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RESEARCH PAPER

The Unhappy Beliefs of Happiness: Investigating the Mechanisms Underlying the Links Between Negative Hedonic Beliefs and Diminished Well-Being

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Abstract
In spite of extensive research that links the absence of pain with happiness, it remains puzzling why possessing beliefs equating the absence of pain with happiness (negative hedonic beliefs) undermine experienced happiness and what underlying mechanisms can explain this paradox. We conducted five studies to address these questions. The participants who had more negative hedonic beliefs exhibited decreased well-being, including subjective well-being and psychological well-being, alongside heightened depression and physical symptoms (Study 1a), an effect that persisted after controlling for behavioral inhibition/activation systems (Study 1b). Hypersensitivity to negative experiences, which reflects a reduced inclination to engage in negative experiences, even when positives exist, mediated the links between negative hedonic beliefs and poor well-being both cross-sectionally (Study 2) and longitudinally (Study 3). Moreover, the propensity to avoid negative experiences was observed in behavioral intention, primarily due to heightened anticipated negative affect when an event was manipulated to include negative aspects (Study 4). Together, the effort to eliminate negative experiences, as adhered to by individuals with negative hedonic beliefs, tends to prevent them from recognizing the potential benefits of unpleasant experiences, inadvertently depriving themselves of opportunities for the enhancement of their well-being.

Keywords Lay belief · Happiness · Well-being · Negative experience · Hypersensitivity to negative experiences

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1 Introduction

Common sense and academic research both tell us that the avoidance of pain and pursuit of pleasure are the pathways to happiness. In particular, the principles of hedonic systems articulate the feeling of pleasure or pain itself as a state of happiness or unhappiness (Bradburn, 1969; Diener, 1984; Kahneman et al., 1999; Watson, 1895). Not only do the results of extensive research link positive emotions to enhanced mental well-being and physical health, they also associate negative emotions with deteriorating conditions in those aspects, including increased depressive symptoms (Denollet & De Vries, 2006), reduced social support (Mayne, 1999), lowered life satisfaction (Schimmack et al., 2002), weakened immune response (Cacioppo et al., 1998), increased disease incidence (Nabi et al., 2008), and even greater mortality risk (Pinquart & Duberstein, 2010). Simultaneously, people utilize information on their positive and negative emotional experiences when forming judgments about their global well-being, guiding that their pursuit of pleasure and engagement in it while minimizing pain, its opposite, enhance well-being (Kim-Prieto et al., 2005; Schimmack et al., 2002).

However, research has shown that possessing the belief that well-being results from the absence of pain (negative hedonic beliefs; NHB) has a negative rather than a positive effect on one's actual experience of well-being, while possessing beliefs that the experience of pleasure constitutes well-being (positive hedonic beliefs; PHB) is associated with increased well-being (e.g., Chen & Zeng, 2023; Luong et al., 2016; McMahan et al., 2016; Willroth et al., 2023). The ironically detrimental effects of NHB have yet to be systematically investigated, so we explored how robustly NHB could predict poor well-being. More importantly, we examined possible explanations why endorsing NHB leads people to fail to attain well-being. In this paper, we interchangeably employ the terms happiness and well-being (Diener et al., 1999).

1.1 Puzzling Links between NHB and Experienced Well-Being

From the substantial body of research illustrating the relationship between negative experiences and happiness (Baumeister et al., 2001; Busseri & Sadava, 2011; Fredrickson, 2013; Kahneman et al., 1999; Kuppens et al., 2008; Larsen et al., 2003), it could seem logical to expect that the elimination of negative affect would lead to greater happiness and that believing this is therefore conductive to well-being. However, empirical evidence has not supported this expectation. Embracing NHB has been found to be inversely associated with life satisfaction and subjective happiness and positively linked to negative affect (McMahan & Estes, 2011; McMahan et al., 2014). Chen and Zeng (2023) observed similar patterns in hedonic avoidance orientation, or focusing on avoiding painful feelings, which is negatively related to well-being, in the forms of life satisfaction, positive affect, and psychological well-being. Moreover, McMahan et al. (2016) demonstrated that individuals with higher levels of NHB experience a more significant decline in well-being when confronting stresses.

This issue is closely intertwined with the existing controversy surrounding whether the pursuit of *hedonic (vs. eudaimonic)* happiness is beneficial or detrimental (Giuntoli et al., 2021; Li et al., 2022; Sheldon et al., 2019). Some studies have indicated a positive relationship between hedonic orientation and happiness (Gentzler et al., 2021; Giuntoli et al., 2021;

Huta & Ryan, 2010), and other researchers have expressed concern regarding the emphasis on seeking hedonia. They suggest that striving to improve hedonic well-being may either be unrelated to or negatively associated with experienced happiness (Chen & Zeng, 2023; Li et al., 2022; Mauss et al., 2011; Schueller & Seligman, 2010; Sheldon et al., 2019). This controversy may not pertain only to the pursuit of hedonic happiness but, more crucially, may arise from the failure to distinguish between the experience of pleasure and the absence of pain in the pursuit of hedonic happiness. In other words, this may be an instance of the paradox whereby striving to avoid pain ends in failure while striving to enhance pleasure tends to succeed (Chen & Zeng, 2023; McMahan et al., 2016). Although both pleasure and the absence of pain contribute to happiness, beliefs regarding these components and their function may vary in relation to whether one is seeking pleasure or avoiding pain. Returning to the issue of NHB while keeping this in mind, the following question necessarily arises: why is the belief that happiness is an absence of negative affects detrimental to happiness although happiness typically increases as negative affects decrease?

1.2 A Potential Mechanism: Hypersensitivity to Negative Experiences

Multiple mechanisms could potentially underlie the detrimental connection between NHB and happiness. Notably, we speculated that lower well-being among individuals with NHB could be attributed in part to the missed opportunity to embrace the positive sides of certain negative experiences. This line of reasoning is supported by two key considerations. First, it is plausible that those with NHB put more effort into avoiding negative experiences, and this strong inclination to evade unpleasant feelings may restrict their exposure to potentially rewarding experiences that can contribute to well-being. For instance, a person might steer clear of interpersonal situations that trigger social anxiety, preventing them from enjoying the benefits to well-being that come from forming social connections (Biggs et al., 2011). Second, it is essential to undergo certain unpleasant or painful experiences to achieve optimal functioning. This is because, in many cases, the pursuit of personal growth and meaningfulness involves challenges and discomfort, meaning that the desire to avoid pain can clash with the aspiration for eudaimonia (Vittersø & Søholt, 2011). As the concept of post-traumatic growth suggests, adversity can foster positive personal growth, such as discovering one's true purpose in life and cultivating deeper appreciation for supportive relationships (Tedeschi & Calhoun, 1995). Nevertheless, the effort to eliminate negative experiences may lead individuals with NHB to overlook the potential benefits that unpleasant experiences can offer, ultimately depriving them of the opportunity to enhance their well-being. Therefore, we suggest that hypersensitivity to negative experiences, characterized by an aversion to engaging with even minor negative experiences despite the great opportunity for positive experiences, may contribute to reduced well-being in individuals with NHB.

Some previous research provides suggestive evidence for our reasoning. For example, individuals who have a negative view on negative emotions (negative meta-emotions) tend to experience psychological impairment, while those who have a positive outlook on negative emotions (positive meta-emotions) are able to maintain psychological health (Bailen et al., 2019). Individuals who tend to accept their negative emotions without judgment, a characteristic that aligns with refraining from evaluating them negatively, exhibit positive psychological health (Aldao et al., 2010), which is partially accounted for by the experience of more beneficial emotions (Ford et al., 2018; Ostafin et al., 2014). Furthermore, the study

of stress mindsets shows that having a positive mindset with respect to stress and considering stress to have positive implications for enhancing health and performance is linked to greater well-being (Keech et al., 2020).

Together, these findings underscore the importance of individuals' perception of negative experiences independent of negative experiences themselves in influencing happiness. Unpleasant experiences may appear particularly problematic to individuals who endorse NHB, as they are discrepant from their standard of happiness, leading them to avoid such experiences. Importantly, this avoidance could result in a missed opportunity to extract potential positive aspects by accepting and overcoming unpleasant experiences.

1.3 The Present Study

Examining on the lay belief that well-being is characterized by a lack of negative experiences, this study investigated (1) the robustness of the negative relationship between NHB and actual well-being and (2) the mechanisms through which this association operates. To these ends, we conducted five studies. In Studies 1a and 1b, we tested whether NHB are linked to lower well-being (Study 1a) and whether this association persists when alternative variables are controlled for, such as behavioral inhibition/activation systems (Study 1b). Studies 2 and 3 delved into hypersensitivity to negative experiences, which reflects a reduced inclination to engage in negative experiences even when positives ones are available. We explored how this hypersensitivity to negative experiences indirectly connects with the way that NHB could hinder well-being both cross-sectionally (Study 2) and longitudinally (Study 3). In Study 4, we manipulated negative information of an event to test whether this would entail an overestimation of the hedonic cost of negativity for those with higher NHB. This, in turn, could reduce the behavioral intention of individuals with higher NHB, leading them to miss opportunities for positive experiences. All studies included PHB to isolate the unique effects of NHB and to compare the dysfunctional aspects of NHB to corresponding aspects of their positive counterpart (Chen & Zeng, 2023). All studies were carried out under IRB approval at Seoul National University (1708/001-012; 1903/002-005; 1802/003-003; 1804/001-002).

2 Studies 1a and 1b

Studies 1a and 1b investigated whether NHB (vs. PHB) are associated with decreased (vs. increased) well-being. We assessed happiness in terms of multiple aspects, including hedonic well-being (i.e., subjective well-being), eudaimonic well-being (i.e., psychological well-being), and ill-being (i.e., depression, physical symptoms).

In Study 1a, we tested these associations in a diverse Korean sample, while Study 1b replicated these findings while also controlling for the behavioral inhibition/activation system. In spite of the observation of the predictive effects of NHB and PHB on well-being, these effects could potentially arise from more general factors, specifically the biologically based behavioral inhibition system/behavioral activation system (BIS/BAS; Carver & White, 1994). The BIS is sensitive to signals related to punishment and novelty, which restrains behaviors that may potentially lead to adverse or painful outcomes, as well as the experience of negative emotions such as anxiety and sadness (Williams et al., 2014). In contrast, the

BAS is responsive to signals of reward, motivating approach behaviors in response to stimuli. It propels individuals toward their goals and is associated with positive affect, including feeling of happiness (Corr, 2004). By controlling for these alternative factors, we sought to determine whether both NHB and PHB uniquely contribute to happiness, even after factoring out the influence of biologically based systems linked to emotional experiences.

2.1 Method

2.1.1 Participants and Procedure

In Study 1a, 519 Seoul residents (255 females) were recruited from a research firm's panel to participate in a survey administered for Korean Adult Longitudinal Study (Choi et al., 2018). This survey included multiple questionnaires, and participants received compensation of 10,000 Korean won (approximately US $9) for participation. Their ages ranged from 20 to 69 (M=44.40, SD=13.68) years.

In Study 1b, 209 undergraduate students (107 females) at a large university in South Korea participated in a 1-hour survey including multiple questionnaires. Participants completed the survey either in a lab setting or remotely via e-mail and received compensation of 30,000 Korean won (approximately US $27) for participation. Their ages ranged from 20 to 28 (M=22.22, SD=1.02) years.

2.1.2 Measures

2.1.2.1 Hedonic Lay Beliefs We used the subscales of the Beliefs about Well-Being Scale (BWBS; McMahan & Estes, 2011) to assess hedonic lay beliefs. The instrument contained four items to assess NHB ("Not experiencing hassles," "Not experiencing negative emotions," "A lack of unpleasant experiences," and "A lack of painful experiences") and four items assessing PHB ("A great amount of pleasure," "Experiencing a great deal of sensual pleasure," "Experiencing euphoria and pleasure," and "Pleasurable experiences"). The participants provided their beliefs about whether each item is necessary and required aspect of well-being and living the good life, using a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

2.1.3 Well-Being

2.1.3.1 Subjective Well-Being To assess hedonic happiness, we measured Subjective Well-Being (SWB; Diener et al., 1999) using the Satisfaction With Life Scale (SWLS; Diener et al., 1985) and the Positive Affect and Negative Affect Schedule (PANAS; Watson et al., 1988). The SWLS includes five items that gauge overall life satisfaction (e.g., "I am satisfied with my life") on a scale from 1 (strongly disagree) to 7 (strongly agree). The PANAS includes 20 items that assess both Positive Affect (PA; e.g., "interested," "excited") and Negative Affect (NA; e.g., "distressed," "upset") experienced over the previous month, with responses given on a scale from 1 (very slightly) to 5 (extremely). SWB was computed by

summing scores from the SWLS with PA scores and then subtracting the NA scores, following the transformation of responses into standardized scores (Pavot, 2018).

2.1.3.2 Psychological Well-Being The Psychological Well-Being scale (PWB; Ryff & Keyes, 1995) measures eudaimonic happiness across six dimensions, each assessed on a three-item scale (e.g., "For me, life has been a continuous process of learning, changing and growth," "Some people wander aimlessly through life, but I am not one of them"). Participants responded on a 5-point scale, ranging from 1 (completely disagree) to 5 (completely agree).

2.1.4 Ill-Being

2.1.4.1 Depression Depression was assessed using the Center for Epidemiologic Studies Depression scale (CES-D; Radloff, 1977), a 20-item instrument requiring participants to rate their mood over the previous week (e.g., "I did not feel like eating; my appetite was poor," "I thought my life had been a failure"). Participants responded on a 4-point Likert scale, ranging from 0 (rarely or none of the time "less than 1 day") to 3 (most or all of the time "5–7 days").

2.1.4.2 Physical Symptoms Different scales were used in Studies 1a and 1b to measure physical symptoms. In Study 1a, we employed questionnaires from the Midlife in the United States Survey II (MIDUS II; Ryff et al., 2021), in which participants rated their physical symptoms on a 6-point Likert scale, ranging from 1 (not at all) to 6 (almost every day), where higher scores reflect more physical symptoms over the previous 30 days (e.g., "headaches," "backaches," "trouble getting to sleep or staying asleep"). In Study 1b, we administered the 13-item Physical Symptoms Inventory (PSI; Spector & Jex, 1998). Participants responded with their symptoms (e.g., "A backache," "Trouble sleeping," "Headache") over the previous month, ranging from 1 (not at all) to 5 (every day).

2.1.4.3 Behavioral Inhibition/Activation System We measured the Behavioral Inhibition System/Behavioral Activation System (BIS/BAS; Carver &White, 1994) Scale as an additional control variable in Study 1b alone. The BIS portion of the scale includes seven items (e.g., "I feel pretty worried and upset when I think or know somebody is angry at me"), and the BAS portion includes 13 items (e.g., "I will often do things for no other reason than that

they might be fun"). The participants indicated the degree to which they agreed with the statement on a scale ranging from 1 (strongly disagree) to 4 (strongly agree).

3 Results

Table 1 displays the correlations between two hedonic beliefs and well-being in Studies 1a and 1b. As predicted, NHB was negatively correlated with well-being, whereas PHB showed a positive correlation. Additional results, including those for life satisfaction, PA, NA, can be found in the Supplemental Information (SI; Table S1).

3.1 Hedonic Beliefs and Well-Being

To examine whether NHB (vs. PHB) are uniquely associated with decreased (vs. increased) well-being, we employed a regression model to predict well-being from two hedonic beliefs.

Table 1 Descriptive statistics and correlations among measures in studies 1a and 1b

	1	2	3	4	5	6	7	8
1. Negative hedonic belief	-	0.181^{**}	-0.259^{***}	-0.315^{***}	0.258^{***}	0.188^{**}	0.304^{***}	-0.092
2. Positive hedonic belief	0.371^{***}	-	0.224^{**}	0.141^{*}	-0.088	-0.081	0.105	0.232^{***}
3. Subjective well-being	-0.139^{**}	0.104^{*}	-	0.726^{***}	-0.759^{***}	-0.447^{***}	-0.457^{***}	0.222^{***}
4. Psychological well-being	-0.099^{*}	0.191^{***}	0.594^{***}	-	-0.620^{***}	-0.467^{***}	-0.427^{***}	0.320^{***}
5. Depression	0.179^{***}	-0.053	-0.606^{***}	-0.563^{***}	-	0.610^{***}	0.437^{***}	-0.064
6. Physical symptoms	-0.011	-0.129^{**}	-0.374^{***}	-0.150^{**}	0.357^{***}	-	0.299^{***}	-0.086
7. Behavioral inhibition system	-	-	-	-	-	-	-	0.010
8. Behavioral activation system	-	-	--	-	-	-	-	-
Study 1a *M* (*SD*)	4.836	5.480	0.000	3.488	1.698	1.869	-	-
	(1.104)	(0.847)	(2.258)	(0.410)	(0.418)	(0.790)	-	-
Study 1b *M* (*SD*)	5.032	6.075	0.000	3.709	0.828	1.916	3.157	3.044
	(1.506)	(0.768)	(2.233)	(0.483)	(0.497)	(0.515)	(0.595)	(0.459)

Note. Correlations from Study 1a are below the diagonal (N=519), and correlations from Study 1b are above the diagonal (N=209)

$^{*}p<.05$, $^{**}p<.01$, $^{***}p<.001$

Table 2 Results of regression in studies 1a and 1b

	Study 1a			Study 1b		
	b	95% CI	*p*	*b*	95% CI	*p*
Outcome: Subjective well-being						
(Intercept)	-0.869	[-2.440, 0.702]	0.278	4.205	[-1.643, 10.054]	0.158
Gender	-0.249	[-0.630, 0.132]	0.200	-0.434	[-0.955, 0.087]	0.102
Age	0.007	[-0.007, 0.021]	0.338	-0.194	[-0.443, 0.056]	0.128
Behavioral inhibition system	-	-	-	-1.728	[-2.181, -1.275]	**<0.001**
Behavioral activation system	-	-	-	0.725	[0.159, 1.291]	**0.012**
Negative hedonic belief	-0.427	[-0.613, -0.241]	**<0.001**	-0.215	[-0.393, -0.036]	**0.018**
Positive hedonic belief	0.503	[0.256, 0.749]	**<0.001**	0.763	[0.422, 1.105]	**<0.001**
R^2	0.052			0.354		
Outcome: Psychological well-being						
(Intercept)	3.244	[2.962, 3.526]	**<0.001**	4.248	[2.971, 5.525]	**<0.001**
Gender	0.002	[-0.066, 0.070]	0.952	0.004	[-0.109, 0.118]	0.939
Age	-0.002	[-0.004, 0.001]	0.172	-0.033	[-0.087, 0.022]	0.240
Behavioral inhibition system	-	-	-	-0.310	[-0.409, -0.211]	**<0.001**
Behavioral activation system	-	-	-	0.288	[0.164, 0.411]	**<0.001**
Negative hedonic belief	-0.072	[-0.106, -0.039]	**<0.001**	-0.063	[-0.102, -0.024]	**0.002**
Positive hedonic belief	0.122	[0.078, 0.167]	**<0.001**	0.099	[0.024, 0.174]	**0.009**
R^2	0.073			0.340		
Outcome: Depression						
(Intercept)	1.603	[1.312, 1.894]	**<0.001**	-0.702	[-2.113, 0.708]	0.327
Gender	-0.017	[-0.087, 0.054]	0.639	-0.045	[-0.171, 0.081]	0.481
Age	0.001	[-0.002, 0.004]	0.478	0.043	[-0.017, 0.104]	0.156
Behavioral inhibition system	-	-	-	0.328	[0.219, 0.437]	**<0.001**
Behavioral activation system	-	-	-	-0.026	[-0.163, 0.110]	0.707
Negative hedonic belief	0.087	[0.052, 0.121]	**<0.001**	0.052	[0.009, 0.095]	**0.019**
Positive hedonic belief	-0.065	[-0.111, -0.020]	**0.005**	-0.104	[-0.186, -0.021]	**0.014**
R^2	0.050			0.242		
Outcome: Physical symptoms						
(Intercept)	2.269	[1.717, 2.822]	**<0.001**	1.960	[0.429, 3.492]	**0.012**
Gender	-0.196	[-0.330, -0.062]	**0.004**	-0.235	[-0.371, -0.099]	**0.001**
Age	0.005	[0.000, 0.010]	**0.045**	-0.001	[-0.066, 0.064]	0.976
Behavioral inhibition system	-	-	-	0.190	[0.072, 0.309]	**0.002**
Behavioral activation system	-	-	-	-0.072	[-0.220, 0.077]	0.342
Negative hedonic belief	0.026	[-0.040, 0.091]	0.443	0.047	[0.000, 0.093]	**0.050**
Positive hedonic belief	-0.119	[-0.205, -0.032]	**0.007**	-0.087	[-0.176, 0.003]	0.058
R^2	0.041			0.168		

Note. The dummy variable was gender (0 = female, 1 = male). Statistically significant p-values are bolded

In this model, gender and age were included as covariates. In Study 1b, BIS/BAS were entered as additional covariates.

As depicted in Table 2, NHB significantly predicted decreased well-being (SWB: b = -0.427, $p < .001$, 95% confidence interval (CI) [-0.613, -0.241]; PWB: b = -0.072, $p < .001$, 95% CI [-0.106, -0.039]) and increased ill-being (depression: $b = 0.087$, $p < .001$, 95% CI [0.052, 0.121]). Conversely, PHB significantly predicted enhanced well-being (SWB: $b = 0.503$, $p < .001$, 95% CI [0.256, 0.749]; PWB: $b = 0.122$, $p < .001$, 95% CI [0.078, 0.167])

and reduced ill-being (depression: b = -0.065, p=.005, 95% CI [-0.111, -0.020]; physical symptoms: b = -0.119, p=.007, 95% CI [-0.205, -0.032]). Furthermore, these effects held true even after accounting for BIS/BAS, as NHB continued to predict decreased happiness (SWB: b = -0.215, p=.018, 95% CI [-0.393, -0.036]; PWB: b = -0.063, p=.002, 95% CI [-0.102, -0.024]) and heightened ill-being (depression: b=0.052, p=.019, 95% CI [0.009, 0.095]; physical symptoms: b=0.047, p=.050, 95% CI [0.000, 0.093]). The unique contribution of PHB remained evident when controlling for BIS/BAS to predict well-being (SWB: b=0.763, p<.001, 95% CI [0.422, 1.105]; PWB: b=0.099, p=.009, 95% CI [0.024, 0.174]) and either significantly or marginally predicted ill-being (depression: b = -0.104, p=.014, 95% CI [-0.186, -0.021]; physical symptoms: b = -0.087, p=.058, 95% CI [-0.176, 0.003]). Results for subscales of SWB (i.e., SWLS, PA, NA) are presented in Table S2 and Table S3 in the SI.

In two studies, we examined the association between NHB (vs. PHB) and the actual experience of well-being with diverse age groups (Study 1a), as well as with a broad range of well-being measures (Studies 1a and 1b). This association persisted even when accounting for BIS/BAS as potential confounding factors (Study 1b). In all, NHB was linked to impaired well-being. The results consistently showed that NHB provided a unique contribution that went over and above those of PHB and behavioral inhibition/activation systems for predicting well-being. Paradoxically, the lay belief that avoiding negative experiences produces in greater happiness not only failed to reduce the level of displeasure or ill-being but also resulted in a reduction of happiness.

Drawing upon the detrimental effects of NHB, we speculated that reduced well-being could be in part, if not entirely, attributed to the loss of opportunities for positive experiences. That is, the negative focus among individuals who endorse NHB could motivate those people to avoid even trivial negative experiences, even where they involve great opportunity for positive experiences—an inclination we refer to as "hypersensitivity to negative experiences." Accordingly, we next tested the mediational relationship.

4 Study 2

Study 2 examined whether hypersensitivity to negative experiences or behavioral restraints against negativity by individuals with NHB mediated the relationship between NHB and well-being. We proposed that this mediation would only be specific to NHB, and not to PHB. To broaden the generalizability of our results, Study 2 enrolled participants from the United States.

5 Method

5.1 Participants and Procedure

We recruited 301 Americans using Amazon Mechanical Turk for 1.00 US dollar per participant. Participants who failed attention checks were excluded from the analysis, resulting in a final sample of 272 participants (143 females). The participants' ages ranged from 19 to 68 (M=35.95, SD=10.98) years.

5.2 Measures

5.2.1 Hedonic Lay Beliefs

We used the same scale that was used in Study 1a.

5.2.2 Well-Being

We assessed SWB and PWB in the same way as we did in Study 1a.

5.2.3 Hypersensitivity to Negative Experiences

To measure hypersensitivity to negativity, we utilized six items that were specifically constructed for this study (e.g., "I would rather choose an event with a small but purely positive experience than an event offering a great positive experience that is accompanied by a little negative experience," "I would rather not engage in an event if the event incurs the possibility, no matter how small, of creating negative experiences," and "A negative experience cannot be offset by a positive experience, no matter how great it is." See Table S7 in the SI for all items, along with their factor analysis and correlations with related scales, as reported in Part 2). The participants indicated their agreement or disagreement with each item, ranging from 1 (strongly disagree) to 7 (strongly agree). Cronbach's alpha coefficient was 0.876.

6 Results

6.1 NHB and Happiness

Descriptive statistics and correlations among variables are presented in Table 3. We conducted multiple regression analyses, employing the same model as in Study 1a. Consistent with the Korean participants in Study 1a and 1b, the American participants with stronger NHB reported lower well-being (SWB: b = -0.335, p < .001, 95% CI [-0.511, -0.158]; PWB: b = -0.113, p < .001, 95% CI [-0.171, -0.055]), while the American participants with stronger PHB exhibited greater well-being (SWB: b = 0.410, p = .003, 95% CI [0.142, 0.677]; PWB: b = 0.143, p = .002, 95% CI [0.055, 0.230]).

Table 3 Descriptive statistics and correlations among measures in study 2

	1	2	3	4	5
1. Negative hedonic belief	-				
2. Positive hedonic belief	0.282^{***}				
3. Subjective well-being	-0.158^{**}	0.090			
4. Psychological well-being	-0.169^{**}	$0.108^{\dagger}$	0.706^{***}		
5. Hypersensitivity to negative experiences	0.481^{***}	0.089	-0.367^{***}	-0.506^{***}	
M (*SD*)	4.075	5.276	0.000	3.982	3.520
	(1.571)	(1.043)	(2.294)	(0.747)	(1.335)

Note. N = 272

$^{\dagger}p$ < .10, $^{*}p$ < .05, $^{**}p$ < .01, $^{***}p$ < .001

6.2 NHB and Hypersensitivity to Negative Experiences

NHB were positively associated with hypersensitivity to negative experiences (b=0.433, p<.001, 95% CI [0.339, 0.527]), indicating that individuals with pronounced NHB tend to avoid even minor unpleasant experiences, regardless of whether they are paired with positive ones. PHB showed no significant association (b = -0.087, p=.230, 95% CI [-0.229, 0.055]).

6.3 Mediation via the Hypersensitivity to Negative Experiences

We examined mediational models of hypersensitivity to negative experiences for mediation of the association between NHB and well-being using the PROCESS macro (Model 4; Hayes, 2013), with 5,000 bootstrapped samples for bias-corrected bootstrap confidence intervals. We controlled for the effects of age, gender, and PHB.

As shown in Fig. 1, our hypotheses were supported. The effect of NHB on well-being was indirectly mediated by hypersensitivity to negative experiences. The direct effect was nonsignificant when the mediator was included, irrespective of whether the dependent variable was SWB (indirect b = -0.259, boot 95% CI [-0.382, -0.147]; direct b = -0.075, boot 95% CI [-0.267, 0.117]) or PWB (indirect b = -0.129, boot 95% CI [-0.171, -0.091]; direct b=0.016, boot 95% CI [-0.043, 0.074]). This pattern indicates that heightened hypersensi-

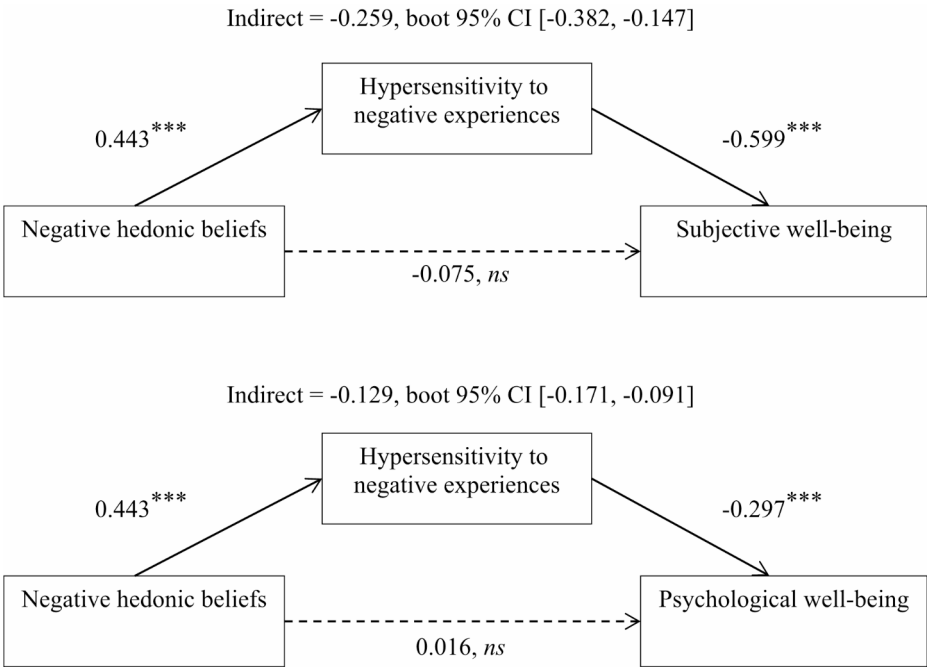

Fig. 1 Indirect effect of negative hedonic beliefs on happiness via hypersensitivity to negative experiences (Study 2). *Note*. Each figure displays the indirect effect of negative hedonic beliefs on subjective well-being (top) and psychological well-being (bottom) through the mediator, hypersensitivity to negative experiences. The mediation model presents both significant and nonsignificant paths using unstandardized beta coefficients. Covariates have been omitted for visual clarity. $^{*}p$<.05, $^{**}p$<.01, $^{***}p$<.001

tivity to negative experiences in individuals with stronger NHB is a contributing factor to their diminished well-being (See Fig. S1 in the SI for results of the SWB subscales).

We likewise examined the mediation between PHB and well-being. In models where the happiness index was regressed on PHB and hypersensitivity to negative experiences, no indirect effects were observed for either SWB (indirect $b = 0.052$, boot 95% CI [-0.031, 0.146]; direct $b = 0.358$, boot 95% CI [0.103, 0.612]) or PWB (indirect $b = 0.026$, boot 95% CI [-0.016, 0.070]; direct $b = 0.117$, boot 95% CI [0.040, 0.194]).

6.4 Study 3

To assess the consistency and robustness of the indirect effects of hypersensitivity to negative experiences, we conducted a longitudinal examination. We collected well-being assessments at two separate time points, with a 5-year gap between them. Our specific focus was on investigating whether NHB could predict future hypersensitivity to negative experiences, ultimately resulting in a decline in well-being five years later, all while accounting for the initial well-being level.

6.5 Method

6.5.1 Participants and Procedure

We initially recruited 291 Korean participants (164 females). The participants completed the first survey in a lab setting, and then they completed the second survey after 5 years, either in a lab or remotely by e-mail. Their participation involved a 1-hour survey including multiple questionnaires. They received compensation of 30,000 Korean won (approximately US $27) for each participation. In all, 217 participants (115 females) responded to both surveys, and their ages ranged from 26 to 36 ($M = 28.27$, $SD = 1.99$).

6.6 Measures

In this context, T0 refers to the measurement of the variable at the first survey as the baseline. T1 refers to a point 5 years later, the measurement of the variable during the second survey.

6.6.1 Hedonic Lay Beliefs

Hedonic lay beliefs were assessed at T0, using the same scale employed in Study 1a.

6.6.2 Well-Being

Well-being was assessed at both T0 and T1, encompassing SWB and PWB. The same scale used in Study 1a was employed.

6.6.3 Hypersensitivity to Negative Experiences

Hypersensitivity to negative experiences was evaluated at T1 using the identical scale utilized in Study 2. Cronbach's alpha was 0.864.

7 Results

The descriptive statistics and correlations among the variables are presented in Table 4.

7.1 Longitudinal Path through the Hypersensitivity to Negative Experiences

We adopted longitudinal path models to test indirect effect, examining whether NHB predicts well-being after 5 years through the pathway of hypersensitivity to negative experiences. Path analyses were conducted with NHB at T0 as the predictor and hypersensitivity to negative experiences at T1 as an intermediary variable, ultimately predicting well-being at T1. All of the models included the covariates age, gender, PHB at T0, and well-being at T0. The significance of the indirect effects was evaluated using the lavaan package in R, with 5,000 bootstrapped samples for bias-corrected confidence intervals (Rosseel, 2012).

The estimates of direct and indirect effects (via hypersensitivity to negative experiences) of NHB at T0 on well-being at T1 are shown in Table 5. First, participants with stronger NHB at T0 were estimated to have greater hypersensitivity to negative experiences at T1 (b=0.285, p<.001, 95% CI [0.171, 0.395]). Second, greater hypersensitivity to negative experiences was associated with decreased well-being at T1 (SWB: b = -0.422, p=.002, 95% CI [-0.689, -0.149]; PWB: b = -0.151, p<.001, 95% CI [-0.198, -0.106]). Third and most importantly, NHB had a significant indirect effect via hypersensitivity to negative experiences on well-being at T1, affecting both SWB (indirect b = -0.120, p=.007, boot 95% CI [-0.215, -0.040]) and PWB (indirect b = -0.043, p<.001, boot 95% CI [-0.065,

Table 4 Descriptive statistics and correlations among measures in studies 3

	1	2	3	4	5	6	7
1. Negative hedonic belief_T0	-						
2. Positive hedonic belief_T0	0.215***	-					
3. Subjective well-being_T0	−0.154*	0.177**	-				
4. Psychological well-being_T0	−0.199**	0.193**	0.727***	-			
5. Subjective well-being_T1	−0.093	0.133*	0.482***	0.458***	-		
6. Psychological well-being_T1	−0.072	0.227***	0.411***	0.578***	0.701***	-	
7. Hypersensitivity to negative experiences_T1	0.305***	−0.078	−0.178**	−0.342***	−0.295***	−0.495***	-
M (*SD*)	4.620 (1.455)	6.086 (0.770)	0.000 (2.294)	3.803 (0.508)	0.000 (2.346)	3.848 (0.506)	3.194 (1.227)

Note. N=217. T0 indicates the baseline index; T1 refers to the index after a 5-year period

*p<.05, **p<.01, ***p<.001

Table 5 Results of longitudinal path models testing effects of negative hedonic beliefs on well-being after 5 years via hypersensitivity to negative experiences

	b	SE	*p*	Boot 95% CI
Outcome: Subjective well-being				
Negative hedonic belief_T0 → Hypersensitivity to negative experiences_T1	0.285	0.057	<0.001	[0.171, 0.395]
Hypersensitivity to negative experiences_T1 → Subjective well-being_T1	-0.422	0.136	0.002	[-0.689, -0.149]
direct (Negative hedonic belief_T0 → Subjective well-being_T1)	0.053	0.111	0.634	[-0.164, 0.268]
Indirect (via Hypersensitivity to negative experiences_T1)	-0.120	0.045	0.007	[-0.215, -0.040]
Outcome: Psychological well-being				
Negative hedonic belief_T0 → Hypersensitivity to negative experiences_T1	0.285	0.057	<0.001	[0.170, 0.392]
Hypersensitivity to negative experiences_T1 → Psychological well-being_T1	-0.151	0.023	<0.001	[-0.198, -0.106]
direct (Negative hedonic belief_T0 → Psychological well-being_T1)	0.038	0.019	0.047	[0.001, 0.076]
Indirect (via Hypersensitivity to negative experiences_T1)	-0.043	0.011	<0.001	[-0.065, -0.024]

Note. T0 indicates the baseline index; T1 refers to the index after a 5-year period. Parameters in bold have Boot 95% CIs that do not cross zero. All path models controlled for covariates, including age, gender, positive hedonic beliefs, and well-being at T0 (i.e., subjective well-being_T0 or psychological well-being_T0)

-0.024]). Separate analyses across SWB sub-indices produced similar findings (see indirect estimates in Table S6 for SWLS, PA, and NA).

Thus, Studies 2 and 3 identified a potential mechanism accounting for the relationships between NHB and well-being. Participants with stronger NHB possessed heightened sensitivity to negative experiences and tended to avoid even positive experiences containing negative elements, thereby limiting their opportunities to experience happiness. This indirect pathway through the hypersensitivity to negative experiences persisted beyond a cross-sectional association. That is, individuals with stronger NHB and their hypersensitivity to negative experiences hindered their future well-being while controlling for their previous well-being levels.

These results consistently suggest that those with heightened NHB, due to their strong aversion and behavioral restraint against negativity, tend to limit their exposure to potentially rewarding experiences. Such experiences typically involve discomfort and challenges, and the well-being benefits often follow after overcoming these obstacles (Gruber et al., 2011; Vittersø & Søholt, 2011). However, it appears difficult for those with stronger NHB to fully savor the positive aspects hidden even behind small negative elements because these individuals would be vigilantly looking for any possible negative aspects. Consequently, individuals with stronger NHB inadvertently deprive themselves of opportunities to enhance their well-being. Nevertheless, these speculations require evidence that individuals with higher NHB are indeed reluctant to engage in any experiences if they include negative aspects, even if they have positive aspects. To test this, we conducted Study 4, manipulating positive and negative information.

8 Study 4

This study tested whether manipulating the presence (vs. absence) of negative elements could decrease behavioral intention among individuals with stronger NHB and whether this withdrawn behavioral intention could be explained by anticipated heightened negative affect. We expected that individuals who held stronger NHB would be more likely to anticipate negative affect from the negative scenario and would therefore be more reluctant to engage in the experience compared than their counterparts. However, we did not expect this to apply to individuals with greater PHB.

8.1 Method

8.1.1 Participants and Procedure

We recruited 170 undergraduate students from a large university in South Korea in exchange for partial course credit. Participants who failed attention checks or did not provide a response to primary variables were excluded from the analysis, for a final samples size of 154 participants (58 females, 96 males). The age of the participants ranged from 18 to 29 (M=20.84, SD=2.21) years.

8.2 Measures

8.2.1 Hedonic Lay Beliefs

We used the same scale used in Study 1a.

8.2.2 Anticipated Affect and Behavioral Intention

Participants were assigned to one of two conditions (i.e., non-negative vs. negative-mixed condition) and read a scenario about a summer trip. In the non-negative condition, participants were only informed of the positive aspects of the trip (e.g., enjoying good scenery, sharing quality conversations with your friends) without mentioning any negative aspects. In the negative-mixed condition, participants were informed of the same positive aspects of the trip along with three negative aspects (e.g., long trip to the destination, inconvenient accommodations). After they read their assigned scenario, participants were asked to rate their anticipated affect during the trip and their willingness to participate in it. To measure the anticipated affect, the participants were asked to rate how likely they were to experience each of 10 emotions if they went on the trip, ranging from 1 (very unlikely) to 9 (very likely). There were five positive ("interested," "excited," "energetic," "passionate," and "proud") and five negative ("annoyed," "painful," "angry," "nervous," and "afraid") items. Next, to assess behavioral intention, the participants were asked, "Would you go on a summer trip like this with your classmates for one night and two days?" They responded with scores on a 10-point Likert scale, ranging from 0 (definitely would not) to 9 (definitely would).

9 Results

9.1 Anticipated Affect

Multiple regression analysis was conducted to test whether individuals with stronger NHB anticipate more negative affect in the negative-mixed condition than in the non-negative condition. We entered the condition, NHB, and the interaction of those two to predict anticipated negative affect while including covariates such as gender, age, and PHB. Firstly, anticipated negative affect was more pronounced in the negative-mixed condition compared to the non-negative condition (b=0.427, p=.001, 95% CI [0.183, 0.670]). Importantly, in line with our prediction, this effect was further qualified by the interaction between condition and NHB (b=0.204, p=.019, 95% CI [0.034, 0.374]), indicating that the impact of the presence or absence of negative information varied depending on one's NHB. As depicted in Fig. 2, participants with higher NHB anticipated greater negative affect in the negative-mixed condition compared to the non-negative condition (b=0.722, p<.001, 95% CI [0.375, 1.069]). Conversely, the condition-dependent anticipated negative affect was not significant among participants with lower NHB (b=0.131, p=.455, 95% CI [-0.214, 0.476]). Put differently, in the non-negative condition, where only positive aspects were present, there was no significant difference in anticipated negative affect based on NHB (b = -0.068, p=.251, 95% CI [-0.185, 0.049]). However, in the negative-mixed condition, where negative aspects were involved, NHB significantly and positively predicted anticipated negative affect (b=0.136, p=.038, 95% CI [0.008, 0.264]).

Next, we tested whether the condition and its interaction with NHB predicted different anticipated positive affect. The main effect of the condition was not significant (b = -0.010, p=.921, 95% CI [-0.212, 0.191]), as the same positive information was presented in both conditions. Additionally, the condition × NHB interaction was not significant (b = -0.072,

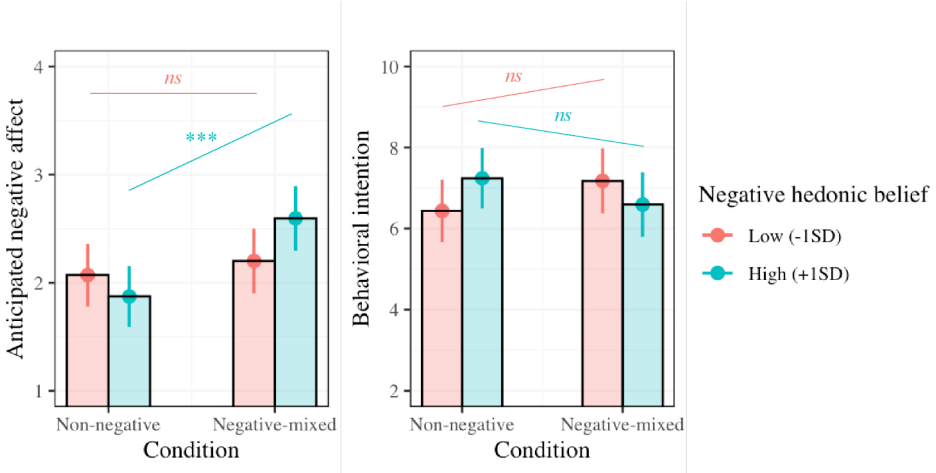

Fig. 2 Anticipated negative affect and behavioral intention depending on the interaction between condition and negative hedonic beliefs (Study 4). *Note*. The interaction effects between condition and negative hedonic beliefs were significant for both predicting both anticipated negative affect (left) and behavioral intention (right)

p=.310, 95% CI [-0.213, 0.068]), indicating that anticipated positive affect did not differ, depending on the extent of NHB across non-negative and negative-mixed conditions.

9.2 Conditional Differences in Behavioral Intention

We examined whether the condition manipulated by negativity predicts behavioral intention differently depending on one's NHB. The model contained condition, NHB, and a condition × NHB interaction for predicting behavioral intention. While the main effect of condition was not significant (b=0.046, p=.888, 95% CI [-0.600, 0.693]), the effect of condition on behavioral intention was moderated by NHB (b = -0.479, p=.037, 95% CI [-0.930, -0.029]). Simple slopes between non-negative and negative-mixed conditions revealed opposite directions depending on NHB, although these simple slopes did not reach statistical significance. That is, participants with higher NHB showed less willingness to engage in the suggested experience in the negative-mixed condition compared to the non-negative condition (b = -0.648, p=.166, 95% CI [-1.569, 0.273]); conversely, those with lower NHB exhibited willingness in the opposite direction (b=0.741, p=.112, 95% CI [-0.175, 1.657]).

9.3 Moderated Mediation

To test whether the relationship between condition and behavioral intention was mediated by the anticipated negative affect as well as whether these effects were moderated by individual's level of NHB, a moderated mediation analysis was conducted using the PROCESS macro (Model 8; Hayes, 2013; see also Fig. S2 in the SI). In this model, the effects of age, gender, and PHB were controlled as covariates, and indirect effects for bootstrapped analyses were resampled 5,000 times for bias correction. For participants with higher NHB, the conditional indirect effect was significant (indirect b = -0.583, boot 95% CI [-1.101, -0.195]), indicating that heightened negative affect anticipated by those with higher NHB ultimately predicted lower behavioral intention. In contrast, the conditional indirect effect was no longer significant for those with lower NHB (indirect b = -0.106, boot 95% CI [-0.448, 0.215]). Finally, the index of moderated mediation via anticipated negative affect was significant (indirect b = -0.165, boot 95% CI [-0.381, -0.016]), indicating that the indirect effect of the presence/absence of negativity on behavioral intention through anticipated negative affect emerged among those with higher NHB but not among those with lower NHB.

The possibility of mediation by anticipated positive affect was tested, in which behavioral intention was predicted not only by condition and anticipated positive affect but also by NHB as a moderator. However, the moderated mediation was not significant (indirect b = -0.146, boot 95% CI [-0.434, 0.163]).

We further analyzed the moderated mediation models to determine whether the association between condition and behavioral intention was mediated by anticipated positive affect (or negative affect) and whether these effects were moderated by PHB, after controlling for demographics and NHB. No significant moderated mediations were found for either anticipated positive affect (indirect b=0.096, boot 95% CI [-0.394, 0.692]) or anticipated negative affect (indirect b = -0.107, boot 95% CI [-0.399, 0.139]) as mediators.

The results of Study 4 indicated that the presence/absence of negativity in an experience is critical in determining the behavioral choices of individuals who hold NHB, because of the extent of anticipated negative affect.

10 General Discussion

This study directly addressed the negative relationship between NHB and actual well-being. This negative relationship was consistently obtained in diverse age groups (Study 1a), with a broad range of measures of well-being measures, such as subjective well-being, psychological well-being, and ill-being (Studies 1a and 1b), in Korea and the United States (Studies 2 and 3). The same pattern was observed after controlling for a possible confounding construct (i.e., behavioral inhibition/activation systems; Study 1b). Taken together, the results of this study suggest that the belief that well-being is related to the absence of negative experiences is counterproductive to well-being.

Hypersensitivity to negativity, expressed as the rigid behavioral intention to avoid negative experiences even despite potential positive outcomes, is shown as an underlying mechanism hampering well-being. The indirect path through hypersensitivity to negative experiences significantly predicted well-being, both cross-sectionally (Study 2) and longitudinally (Study 3). The consistency of these findings suggests that individuals who strongly associate lack of negative experience with happiness tend not to expose themselves to situations where they expect a significant likelihood of negative experiences, regardless of their triviality they might be. This further suggests that they may thereby ultimately be choosing to forego opportunities to experience pleasure and happiness. This mechanism was further supported by the observation that those with stronger NHB tended to view negative information in a more negative light and are thus more reluctant to expose themselves to negative experiences (Study 4). Notably, in the negative-mixed condition, such individuals anticipated stronger negative feelings than those with weaker beliefs. This avoidance behavior, followed by anticipated negative affect, caused them to miss out on positive experiences, including forming relationships or enjoying attractive scenery. This tendency to emphasize negativity and overlook potential positivity could lead to missed opportunities for positive experiences and happiness, highlighting the significance of this path in the quest for well-being.

Drawing upon the heightened anticipation of negative affect in the presence of negative aspects within this group, we suggest that those who have NHB not only miss out on the opportunity for positive experiences but also overlook the positive sides of negative experiences. That is, they overlook the critical role that negative experiences can play. Although mathematical questions have been raised concerning the concept of the positivity ratio (Brown et al., 2013; Fredrickson & Losada, 2005), it is not necessary for optimal functioning that negativity be absent. Researchers have found that too much positivity can be counterproductive and, in fact, positivity that is combined with appropriate levels of negativity are more adaptive (Fredrickson, 2013; Oishi et al., 2007; Rego et al., 2012; Shrira et al., 2011). This recalls the observation that experiencing negative emotions is a natural part of life. Negative emotions are normal, and they can generate functional responses in certain situations (Gruber et al., 2011). For instance, it is natural to feel sad following the loss of a loved one. Forgas (2013) indicates that sadness can lead a person to become more detail-oriented, develop better memory, and, often, make better decisions. Anxiety allows the body to prepare itself quickly to find solutions, such as fighting or fleeing in threatening situations. Likewise, negative emotions are a sign that more additional attention is required to a challenging situation (Schwarz, 2002). Furthermore, eudaimonic goals (such as personal growth and meaningfulness) can be achieved by overcoming challenges and adversity,

and this may entail giving up immediate pleasure. Similarly, those who confront stressors are more likely to find meaning in events (Folkman & Mosowitz, 2000). Research indicates that the experience of stress can change people in positive ways, enhancing their social relationships, strengthening their sense of their priorities, and increasing their appreciation of life (Crum et al., 2013). This body of research implies that those who hold NHB may be unaware of the potential benefits that negative emotions can offer.

11 Limitations and Future Suggestions

It should be noted that the results of this study do not fully establish a causal direction for the relationship between negative hedonic lay beliefs and well-being. It remains unclear whether lay beliefs determine one's level of happiness. Until it is tested in an experimental design, it will remain so, as will the extent to which happy states shape such lay beliefs. In particular, for those with strong NHB, it remains unclear whether their defensive behavioral tendencies stem from their negative advance expectations or rather that they choose not to attempt encountering negative events because they know that they are actually harmful to them. More research needs to be done to identify the direction of the causal relationship between lay beliefs regarding happiness and well-being.

Moreover, the relationship between hypersensitivity to negative experiences and well-being was only supported by correlational data in Studies 2 and 3, leaving the causal direction unresolved. To address this, Study 4 manipulated the number of negative components and assessed hypersensitive responses through affective appraisals and behavioral willingness in conditions involving negative components. However, the results still did not directly demonstrate the impact on well-being. Therefore, additional studies that experimentally manipulate hypersensitivity to negativity are necessary to confirm whether such manipulation leads to diminished well-being, especially among those with higher NHB.

Despite the significant role of hypersensitivity to negative experiences, it is crucial to explore other potential mechanisms to gain a deeper understanding of how possessing NHB dampens one's well-being. For instance, NHB may diminish well-being simply because negative experiences are sometimes unavoidable. When individuals believe that happiness is contingent upon the absence of negative experiences, they may experience greater distress when encountering such situations (McMahan et al., 2016). Additionally, the pursuit of avoiding unpleasant emotions can lead to dysfunctional coping behaviors, such as smartphone addiction (Chen & Zeng, 2024; Wen et al., 2023), which may exacerbate the negative impact on well-being.[1] Given these considerations, further research that incorporates these mechanisms and examines the various factors contributing to the adverse effects of NHB could foster a more comprehensive understanding of strategies to enhance well-being.

Finally, our findings pave the way for future intervention research. When people believe that happiness to be related to the absence of negative experiences, they report decreased well-being, which has implications for the effective pursuit of happiness. Therefore, applying interventions to encourage the belief that the pursuit of happiness may involve the experience of negative emotions is expected to significantly improve well-being, especially among those who endorse NHB. In addition, an intervention that encourage PHB would help people to cultivate a happier life. Further research is suggested to address these possibilities.

[1] We thank an anonymous reviewer for suggesting the specific mechanisms.

12 Conclusion

Is it possible to remove pain from our lives and experience only happiness? There are two paths we can take with respect to this question. Along one, we give up pleasure due to the fear of pain. Along the other, we may choose pleasure in spite of the risk of pain. We may refrain from pursuing an ambitious goal as a result of the possibility of failure, or we may aim for the goal in spite of the difficulty of the process, as well as of possible failure. We may hesitate to pursue a romantic relationship to avoid the possibility of a painful breakup, or we commit to one regardless of that risk, simply to be immersed in the pleasure. This study indicates that this choice is fundamental to our pursuit of happiness. The results indicate that the assessment of those with negative hedonic beliefs may be invalid. It may be that those with stronger negative hedonic beliefs overlook the great positive opportunities hiding behind smaller but negative occurrences.

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Declarations

Conflict of interest The authors have no conflicts of interest to declare.

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