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Excessive implicit self-esteem may impair girls' academic performance: A survey of Japanese junior high school students

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Abstract: This study investigated (1) whether self-esteem levels predict academic performance and (2) whether this relationship differs by gender. A total of 158 seventh-grade students (81 boys, 77 girls) at a Japanese junior high school were assessed for self-esteem using both a group-administered Implicit Association Test (IAT) and a self-report questionnaire. Students were classified into groups based on implicit and explicit self-esteem levels, and their academic achievement (standardized Z-scores) was tracked across five testing periods during the school year. While girls outperformed boys overall, students with higher explicit self-esteem—regardless of gender—achieved better academic results. However, patterns differed for implicit self-esteem: boys with high implicit self-esteem improved over time, whereas girls with similarly high levels experienced a decline. These findings suggest that excessive implicit self-esteem may hinder academic progress in girls.

Keywords: *Academic achievement, Gender differences, Implicit self-esteem, Junior high school students, Paper-and-pencil IAT.*

1. Introduction

The importance of self-esteem in shaping students' academic and social development has been well documented by both researchers and educators. Students with high self-esteem typically demonstrate higher academic achievement and better psychological adjustment than those with low self-esteem.

The relationship between self-esteem and academic performance in early adolescence was reported as early as the 1980s (Eccles et al., 1989) and has been examined repeatedly since then (Alves-Martins, Peixoto, Gouveia-Pereira, Amaral, & Pedro, 2002; Baumeister, Campbell, Krueger, & Vohs, 2003; Ghazvini, 2011; Gultom & Oktaviani, 2022; Pullmann & Allik, 2008). These studies have predominantly reported a positive effect of high self-esteem on academic performance. For example, Stake, DeVille, and Pennell (1983) attempted to enhance adolescent girls' self-esteem through assertiveness training. The positive relationship between self-esteem and academic achievement has also been observed across various countries and cultural contexts, including Japan (Iwai & Oda, 1986) China (Yu et al., 2022) Iran (Owrangi & Yousliani, 2011) Turkey (Atik, 2006) and Nigeria (Tella, 2007).

However, recent data point to a striking paradox in Japanese education. An international survey conducted by the Yu et al. (2022) found that Japanese adolescents reported lower self-esteem than their peers in six other countries, including the United States, the United Kingdom, and South Korea. Paradoxically, Japanese students consistently outperform those same countries in international academic assessments such as PISA (Schleicher, 2019) and TIMSS (Matsuura & Nakamura, 2021). This discrepancy raises an important question: Why do Japanese students report relatively low self-esteem despite their high academic achievement?

The relatively low levels of self-esteem among Japanese junior and senior high school students, compared to their counterparts in other countries, have also been noted in a scholarly article published in *Trends in the Sciences*, the journal of the Japan Society for the Promotion of Science (Kashiwagi, 2001).

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One possible explanation lies in how self-esteem is measured. Traditional self-report questionnaires may be vulnerable to social desirability bias and distortions in self-perception (Greenwald & Banaji, 1995). To address this issue, Kitayama and Karasawa (1997) assessed the implicit self-esteem of Japanese undergraduates using the Name Letter Effect, rather than conventional self-report measures. Nuttin Jr (1985) originally found that people tend to prefer letters used in their own names and coined this phenomenon the "Name Letter Effect." Kitayama and Karasawa (1997) replicated this effect with Japanese participants and proposed it as a potential index of implicit self-esteem.

However, Kitayama and Karasawa did not examine whether individuals who selected their name letters more frequently actually possessed higher levels of implicit self-esteem than those who selected them less frequently. Although the Name Letter Effect may reflect certain aspects of implicit self-esteem, it is not suitable for assessing the degree of self-esteem.

Meanwhile, Greenwald, McGhee, and Schwartz (1998) developed the Implicit Association Test (IAT), which measures unconscious attitudes and biases. The IAT soon became a widely used tool for assessing various forms of implicit attitudes, including implicit self-esteem (Greenwald & Farnham, 2000).

Although effective, the original IAT requires a computer, which limits its applicability in typical classroom settings. To address this limitation, Mori, Uchida, and Imada (2008) developed a paper-and-pencil version of the IAT—the FUMIE Test—that can be administered to groups in under five minutes. This method has been used to reveal discrepancies between students' explicit and implicit attitudes. For example, Mori et al. (2008) found that approximately 20% of students who reported disliking mathematics on questionnaires actually showed positive implicit associations—so-called "fake math-dislikes."

A similar approach was later applied to the study of self-esteem. In that pilot study, several students who reported low self-esteem on questionnaires exhibited high levels of implicit self-esteem. This finding raised the possibility that traditional self-report measures may underestimate some students' true self-perceptions.

However, the pilot study was unable to determine which measure—explicit or implicit—more accurately predicted academic performance. The present study seeks to address this gap by examining how each type of self-esteem is associated with students' academic outcomes over time.

While previous research has consistently linked explicit self-esteem to academic success, the role of implicit self-esteem—particularly in East Asian contexts—remains poorly understood. If implicit self-esteem proves to be a stronger predictor, it would support the validity of the FUMIE Test as a meaningful tool for educational assessment.

Accordingly, this study addresses the following research questions:

1. Do seventh-grade students' implicit and explicit self-esteem levels predict their academic performance over the first year of junior high school?
2. Does the relationship between self-esteem and academic achievement differ by gender?

2. Method

2.1. Research Design

The present study employed a one-year longitudinal design involving Japanese junior high school students. The dependent variable was academic achievement, assessed five times over the course of the students' first year (seventh grade). At the beginning of the school year, students' self-esteem was measured using both explicit and implicit methods. Based on each measure, students were independently classified into high and low self-esteem groups. Gender was included as an additional between-subjects variable. We then examined how academic performance changed over time across these different groups.

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2.2. Participants

A total of 158 seventh-grade students (81 boys and 77 girls) from a junior high school in Nagano, Japan, participated in the study. Nagano City, located approximately 200 kilometers north of Tokyo, is the capital of Nagano Prefecture. The school was a municipal public institution, and the students generally came from families with average socioeconomic status. All participants were native speakers of Japanese. Instead of conducting a power analysis, we included all seventh-grade students at the school. Although random sampling was not employed, the sample was considered representative of typical Japanese junior high school students.

2.3. Assessment of Self-Esteem

2.3.1. Implicit Assessment: the FUMIE Test

Implicit self-esteem was assessed using the FUMIE Test (Mori et al., 2008) which consists of a series of word evaluation tasks designed to measure implicit associations. The A3-sized test sheet contained lines of words with either positive or negative connotations. Participants were instructed to classify each word as either "good" or "bad" by marking it with a circle or a cross, respectively—a standard response format in Japan. Each line was completed under a time limit of 20 seconds.

The target concept word, "myself," was inserted at regular intervals (every two words) among the evaluative words. Participants were instructed to mark the target word with a circle on even-numbered lines (positive task) and with a cross on odd-numbered lines (negative task). The underlying logic is that individuals with a positive implicit attitude toward the target concept will complete the positive task more quickly than the negative one, and vice versa. The difference in performance between the positive and negative tasks serves as an indicator of the participant's implicit attitude toward the self.

For this study, a 15-line FUMIE Test sheet was prepared using "myself" as the target word. The first line served as a practice trial and did not contain any target words. Lines 2 through 7 included the target word and were used for analysis. The remaining lines were excluded to minimize potential fatigue effects toward the end of the task.

2.3.2. Explicit Assessment: Questionnaires

Explicit self-esteem was assessed using a 10-item questionnaire printed on a single sheet. One of the key items asked, "I think I have more good qualities than others," which was rated on a four-point Likert scale. This key item was embedded as the eighth question among other filler items.

2.4. Assessment Procedure

One of the authors, who was a junior high school mathematics teacher at the time, administered both the FUMIE Test and the questionnaire during class time in April, shortly after the beginning of the academic year. The entire procedure took approximately 10 minutes. The steps were as follows:

1. Following standard informed consent procedures, the teacher distributed the FUMIE Test sheets.
2. General instructions were given: "Quickly evaluate the meaning of each word by marking it with a circle or a cross. Proceed line by line following the start cue, and stop when signaled. For target words, mark them as instructed regardless of meaning."
3. The first line served as a practice trial. The teacher gave a start cue, allowed 20 seconds, and then signaled to stop.
4. For line 2 (positive task), students were instructed to mark "myself" with a circle.
5. For line 3 (negative task), students were instructed to mark "myself" with a cross, regardless of meaning.
6. This pattern (positive task followed by negative task) was repeated for lines 4 through 7, using the same cues and timing.

Immediately after collecting the FUMIE sheets, the teacher distributed the questionnaire and instructed students to complete it.

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2.5. Academic Achievement Scores

Academic performance data were obtained anonymously from the school. Students were assessed through five regular-term examinations administered in May, July, October, November, and February. (Note: The Japanese school year begins in April and ends in March.) Each exam covered five subjects: Japanese language, social studies, mathematics, science, and English. In accordance with common practice in Japanese schools, raw scores were converted into standardized Z-scores (mean = 50, SD = 10). The Z-scores from the five testing periods were used for analysis.

Table 1.
Student groups categorized by three levels of implicit self-esteem.

Group	Boys	Girls	Total
Strongly Positive (iSPSE)	24	17	41
Positive (iPSE)	35	34	69
Negative (iNSE)	13	13	26

Table 2.
Student groups categorized by two levels of explicit self-esteem.

Group	Boys	Girls	Total
High Self-Esteem (eHSE)	45	37	82
Low Self-Esteem (eLSE)	27	27	54

3. Results

3.1. Classification by Self-Esteem Levels

3.1.1. Based on IAQ_{100} scores: Implicit Self-Esteem

First, we counted the number of words marked on even-numbered lines (WP; positive task) and odd-numbered lines (WN; negative task). We then calculated the Implicit Association Quotient (IAQ_{100}) using the formula:

$$IAQ_{100} = 100 \times (WP - WN) / (WP + WN).$$

The IAQ_{100} represents the difference between positive and negative task performance, normalized per 100 words. A positive IAQ_{100} indicates a positive implicit attitude toward the self ("myself"), and a negative IAQ_{100} indicates a negative one. This index was used as a measure of implicit self-esteem.

Students were divided by gender and grouped according to their IAQ_{100} scores as follows:

- Positive Implicit Self-Esteem ($IAQ_{100} \geq +1.0$)
- Negative Implicit Self-Esteem (iNSE: $IAQ_{100} \leq -1.0$)

Students with extreme IAQ_{100} scores (too high or too low) were excluded. Those with near-zero scores ($-1.0 < IAQ_{100} < +1.0$) were also excluded from further analyses.

The remaining students in the positive group were further split into:

- Strongly Positive Implicit Self-Esteem (iSPSE: $IAQ_{100} > M + 0.67SD$)
- Moderately Positive Implicit Self-Esteem (iPSE: $+1.0 \leq IAQ_{100} \leq M + 0.67SD$)

As a result, six subgroups were formed (see Table 1).

b) Based on questionnaire ratings: Explicit Self-Esteem

The Students responded to the statement "I think I have more good qualities than others" using a four-point scale. Based on their responses, students were grouped by gender into:

- High Explicit Self-Esteem (eHSE): Agree / Somewhat agree
- Low Explicit Self-Esteem (eLSE): Disagree / Somewhat disagree

This resulted in four subgroups (see Table 2).

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3.2. Average Scholastic Scores of Student Groups with Defferent Self-Esteem Levels

Figure 1 shows the average Z-scores across five time points for the different self-esteem groups, separately for boys and girls. The left panel displays results for implicit self-esteem, and the right panel for explicit self-esteem. (Note: Z-scores are standardized with a mean of 50 and SD of 10.)

3.2.1. Explicit Self-Esteem and Scholastic Performances

We first analyzed the simpler case of explicit self-esteem. As shown in Figure 1 (right), students with high explicit self-esteem (HSE_boy and HSE_girl) scored higher than those with low explicit self-esteem (LSE_boy and LSE_girl). Overall, girls outperformed boys.

This pattern is consistent with previous findings showing that students with higher self-esteem tend to be better adapted to school life. The current results provide additional support for this.

Furthermore, the average scores remained relatively stable throughout the year. Students who began the year with high self-esteem maintained higher performance, while those with low self-esteem remained lower. This suggests that explicit self-esteem at the beginning of junior high school may predict later academic performance.

3.2.2. Implicit Self-Esteem and Scholastic Performances

The relationship between implicit self-esteem and academic performance was more complex, as shown in Figure 1 (left). Some patterns even contradicted typical findings in the explicit self-esteem literature.

For boys, the three groups (strongly positive, moderately positive, and negative implicit self-esteem) showed generally similar trends, with the exception of the November test for the NSE_boy group. Boys with strongly positive implicit self-esteem (iSPSE) showed improvement over time.

For girls, the results were notably different. Girls with strongly positive implicit self-esteem (iSPSE_girl) had the lowest performance among the three girl groups, although still outperforming all boy groups. Notably, their scores declined over time. Girls with moderately positive implicit self-esteem (PSE_girl) began with the highest scores in May but declined steadily, eventually reaching scores comparable to the negative group (NSE_girl) by February. Only the strongly positive implicit group showed a distinct downward trajectory throughout the year.

3.3. Statistic Analyses

To examine the significance of these trends, we conducted a four-way ANOVA: 2 (Gender) × 3 (Implicit Self-Esteem Level) × 2 (Explicit Self-Esteem Level) × 5 (Test Period) for academic performance (see Table 3).

The main effects of Gender and Explicit Self-Esteem Level were significant:

- Gender: $F_{(1, 124)} = 4.713$, $p = .0318$
- Explicit Self-Esteem Level: $F_{(1, 124)} = 6.816$, $p = .0101$

The main effect of Test Period was not significant:

- $F_{(4, 496)} = 0.288$, $p = .8857$

A highly significant three-way interaction was observed:

- Gender × Implicit Self-Esteem × Test Period: $F_{(8, 496)} = 3.926$, $p = .0002$
- Further analysis revealed the following trends:
- Girls with excessively positive implicit self-esteem showed a clear decline in scores over time: (May to Feb: 51.673 → 49.083).
- Boys with excessively positive implicit self-esteem showed the opposite pattern, improving from the lowest point in May (45.441) to higher scores later (e.g., 48.064 in Nov).
- Boys with negative implicit self-esteem performed relatively well early in the year but declined in later tests: (May–July: ~48 → Nov: 45.821).

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Table 3.
ANOVA results for test scores of boys and girls with high vs. low self-esteem.

S.V	SS	df	MS	F
Gender	2819.5128	1	2819.5128	6.33 *
ExplicitSE	4823.7234	1	4823.7234	10.83 **
Gender x SE	115.1458	1	115.1458	0.26 ns
Participants	58817.8948	132	445.5901	
TestPeriod	6.0441	4	1.5110	0.24 ns
SE xTest	9.6113	4	2.4028	0.39 ns
Gender x Test	96.5067	4	24.1267	3.87 **
G x SE x Test	23.3719	4	5.8430	0.94 ns
P x Test	3290.8722	528	6.2327	
Total	70002.6829	679		

Note: +p<0.10 *p<0.05 **p<0.01.

4. Discussion

This study examined how explicit and implicit self-esteem, measured at the beginning of junior high school, predicted students' academic performance over the course of the first year, with particular attention to gender differences. The results supported previous findings that higher explicit self-esteem is associated with better academic outcomes, regardless of gender. More notably, the relationship between implicit self-esteem and academic performance revealed a gender-specific pattern: boys with strongly positive implicit self-esteem showed improvement over time, whereas girls with similarly high implicit self-esteem experienced a gradual decline.

These findings suggest that excessive implicit self-esteem may not consistently benefit academic performance and, in the case of girls, may even have adverse effects. This stands in contrast to the more stable and positive influence of explicit self-esteem. The discrepancy underscores the importance of distinguishing between consciously endorsed self-perceptions and those that operate at an unconscious level.

One possible interpretation is that girls with excessively positive implicit self-esteem may hold unrealistically elevated self-perceptions that are not reinforced by academic feedback, which may lead to frustration or disengagement over time. Conversely, boys with high implicit self-esteem may be more resilient or motivated by challenges, thereby benefiting from their confidence. These gender-specific responses may reflect broader sociocultural expectations or coping mechanisms, both of which warrant further investigation.

These results should be considered with caution. Some of the observed fluctuations in scores—particularly the decline among high-performing students and the improvement among initially low-performing ones—may be attributable to regression toward the mean, rather than indicating meaningful changes in ability or academic engagement. Furthermore, the sample was limited to a single school cohort, which may constrain the generalizability of the findings.

Despite these limitations, the study offers novel insights by applying a paper-based implicit measure—the FUMIE Test—in an actual school setting. It demonstrates the potential of combining implicit and explicit assessments to achieve a more nuanced understanding of students' psychological profiles and academic trajectories.

Future research should replicate these findings with larger and more diverse samples and explore the underlying psychological mechanisms (e.g., motivation, anxiety, feedback sensitivity) that may account for the differential effects of implicit self-esteem. Longitudinal tracking beyond the first year of junior high school would also help determine whether the observed trends persist, intensify, or reverse over time.

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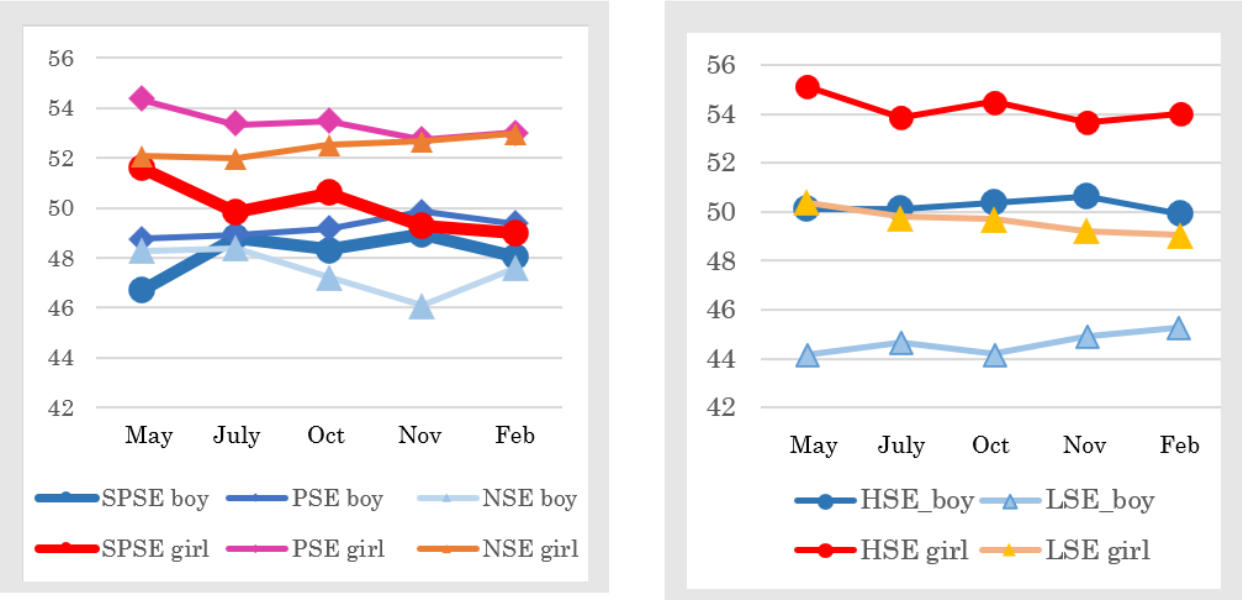

Figure 1.
Average Test Scores (Z-scores) of students with different self-esteem levels: Implicit self-esteem (left), Explicit self-esteem (right).

5. Conclusion

This study examined the influence of both explicit and implicit self-esteem on academic performance among Japanese junior high school students, revealing distinct gender-related patterns. Explicit self-esteem demonstrated a consistent positive association with academic achievement across genders, reaffirming previous findings. In contrast, the relationship between implicit self-esteem and academic performance varied: boys with high implicit self-esteem showed improvement over time, whereas girls with similarly high levels exhibited a gradual decline.

These findings suggest that excessive implicit self-esteem—particularly among girls—may hinder academic progress, potentially due to a mismatch between internal self-perceptions and external feedback. The results highlight the importance of considering both explicit and implicit dimensions of self-esteem in educational research and practice.

Several limitations should be acknowledged. First, the sample was drawn from a single school, which may limit the generalizability of the findings to the broader population of Japanese students. Second, the exclusion of students with mid-range IAQ_{100} scores may have reduced the representativeness of the sample. Third, some of the observed score patterns may partly reflect statistical regression to the mean rather than genuine changes in academic ability or engagement.

Transparency:

The authors confirm that the manuscript is an honest, accurate and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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