

The predictive role of future anxiety in anxiety toward future life events in Japanese university students: Controlling for trait anxiety

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未来不安が日本人大学生における将来ライフイベントへの不安を予測する効果

—特性不安を統制した検討—

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要約

未来不安とは、個人の将来に起こりうる好ましくない変化に対する懸念を指す概念である。近年、このような個人的な将来に特化した不安に関する研究が増加している。しかしながら、未来不安が特定の将来ライフイベントに対する不安とどの程度関連しているのか、またその関連が一般的な特性不安から独立したものであるかについては、十分に明らかにされていない。そこで本研究は、日本人大学生 383 名を対象に調査を行い、未来不安、特性不安、および複数の将来ライフイベントに対する不安を測定した。将来ライフイベントとしては、比較的近い将来から遠い将来にわたる出来事を含めるため、期末試験、初めての正規就職、結婚、子どもを持つ、マイホーム購入、子どもの独立、退職を取り上げた。分析にあたっては、特性不安を統制した重回帰分析を行い、未来不安が各将来ライフイベントに対する不安をどの程度予測するのかを検討した。その結果、未来不安は特性不安を統制した後も、多くの将来ライフイベントに対する不安を有意に予測した。一方で、子どもの独立に対する不安のみ、未来不安の予測効果は有意ではなかったが、これは、大学生にとって当該イベントの自己関連性が比較的に低いことを反映している可能性がある。以上の結果から、未来不安は特定の将来ライフイベントに対する不安と独自に関連し、特性不安とは独立した概念であることが示唆された。

Key words

future anxiety, trait anxiety, future life events, Japanese university students, multiple regression analysis

1. Introduction

Contemporary society is often characterized by high levels of uncertainty, making the future difficult to predict. This heightened uncertainty may contribute to increased concerns about one's personal future. Consistent with this, an increasing number of studies in recent years have focused on future anxiety (e.g., Jannini, Rossi, Socci, & Di Lorenzo, 2022; Jung, Choi, & Lee, 2025; Szcześniak, Timoszyk-Tomczak, Łoś, & Grzeczka, 2025; Yıldırım, Kaynar, Arslan, & Chirico, 2023). Future anxiety, as conceptualized by Zaleski (1996; see also Zaleski, Sobol-Kwapinska, Przepiorka, & Meisner, 2019), refers to a negative attitude toward one's more remote personal future, characterized by apprehension and worry about possible unfavourable changes. A growing body of research suggests that future anxiety is associated with a range of mental health outcomes, including stress and depression (Öztekın, Gómez-Salgado, & Yıldırım, 2025), subjective mental well-being (Paredes, Apaolaza, Fernandez-Robin, Hartmann, & Yañez-Martinez, 2021), and quality

of life (Jannini, Mordacchini, Rossi, Socci, & Lorenzo, 2024).

Existing studies have underlined the significance of future anxiety in relation to psychological adaptation and have made efforts to uncover its underlying mechanisms (e.g., Öztekın et al., 2025). However, despite being defined as anxiety specifically about one's personal future (Zaleski, 1996; Zaleski et al., 2019), few studies have examined whether future anxiety is associated with anxiety toward specific personal future life events, and to what extent this association is independent of general trait anxiety. The present study addresses this gap by examining the predictive role of future anxiety in anxiety toward specific future life events among Japanese university students, while controlling for trait anxiety.

1.1 The predictive role of future anxiety in anxiety toward future life events in university students

University students are in the stage of emerging adulthood (Arnett, 2000), a transitional life period characterized by increasing reflection on their future. Future-oriented thoughts during this period are not limited to the immediate time ahead, but often extend across a broader timespan, including various major life events in one's personal life. For example, Berntsen

& Bohn (2010) reported that when participants were asked to generate their important future events, they frequently referred to a “culture life script” (Berntsen & Rubin, 2004), a culturally shared representation of normative life events such as job, marriage, and having children. Although such life events often involve positive elements (e.g., the joy of one’s own child’s birth), they also entail substantial uncertainty, which may evoke anxiety. Indeed, existing studies have reported various forms of anxiety related to specific future life events among university students, such as employment (Shin, 2019), marriage (Cantekin & Kunduraci, 2024), and childbirth (Zhang, Wei, Zhu, Teng, Zhang, Xu, Qin, Jiang, Alias, & Wong, 2022). Given their potential to impact mental health and shape individuals’ engagement with major life decisions, it is important to explore the factors that contribute to these forms of anxiety.

Several lines of reasoning suggest that future anxiety may serve as a significant predictor of anxiety toward personal future life events. First, considerations about the personal future are often examined within the framework of future time perspective (e.g., Zimbardo & Boyd, 1999), which broadly shapes how individuals think, feel, and plan for the future. In this context, future anxiety is regarded as a core element of its negative dimension (Zaleski et al., 2019), which may negatively influence how individuals think about their specific future life events. For instance, Zaleski (1996) originally argued that individuals with a high level of future anxiety tend to hold a generally negative view of specific matters related to their future. Second, anxiety toward specific future life events may be considered a domain-specific manifestation of broader, global future anxiety. In other words, individuals with higher levels of future anxiety are more likely to feel anxious when thinking about specific future life events.

1.2 Controlling for the influence of trait anxiety

Trait anxiety reflects a general tendency to be sensitive to potential threats. Individuals high in trait anxiety are more likely to perceive specific situations as threatening and to experience heightened anxiety in response. For example, previous studies have shown that trait anxiety is associated with anxiety toward specific situations, such as job-related anxiety (Muschalla, Linden, & Olbrich, 2010). Given that this study aims to examine the predictive role of future anxiety in anxiety toward future life events, and considering that trait anxiety may also serve as a potential predictor for such anxiety, it is crucial to clarify whether the predictive effect of future anxiety is independent of trait anxiety. Theoretically, although future anxiety and trait anxiety may share some overlap due to their common anxiety component, they are conceptually distinguishable. Trait anxiety reflects a general tendency to experience anxiety that is not specific to one’s personal future per se. In contrast, future anxiety is characterized by concerns about unfavorable changes in the future (e.g., Zaleski et al., 2019), thereby allowing it to be regarded as a specific form of anxiety toward one’s personal future. For example,

Zaleski (1996) suggested that while future anxiety is related to other forms of anxiety, it has its own specificity, which he attributed to an aspect of personal future perspective. Indeed, Yakın & Temeloğlu Şen (2023) have found a moderate correlation ($r = .67$) between future anxiety and trait anxiety, suggesting that the two constructs are related yet not fully overlapping. However, since empirical evidence is limited, whether this nonoverlap reflects a future-oriented core specific to future anxiety remains to be clarified. Thus, a key aim of the present study is to examine whether future anxiety uniquely predicts anxiety toward future life events across different temporal distances, above and beyond trait anxiety. Using this approach, the present study contributes to evaluating the construct independence of future anxiety as an anxiety directed toward one’s personal future.

1.3 The present study

Based on the above background, the present study aimed to examine the predictive role of future anxiety in anxiety toward future life events among university students, after controlling for trait anxiety. Given that future anxiety concerns the relatively distant future (rather than a short-term future limited to minutes, hours, or days; Zaleski, 1996), the present study focuses on a set of future life events varying in temporal distance, including first full-time job, marriage, having children, buying a house, children leaving home, and retirement. These events were drawn from the concept of cultural life scripts (Berntsen & Rubin, 2004; Janssen, Uemiya, & Naka, 2014), which reflect culturally shared expectations about typical life trajectories, were expected to reflect typical future life events relevant to university students. Additionally, to cover a broader range of future timeframes, we included a more temporally proximal but not immediate event that is considered important to university students. That is, the upcoming final exam in two to three weeks. Following the above reasoning, we expected that future anxiety would significantly positively predict anxiety toward the above events, even after controlling for trait anxiety.

2. Method

2.1 Participants

Participants were 406 Japanese university students (243 female and 163 male) from 18 to 25 years old ($M = 18.69$, $SD = 1.01$). They were recruited during lecture classes and completed the questionnaire online by scanning a QR code. Before answering, they read a description of the study and were informed that participation was voluntary and could be discontinued at any time. Only those who agreed to participate completed the questionnaire. No compensation was provided. The study was approved by the ethics committee of the authors’ institution (sha_2024_48).

2.2 Measures

2.2.1 Future anxiety

The 5-item Japanese version of the Dark Future Scale (DFS;

Zhang, Horiuchi, & Sobol, 2026) was used to measure future anxiety (e.g., “I am afraid that in the future my life will change for the worse”). The scale was rated on a 7-point Likert scale (0 = decidedly false, 6 = decidedly true), with higher scores indicating a greater tendency to experience anxiety toward one’s personal future.

2.2.2 Trait anxiety

The 20-item trait anxiety subscale of the Japanese version of the State-Trait Anxiety Inventory (STAI-T; Shimizu & Imae, 1981) was used to measure trait anxiety (e.g., “I worry too much over something that really doesn’t matter”). The scale was rated on a 4-point Likert scale (1 = not at all, 4 = very much so), with higher scores indicating greater levels of trait anxiety.

2.2.3 Measures of future life events

This study assessed anxiety toward seven future life events: the upcoming final exam, first full-time job, marriage, having children, buying a house, children leaving home, and retirement. Except for the final exam, the other six events were selected from the culture life script of Japanese adults reported by Janssen et al. (2014), as they represent a temporal sequence and share common characteristics, including (1) similar emotional valence (ranging from neutral to positive), (2) high perceived importance, and (3) relatively predictable timing in the life course (i.e., low variance in expected occurrence age). To ensure consistency with Janssen et al. (2014), participants rated each event’s perceived temporal distance (anticipated time to occurrence, in years, reported as a specific number), emotional valence (1 = very positive, 6 = very negative), and importance toward their future (1 = not important at all, 6 = very important).

Anxiety toward each event was measured using a single item (e.g., “How anxious do you feel when thinking about the first full-time job?”). Participants responded on a 6-point Likert scale (1 = not anxious at all, 6 = extremely anxious).

Prior to assessing event characteristics and anxiety for each event, participants indicated their intention to implement the target event using a 5-point scale (1 = want to do, 2 = somewhat want to do, 3 = somewhat do not want to do, 4 = do not want to do, 5 = not applicable to this event; e.g., already employed in the case of the first full-time job). The intention to implement was not assessed for the event of children leaving home, as in the Japanese context this event is generally regarded as a normative life course event for parents rather than a discretionary personal choice.

For the final exam, which was an event uniquely included in the present study, participants rated anxiety, emotional valence, and perceived importance. However, intention to implement and perceived temporal distance were not assessed, as the final exam was a common event that all participants were expected to take, and its timing was fixed (scheduled to occur approximately two to three weeks after the study).

2.2.4 Attention check items

Four attention check items were evenly embedded throughout the questionnaire (e.g., instructing participants to select “4”) to assess careless responding.

2.3 Procedure

Participants first reported their age, gender, and academic year. They then completed the Japanese versions of the DFS and STAI-T. Next, they evaluated the future life events described above. The final exam was assessed first, followed by the remaining events in the following order: first full-time job, marriage, having children, children leaving home, buying a house, and retirement.

For each event, except for the final exam and children leaving home, participants were first asked about their intention to implement the event. Event characteristics and anxiety for the target event were assessed only if the participant indicated having the relevant intention (rated 1 = want to do or 2 = somewhat want to do). If participants indicated 3 (somewhat do not want to do), 4 (do not want to do), or 5 (not applicable to this event), they skipped the remaining items for that event and proceeded to the next event. Items related to children leaving home were presented only to participants who indicated an intention to have children, immediately following the completion of the item block about having children.

2.4 Data exclusion

Prior to analysis, responses were screened for data quality. Participants who failed the attention checks were excluded ($n = 10$). Participants were also excluded ($n = 11$) if they did not follow the instructions for reporting a specific number for the perceived temporal distance of future life events (e.g., providing ranges such as “14-20” years or entering text instead of a number) or reporting clearly implausible values (e.g., “9999” years). In addition, participants who did not indicate specific academic year were excluded ($n = 2$). As a result, data from 383 participants (228 female, 155 male, $M_{\text{age}} = 18.67$, $SD = 0.93$) were included in the analyses.

2.5 Data analysis

All analyses were conducted using jamovi ver.2.5.3.0. Internal consistency of the DFS and STAI-T was examined using Cronbach’s α , and Pearson correlation coefficients were calculated to assess the association between future anxiety and trait anxiety. Descriptive statistics (means and standard deviations) were calculated for DFS, STAI-T, and all measures related to future life events.

To test whether future anxiety predicts anxiety toward each future life event above and beyond trait anxiety, multiple linear regression analyses were conducted for each life event. In each model, the anxiety score for the given event was the dependent variable, with DFS and STAI-T entered as predictors. Gender

and academic year were also entered as predictors to control their potential influence. Statistical significance was set at $\alpha = 0.05$. We report the standardized regression coefficients (β) for all predictors, with a focus on the coefficient for DFS.

3. Results

3.1 Reliability and correlation between future anxiety and trait anxiety

Means, standard deviations, Cronbach's α and correlation between DFS and STAI-T were obtained based on the full sample ($N = 383$). Cronbach's α was .85 for the DFS ($M = 3.61$, $SD = 1.34$) and .87 for the STAI-T ($M = 2.50$, $SD = 0.46$). The correlation between DFS and STAI-T was $r = .54$ ($p < .001$).

3.2 Descriptive statistics for each future life event

Descriptive statistics for each future life event are presented in Table 1. Data for the final exam were based on the full sample, whereas the remaining events were based on participants

who indicated an intention to engage in the respective event. As shown, anxiety scores ($M = 3.33$ - 4.73) varied across events and were generally around or above the notional middle point of the scale (3.50), indicating that participants experienced at least a moderate level of anxiety for every event. For the life script events, emotional valence was generally positive ($M = 1.92$ - 2.89) and perceived importance was high ($M = 4.18$ - 5.42). The perceived temporal distance also followed a sequential order from the first full-time job ($M = 4.37$ years) to retirement ($M = 46.80$ years). These patterns were consistent with the findings of Janssen et al. (2014), confirming that the selected life script events shared common characteristics and represented future life events among university students.

3.3 Predictive role of future anxiety across future life events

Results of multiple regression analyses are presented in Table 2. After controlling for gender, academic year, and trait anxiety, future anxiety significantly predicted anxiety toward

Table 1: Means (standard deviations) of anxiety and event characteristics for each event

	<i>n</i>	Anxiety	Valence	Importance	Distance
Final exam	383	4.64 (1.11)	4.81 (0.98)	4.09 (1.19)	N/A
First full-time job	352	4.73 (1.12)	2.89 (1.28)	5.42 (0.70)	4.37 (2.07)
Marriage	311	3.88 (1.24)	2.05 (0.84)	4.78 (1.03)	9.00 (2.59)
Having children	281	4.32 (1.17)	2.12 (0.85)	4.68 (1.05)	11.10 (2.98)
Buying a house	322	3.78 (1.31)	1.92 (0.82)	4.39 (1.18)	15.70 (6.20)
Children leaving home	281	3.75 (1.33)	2.58 (1.10)	4.53 (1.08)	29.30 (5.19)
Retirement	320	3.33 (1.36)	2.59 (0.99)	4.18 (1.16)	46.80 (9.47)

Note: Higher valence scores indicate more negative evaluations of the event.

Table 2: Multiple regression analyses of anxiety toward each future life event

Predictor	Final exam		First full-time job		Marriage		Having children	
	β	95 % CI	β	95 % CI	β	95 % CI	β	95% CI
Gender	-.06	[-.15, .04]	-.08	[-.18, .01]	-.03	[-.14, .08]	-.09	[-.21, .02]
Academic year	-.39 ***	[-.48, -.30]	.06	[-.04, .15]	-.01	[-.11, .10]	.02	[-.10, .13]
STAI-T	.10	[-.003, .21]	.26 ***	[.14, .37]	.09	[-.04, .22]	.15 *	[.01, .28]
DFS	.21 ***	[.11, .32]	.23 ***	[.12, .34]	.30 ***	[.17, .43]	.17 *	[.04, .31]
Adjusted R^2	.21		.20		.12		.08	
<i>F</i>	26.30 ***		23.50 ***		11.60 ***		7.44 ***	

Predictor	Buying a house		Children leaving home		Retirement	
	β	95 % CI	β	95% CI	β	95 % CI
Gender	-.05	[-.16, .06]	-.04	[-.16, .08]	-.06	[-.17, .05]
Academic year	-.08	[-.19, .02]	-.22 ***	[-.33, -.10]	-.07	[-.18, .03]
STAI-T	.07	[-.06, .19]	.18 **	[.05, .31]	-.12	[-.25, .01]
DFS	.29 ***	[.17, .41]	.09	[-.04, .22]	.32 ***	[.19, .44]
Adjusted R^2	.11		.09		.07	
<i>F</i>	10.40 ***		8.29 ***		7.24 ***	

Notes: DFS = Dark Future Scale; STAI-T = State-Trait Anxiety Inventory - Trait. Gender was coded as 0 = female and 1 = male. Academic year was coded from 1 to 4. VIFs ranged from 1.03 to 1.49. * $p < .05$, ** $p < .01$, *** $p < .001$.

the final exam ($\beta = .21$), first full-time job ($\beta = .23$), marriage ($\beta = .30$), having children ($\beta = .17$), buying a house ($\beta = .29$), and retirement ($\beta = .32$). For children leaving home, the significant predictors were academic year ($\beta = -.22$) and trait anxiety ($\beta = .18$), rather than future anxiety (*ns*).

4. Discussion

This study examined the predictive role of future anxiety in anxiety toward future life events among university students. Across the seven events examined, future anxiety significantly predicted anxiety toward six events, including the final exam, first full-time job, marriage, having children, buying a home, and retirement. Previous studies have reported anxiety related to specific future life events for university students (e.g., Cantekin & Kunduracı, 2024; Zhang et al., 2022). Building on these findings, the present study identified future anxiety as a key predictor of such event-specific anxiety.

Notably, despite a moderate positive correlation between future anxiety and trait anxiety ($r = .54$), the predictive effect of future anxiety remained significant after controlling for trait anxiety. This finding suggests that, although the two constructs partially overlap, future anxiety explains anxiety toward future life events beyond trait anxiety. This result is consistent with the conceptualization of future anxiety as concern specifically directed toward one's personal future (Zaleski, 1996; Zaleski et al., 2019), distinguishing it from general trait anxiety.

The only exception was the event of children leaving home, for which future anxiety was not a significant predictor, whereas trait anxiety was. This finding should be considered within the context of our university student sample. Future anxiety reflects concern about one's personal future (Zaleski, 1996). From this perspective, children leaving home may be a personally relevant future life event for parents, rather than for university students. Thus, for university students who are not yet parents, children leaving home likely has low self-relevance associated with their personal future. Consequently, future anxiety may not effectively account for anxiety toward this low self-relevance event given the characteristics of the present sample. In contrast, trait anxiety, as a broader disposition, was a significant predictor. Although speculative, this result points to the possibility that the predictive role of future anxiety may depend not merely on an event's temporal distance but also on its perceived self-relevance, a possibility warranting future investigation.

5. Limitations and future directions

There are several limitations in the present study. First, although guided by theories of future time perspective and future anxiety, we assumed that future anxiety predicts anxiety toward future life events. However, the cross-sectional design precludes causal conclusions. Future research could adopt longitudinal designs, assessing future anxiety and anxiety toward specific future life events at multiple time points to address the direction

of influence, or experimentally manipulate future anxiety to investigate its effect on anxiety toward specific future life events. Second, as the present study was limited to university students, the generalizability of the results is restricted. Their limited life experience may reduce the perceived realism and self-relevance of distant future life events. Future research should include participants from a wider range of age groups and life experiences (e.g., parents, working adults) to enhance the generalizability of the present findings. For example, future research could examine whether future anxiety predicts anxiety toward children leaving home in a parent sample. Additionally, they could compare the relationship between future anxiety and anxiety toward retirement across different occupations. Third, the present study's sample was limited to a Japanese population. For specific future life events such as retirement or buying a house, the meaning and psychological impact of these events may differ across cultural and social contexts. Therefore, the findings should be generalized to other cultural settings with caution, and cross-cultural studies are needed.

6. Conclusion

Despite these limitations, the present study indicates that future anxiety consistently predicted anxiety toward multiple future life events, even after accounting for trait anxiety. These findings support the validity of future anxiety as a construct distinct from general trait anxiety and highlight its relevance for understanding anxiety toward personal future life events.

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