Online Supplemental A:

An additional study distinguishing "dread looms larger" from loss aversion

Methods

A national sample of 108 participants were recruited online from Amazon's Mechanical Turk service and paid $4.55 for participating. Forty-six participants failed the attention check and were excluded from further analysis. The experimental procedure was similar to Study 1, with a few differences. First, participants read a list of all twenty events (the same as used in Study 1), to familiarize them with the range of events and facilitate comparisons between gains and losses. Then, participants were presented with one event at a time, similar to Study 1.

For each event, participants were first asked, "Assuming you knew this event were coming, when would you prefer it to happen? Immediately, or in one week?" They responded on a 7-point scale from (3) "Strongly prefer immediately" to (-3) "Strongly prefer in one week." Subsequently, participants were asked two questions to determine experience utility, following the guidelines of McGraw and colleagues (2010): "Please imagine this event happening one week from now. Would experiencing this event be pleasurable or unpleasurable?" and then "How strongly would experiencing this event affect your feelings at that time?" which they answered by clicking on a number line labeled with "not at all" on one end and "extremely" on the other. Then, participants were asked two questions to determine anticipation utility: first, "If this event were one week away, would the anticipation be psychologically pleasurable or unpleasurable? In other words, how would you feel while waiting for it?" which was answered by choosing "like the feeling of waiting" or "dislike the feeling of waiting" and second, "How strongly would anticipating this event affect your feelings while waiting for the event?" which was answered on a continuous scale from "not at all" to "extremely".

1 As with the other studies, the results are very similar whether or not these participants are excluded.
After answering these five questions for all twenty events, participants were then presented with 36 pairs of events (one gain and one loss), in random order. For each pair, participants were asked "If you could choose whether or not to experience both these events immediately, would you accept this pair?", which they answered on a 7-point scale, from "definitely yes" to "definitely no", with "unsure" in the middle. Finally, participants answered demographic questions.

**Results**

To analyze the experience and anticipation utility data, we combined participants' binary ratings (positive or negative) with the unipolar continuous scale, to produce a -100 to 100 scale comparable to that used in Study 2. As shown in Figure 3, the negative and positive events were comparably significant (-61 vs. 57; \(F(1,1238)=4.0, p<.05\)), but the losses were dreaded markedly more than gains were savored (-50 vs. 22; \(F(1,1238)=127.1, p<.001\)). This difference in the anticipation utility of gains and losses persisted even when controlling for the intensity of the predicted experienced utility \(F(1,1237)=31.3, p<.001\).

As a further test of whether "dread looms larger" after controlling for the subjective magnitude of the experienced utility of the event, we restricted our analysis to the 128 pairs of positive and negative events about which participants were "unsure" whether they would accept – which suggests that these gains and losses were regarded as comparably significant. Among these, losses conferred much more intense anticipation utility than gains (-57 vs. 24) as

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2 To test this conservatively, we first ran a mixed model with intensity of experience utility (on a 1-100 scale) and a random effect of subject predicting intensity of anticipation utility (on a 1-100 scale). The relationship was strong, \(b=.75, F(1,1227.1)=1313.2, p<.001\), indicating that more intense experiences were anticipated more strongly. We then used sign (positive or negative, as judged by the participant) to predict the residuals from this model (i.e., anticipation utilities from which loss aversion in experience utility had been removed) in a second mixed model, which revealed losses being anticipated more strongly than gains (mean difference=5.7), \(F(1,1237)=31.3, p<.001\).
confirmed by a mixed model with participant ID as a random factor and sign as a fixed factor predicting the intensity of anticipation, $F(1,215.1)=53.1, p<.001$.

Participants demonstrated the sign effect, wanting to accelerate gains ($M=1.2$) more strongly than they wanted to postpone losses ($M=-0.1$), as confirmed by a mixed model with sign as a fixed factor and participant ID as a random factor, $F(1,1238)=97.0, p<.001$.

Finally, we tested whether anticipation utility predicted time preference while controlling for loss aversion by first running a mixed model with experience utility (on a -100 to 100 scale) and a random effect of subject. The relation was significant, $b=.010, F(1,1185.5)=152.1, p<.001$, indicating that the more positively an event was rated, the more strongly participants wanted to have it immediately. We then ran a mixed model using anticipation utility (on a -100 to 100 scale) to predict the residuals (i.e., time preferences from which experience utilities had been removed). This also revealed a significant relation, $b=-.005, F(1,1238)=24.6, p<.001$, indicating that the more participants enjoyed anticipating an event, the less strongly they wanted to have it immediately, even after controlling for the utility of experiencing the event.

**Figure A1**

*Average experience utility and anticipation utility for the 10 gains and 10 losses in Supplemental Study A1. Error bars represent +/- one standard error.*