



Seizing and freezing to life outcomes: Need for cognitive closure intensifies affective reactions to major events

Seung Eun Cha^{1,2} · Xyle Ku³ · Soeun Sarah Lee³ · Incheol Choi^{3,4}

Accepted: 8 January 2024 / Published online: 23 February 2024
© The Author(s) 2024

Abstract

Research shows that significant well-being disparities emerge between individuals who experience major negative events and those who undergo major positive events. However, such differences may vary among individuals. Drawing from the theory of the need for cognitive closure (NFC), we theorize and test whether NFC, which captures seizing and freezing on salient information to reach a fast conclusion, intensifies the differences in affective well-being between those who experience negative or positive events. Across three studies (total $N=2,399$), we provide converging evidence that supports our theoretical claim. We first found that participants with high (vs. low) NFC show a greater affective well-being gap between those who recalled their past negative and positive major events (Study 1). We also discovered consistent patterns when participants were provided with negative or positive major event scenarios (Study 2). Lastly, we further substantiated our findings by utilizing a longitudinal study of the 20th presidential election in South Korea (Study 3). Over a 6-week period, the well-being gaps between the supporters of the election winner and the runner-up were more pronounced among individuals with higher NFC. Overall, our findings have implications for identifying a novel psychological trait that influences the affective well-being gaps following significant events in one's life.

Keywords Major events · Need for cognitive closure · Affective well-being · Longitudinal study · Moderation

Introduction

Major life events are events that happen at one point in an individual's life that are extraordinary or of great importance to the experiencer (Luhmann et al., 2021). Consequently, substantial differences in well-being emerge between individuals who experience a major negative event (e.g., being laid off) and those who experience a major positive event (e.g., being promoted). For instance, Lucas et al. (2003) found in a longitudinal study that marriage increased individuals' happiness, whereas widowhood led to a steep

decline in their happiness. However, is the magnitude of the well-being gap consistent across all individuals in response to major negative and positive events? Based on three empirical pieces of evidence, we propose in this study that the well-being gaps resulting from negative vs. positive events are amplified among individuals with a higher need for cognitive closure (NFC).

Well-being following major events

Well-being changes within individuals

A substantial body of prior research has explored how major events, particularly negative ones, influence changes in well-being within individuals (Anusic et al., 2014b; Diener et al., 2006; Lucas, 2007; Luhmann et al., 2012b). For example, Lucas (2005) found that experiencing divorce leads to a major dip in individuals' well-being, and this decline does not fully recover to its initial level. These changes in well-being are also evident following the onset of disability, with a sharp decline in their well-being and limited adaptation over time (Lucas, 2007).

✉ Incheol Choi
ichoi@snu.ac.kr

¹ Department of Psychology, University of Wisconsin-Madison, Madison, WI, USA

² Institute on Aging, University of Wisconsin-Madison, Madison, WI, USA

³ Department of Psychology, Seoul National University, 1 Gwanak-Ro, Gwanak-Gu, Seoul 08826, Republic of Korea

⁴ Center for Happiness Studies, Seoul National University Seoul, Seoul, Republic of Korea

However, prior research also took note that the degree of changes in individuals' well-being varies considerably across individuals (Anusic et al., 2014b; Yap et al., 2012), and that certain psychological attributes may influence the magnitude of such changes. The most frequently identified variables were demographics, such as age and gender, and the Big Five Personality (Cheung et al., 2020; Thompson et al., 2020). For example, Choi et al. (2021) found that when the World Health Organization (WHO) announced COVID-19 as a global pandemic, the young and middle-aged group (the 10s to the 40s) showed a steeper decline in their well-being compared to the older group (over the 50s). Furthermore, individuals with higher neuroticism were more likely to experience depressive emotions following the catastrophic hurricane Sandy, whereas those with higher extraversion experienced them to a lesser extent (Kopala-Sibley et al., 2016). In sum, psychological attributes influence the extent to which one's initial well-being changes in response to major events.

Well-being gaps between individuals

Despite their significance, it is surprising that there has been limited empirical attention to understanding how major events lead to well-being gaps *between* individuals, and which psychological mechanisms contribute to such differences. Major events, whether personal (e.g., passing an exam) or societal (e.g., presidential election), not only alter one's well-being trajectories, but also impact well-being disparities between individuals. For example, the legalization of same-sex marriage in California—a major breakthrough for gay rights—has significantly reduced the well-being gap between heterosexual and homosexual couples (Wight et al., 2013). Furthermore, entering college, which is a major transition in one's life, more negatively impacts the well-being of minorities (e.g., female, first-generation student) compared to others (Kroshus et al., 2021). For societal major events, the Brexit movement in the United Kingdom shifted individuals' well-being based on their attitudes toward the European Union, further affecting their responses to the Brexit transition (Kavetsos et al., 2020). Therefore, major negative and positive events tend to influence individuals' well-being in different directions, thus engendering well-being disparities between individuals.

However, psychological mechanisms also play a crucial role in the degree of such disparities. Among the few studies that have investigated psychological moderators, Toshkov and Mazepus (2022) found that a noticeable well-being gap arises between supporters of the losing and the winning sides in a democratic election, with this gap being wider for individuals with strong partisan affiliations. Conversely, the well-being gap between the disadvantaged (e.g., ethnic minority and women) and the advantaged group (e.g.,

European and men) tends to be reduced when the disadvantaged endorse the system-justification beliefs, as it serves as a buffer in perceived discrimination (Bahamondes et al., 2019). Despite prior attempts, there is still a lack of studies that uncover how individuals' psychological attributes influence well-being disparities following major events that one experiences throughout their lifetime. To address this gap, our primary focus is to examine the psychological variable that impacts the well-being gap between individuals who have experienced major negative and positive events, particularly in terms of affective well-being (i.e., the presence of positive affect and the absence of negative affect; Luhmann et al., 2012a).

The need for cognitive closure as a moderator

To explain the variability of well-being, we especially focus on the theory of Need for Cognitive Closure (NFC), the inherent cognitive aspects of individuals. NFC refers to a tendency or a “*desire for a firm answer to a question, any firm answer as compared to confusion and/or ambiguity*” (Kruglanski, 2004, p. 4). Thus, individuals with high NFC desire to avoid uncertainty and unpredictability while seeking definite knowledge on a given topic (Kruglanski & Webster, 1996). Although NFC can vary according to the situational context (e.g., time pressure, ambient noise), it can also be a stable individual trait, which this study focuses on (Webster & Kruglanski, 1994).

Individuals who have high NFC show two cognitive consequences—seizing and freezing, also known as urgency and permanence tendencies (Kruglanski & Webster, 1996). First, they are more prone to *seizing* on closure quickly on a certain topic. They speculate less on available information and instead use simple heuristics to reach a fast conclusion, as alternative thoughts or opinions are perceived as bothersome (Choi et al., 2008; Marchlewska et al., 2017). Thus, individuals with high NFC process information at a more baseline sensory level and use this information to make quick judgments (Kossowska et al., 2015). Furthermore, they are susceptible to *freezing* on the initial judgment and show close-mindedness. They are more likely to be unshaken by additional information that can delay or alter their conclusion, thus preserving the closure that they made (Webster & Kruglanski, 1997). Collectively, these epistemic tendencies make it difficult for them to view situations through multifaceted lenses and be flexible in updating their beliefs (Webster et al., 1996).

Although a wealth of literature on NFC was mostly discussed outside the affective domain (Lemay et al., 2015; Marchlewska et al., 2017; Webster & Kruglanski, 1997; Webster et al., 1996), cognition and motivation are inevitably linked with emotion (Lazarus, 1991). For example, cognitive appraisal theories of emotions propose that the

intensity and quality of emotional experiences can vary heavily depending on how one appraises the events (Conte et al., 2023; Lazarus, 1991; Moors et al., 2013). In line with the notion, the perceived event characteristics of the situation (e.g., how much one perceives the event as impactful) can significantly influence individuals' affective reactions toward the major event they experience (Haehner et al., 2022). Therefore, affective responses are shaped according to how much we appraise the event as significant to our well-being (Lazarus, 1991).

Taking on this framework, we postulate that NFC will not only influence one's cognitive appraisals of the situation, but also shape their *affective* responses (Mannetti et al., 2007; Roets & Soetens, 2010). Several prior research speaks to these associations (e.g., Iannello et al., 2017). For example, those with high NFC were less likely to show positive affective responses regarding cultural fusion, as it goes against their need to have less ambiguity (De Keersmaecker et al., 2016). Similarly, when those with high NFC were situated to engage in tasks that threatened their closure (i.e., divergent thinking tasks), they displayed more negative and less positive emotions than those with low NFC (Wronska et al., 2019). Regarding a specific situation, those who scored high in the NFC subset—high in ambiguity intolerance and close-mindedness—had lower emotional, social, and psychological well-being during the COVID-19 pandemic (Bassi et al., 2023). The ambiguity of the pandemic elicited more stress and anxiety for those who desired fast closure (White, 2022). To sum up, the inclination for a fast closure reflected by NFC can have a considerable effect on individuals' subsequent emotions.

By the same token, we posit that individuals with high NFC would show amplified affective responses when experiencing major negative vs. positive events. Those with high NFC are quick to make black-and-white judgments about the social world, and take it to the extreme (Federico et al., 2013; Kruglanski & Webster, 1996). They are more likely to make fast distinctions between what is “good” and “bad” (Kruglanski et al., 2006; De Zavala et al., 2010). In this sense, their inclination to develop a fast judgment regarding the situation elicits stronger corresponding emotions (Colbert et al., 2006). Specifically, those with high NFC will be more likely to appraise the event using surface-level information, thus letting the event's initial valence influence their affective state considerably more. Conversely, those with low NFC are more likely to abstain from making swift appraisals but rather interpret them from various perspectives and frequently adjust their judgments. Together, our study proposes that the affective well-being disparity between those experiencing a major negative event and those experiencing a major positive event will be wider for individuals with high NFC than those with low NFC. Therefore, we hypothesize as follows:

Hypothesis: The need for cognitive closure intensifies the differences in affective well-being between individuals who experience major negative event and those who experience major positive event.

Overview of the present research

To test our hypothesis, we conducted three studies. In Study 1, we tested the hypothesis by asking individuals to recall any major negative or positive event they experienced during the last 5 years and report their affective well-being retrospectively. In Study 2, we replicated Study 1 by asking participants to predict their affective well-being for given scenarios that reflect major negative or positive events. In Study 3, we constructively extended Studies 1 and 2 by deploying a longitudinal study assessing affective well-being around a major societal event that happened at a population level in South Korea. Specifically, we tested how NFC moderated affective well-being trajectories of the supporters of the winner or the loser (i.e., runner-up) following the 20th presidential election on March 9th, 2022.

Transparency and openness

In the current article, we report how we determined our sample size, all data exclusions, and all measures that were included in this study. Data in Studies 1 and 2 were analyzed using SPSS PROCESS Macro (Hayes, 2013), and data in Study 3 were analyzed using R (R Core Team, 2023). The design and hypothesis of the present study were not preregistered, and the data are available from the corresponding author upon request.

Study 1

In Study 1, we aimed to gather preliminary evidence that NFC strengthens the impact of emotional events on affective well-being. To that end, we used a recall paradigm. Specifically, we asked individuals to retrospectively think about any major event they experienced that was negative or positive and reflect on their affective well-being following the event.

Participants

From the Amazon Mechanical Turk (MTurk) participant pool, we recruited 300 participants who reside in the United States. Of the initial samples, 16 participants were removed from the initial sample owing to two failed attention checks (e.g., “Click on strongly disagree”). Also, one participant who did not adequately complete the writing task was identified by two research assistants and was removed, leaving

a final sample of 283 participants. The final sample was 34.6% male, 79.9% White, and on average 44.89 years old ($SD = 13.37$). Power analysis conducted using G*Power 3.1 (Faul et al., 2009) revealed that 247 participants would show 90% power to detect a small effect (Cohen's $f = 0.08$; $\alpha = 0.05$). Therefore, we believe our final sample is sufficiently powered. We obtained the Institutional Review Board approval at the Seoul National University for Studies 1 and 2 (Protocol No. 2210/002-017). Prior to the Studies, all participants received informed voluntary online consent.

Procedures and measures

Independent variable: event condition (negative vs. positive event)

Participants were randomly assigned to recall any significant negative ($n = 142$) or positive major events ($n = 141$). Specifically, participants in the negative (positive) event condition read the instructions below:

Please take a moment to think about any major life event (personal or societal) that elicited negative (positive) emotional episodes during the last five years. Possible situations might be failing (passing) an exam, being laid off (promoted), or the presidential candidate that you support losing (winning) the election.

After recalling a specific event, they were then instructed to briefly describe the event they reflected on by engaging in a writing task.

Dependent variable: recalled affective well-being

After recalling either a negative or positive life event, all participants were asked to retrospectively think about how much they felt positive and negative affect *after* the major event using a 6-item questionnaire that consists of positive affect (PA) and negative affect (NA) (e.g., Choi et al., 2021). PA was measured with three items (i.e., happy, pleasant, relaxed), and NA was measured with three items (i.e., anxious, depressed, annoyed) on an 11-point Likert scale (0 = “not at all” to 10 = “very much”). For calculating the overall affective well-being index, averaged NA (Cronbach's $\alpha = 0.85$) was deducted from averaged PA (Cronbach's $\alpha = 0.96$).¹

¹ We also assessed affective well-being using the PANAS short version (Mackinnon et al., 1999) as an alternative measure. When analyzing the results based on this measure, we obtained consistent findings as reported in the main text (see Supplemental Material Table S2).

Moderator variable: NFC

We assessed participants' NFC using the 15-item short version of the NFC scale (Roets & Van Hiel, 2011) on a 6-point Likert scale (1 = “strongly disagree” to 6 = “strongly agree”). Sample items included (Cronbach's $\alpha = 0.89$): “I don't like situations that are uncertain” and “When I am confronted with a problem, I'm dying to reach a solution very quickly.”

Control variables

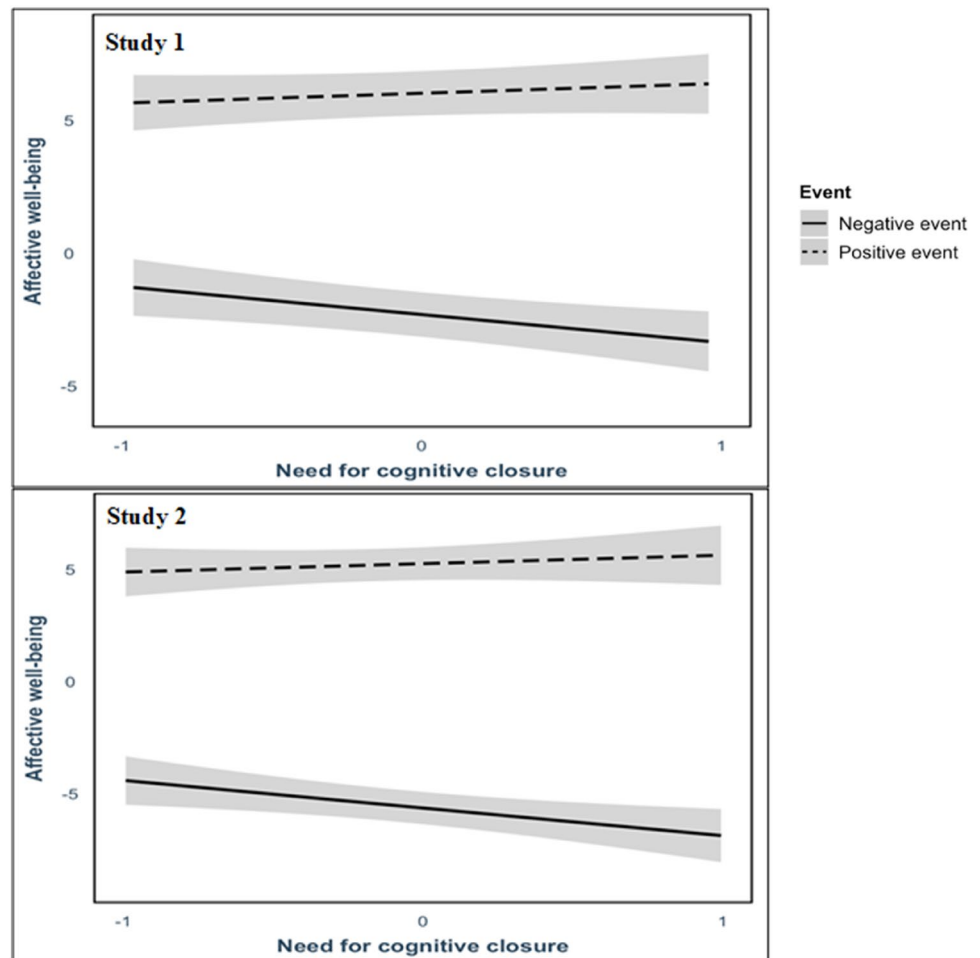
Baseline affective well-being was controlled for (Meyvis et al., 2010), which was measured using the same 6-item questionnaire deployed to assess recalled affective well-being. We specifically instructed them to think about how much they felt positive and negative affect during the past few weeks. Averaged NA (Cronbach's $\alpha = 0.84$) was deducted from averaged PA (Cronbach's $\alpha = 0.93$). Additionally, we controlled for dialectical thinking, which was measured using the 14-item Dialectical Self Scale (Spencer-Rodgers et al., 2008) on a 7-point Likert scale. We included dialectical thinking, defined as the tolerance for understanding contradictory aspects of a phenomenon, as those who hold dialectical self-concepts are more likely to display mixed emotions and show emotional complexity when interpreting the events they experience (Hui et al., 2009). Sample items included (Cronbach's $\alpha = 0.89$): “I often find that things will contradict each other.” Lastly, we controlled for relevant demographic variables such as age, gender (1 = male, 2 = female), and ethnicity (1 = White, 2 = Others).

Results

All descriptive statistics and bivariate correlations across all studies (Studies 1 to 3) are reported in the Supplemental Material. Participants assigned to the negative event condition ($M = 4.18$, $SD = 0.81$) and the positive event condition ($M = 4.19$, $SD = 0.85$) did not differ in their levels of NFC, $t(281) = 0.15$, $p = 0.88$, $d = 0.01$. Baseline affective well-being score did not differ between the participants in the negative event condition ($M = 2.07$, $SD = 4.75$) and those in the positive event condition ($M = 2.68$, $SD = 2.68$), $t(281) = 1.08$, $p = 0.28$, $d = 0.13$. However, the score differed between the participants with low NFC ($-1SD$; $M = 4.23$, $SD = 4.54$) and high NFC ($+1SD$; $M = 1.53$, $SD = 4.58$), $t(86) = 2.78$, $p = 0.007$, $d = 0.59$.

We tested our hypothesis using PROCESS MACRO model 1 (Hayes, 2013). All continuous variables were mean-centered prior to analyses, and covariates were controlled for (see Supplemental Material Table S2 for the full results). The results revealed that there was a significant main effect of the event condition ($B = 8.31$, $SE = 0.43$, $p < 0.001$), meaning that those who recalled negative events were more

Fig. 1 Regression slopes for the interaction of the event and the need for cognitive closure in Studies 1 and 2. *Note.* The upper graph indicates the two-way interaction results of Study 1, and the bottom graph indicates the results of Study 2. Solid lines indicate a major negative event, and dashed lines indicate a major positive event. Shaded areas indicate 95% confidence intervals



likely to report lower affective well-being than those who recalled positive events. There was also a significant main effect of NFC ($B = -2.48$, $SE = 0.83$, $p = 0.003$), such that those with higher NFC reported lower affective well-being. Baseline affective well-being was also a significant predictor in that those with more positive affective well-being at their baseline were more likely to rate higher in event affective well-being ($B = 0.50$, $SE = 0.05$, $p < 0.001$). Lastly, dialectical self did not significantly associate with individuals' affective well-being ($B = -0.24$, $SE = 0.24$, $p = 0.33$).

More importantly, the moderation of NFC was significant ($B = 1.43$, $SE = 0.52$, $p = 0.007$, 95% CI [0.40, 2.45]).² Participants with higher NFC (+1SD) showed more differences in their affective well-being between the negative and positive event conditions ($B = 9.50$, $SE = 0.60$, $p < 0.001$) compared to those with lower NFC (-1SD) ($B = 7.13$, $SE = 0.61$, $p < 0.001$). That is, as illustrated at the top of

Fig. 1, participants generally reported lower affective well-being after experiencing negative (vs. positive) events; however, this tendency was stronger when they had higher levels of NFC, supporting our hypothesis.

Additionally, we tested simple slopes by entering NFC as the independent variable while considering the event condition as the moderator. The analyses showed that the effect of NFC was significant only in the negative event condition ($B = -1.06$, $SE = 0.37$, $p = 0.005$), but not in the positive event condition ($B = 0.37$, $SE = 0.37$, $p = 0.31$).

To validate our findings, we ran two additional analyses (for further detail, see Supplemental Material p. 4). As participants recalled a variety of major events, the importance of the event (i.e., event importance) or the content of the event (whether it was societal or personal; i.e., event nature) could have influenced the results. To probe this possibility, we ran a three-way interaction of the two variables and found that the moderating role of NFC was not influenced by event importance or event nature (all $ps > 0.54$).

² The interaction of the event and NFC showed a similar pattern, when excluding all covariates entered in the model ($B = 1.07$, $SE = 0.62$, $p = 0.08$, 95% CI [-0.14, 2.29]).

Discussion

Results from Study 1 laid initial support for our hypothesis. To be specific, there was a sizeable difference in affective well-being between those who experienced negative vs. positive major events, especially among those with higher NFC. Therefore, NFC facilitated the well-being differences for any recalled event the participants reported being significant to themselves. Notably, these differences seemed to be driven mainly by the effect of NFC on negative major events rather than positive major events.

Although promising, findings in Study 1 warrant further exploration. In particular, although the importance or the content of the recalled major event did not influence the hypothesized effect, it seems necessary to replicate the findings while the event is specified.

Study 2

In Study 2, we sought to replicate and extend the results of Study 1. To do so, we used a scenario-based design method. Prior research has identified (un)employment as a job-related event that profoundly impacts individuals' well-being (Anusic et al., 2014a, 2014b). Therefore, we selected a scenario of getting *rejected* from a dream job as a major negative event and getting *accepted* to a dream job as a major positive event. After participants imagined the given scenario, we asked them to predict their affective well-being in those hypothetical events.

Participants

As in Study 1, we recruited 303 Mturk users. Of the initial samples, two attention check items left a final sample of 283 participants. The majority of the sample was male (40.3%) and White (79.9%); their average age was 42.30 years old ($SD=12.90$). Power analysis conducted using G*Power 3.1 (Faul et al., 2009) showed that 236 participants would result in 90% power to detect a small effect (Cohen's $f=0.08$; $\alpha=0.05$). Therefore, we reason that the current study is adequately powered.

Procedures and measures

The questionnaire consisted of two parts: (1) providing a scenario and assessing predicted affective well-being, and (2) assessing NFC and control variables (baseline affective well-being and demographics). Participants were presented with these two parts in counterbalanced order.

Independent variable: event condition (negative vs. positive event)

Participants were randomly assigned to either negative ($n=130$) or positive event conditions ($n=153$). Participants in the negative (positive) event condition were then asked to read the following short paragraph:

In this section, imagine that you got rejected from (finally got accepted to) your dream job. Try to feel this emotion as profoundly and vividly as possible, as if this really happened in your life.

We intentionally described the scenario briefly to avoid providing subtle implications (e.g., Karremans et al., 2003).

Dependent variable: predicted affective well-being

After fully imagining the given scenarios, participants were instructed to predict their affective well-being using the same scale in Study 1. The overall affective well-being index was then calculated by deducting averaged NA (Cronbach's $\alpha=0.83$) from averaged PA (Cronbach's $\alpha=0.94$).³

Moderator variable: NFC

To increase the validity of the NFC measure, we used the 41-item scale (Roets & Van Hiel, 2007) on a 6-point Likert scale (1 = "strongly disagree" to 6 = "strongly agree"). Sample items included (Cronbach's $\alpha=0.91$): "I think that having clear rules and order at work is essential for success" and "I like to have friends who are unpredictable."

Control variables

Baseline affective well-being was assessed and controlled for as in Study 1. Averaged NA (Cronbach's $\alpha=0.86$) was deducted from averaged PA (Cronbach's $\alpha=0.94$). Furthermore, we controlled for relevant demographic variables, such as age, gender (1 = *male*, 2 = *female*), and ethnicity (1 = *White*, 2 = *Others*). For Study 2, we did not include the dialectical self measure, as it had no significant effect on one's affective well-being in Study 1.

³ As in Study 1, we additionally measured affective well-being using the PANAS short version (Mackinnon et al., 1999). When analyzing based on this measure, the results were consistent with those reported in the main text. For more information, refer to Supplemental Material Table S4.

Results

The scores of NFC did not differ between participants in the negative event condition ($M = 4.08$, $SD = 0.66$) and those in the positive event condition ($M = 4.01$, $SD = 0.56$), $t(281) = 0.95$, $p = 0.34$, $d = 0.11$. Baseline affective well-being score did not differ between the participants in the negative event condition ($M = 3.34$, $SD = 4.90$) and those in the positive event condition ($M = 3.44$, $SD = 4.79$), $t(281) = 0.18$, $p = 0.86$, $d = 0.02$, but significantly differed between the participants with low NFC ($-1SD$; $M = 4.64$, $SD = 4.97$) and high NFC ($+1SD$; $M = 2.00$, $SD = 5.79$) NFC, $t(92) = 2.35$, $p = 0.021$, $d = 0.49$.

To test our hypothesis, we used PROCESS MACRO model 1 (Hayes, 2013). Prior to the analysis, all continuous variables were mean-centered, and baseline affective well-being and demographic variables were controlled for (see Supplemental Material Table S4 for the full results). The analysis showed that the main effect of the event condition was significant ($B = 10.91$, $SE = 0.39$, $p < 0.001$), such that those assigned to the negative major event scenario imagined worse affective well-being than those who imagined the major positive event. As in Study 1, there was a significant tendency for those with higher NFC to report lower affective well-being than those with lower NFC ($B = -2.85$, $SE = 0.99$, $p = 0.004$).

Most central to our hypothesis, we found a significant interaction between the event condition and NFC ($B = 1.61$, $SE = 0.64$, $p = 0.013$, 95% CI [0.35, 2.88]).⁴ As shown at the bottom of Fig. 1, a simple slopes analysis revealed a supportive pattern for our hypothesis: The difference in predicted affective well-being between the event conditions was greater among individuals with high NFC ($+1SD$; $B = 11.89$, $SE = 0.55$, $p < 0.001$), than among those with low NFC ($-1SD$; $B = 9.93$, $SE = 0.55$, $p < 0.001$).

As in Study 1, we tested the simple slopes by entering NFC as the independent variable in each condition. We found again that NFC was negatively associated with predicted affective well-being in the negative event condition ($B = -1.24$, $SE = 0.45$, $p = 0.006$). In contrast, there was no significant relationship in the positive event condition ($B = 0.38$, $SE = 0.49$, $p = 0.45$). Those high in NFC predicted lower affective well-being following the negative event, while NFC did not influence one's affective well-being in the positive event.

⁴ The interaction of the event and NFC showed a similar pattern, when excluding all covariates entered in the model ($B = 1.28$, $SE = 0.68$, $p = 0.06$, 95% CI [-0.07, 2.62]).

Discussion

The findings in Study 2 further substantiated the moderating effect of NFC on the association of the event condition with affective well-being. Specifically, the differences in the predicted affective well-being between failing to secure a dream job (major negative event) and succeeding in securing a dream job (major positive event) were more prominent among those with higher NFC. Interestingly, Study 2 also found that the role of NFC was significant only in the negative event condition, as in Study 1. We discuss the possible interpretation of this consistency in the General Discussion.

Overall, we gathered converging evidence that NFC moderates the difference in affective well-being following negative vs. positive major events across Studies 1 and 2. However, the robustness of our hypothesized moderation model merits further examination. First, the participants of Studies 1 and 2 were recruited from the United States, which speaks to the need to validate the findings with a different participant pool to ensure cross-cultural generalizability. Second, Studies 1 and 2 materialized a recall paradigm and hypothetical scenarios to test our hypothesis, respectively. However, predicting and recalling emotions are both vulnerable to response bias (Wenze et al., 2012), which might have impacted our results. Furthermore, using predictions and retrospections is likely to tap into cognitive approximations about well-being, rather than demonstrating their actual affective responses. Therefore, a critical next step would be to probe whether the findings can be replicated when capturing affective well-being in real life, which can be achieved through a longitudinal study.

Study 3

The purpose of Study 3 was to probe affective well-being trajectories following a major societal event in South Korea—the 20th presidential election. Prior studies suggest that the presidential election is a highly salient event that produces a significant population well-being gap (Kinari et al., 2019; Lench et al., 2019; Toshkov & Mazepus, 2022). For example, the 2016 presidential election in the United States produced a well-being gap such that Trump and Clinton supporters showed substantial differences in well-being for 6 months (Lench et al., 2019). Therefore, in Study 3, we utilized the presidential election as a major societal event that elicits positive affect on some individuals and negative affect on other individuals.

The 20th South Korean Presidential election

The 20th presidential election was held in South Korea on March 9th, 2022. Before the election, opinion polls

repeatedly showed that the two leading candidates—Jaemyung Lee of the Democratic Party and Suk-yeol Yoon of the People Power Party—were running neck and neck. The election was finalized on March 10th, 2022, marking the narrowest margin of victory in the history of the South Korean presidential election: Yoon (48.56%) won the election, defeating Lee (47.83%) by only 0.73% (Nam, 2022). As the election outcome was highly unpredictable, we speculate that the emotional impact of the election was substantial for both supporters.

Participants

Participants were recruited via Embrain, an online survey company in South Korea that maintains a panel of over one million participants. Like that of Mturk, Embrain participants can voluntarily select the surveys they are interested in for participation. In the current analysis, we materialized 1,833 participants who rooted for the two leading candidates (i.e., Lee vs. Yoon) to better distinguish those who experienced major negative vs. positive events (Fazio & Williams, 1986).⁵ Study 3 was approved by the Institutional Review Board at Seoul National University as a broader data collection effort (Protocol No. 2202/004-015). Therefore, a priori power analyses were not conducted regarding the current research. However, we have determined our sample size by considering prior research on longitudinal data with four time points as in the current study (e.g., $N = 1,549$; Losada-Baltar et al., 2021).

Procedures and materials

We recruited participants over 6 weeks in a 2-week interval, and participants provided informed voluntary online consent for each survey. Participants who completed the initial survey 2 weeks before the election (Time 1; $N = 1,833$) were further invited to complete the follow-up survey registered the day after (Time 2; $N = 1,191$), 2 weeks after (Time 3; $N = 984$), and 4 weeks after the election (Time 4; $N = 842$). The attrition rates at each time point are reported in the Supplemental Material (Table S6). During the baseline assessment (Time 1), participants' NFC, their supporting candidate, current affective well-being, and relevant control variables (i.e., demographic variables; age, gender, political orientation, subjective socioeconomic status) were measured. Additionally, they were asked to *predict* their affective well-being when imagining negative or positive election outcomes (losing vs. winning). Therefore, both current

affective well-being and their *predicted* affective well-being were measured at Time 1, whereas only participants' current affective well-being was measured from Time 2 to Time 4, .

Independent variable: support (loser vs. winner) (Time 1)

To distinguish major negative vs. positive events, participants reported which presidential candidate they supported in response to a single item question, “Which presidential candidate do you support?” on a categorical scale (1 = Lee, 2 = Yoon). As Yoon won the election and Lee became the runner-up, we subsequently indicate Lee supporters as the *loser*, and Yoon supporters as the *winner* for succinctness.

Moderator variable NFC (Time 1)

Participants reported their trait NFC using the same 15-item scale as in Study 1 (Cronbach's $\alpha = 0.87$).

Control variables (Time 1)

We controlled for participants' demographic variables—age, gender, political orientation, and socioeconomic status (SES)—as they are well-known factors that influence whom they support in the presidential election and thus are frequently controlled for in prior research (e.g., Panagopoulos & Weinschenk, 2022). Participants were asked to report their age, gender (1 = *male*, 2 = *female*), and their political orientation on a 7-point Likert scale ranging from 1 (“*extremely liberal*”) to 7 (“*extremely conservative*”). Lastly, participants reported their SES by indicating their perceived social rank on a ten-rung ladder (Adler et al., 2000), with higher numbers reflecting higher standings relative to others in South Korea.

Dependent variable 1: predicted affective well-being for the hypothetical election outcome (Time 1)

Participants were asked to predict their affective well-being for both imagined scenarios—their supporting candidate *losing* the election (i.e., hypothetical loser) and *winning* the election (i.e., hypothetical winner). Participants responded to the same 6-item affective well-being measure from our previous studies. Predicted affective well-being for the negative and positive election results was calculated by deducting averaged NA (loser: Cronbach's $\alpha = 0.87$; winner: Cronbach's $\alpha = 0.92$) from averaged PA (loser: Cronbach's $\alpha = 0.79$; winner: Cronbach's $\alpha = 0.92$).

⁵ Here, we define those who supported the runner-up as experiencing major negative event, and those who supported the winner as experiencing major positive event.

Dependent variable 2: current affective well-being (Time 1, 2, 3 and 4)

Current affective well-being at each time point was assessed using the same measures deployed in Studies 1 and 2. Longitudinal reliability analysis (Haney et al., 2023) using *omegaSEM* function in the *multilevelTools* R package (Geldhof et al., 2014) showed that NA demonstrated good reliability (within-person $\omega = 0.79$; between-person $\omega = 0.96$). PA also showed excellent reliability (within-person $\omega = 0.77$; between-person $\omega = 0.96$). Averaged NA was deducted from averaged PA at each time point to indicate affective well-being.

Analytical strategy

Statistical analyses were conducted using the *lme4* R package (Bates et al., 2015) and the *emmeans* R package (Lenth, 2022). All continuous variables were mean-centered. To identify the best model, we utilized a likelihood ratio test. We compared the random intercepts-only model to account for the interdependence of multiple observations made by the participants and random intercepts with the random slopes-of-the-time model to test the heterogeneity of affective well-being at each time point. The random slopes-of-the-time model showed a significantly better fit than the random intercepts-only model, $\chi^2(2) = 72.64, p < 0.001$. Thus, our subsequent models had individual participants as random intercepts and time as random slopes. We used a model that included cubic terms for time since it significantly improved model fit over linear or quadratic terms (for model fit comparisons, see Supplemental Material Table S9), and best represents the affective well-being trajectories following the presidential election (Lench et al., 2019). We also used an autoregressive structure to consider the higher correlations of affective well-being in closer proximity.

Results

Predicted affective well-being of the hypothetical election outcomes

We first probed whether significant affective well-being differences existed between the hypothetical election outcomes. Not surprisingly, individuals predicted significantly lower affective well-being when they imagined their supporting candidate lost ($M = -2.48, SD = 3.52$) than when the candidate won the election ($M = 3.46, SD = 3.26$), $t(3664) = 52.79, p < 0.001, d = 1.74$.

Next, we examined whether NFC moderated this observed pattern. To do so, we specified a two-level model with participants as random intercepts and the hypothetical election outcomes (i.e., when the supported candidate lost

vs. won the election) as random slopes to account for the between-participant variability in the given imagined scenario.⁶ We regressed relevant control variables (i.e., political orientation, gender, age, SES, and Time 1 affective well-being), hypothetical election outcomes, and NFC to predict affective well-being.

The results revealed a significant main effect of the hypothetical election outcomes ($B = 5.94, SE = 0.13, p < 0.001$), aligning with the above finding: Participants predicted lower levels of affective well-being when their supported candidate lost (vs. won) the election. Furthermore, the main effect of NFC was significant ($B = -0.50, SE = 0.08, p < 0.001$), indicating that higher NFC predicted lower affective well-being.

Most importantly, the two-way interaction between the hypothetical election outcomes and NFC was significant ($B = 0.94, SE = 0.13, p < 0.001$). As depicted in the Supplemental Material Fig. S1, NFC strengthened the impact of the hypothetical election outcomes on predicted affective well-being. Specifically, the tendency for individuals to predict lower levels of affective well-being when their supported candidate lost (vs. won) the election was heightened for those with high NFC (+1SD; $B = 6.87, SE = 0.19, p < 0.001$), while the effect was weaker among those with low NFC (−1SD; $B = 5.00, SE = 0.19, p < 0.001$). As in Studies 1 and 2, we ran additional analyses for simple slopes using NFC as the independent variable. The results revealed that NFC was negatively associated with predicted affective well-being when they imagined losing the hypothetical election outcome ($B = -0.50, SE = 0.08, p < 0.001$), while NFC was positively related to predicted affective well-being when they imagined winning ($B = 0.43, SE = 0.07, p < 0.001$).

Actual affective well-being across time points

We report information regarding the overall affective well-being trajectories around the 20th presidential election in the Supplemental Material (p. 10 and Fig. S2). Before examining the moderating role of NFC, we first probed the main effects. As shown in Table 1 Model 1, the results indicated that both age and SES were positively associated with affective well-being, suggesting that those who were older or with higher SES showed higher affective well-being. Additionally, political orientation or gender were not significant predictors. The support (loser vs. winner; we again note that the terms loser/winner refer to the *supporters* of the runner-up/winner) was also positively associated with affective well-being in that the loser showed worse affective well-being

⁶ Unlike the longitudinal data collected in our main analyses, the analyses were ran using the within-participant model by providing both negative and positive election scenarios to predict. Additionally, the model with random slope explained the data significantly better than the intercept-only model, $\chi^2(2) = 315.47, p < 0.001$.

Table 1 Estimates and standard errors of multilevel regression analyses in Study 3

	Model 1		Model 2		Model 3	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Intercept	4.66***	0.50	8.15***	0.68	8.08***	0.69
Age	0.04***	0.01	0.04***	0.01	0.04***	0.01
Gender	0.14	0.15	0.18	0.15	0.18	0.15
SES	0.76***	0.04	0.75	0.04	0.75	0.04
PO	0.04	0.07	-0.01	0.07	-0.01	0.07
Event	0.46*	0.19	-6.62***	0.96	-6.64***	0.97
NFC	-0.38***	0.08	-0.99*	0.48	-1.91**	0.73
Time	-4.83***	0.77	-9.72***	1.06	-9.59***	1.07
<i>Time</i> ²	1.90***	0.34	3.70***	0.48	3.63***	0.48
<i>Time</i> ³	-0.23***	0.05	-0.43***	0.06	-0.42***	0.06
Time × Support			9.77***	1.49	9.80***	1.50
<i>Time</i> ² × Support			-3.63***	0.67	-3.64***	0.67
<i>Time</i> ³ × Support			0.41***	0.09	0.41***	0.09
NFC × Support			0.24	0.15	1.85	0.99
Time × NFC			0.75	0.76	2.39*	1.15
<i>Time</i> ² × NFC			-0.32	0.34	-1.14*	0.52
<i>Time</i> ³ × NFC			0.04	0.05	0.16*	0.07
Time × NFC × Support					-2.87	1.54
<i>Time</i> ² × NFC × Support					1.44*	0.69
<i>Time</i> ³ × NFC × Support					-0.20*	0.09
Model comparison						
$\Delta\chi^2$			182.76		8.47	
<i>P</i>			<0.001		0.037	

Note: Gender (1 = male, 2 = female) SES subjective socio-economic status, PO political orientation Support (1 = Loser (Lee supporter), 2 = Winner (Yoon supporter)) * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Fig. 2 Three-way interaction of the time, event, and need for cognitive closure in Study 3. Note. The left graph indicates NFC one standard deviation below, and the right graph indicates NFC one standard deviation above. Shaded areas indicate 95% confidence intervals. The X-axis indicates the four-time points, and the Y-axis indicates affective well-being. Solid lines indicate the loser (1 = Supporters of the runner-up), and dotted lines indicate the winner (2 = Supporters of the winner)

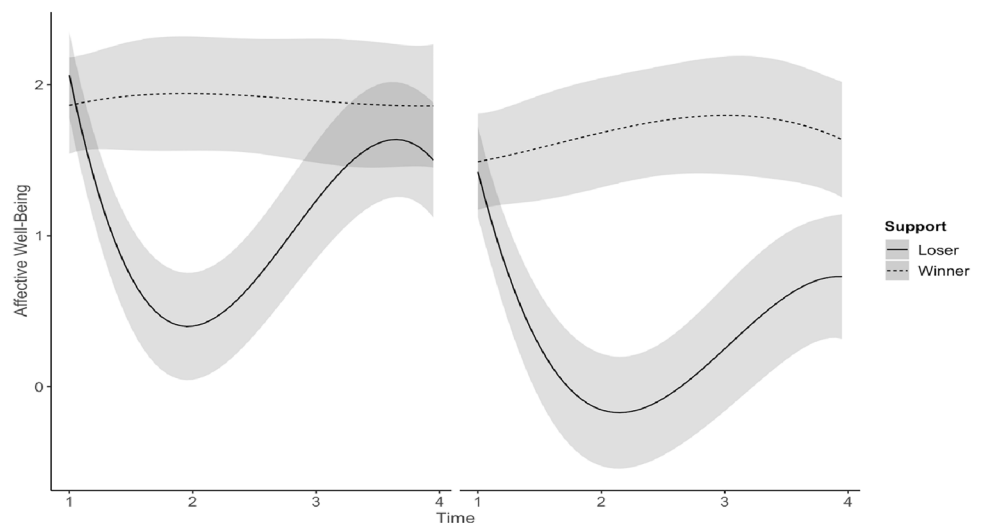


Table 2 Pairwise contrasts of the event at each time point and NFC level in Study 3

Time	NFC	Estimate	SE	<i>t</i>	<i>p</i>
1	-1SD	0.28	0.24	0.95	0.34
2		-1.46	0.30	-5.94	<0.001
3		-0.41	0.33	-2.34	0.02
4		-0.28	0.34	-1.44	0.15
1	+1SD	-0.14	0.25	-0.31	0.76
2		-1.92	0.30	-7.11	<0.001
3		-1.80	0.33	-5.45	<0.001
4		-1.03	0.34	-3.10	0.002

than the winner. NFC was also a significant predictor in that higher NFC showed worse affective well-being, which is consistent with the findings across Studies 1 and 2. Lastly, the time variable was significant in that the aggregated response of affective well-being differed over time.

The statistics in Model 2 demonstrated that including the two-way interactions of all possible combinations between the time, NFC, and support significantly improved the model fit. Although the two-way interactions between the NFC and support or between *time*³ and NFC were not significant, the interaction between *time*³ and support was significant, indicating that the affective well-being trajectories heavily depended on which candidate one supported.

Lastly, adding a three-way interaction in Model 3 improved model fit over Model 2. In line with our theorizing, NFC significantly moderated the effect of the support on affective well-being at each time point ($B = -0.20$, $SE = 0.09$, $p = 0.029$).⁷ The graph of this three-way interaction is plotted in Fig. 2. To further interpret this three-way interaction that denotes the difference in affective well-being trajectories between individuals with high vs. low NFC, we conducted a series of pairwise comparisons between the loser and the winner within both high and low NFC groups (see Table 2). Two weeks before the election took place (Time 1), the scores for affective well-being among the supporters of the two leading candidates were similar. The differences were not evident whether they had low (-1SD; $t_{(loser-winner)} = 0.95$, $p = 0.34$) or high NFC (+1SD; $t_{(loser-winner)} = -0.31$, $p = 0.76$).

However, differences emerged when the election results were finalized (Time 2) such that the loser generally experienced lower levels of affective well-being compared to the winner. Importantly, this pattern was starker among the high NFC group (+1SD; $t_{(loser-winner)} = -7.11$, $p < 0.001$) than

among the low NFC group (-1SD; $t_{(loser-winner)} = -5.94$, $p < 0.001$), despite the difference (-7.11 vs. -5.94) was not significant ($Z = 0.81$, $p = 0.42$; Clogg et al., 1995).

This trend became more evident when 2 weeks had elapsed since the election (Time 3). Individuals with high NFC exhibited a more pronounced affective well-being gap between the loser and the winner ($t_{(loser-winner)} = -5.45$, $p < 0.001$) compared to those with low NFC ($t_{(loser-winner)} = -2.34$, $p = 0.02$). Furthermore, this difference (-5.45 vs. -2.34) was significant, $Z = 2.21$, $p = 0.03$, suggesting that election outcome had a more substantial effect on one’s affective well-being for the higher NFC group.

Four weeks after the election, the effect of the election petered out for those with low NFC, showing non-significant affective well-being differences between the loser and the winner ($t_{(loser-winner)} = -1.44$, $p = 0.15$). However, those with high NFC seemed to be continuously impacted by the election outcome, showing noticeable affective well-being differences between the loser and the winner ($t_{(loser-winner)} = -3.10$, $p = 0.002$). When comparing between high and low NFC, the differences between the loser and the winner were not significantly different, $Z = 1.19$, $p = 0.24$.

Discussion

Study 3 provides important support for our hypothesis that individuals’ degree of NFC increases the well-being gap following major events. Those with higher levels of NFC were more likely to magnify the event’s influence, resulting in intensified affective well-being outcomes. The findings were both consistent when the participants *predicted* their affective well-being according to the hypothetical election results and when their affective well-being was tracked down following the actual election. Moreover, the results demonstrated that individuals with higher NFC were significantly more affected by the election results even when 4 weeks elapsed after the election. Overall, results in Study 3 showed that not only did individuals with higher NFC recall (Study 1) or predict (Study 2) their affective well-being to be more influenced by major events, but there were also greater differences in affective well-being when capturing the major event they were experiencing at the moment.

General discussion

Integrating the theory of NFC with the extant literature on major events and their impact on well-being, we theorized and tested whether and how NFC moderated individuals’ affective well-being gap following major negative vs. positive events in their lives. Across the three studies, we found converging evidence that NFC strengthens emotional responses to major events. Participants with high

⁷ The interaction of the event and NFC showed a similar pattern, when excluding all covariates entered in the model ($B = -0.20$, $SE = 0.09$, $p = 0.03$).

NFC were more likely to show marked differences in their recalled (Study 1) and predicted (Study 2) affective well-being among those who experienced major negative vs. positive events. This pattern was replicated and extended in a 6-week longitudinal data collected around the 20th presidential election in South Korea (Study 3). Before the election, supporters of the two leading candidates with higher levels of NFC predicted that they would experience greater differences in affective well-being when they imagined both negative and positive election outcomes. Indeed, the 6-week affective well-being trajectories around the election revealed that the well-being disparities between the loser and the winner were more pronounced when they had higher NFC. Overall, our results support the hypothesis that NFC amplifies the affective well-being gap between individuals experiencing major negative vs. positive events.

Although we did not have a priori predictions concerning the relative associations of NFC with affective well-being in *negative vs. positive* events, NFC was more related to affective well-being in negative events than in positive events throughout the three Studies. Furthermore, Study 3 showed that the loser (i.e., negative event) showed substantial changes in affective well-being spanning 6-weeks after the finalization of election outcomes, whereas the winner (i.e., positive event) did not differ in their affective well-being according to their NFC levels.

These consistent patterns may be due to negative events having a stronger impact on individuals' emotional consequences compared to positive events (Bohanek et al., 2005; Taylor, 1991). In other words, negative stimuli tend to elicit pronounced motivational reactions, prompting individuals to engage in faster information processing for survival (Baumeister et al., 2001; Taylor, 1991). Given that negative stimuli are typically less similar to one another than positive stimuli (Alves et al., 2015), acute attention towards negative stimuli becomes crucial as it is less predictable. For example, Alves et al. (2016) discovered that participants spatially clustered positive events they experienced in closer proximity, whereas negative events were scattered, indicating how dissimilar they were to each other. Consequently, individuals with higher NFC may experience a stronger motivation to make rapid judgments concerning heterogeneous negative events compared to relatively similar positive events. It is possible that the heightened demand to shift one's attention to the negative event and engage in fast information processing has led them to rely more on seizing and freezing as a means to fulfill their needs for fast closure (Kruglanski & Webster, 1996). Within this framework, we suspect individuals with higher NFC to have been less likely to measure the negative event in multifaceted ways or update their beliefs. Rather, they may rapidly perceived negative events as strongly adverse and unchanging, thereby exacerbating

their emotional consequences. Nonetheless, this remains speculative, and future research should be conducted to address this further.

Contributions and limitations

Our findings offer several theoretical contributions. First, our research suggests a novel psychological trait that explains the well-being gap following major events. The extant literature on the relationship between major events and their impacts on well-being documents a significant variability around well-being outcomes (e.g., Lucas et al., 2003). Yet, the need to identify the psychological trait-level moderators has been repeatedly addressed as a future avenue of research (Lucas et al., 2003; Luhmann et al., 2012b). Our research sought to address this question by suggesting a novel predictor—namely, NFC—as a significant psychological trait by replicating the findings across three studies. We especially investigated how NFC fueled the well-being gap of those who responded negatively vs. positively to a major event (i.e., job hunting, the presidential election). We believe our approach provides a new understanding: for those with high NFC, major events can have a much more significant impact on their well-being, potentially widening the well-being gap between individuals.

Second, our results have a valuable contribution with respect to the NFC literature. Although the consequences of NFC have been extensively examined (Webster & Kruglanski, 1997), prior research on this topic has focused mainly on how NFC impacts the cognitive decision-making process (Choi et al., 2008; Mannetti et al., 2007). In this sense, to the best of our knowledge, there has been a substantial lack of empirical attention to how individuals' NFC can produce emotional consequences. The current investigation fills this void by establishing how the motivational tendency to seek immediate closure can be significantly related to intensified affective experiences (Pierro & Kruglanski, 2008).

Finally, we provide cross-cultural support for our hypothesized effect. Across Studies 1 and 2, we validated our hypothesis by utilizing the American participant pool (i.e., Mturk workers). In Study 3, however, we materialized a non-western sample from South Korea and replicated the findings in Studies 1 and 2. Therefore, we believe that our consistent findings across the Western and non-Western samples attest to the cross-cultural generalizability of our hypothesized effect of NFC.

Our findings, however, are not free from limitations. First, Studies 1 and 2 assessed affective well-being following the event through recalling or forecasting, respectively. Therefore, we can't rule out the possibility that the assessment reflects individuals' cognitive estimation of their affective responses, rather than demonstrating actual affective consequences. As high NFC individuals seize and freeze on the

salient information, they would likely have anchored their response to more extreme values when asked to recall (imagine) either negative or positive major events. However, the patterns of affective responses in Studies 1 and 2 were similar to that of Study 3, which utilized at-the-moment assessment of affective responses. Therefore, we believe Study 3 can partially address the limitations in Studies 1 and 2.

Second, Study 3 utilized a longitudinal approach by materializing a major societal event that happened at a population level, using relatively short follow-up intervals. Although we found consistent results across Studies 1 to 3, future research could further validate the findings in Study 3 by examining how major personal events (e.g., divorce, marriage) can lead to diverging affective well-being trajectories. Therefore, we suggest future research to probe whether NFC can be a significant moderator for major *personal* events with longer intervals.

Third, we cannot draw inferences about affective well-being adaptation in Studies 1 and 2. Although we partially addressed this limitation in Study 3 through a longitudinal approach, we asked participants to gauge their affective well-being after they recalled or predicted negative and positive major events for Studies 1 and 2. To further investigate well-being trajectories as in Study 3, we encourage future research to ask participants to recall (predict) their affective well-being for various time points (e.g., 1 month before, the day of the event, 1 month after the event; Luhmann et al., 2021).

Conclusion

Who shows a wider well-being gap following the highs and the lows of life? Our findings highlight that people diverge significantly in how they react to these major events, possibly due to one's chronic NFC. The motivational tendency for fast and simple conclusions can lead to amplified emotional consequences when encountering events that are significant to oneself.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s11031-024-10058-1>.

Author contributions SEC served as a lead for conceptualization, data curation, formal analysis, investigation, methodology, project administration, visualization, and writing-original draft and contributed equally to writing-review and editing. XK contributed equally to writing-review and editing and served in a supporting role for conceptualization and project administration. SSL served in a supporting role for writing-review and editing. IC served as lead for funding acquisition, resources, supervision, and contributed equally to writing-review and editing.

Funding Open Access funding enabled and organized by Seoul National University. This research was funded by the Center for

Happiness Studies within the Center for Social Sciences at Seoul National University.

Declarations

Conflict of interest The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as conflict of interest.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

References

- Adler, N. E., Epel, E. S., Castellazzo, G., & Ickovics, J. R. (2000). Relationship of subjective and objective social status with psychological and physiological functioning: Preliminary data in healthy White women. *Health Psychology, 19*, 586–592. <https://doi.org/10.1037/0278-6133.19.6.586>
- Alves, H., Koch, A., & Unkelbach, C. (2016). Why good is more alike than bad: Processing implications. *Trends in Cognitive Sciences, 21*(2), 69–79. <https://doi.org/10.1016/j.tics.2016.12.006>
- Alves, H., Unkelbach, C., Burghardt, J., Koch, A., Krüger, T., & Becker, V. (2015). A density explanation of valence asymmetries in recognition memory. *Memory and Cognition, 43*(6), 896–909. <https://doi.org/10.3758/s13421-015-0515-5>
- Anusic, I., Yap, S. C. Y., & Lucas, R. E. (2014a). Does personality moderate reaction and adaptation to major life events? Analysis of life satisfaction and affect in an Australian national sample. *Journal of Research in Personality, 51*, 69–77. <https://doi.org/10.1016/j.jrp.2014.04.009>
- Anusic, I., Yap, S. C. Y., & Lucas, R. E. (2014b). Testing set-point theory in a Swiss national sample: Reaction and adaptation to major life events. *Social Indicators Research, 119*(3), 1265–1288. <https://doi.org/10.1007/s11205-013-0541-2>
- Bahamondes, J., Sibley, C. G., & Osborne, D. (2019). “We look (and feel) better through system-justifying lenses”: System-justifying beliefs attenuate the well-being gap between the advantaged and disadvantaged by reducing perceptions of discrimination. *Personality and Social Psychology Bulletin, 45*(9), 1391–1408. <https://doi.org/10.1177/0146167219829178>
- Bassi, M., Mangialavori, S., & Delle Fave, A. (2023). Need for cognitive closure and positive mental health among Italian university students during the COVID-19 pandemic. A multi-level analysis. *Personality and Individual Differences, 214*, 112326. <https://doi.org/10.1016/j.paid.2023.112326>
- Bates, D., Mächler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software, 67*(1), 1–48. Retrieved from <https://www.jstatsoft.org/article/view/v067i01/>
- Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology, 5*(4), 323–370. <https://doi.org/10.1037/1089-2680.5.4.323>

- Bohanek, J., Fivush, R., & Walker, E. (2005). Memories of positive and negative emotional events. *Applied Cognitive Psychology, 19*(1), 51–66. <https://doi.org/10.1002/acp.1064>
- Cheung, F., Kube, A., Tay, L., Diener, E., Jackson, J. J., Lucas, R. E., Ni, M. Y., & Leung, G. M. (2020). The impact of the Syrian conflict on population well-being. *Nature Communications, 11*(1), 3899. <https://doi.org/10.1038/s41467-020-17369-0>
- Choi, I., Kim, J., Kim, N., Choi, E., Choi, J., Suk, H., & Na, J. (2021). How COVID-19 affected mental well-being: An 11-week trajectories of daily well-being of Koreans amidst COVID-19 by age, gender and region. *PLoS ONE, 16*(4), E0250252. <https://doi.org/10.1371/journal.pone.0250252>
- Choi, J. A., Koo, M., Choi, I., & Auh, S. (2008). Need for cognitive closure and information search strategy. *Psychology and Marketing, 25*(11), 1027–1042. <https://doi.org/10.1002/mar.20253>
- Clogg, C., Petkova, E., & Haritou, A. (1995). Statistical methods for comparing regression coefficients between models. *The American Journal of Sociology, 100*(5), 1261–1293. <https://doi.org/10.1086/230638>
- Colbert, S., Peters, E., & Garety, P. (2006). Need for closure and anxiety in delusions: A longitudinal investigation in early psychosis. *Behaviour Research and Therapy, 44*(10), 1385–1396. <https://doi.org/10.1016/j.brat.2005.06.007>
- Conte, B., Hahnel, U. J. J., & Brosch, T. (2023). From values to emotions: Cognitive appraisal mediates the impact of core values on emotional experience. *Emotion, 23*(4), 1115–1129. <https://doi.org/10.1037/emo0001083>
- De Keersmaecker, J., Van Assche, J., & Roets, A. (2016). Need for closure effects on affective and cognitive responses to culture fusion. *Journal of Cross-Cultural Psychology, 47*(10), 1294–1306. <https://doi.org/10.1177/0022022116666375>
- De Zavala, A., Cislak, A., & Wesolowska, E. (2010). Political conservatism, need for cognitive closure, and intergroup hostility. *Political Psychology, 31*(4), 521–541. <https://doi.org/10.1111/j.1467-9221.2010.00767.x>
- Diener, E., Lucas, R. E., & Scollon, C. N. (2006). Beyond the hedonic treadmill: Revising the adaptation theory of well-being. *American Psychologist, 61*(4), 305–314.
- Fazio, R. H., & Williams, C. J. (1986). Attitude accessibility as a moderator of the attitude–perception and attitude–behavior relations: An investigation of the 1984 presidential election. *Journal of Personality and Social Psychology, 51*(3), 505–514. <https://doi.org/10.1037/0022-3514.51.3.505>
- Federico, C. M., Hunt, C. V., & Fisher, E. L. (2013). Uncertainty and status-based asymmetries in the distinction between the “good” us and the “bad” them: Evidence that group status strengthens the relationship between the need for cognitive closure and extremity in intergroup differentiation. *Journal of Social Issues, 69*(3), 473–494. <https://doi.org/10.1111/josi.12025>
- Geldhof, G. J., Preacher, K. J., & Zyphur, M. J. (2014). Reliability estimation in a multilevel confirmatory factor analysis framework. *Psychological Methods, 19*(1), 72–91. <https://doi.org/10.1037/a0032138>
- Haehner, P., Pfeifer, L. S., Fassbender, I., & Luhmann, M. (2022). Are changes in the perception of major life events associated with changes in subjective well-being? *Journal of Research in Personality, 102*(2023), 104321. <https://doi.org/10.1016/j.jrp.2022.104321>
- Haney, A. M., Fleming, M. N., Wycoff, A. M., Griffin, S. A., & Trull, T. J. (2023). Measuring affect in daily life: A multilevel psychometric evaluation of the PANAS-X across four ecological momentary assessment samples. *Psychological Assessment, 35*(6), 469–483. <https://doi.org/10.1037/pas0001231>
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. The Guilford Press.
- Hui, C., Fok, H., & Bond, M. (2009). Who feels more ambivalence? Linking dialectical thinking to mixed emotions. *Personality and Individual Differences, 46*(4), 493–498. <https://doi.org/10.1016/j.paid.2008.11.022>
- Iannello, P., Mottini, A., Tirelli, S., Riva, S., & Antonietti, A. (2017). Ambiguity and uncertainty tolerance, need for cognition, and their association with stress: A study among Italian practicing physicians. *Medical Education Online, 22*(1), 1270009. <https://doi.org/10.1080/10872981.2016.1270009>
- Karremans, J. C., Van Lange, P. A. M., Ouwerkerk, J. W., & Kluyver, E. S. (2003). When forgiving enhances psychological well-being: The role of interpersonal commitment. *Journal of Personality and Social Psychology, 84*(5), 1011–1026. <https://doi.org/10.1037/0022-3514.84.5.1011>
- Kavetsos, G., Kawachi, I., Kyriopoulos, I., & Vondoros, S. (2020). The effect of the Brexit referendum result on subjective well-being. *Journal of the Royal Statistical Society Series A: A Statistics in Society, 184*(2), 707–731. <https://doi.org/10.1111/rssa.12676>
- Kinari, Y., Ohtake, F., Kimball, M., Morimoto, S., & Tsutsui, Y. (2019). Happiness before and after an election: An analysis based on a daily survey around Japan’s 2009 election. *Japan and the World Economy, 49*, 187–194.
- Kopala-Sibley, D. C., Danzig, A. P., Kotov, R., Bromet, E. J., Carlson, G. A., Olino, T. M., Bhatia, V., Black, S. R., & Klein, D. N. (2016). Negative emotionality and its facets moderate the effects of exposure to Hurricane Sandy on children’s postdisaster depression and anxiety symptoms. *Journal of Abnormal Psychology, 125*(4), 471–481. <https://doi.org/10.1037/abn0000152>
- Kossowska, M., Czarnek, G., Wyczesany, M., Wronka, E., Szwed, P., & Bukowski, M. (2015). Electrocardiac indices of attention correlate with the need for closure. *NeuroReport, 26*(5), 285–290. <https://doi.org/10.1097/WNR.0000000000000000>
- Kroshus, E., Hawrilenko, M., & Browning, A. (2021). Stress, self-compassion, and well-being during the transition to college. *Social Science and Medicine, 269*, 113514. <https://doi.org/10.1016/j.socscimed.2020.113514>
- Kruglanski, A. W. (2004). *The psychology of closed-mindedness*. Psychology Press.
- Kruglanski, A. W., & Webster, D. M. (1996). Motivated closing of the mind: “Seizing” and “freezing.” *Psychological Review, 103*(2), 263–283. <https://doi.org/10.1037/0033-295X.103.2.263>
- Lazarus, R. S. (1991). Progress on a cognitive-motivational-relational theory of emotion. *American Psychologist, 46*(8), 819–834. <https://doi.org/10.1037/0003-066X.46.8.819>
- Lemay, E. P., Jr., Lin, J. L., & Muir, H. J. (2015). Daily affective and behavioral forecasts in romantic relationships: Seeing tomorrow through the lens of today. *Personality and Social Psychology Bulletin, 41*(7), 1005–1019. <https://doi.org/10.1177/0146167215588756>
- Lench, H. C., Levine, L. J., Perez, K. A., Carpenter, Z. K., Carlson, S. J., & Tibbett, T. (2019). Changes in subjective well-being following the U.S. Presidential election of 2016. *Emotion, 19*(1), 1–9. <https://doi.org/10.1037/emo0000411>
- Lenth, R. V. (2022). emmeans: Estimated marginal means, aka least-squares means. R package version 1.7.3. Retrieved from <https://CRAN.R-project.org/package=emmeans>
- Losada-Baltar, A., Martínez-Huertas, J. Á., Jiménez-Gonzalo, L., Pedrosa-Chaparro, M. S., Gallego-Alberto, L., Fernandes-Pires, J., & MárquezGonzález, M. (2021). Longitudinal correlates of loneliness and psychological distress during the lockdown situation due to COVID-19. Effects of age and self-perceptions of aging. *The Journal of Gerontology: Series B, 77*(4), 652–660. <https://doi.org/10.1093/geronb/gbab012>
- Lucas, R. E. (2005). Time does not heal all wounds: A longitudinal study of reaction and adaptation to divorce. *Psychological*

- Science*, 16(12), 945–950. <https://doi.org/10.1111/j.1467-9280.2005.01642.x>
- Lucas, R. E. (2007). Adaptation and the set-point model of subjective well-being: Does happiness change after major life events? *Current Directions in Psychological Science*, 16(2), 75–79. <https://doi.org/10.1111/j.1467-8721.2007.00479.x>
- Lucas, R. E., Clark, A. E., Georgellis, Y., & Diener, E. (2003). Reexamining adaptation and the set point model of happiness: Reactions to changes in marital status. *Journal of Personality and Social Psychology*, 84(3), 527–539. <https://doi.org/10.1037/0022-3514.84.3.527>
- Luhmann, M., Fassbender, I., Alcock, M., & Haehner, P. (2021). A dimensional taxonomy of perceived characteristics of major life events. *Journal of Personality and Social Psychology*, 121(3), 633–668. <https://doi.org/10.1037/pspp0000291>
- Luhmann, M., Hawkey, L., Eid, M., & Cacioppo, J. (2012a). Time frames and the distinction between affective and cognitive well-being. *Journal of Research in Personality*, 46(4), 431–441. <https://doi.org/10.1016/j.jrp.2012.04.004>
- Luhmann, M., Hofmann, W., Eid, M., & Lucas, R. E. (2012b). Subjective well-being and adaptation to life events: A meta-analysis. *Journal of Personality and Social Psychology*, 102(3), 592–615. <https://doi.org/10.1037/a0025948>
- Mackinnon, A., Jorm, A. F., Christensen, H., Korten, A. E., Jacomb, P. A., & Rodgers, B. (1999). A short form of the Positive and Negative Affect Schedule: Evaluation of factorial validity and invariance across demographic variables in a community sample. *Personality and Individual Differences*, 27(3), 405–416. [https://doi.org/10.1016/S0191-8869\(98\)00251-7](https://doi.org/10.1016/S0191-8869(98)00251-7)
- Mannetti, L., Pierro, A., & Kruglanski, A. (2007). Who regrets more after choosing a non-status-quo option? Post decisional regret under need for cognitive closure. *Journal of Economic Psychology*, 28(2), 186–196. <https://doi.org/10.1016/j.joep.2005.12.004>
- Marchlewska, M., Cichočka, A., & Kossowska, M. (2017). Addicted to answers: Need for cognitive closure and the endorsement of conspiracy beliefs. *European Journal of Social Psychology*, 48(2), 109–117. <https://doi.org/10.1002/ejsp.2308>
- Meyvis, T., Ratner, R. K., & Levav, J. (2010). Why don't we learn to accurately forecast feelings? How misremembering our predictions blinds us to past forecasting errors. *Journal of Experimental Psychology: General*, 139(4), 579. <https://doi.org/10.1037/a0020285>
- Moors, A., Ellsworth, P. C., Scherer, K. R., & Frijda, N. H. (2013). Appraisal theories of emotion: State of the art and future development. *Emotion Review*, 5(2), 119–124. <https://doi.org/10.1177/1754073912468165>
- Nam, H. W. (2022, March). Yoon vows to open era of national unity. *The Korea Times*. Retrieved from https://www.koreatimes.co.kr/www/nation/2022/09/803_325297.html
- Pierro, A., & Kruglanski, A. (2008). “Seizing and freezing” on a significant-person schema: Need for closure and the transference effect in social judgment. *Personality and Social Psychology Bulletin*, 34(11), 1492–1503. <https://doi.org/10.1177/0146167208322865>
- R Core Team (2023). R: A language and environment for statistical computing. R Foundation for Statistical Computing. Retrieved from <https://www.R-project.org/>
- Roets, A., & Soetens, B. (2010). Need and ability to achieve closure: Relationships with symptoms of psychopathology. *Personality and Individual Differences*, 48(2), 155–160. <https://doi.org/10.1016/j.paid.2009.09.013>
- Roets, A., & Van Hiel, A. (2007). Separating ability from need: Clarifying the dimensional structure of the need for closure scale. *Personality and Social Psychology Bulletin*, 33(2), 266–280. <https://doi.org/10.1177/0146167206294744>
- Roets, A., & Van Hiel, A. (2011). Item selection and validation of a brief, 15-item version of the Need for Closure Scale. *Personality and Individual Differences*, 50(1), 90–94. <https://doi.org/10.1016/j.paid.2010.09.004>
- Spencer-Rodgers, J., Srivastava, S., Boucher, H. C., English, T. L., Paletz, S. B., & Hou Y. (2008). *The Dialectical Self Scale*. Unpublished manuscript, University of California, Santa Barbara.
- Taylor, S. E. (1991). Asymmetrical effects of positive and negative events: The mobilization-minimization hypothesis. *Psychological Bulletin*, 110(1), 67–85. <https://doi.org/10.1037/0033-2909.110.1.67>
- Thompson, R., Holman, E., & Silver, R. (2020). Worst life events and media exposure to terrorism in a nationally representative U.S. sample. *Journal of Traumatic Stress*, 33(6), 984–993. <https://doi.org/10.1002/jts.22534>
- Toshkov, D., & Mazepus, H. (2022). Does the election winner-loser gap extend to subjective health and well being? *Political Studies Review*. <https://doi.org/10.1177/14789299221124735>
- Webster, D. M., & Kruglanski, A. W. (1994). Individual differences in need for cognitive closure. *Journal of Personality and Social Psychology*, 67(6), 1049–1062. <https://doi.org/10.1037/0022-3514.67.6.1049>
- Webster, D., & Kruglanski, A. W. (1997). Cognitive and social consequences of the need for cognitive closure. *European Review of Social Psychology*, 8(1), 133–173. <https://doi.org/10.1080/14792779643000100>
- Webster, D. M., Richter, L., & Kruglanski, A. W. (1996). On leaping to conclusions when feeling tired: Mental fatigue effects on impression primacy. *Journal of Experimental Social Psychology*, 32(2), 181–195. <https://doi.org/10.1006/jesp.1996.0009>
- Wenze, S. J., Gunthert, K. C., & German, R. E. (2012). Biases in affective forecasting and recall in individuals with depression and anxiety symptoms. *Personality and Social Psychology Bulletin*, 38(7), 895–906. <https://doi.org/10.1177/0146167212447242>
- White, H. (2022). Need for cognitive closure predicts stress and anxiety of college students during COVID-19 pandemic. *Personality and Individual Differences*, 187, 111393. <https://doi.org/10.1016/j.paid.2021.111393>
- Wight, R. G., Leblanc, A. J., & Lee Badgett, M. V. (2013). Same-sex legal marriage and psychological well-being: Findings from the California Health Interview Survey. *American Journal of Public Health*, 103, 339–346. <https://doi.org/10.2105/ajph.2012.301113>
- Wronska, M. K., Bujacz, A., Gocłowska, M. A., Rietzschel, E. F., & Nijstad, B. A. (2019). Person-task fit: Emotional consequences of performing divergent versus convergent thinking tasks depend on need for cognitive closure. *Personality and Individual Differences*, 142, 172–178. <https://doi.org/10.1016/j.pnanciniaid.2018.09.018>
- Yap, S. C., Anusic, Y., & Lucas, R. E. (2012). Does personality moderate reaction and adaptation to major life events? Evidence from the British Household Panel Survey. *Journal of Research in Personality*, 46, 477–488. <https://doi.org/10.1016/j.jrp.2012.05.005>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.