opinion). Following the resulting tension, the individual is motivated to reduce or eliminate the tension by changing the first or second cognition, or by substituting a third cognition. In other words, cognitive dissonance is the result of the first cognition violating the second, or vice versa.

Cognitive dissonance can influence decision-making power, and indeed the bidirectional interaction of these variables suggests that an individual's decision-making ability affects the emergence of this cognitive dissonance and is influenced by it. The presence of cognitive deficiencies prevents the individual from establishing cognitive balance after the emergence and experience of imbalance and cognitive dissonance. Therefore, the emergence of a state of cognitive dissonance in an individual, alongside some emotional and cognitive disabilities, can lead to wrong decisions by the individual (Riazi et al., 2020). Essentially, cognitive dissonance reduces dissonance and disorders in the individual through changes in cognitive functioning. Two cognitive elements become dissonant when affirming one leads to negating the other. This state arises when an individual holds contradictory beliefs or even opposing attitudes and behaviors. According to Festinger's theory, someone who knows they have two dissonant cognitive elements experiences an unpleasant state of tension. The internal conflict manifests through an unpleasant increase in physiological arousal. The more important the

relevant cognitions are and the greater their discrepancy from each other, the greater the dissonance will be. In this state, besides efforts to reduce dissonance, the person actively avoids situations and information that might increase the dissonance (Hassani et al., 2021).

A review on the conducted researches indicates the extensive effectiveness of cognitive dissonance in changing attitudes and behavior. For example, research by Jedicke et al. (2025), revealed that under conditions of high adherence to moral principles by consumers and violation of these principles by the seller, due to the created cognitive dissonance, the intention to boycott the brand increases. Also, research by Awwad et al. (2025) indicated that cognitive dissonance positively affects purchase regret. As well, qualitative research by Ali Shah & Lacaze (2025), showed that employees exposed to cognitive dissonance face problems in their professional and personal lives in various ways (physically and psychologically). Moreover, a systematic review by Devi & Gangwar (2025) indicated that psychological interventions based on cognitive dissonance increased purchase intention in consumers. In addition, research by Skandali & Yfantidou (2025), showed that psychological interventions based on cognitive dissonance changed women's attitudes towards breast cancer screening, leading them to visit screening health centers. Besides, Research by Muminović (2025), concluded that cognitive dissonance partially mediated the relationship between norms and support for pro-environmental behaviors. This means that belonging to stronger norms is associated with increased cognitive dissonance, which in turn leads to greater support for pro-environmental behaviors. Furthermore, Research by González et al. (2024), showed that cognitive dissonance induced

by expressing support for a losing candidate causally led participants to align their political preferences more closely with those of the supported candidate. And, Abdivarmazan et al. (2024), in a qualitative study, constructed and validated a motivation-oriented educational content aimed at increasing electricity-saving behavior. Consequently, they designed a valid 8-session training package, and its effectiveness on electricity consumers' behavior was confirmed. The content of one of the sessions was inducing a feeling of cognitive dissonance.

Based on the reviewed theoretical and research foundations, since induced cognitive dissonance, by creating tense conditions, motivates individuals to reduce the created cognitive dissonance; therefore, and citing this important principle, induced cognitive dissonance in procrastinating students could lead to changes in their procrastinating behavior by creating dissonance among the cognitions of procrastinating students. Thus, the present study intends to develop intervention programs based on cognitive dissonance theory and determine its effectiveness on the academic procrastination of procrastinating students, answering the question: Does an intervention program based on cognitive dissonance theory affect the academic procrastination of procrastinating junior high school students?

According to an extensive research review in reputable Iranian (for example, SID, Mag Iran, Iran doc, Civilica, etc.) and non-Iranian (for example, Science Direct, Google Scholar, Research Gate, Psych Info, etc.) scientific databases, it indicates the widespread application of cognitive dissonance in the fields of consumer psychology and health and wellness. However, until now, within the field of educational psychology and the variables studied in this domain for changing student attitudes and

behavior, the application of cognitive dissonance has not been examined, studied, or published. Therefore, the innovation of the present research lies in the fact that such an approach is used for the first time to change the procrastinating behavior of students.

## Method

The present study employed a quasi-experimental single-case design. Among single-case experimental designs, the "multiple baselines" experimental design was used, as these types of designs are suitable research tools for practical work in determining the effectiveness of intervention models and interventions (Peterson et al., 2009). In such designs, experimental conditions are carefully controlled, and the independent variable is systematically applied to the participant. Therefore, single-case experimental designs are more appropriate than case studies for controlling unwanted conditions (Hyman, 1984, cited in Hamidpour et al., 2005). The underlying logic of single-case experimental designs is similar to that of group designs, and the impact of the intervention is assessed by comparing the different conditions presented to the subject. The subject's performance in the pre-intervention or baseline phase is used to predict their future behavior (Anderson & Kim, 2003). Single-case designs do not have a control group; each individual serves as their own control. In this study, participants entered the baseline phase simultaneously. Assessment was then conducted throughout 3 intervention sessions and finally during one follow-up session.

The statistical population of this study consisted of procrastinating students at a girls' high school in Isfahan city, selected through convenience sampling. From this population, 16 students with high scores on the Solomon & Rothblum Academic

Procrastination Questionnaire (1984) were selected. After explaining the research process to them, 4 individuals who expressed the highest willingness to participate were ultimately chosen as the main sample. The other 12 students were randomly assigned into three groups of 4 to receive training from the main participants.

Since the intervention in this study involved inducing cognitive dissonance in procrastinating students, it was delivered to the participants over 3 phases, each consisting of 3 sessions (pre-test in each session with a two-week interval, intervention in each session with a three-week interval, and follow-up in each session with a two-week interval). To induce cognitive dissonance, intervention methods such as reading "Eat That Frog!" using a weekly planner or schedule, discussions about the consequences and drawbacks of procrastination, and writing positive energy affirmations on colored paper in case of non-procrastination were taught. After completing each phase, each student in the experimental group was asked to teach the received training to 4 of their procrastinating friends over three phases. A post-test was administered after each phase was completed. Subsequently, to assess the persistence of the effect, a follow-up test was conducted at two-week intervals across three phases.

**Instruments**

**Academic Procrastination Questionnaire**

This questionnaire was developed by Solomon and Rothblum (1984) and consists of 27 items. The mentioned questionnaire has three subscales, preparing for Exams (items 1 to 8), Completing Academic Assignments (items 9 to 19) and Preparing End-of-Semester Research Papers (items 20 to 27). The items are rated on a Likert scale from never (1) to always (5). The minimum

possible score on this questionnaire is 27, the maximum is 135, and its cut-off point is 81. Furthermore, items 2, 4, 6, 11, 13, 15, 16, 21, 23, and 25 are reverse-scored. Solomon (1984) reported an internal consistency coefficient (Cronbach's alpha) of 0.84 for this questionnaire. This instrument has been used in numerous domestic (Iranian) and international studies, all of which indicate its high validity and reliability. For example, in a study by Moeinifar et al. (2023), its reliability, calculated using Cronbach's alpha, was found to be 0.78.

## Results

Demographic characteristics of the participants are reported in Table 1.

**Table 1**

**Demographic characteristics of participants**

| participants | Age | Mother's education | Father's education | Father's job |
|---|---|---|---|---|
| 1 | 12 | Diploma | Bachelor degree | Official employee |
| 2 | 13 | Bachelor degree | Bachelor degree | self-employed |
| 3 | 14 | Master degree | Master degree | Official employee |
| 4 | 14 | Bachelor degree | Bachelor degree | Official employee |

As presented in Table 1, the age distribution of participants was as follows: one participant was 12 years old, one was 13 years old, and two were 14 years old. Regarding parental education, one mother held a high school diploma, two held bachelor's degrees, and one held a master's degree. Among the fathers, three held bachelor's degrees and one held a master's degree. In terms of

paternal occupation, three fathers were employees, and one was self-employed.

Research Question: do cognitive dissonance theory-based interventions program effective on academic procrastination among procrastinating junior high school students in Isfahan?

Table 2 and Chart 1 show the status and scores of four participants regarding academic procrastination during the baseline, intervention, and follow-up phases**.**

**Table 2**

**The Process of Change in the Stages of Intervention Based on Cognitive Dissonance Theory for 4 Subjects in Academic Procrastination**

| Participants<br>Intervention steps | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| | | **Base line** | | |
| First base line | 41 | 41 | 33 | 46 |
| Second base line | 42 | 41 | 33 | 45 |
| Third base line | 42 | 40 | 33 | 45 |
| base lines Mean | 41.66 | 40.66 | 33 | 45.33 |
| | | **Intervention** | | |
| Third session | 31 | 34 | 28 | 39 |
| Session Six | 25 | 21 | 20 | 31 |
| Session Nine | 16 | 14 | 14 | 20 |
| Mean of Treatments | 24 | 23 | 20.66 | 30 |
| Stationary Change Index (Intervention) | 6.49 | 6.49 | 4.53 | 5.63 |
| Percentage of improvement after intervention | 42.39 | 43.43 | 37.39 | 33.81 |

| | | | | |
|---|---|---|---|---|
| Percentage of overall improvement after intervention | | 39.25 | | |
| | | **Follow-up** | | |
| First follow-up | 17 | 15 | 14 | 21 |
| Second follow-up | 15 | 14 | 14 | 20 |
| Third follow-up | 16 | 15 | 14 | 20 |
| Average follow-ups | 16 | 14.66 | 14 | 20.33 |
| Stationary Change Index (follow-up) | 9.43 | 9.55 | 6.98 | 9.19 |
| Percentage of improvement after follow-up | 61.59 | 63.94 | 57.57 | 55.15 |
| Percentage of overall improvement after follow-up | | 59.56 | | |

As seen in Table 1, the obtained value of the Stationary Change Index for the first participant regarding academic procrastination became significant at the $p < .01$ level in both the post-intervention and follow-up stages. This was also significant in both stages for the second, third, and fourth participants. The percentage of improvement for the first participant in academic procrastination was 42.39% post-intervention and 61.59% at follow-up. For the second participant, the improvement percentage was 43.43% post-intervention and 63.94% at follow-up. The third participant's improvement percentage was 37.39% post-intervention and 57.57% at follow-up, while the fourth participants was 33.81% post-intervention and 55.15% at follow-up.

Therefore, based on the overall improvement percentage of these four participants in the intervention stage (39.25%) and the follow-up stage for academic procrastination (59.56%), it can be

stated that the effectiveness of the intervention program based on cognitive dissonance theory for the participants' academic procrastination falls into the category of slight improvement at the intervention stage and into the category of intervention success at the follow-up stage. Overall, this signifies the success of the cognitive dissonance theory-based intervention program for reducing academic procrastination among female junior high school students.

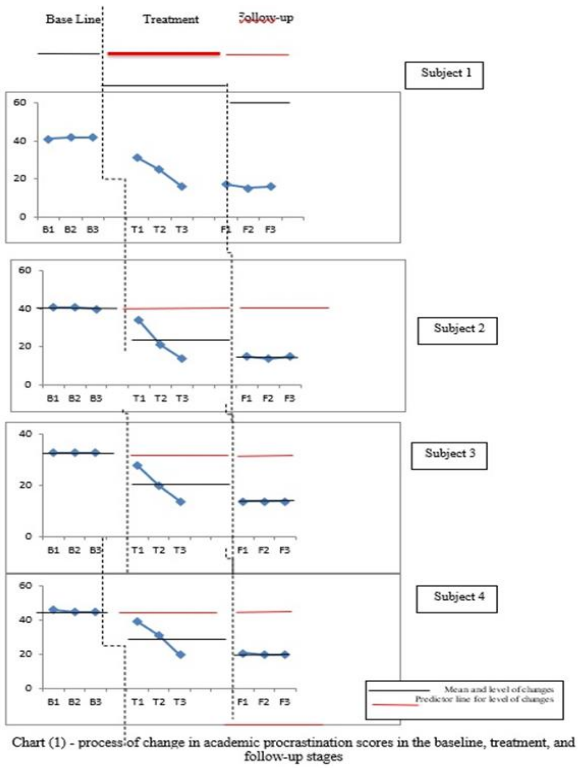


Chart (1) - process of change in academic procrastination scores in the baseline, treatment, and follow-up stages

As can be seen in Figure 1, the mean and level of academic procrastination scores in all three subjects decreased during the

intervention and follow-up phases compared to the baseline phase.

## Discussion

The results of the present study indicated that the effectiveness of the intervention program based on cognitive dissonance theory on academic procrastination among junior high school subjects was in the "slight improvement" category during the intervention phase and in the "intervention success" category during the follow-up phase. Overall, the findings demonstrate the success of the cognitive dissonance theory-based intervention program for reducing academic procrastination among junior high school students.

Since an extensive search of reputable Persian (e.g., SID, Mag Iran, Iran Doc, Civilica, etc.) and non-Persian (e.g., Science Direct, Google Scholar, Research Gate, Psych Info, etc.) scientific databases did not yield any studies on the effectiveness of a cognitive dissonance theory-based intervention program targeting academic procrastination, it is not possible to report consistencies or inconsistencies with previous findings. However, as thoroughly reviewed in the literature, the vast majority of existing research on the effectiveness of cognitive dissonance has been in the fields of consumer psychology and health psychology .

Therefore, the findings of the present study are consistent with those of Jedik et al. (2025), Ali Shah & Lakaz (2025), Devi & Gangwar (2025), Skandali & Yfantidou (2025), Muminović (2025), Gonzalez et al. (2024), and Abdi Varmazan et al. (2024). To explain this finding, it can be stated that cognitive dissonance is defined as a state of tension arising from simultaneously holding two psychologically inconsistent cognitive processes

(thoughts, beliefs, attitudes, or opinions). This tension motivates the individual to reduce or eliminate the discomfort by altering the first or second cognition or by replacing them with a new cognition. In other words, cognitive dissonance results from a contradiction between one cognition and another (Aronson, 2019). Thus, when subjects are exposed to cognitive dissonance induction (i.e., procrastinating students were educated about the disadvantages of procrastination and transmitted this knowledge to other students—explaining to them, using rational arguments, that procrastination is not beneficial), the procrastinating individual experiences cognitive dissonance. To alleviate the tension caused by this dissonance, the individual must either change the first cognition ("I am a procrastinator") or the second cognition ("procrastination is acceptable") or replace them with a new cognition while retaining both. According to the theory of justification (Aronson, 2019), replacing cognition with a new one is possible only when sufficient external justification (e.g., adequate reward or punishment) is present. Such conditions were not present for the subjects in this study. Therefore, the only remaining option was to change either the first or the second cognition. Since the subjects in the study had educated others about the drawbacks of procrastination, they consequently modified their second cognition ("procrastination is acceptable"). Following this change in the second cognition, a change occurred in their first cognition ("I am not a procrastinator"), resulting in cognitive consistency .

Like other studies, the present research has limitations, such as being conducted on procrastinating students from a single school in Isfahan and using a convenience sampling method, which limits the generalizability of the findings to other schools or

educational institutions. In this regard, it is recommended that other researchers, due to the novelty of this study, replicate it in other schools in Isfahan Province and other provinces of Iran, preferably using random sampling methods. Given the results of the present study, which confirm the success of the cognitive dissonance theory-based intervention program in addressing student academic procrastination, it is recommended that educational system officials, school administrators, educational psychologists, and academic counselors use this intervention program to reduce academic procrastination among students.

**Acknowledgments**

This research is taken from the doctoral dissertation of educational psychology of the first author of the article, and I hereby express my sincere thanks and appreciation to all students and School officials, who made it possible to carry out the research with their participation and cooperation in this study.

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