Est. 1841 | YORK ST JOHN UNIVERSITY

Clayton McClure, Jack Helgi, Riggs, Kevin J, Dewhurst, Stephen A and Anderson, Rachel J (2024) Differentiating anticipated and anticipatory emotions and their sensitivity to depressive symptoms. Emotion, 24 (7). pp. 1642-1651.

Downloaded from: https://ray.yorksj.ac.uk/id/eprint/9773/

The version presented here may differ from the published version or version of record. If you intend to cite from the work you are advised to consult the publisher's version: https://doi.org/10.1037/emo0001371

Research at York St John (RaY) is an institutional repository. It supports the principles of open access by making the research outputs of the University available in digital form. Copyright of the items stored in RaY reside with the authors and/or other copyright owners. Users may access full text items free of charge, and may download a copy for private study or non-commercial research. For further reuse terms, see licence terms governing individual outputs. Institutional Repositories Policy Statement

RaY

Research at the University of York St John

For more information please contact RaY at ray@yorksj.ac.uk

Emotion

Differentiating Anticipated and Anticipatory Emotions and Their Sensitivity to Depressive Symptoms

J. Helgi Clayton McClure, Kevin J. Riggs, Stephen A. Dewhurst, and Rachel J. Anderson

Online First Publication, June 6, 2024. https://dx.doi.org/10.1037/emo0001371

CITATION

Clayton McClure, J. H., Riggs, K. J., Dewhurst, S. A., & Anderson, R. J. (2024). Differentiating anticipated and anticipatory emotions and their sensitivity to depressive symptoms.. *Emotion*. Advance online publication. https://dx.doi.org/10.1037/emo0001371

AMERICAN PSYCHOLOGICAL ASSOCIATION

Emotion

© 2024 The Author(s)
ISSN: 1528-3542

https://doi.org/10.1037/emo0001371

Differentiating Anticipated and Anticipatory Emotions and Their Sensitivity to Depressive Symptoms

J. Helgi Clayton McClure[1, 2], Kevin J. Riggs[2], Stephen A. Dewhurst[2], and Rachel J. Anderson[2]
[1] School of Education, Language and Psychology, York St John University
[2] School of Psychology and Social Work, University of Hull

Anticipated emotions are the feelings one *expects* if a hypothetical future event were to occur, whereas anticipatory emotions are those one *experiences right now* while imagining the event. There has been little direct comparison of these two forms of future-oriented emotion, and authors have typically focused on positive emotions (e.g., pleasure). Besides, their sensitivity to depressive symptoms—which may help to explain motivational problems in depression—has only recently been investigated (e.g., Anderson et al., 2023; Gamble et al., 2021). The present study (conducted September–November 2022) used innovative picture-and-text vignettes depicting everyday positive and negative future events, to which participants rated their anticipated and anticipatory responses on separate dimensions of valence (i.e., how positive or negative) and arousal (i.e., emotional intensity). Based on prior literature, anticipatory emotions were expected to be correlated with, yet weaker than, anticipated emotions, reflecting a conceptualization of anticipatory emotions as a "foretaste" of the affective response one expects in the future. We also predicted that high depressive symptoms would coincide with diminished emotion ratings overall and specifically for anticipatory emotions (tightly coupled with event expectations; Carrera et al., 2012). Results largely supported these preregistered predictions, yet anticipatory emotions (positive and negative) were only weaker in more highly depressed participants. Depressive symptoms may therefore affect how one currently feels about future possibilities without altering one's expectations of how such events would actually feel. Implications and future research objectives arising from this are discussed.

Keywords: anticipated emotion, anticipatory emotion, future thinking, depression, multilevel models

The psychological literature distinguishes between two forms of future-oriented emotion: anticipated and anticipatory (Barsics et al., 2016; Baumgartner et al., 2008). Anticipated emotions are defined as those one *expects to feel* if a hypothetical future event were to occur, whereas anticipatory emotions are those one *experiences right now* while imagining a given event. To reuse an example from Mellers and McGraw (2001), one can rate the pleasure one would feel when visiting a potential holiday destination (anticipated pleasure), and one can also gauge the emotional response evoked, in the present moment, by the prospect of an enjoyable holiday (anticipatory pleasure). While the two are closely related, there is evidence that anticipated and anticipatory emotions exert distinct effects on goal-directed intentions and behavior (Baumgartner et al., 2008; Carrera et al., 2012). Yet less is known about the extent of similarity/divergence between the two emotion types as basic affective processes. Furthermore, future-oriented emotions may be muted in individuals showing high levels of depressive symptoms (Anderson et al., 2023; Gamble et al., 2021), a question warranting more systematic research. In this article, we first outline existing research on future-oriented emotions and their relationship with depression, before introducing the novel methodological approach used in the present study to address two theoretically motivated hypotheses.

Anticipated and Anticipatory Emotion

The concept of anticipated emotion has gained traction through extensive research on *affective forecasting* (Mellers & McGraw, 2001;

Jeffrey R. Huntsinger served as action editor.

J. Helgi Clayton McClure https://orcid.org/0000-0001-6858-3116

This work was supported by a grant from the Economic and Social Research Council awarded to Rachel J. Anderson (Grant ES/R007152/1). Study data, analysis code, and materials are openly available on the Open Science Framework (https://osf.io/zkqm7/?view_only=ed9059ce29ea488b83f1874c15921329). The study was also preregistered via the Open Science Framework (available at https://doi.org/10.17605/OSF.IO/JN3VF).

Open Access funding provided by University of Hull: This work is licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0; https://creativecommons.org/licenses/by/4.0). This license permits copying and redistributing the work in any medium or format, as well as adapting the material for any purpose, even commercially.

J. Helgi Clayton McClure played a lead role in conceptualization, data curation, formal analysis, methodology, project administration, and writing–original draft. Kevin J. Riggs played a supporting role in supervision and writing–review and editing. Stephen A. Dewhurst played a supporting role in supervision and writing–review and editing. Rachel J. Anderson played a lead role in supervision and writing–review and editing and a supporting role in conceptualization.

Correspondence concerning this article should be addressed to J. Helgi Clayton McClure, School of Education, Language and Psychology, York St John University, Lord Mayor's Walk, York YO31 7EX, United Kingdom. Email: h.claytonmcclure@yorksj.ac.uk

Wilson & Gilbert, 2005). This is the process of estimating one's emotional response to a future event or outcome—which can then be compared to later judgments of "real" emotion when the target event has occurred. Studies of affective forecasting have generally shown that individuals overestimate the extent of emotion they will feel, a finding referred to as the *impact bias* (see review by Miloyan & Suddendorf, 2015). It has been argued that this tendency reflects not just cognitive bias in the estimation of future emotional states (Wilson et al., 2000) but also a motivational strategy (either implicit or explicit) that serves to facilitate decision making and goal-directed action by increasing the salience of desirable and undesirable outcomes (Morewedge & Buechel, 2013).

In contrast, research on anticipatory emotion has been more sporadic and has typically used different methodologies (Herwig et al., 2007; Moran & Kring, 2018; Nasso et al., 2019). For instance, both Herwig et al. (2007) and Moran and Kring (2018) captured subjective reports and objective markers of autonomic arousal during anticipation of neutral versus emotionally evocative images. In this context, however, the "events" being anticipated are stimuli within an ongoing task rather than distinct life events (see Zacks et al., 2007). Only a few studies have assessed both anticipated and anticipatory emotion in tandem, in relation to events distinct from immediate experience (Anderson et al., 2023; Barsics et al., 2016; Baumgartner et al., 2008; Carrera et al., 2012; Ernst et al., 2018).

Baumgartner et al. (2008) investigated future-oriented emotions relating to the year 2000 millennium transition, demonstrating in a longitudinal design that both forms of emotion predicted behavioral intentions (and thereby self-reported preparatory behavior), though anticipated emotions were the stronger predictor. Yet notably, the two constructs were measured in fundamentally different ways: Anticipated emotions were represented by 10 discrete emotion categories (including "satisfied" and "disappointed"), while anticipatory emotions were represented by a different set of five categories (e.g., "optimistic" and "anxious"). Moreover, anticipatory emotions were elicited at a general level, in relation to possible "negative outcomes" of the millennium transition, whereas anticipated emotions were elicited after imagining a detailed sequence of events, including preparatory behaviors one might take (e.g., making financial preparations). Thus, despite presenting longitudinal evidence of the role of future-oriented emotions in predicting intentions and behavior, Baumgartner et al.'s (2008) method did not allow the direct comparison of anticipated and anticipatory emotions as basic phenomena. Furthermore, their study focused exclusively on (preparation for) negative outcomes in a historically unique set of circumstances, rather than a range of positive and negative events that might occur in one's everyday life.

Carrera et al. (2012) examined the contribution of anticipated and anticipatory emotions such as joy, sorrow, and anger to students' intentions and behavioral expectations regarding binge drinking. In a between-subjects design, participants rated their intention to binge drink "at any time in the near future," their expectation (i.e., perceived likelihood) of the same occurrence, and other measures including *either* anticipated or anticipatory emotions relating to the binge-drinking event. Analyzing intention and expectation as separate outcomes, the authors found that anticipated joy predicted the intention to binge drink, while anticipatory joy predicted the *expectation* of binge drinking, over and above several other predictors (e.g., attitude, social norms; Carrera et al., 2012). This suggests a functional dissociation between the two forms of future-oriented emotions, with anticipatory emotions being more closely related to one's underlying expectations of future event occurrence. Nonetheless, like Baumgartner et al. (2008), the findings only reflect feelings about one specific category of future event (i.e., binge-drinking episodes), and the between-subjects design prevents comparison of the two emotions' magnitude for the same individuals and events.

Other authors have assessed both anticipated and anticipatory emotions across a sample of individuals (Barsics et al., 2016; Ernst et al., 2018). Barsics et al. (2016) captured everyday future thoughts using a diary method (D'Argembeau et al., 2011), assessing anticipated and anticipatory emotions in terms of valence/intensity (combined Likert; -3 = *very negative* to $+3$ = *very positive*) and specific emotion categories such as joy and fear (cf. Baumgartner et al., 2008). They compared the frequency of predominantly positive (>0) versus predominantly negative (<0) naturally occurring future thoughts, based on both anticipated and anticipatory ratings. Based on anticipated ratings, positive future thoughts were more than twice as numerous as negative, yet this was not the case for anticipatory ratings, where positive and negative thought frequencies were equal. Barsics et al. (2016) therefore concluded that the positivity bias often reported in future thinking (e.g., D'Argembeau et al., 2011) only applies to the emotions people expect to feel, rather than their present-moment emotional experience. More specifically, Ernst et al. (2018) found that anticipated emotions were judged as *more intense* than anticipatory emotions when participants thought about achieving their personal goals (i.e., future outcomes that they had existing commitments to achieve or avoid; Dickson & MacLeod, 2004).

Taken together, these sources of evidence support the theoretical view that anticipatory emotions are weaker than anticipated emotions, representing a "foretaste" of the full-blown emotional response one expects if a simulated future event were to occur (Anderson et al., 2023; see also Baumgartner et al., 2008), yet more closely connected to one's expectations of what the future will hold (Carrera et al., 2012). However, these studies have relied on judgments of self-selected events, either generated from cue words (Barsics et al., 2016) or individuals' personal goals (Ernst et al., 2018). While such methods offer the advantage of high ecological validity—because participants are free to generate and describe future events that are relevant or meaningful to themselves—this comes at the cost of sacrificing experimental control. There is therefore a need for precise experimental work, using a standardized, manipulable range of future events, to further differentiate anticipated and anticipatory forms of future-oriented emotion.

Future-Oriented Emotions and Depressive Symptoms

Previous work on future-thinking biases in depression has suggested that positive future-oriented emotions may be muted in conditions of high depressive symptomatology (Anderson et al., 2023; Gamble et al., 2021; see also Hallford & Sharma, 2019). Specifically, Anderson et al. (2023) found that more depressed participants registered lower levels of future-oriented happiness, satisfaction, and pleasure in relation to personal goals. This was the case for both anticipated and anticipatory emotions, analyzed together (i.e., there was no interaction between emotion type and depressive symptom level; Anderson et al., 2023). Furthermore, happiness and satisfaction values were generally lower for anticipatory (now) than anticipated (expected) judgments, consistent with the

findings of Barsics et al. (2016) and Ernst et al. (2018). Comparably, Li et al. (2019) found using a daily experience sampling paradigm that dysphoric individuals expected to derive (and subsequently, derived) less pleasure from everyday activities than nondysphoric controls.

It is, however, less clear how future-oriented emotions in relation to *negative* events should differ as a function of depressive symptoms. The pessimism for the future generally observed in depressed individuals (Pyszczynski et al., 1987; Thimm et al., 2013) has been explained in terms of a lack of positive, rather than a preponderance of negative, event expectations (MacLeod et al., 1997; MacLeod & Salaminiou, 2001). It is therefore conceivable that depressive effects on future-oriented emotion are likewise more pronounced for positive than for negative events. On the other hand, there is evidence that clinically depressed individuals show increased negative future-oriented emotion (displeasure) in a naturalistic context (Wu et al., 2017). By assessing emotional responses to both positively and negatively valenced events, this question can be tested in an unbiased way within a sample of participants of varying depressive symptom levels.

The Present Study

The literature reviewed above suggests that anticipated emotions are generally stronger than corresponding anticipatory emotions, whether measured in terms of valence/intensity (Barsics et al., 2016), intensity (Ernst et al., 2018), or the degree of specific (positive) emotions experienced (e.g., happiness, pleasure; Anderson et al., 2023). This is consistent with the possibility that anticipatory emotions represent a "foretaste" of one's anticipated feelings in a given future event, equal in direction but lesser in degree. However, this remains to be tested in the case of negative future-oriented emotions. The first aim of the present study was therefore to establish whether this proposed relationship between anticipated and anticipatory emotions holds for negative, as well as positive, events.

Our second aim was to enhance understanding of future-oriented emotions in the presence of depressive symptoms (Anderson et al., 2023; Gamble et al., 2021). Gamble et al. (2021) only measured anticipated emotion, using a single item reflecting *expected joy*, while Anderson et al. (2023) used a between-groups design, comparing anticipated and anticipatory emotion based on separate samples of personal goals. Hence, differences between the two emotion types—both overall and according to depressive symptom level—were captured with limited precision. If anticipatory emotions are a dilute reflection of anticipated feelings, more closely related to one's underlying expectations surrounding an event (Carrera et al., 2012), they should be more sensitive to the presence of depressive symptoms (known to negatively impact future expectations; Pyszczynski et al., 1987; Thimm et al., 2013). In other words, even where highly depressed individuals' anticipated emotion judgments are relatively unbiased (i.e., overestimated to a normal degree; Miloyan & Suddendorf, 2015), their in-the-moment affective response should be diminished (Hallford & Sharma, 2019). By contrasting anticipated and anticipatory emotions directly, across the same set of individuals and events, we aimed to clarify their respective sensitivity to depressive symptoms.

To fulfil the stated aims, we devised a set of vignette stimuli each consisting of a photograph and a short paragraph of text. Each vignette depicts a somewhat probable future event, either positive (e.g., receiving a financial gift) or negative (e.g., losing a luggage item), and provides "ready-made" episodic detail in a standardized way. Whereas previous studies have allowed participants to select their own events or goals to report on (Anderson et al., 2023; Barsics et al., 2016; Ernst et al., 2018), the vignette approach captures authentic judgments of future-oriented emotions across a range of events, free from potential selection bias (e.g., selecting predominantly positive events) and individual differences in the cognitive processes underlying future event simulation (Arnold et al., 2011; D'Argembeau & Van der Linden, 2006). While future thinking research commonly relies on verbal cues (see review by Schacter et al., 2012) and occasionally pictures (e.g., Bär et al., 2023; Gaesser et al., 2011), this is to our knowledge the first study to combine images and text into standardized, yet phenomenologically rich, future event stimuli.

We examined two main preregistered hypotheses in the present study[1]:

> *Hypothesis 1:* Consistent with Barsics et al. (2016), Ernst et al. (2018), and Anderson et al. (2023), anticipatory emotions are expected to be (a) correlated with but (b) weaker than anticipated emotions. This should be the case regardless of event valence, reflecting the proposed conceptual link between the two emotion types.

> *Hypothesis 2:* In line with Anderson et al. (2023), we expect both types of future-oriented emotion to covary negatively with depressive symptoms, yet we predict a steeper negative relationship between depressive symptom level and anticipatory emotion ratings. This would be consistent with the evidence that anticipatory emotions are more closely related to event expectations (Carrera et al., 2012), which are in turn heavily impacted by depression.

Hypotheses were examined separately for the dependent variables of *emotional valence* and *emotional arousal* (taken to be distinct fundamental dimensions of emotion; Ernst et al., 2018; Posner et al., 2005).

Method

Transparency and Openness

In line with current Transparency and Openness Promotion Guidelines (Nosek et al., 2015), data, code and materials associated with the present study are openly available on the Open Science Framework (https://osf.io/zkqm7/?view_only=ed9059ce29ea488b83f1874c15921329; Clayton McClure et al., 2023). The study was also preregistered, using the https://AsPredicted.org template via the Open Science Framework (available at https://doi.org/10.17605/OSF.IO/JN3VF; Clayton McClure, 2022).

[1] A third hypothesis, regarding event causation (self-caused or other-caused), is referenced in the preregistration but omitted from the present article as its rationale was less clearly linked to the literature. Analyses were not materially impacted by omitting this factor.

Participants

One hundred one undergraduate psychology students (86% female, M_{age} = 21.2 ± 5.5 years)[2] at the University of Hull participated between September and November 2022, in return for 0.5 hr research participation credit.[3] A minimum target sample size of 70 was established based on data simulation (DeBruine & Barr, 2021), indicating that this would be sufficient to detect a small three-way interaction (e.g., Center for Epidemiologic Studies Depression Scale–Revised [CESD-R] × Emotion Type × Event Valence) with power of 0.95 ($\alpha = .05$). Further details can be found in the preregistration at https://doi.org/10.17605/OSF.IO/JN3VF. The study was reviewed and approved by the Faculty of Health Sciences Research Ethics Committee at the University of Hull.

Design

We used a 2 (emotion type) × 2 (event valence) within-subjects design in which all participants rated both anticipated and anticipatory emotions in response to both positive and negative event vignettes. CESD-R score, measuring depressive symptom levels across the full clinical and nonclinical spectrum (Eaton et al., 2004), was included as a participant-level continuous predictor. All interactions among these three predictors were included in multilevel linear models (see the Analysis Plan and Data Preparation section).

Materials

Vignette stimuli were constructed by shortlisting everyday positive and negative events that most undergraduate students would perceive as relatively likely to occur in the next year of their lives (e.g., receiving a financial gift or losing a luggage item). These were then elaborated into detailed texts (mean word count 51.9 ± 8.9) and paired with a stock picture obtained freely from https://www.pixabay.com/ to represent each scenario. Pictures were selected with the constraints that they must be approximately 640 × 460 pixels (original resolution) and contain objects relevant to the target event (e.g., banknotes on a table; a suitcase with some seating) but no in-focus humans to avoid unintended effects of person perception (Hehman et al., 2017) or differential attention capture (Carretié et al., 2013) on emotional ratings.

In total, 32 vignettes were formulated (16 positive, 16 negative),[4] with each participant responding to a subset of 16 stimuli (eight positive, eight negative), counterbalanced in four alternate lists so that every event appeared with equal probability. All stimuli are available at https://osf.io/zkqm7/?view_only=ed9059ce29ea488b83f1874c15921329.

Anticipated emotion was assessed through two questions: "What will your predominant emotion be in this imagined future scenario?" (valence) and "How strong will your emotional reaction to the situation be?" (arousal). Correspondingly, anticipatory emotion was assessed through the following: "What is your predominant emotion right now, as you imagine this scenario?" (valence) and "How strong is your emotional experience right now?" (arousal). Valence responses were provided on a slider scale ranging from −50 (*clearly negative*) to +50 (*clearly positive*); arousal responses were provided on a slider scale ranging from 0 (*very little emotion*) to 100 (*intense emotion*). Control measures were event likelihood (0 = *highly unlikely* to 100 = *highly likely*) and desirability (0 = *highly undesirable* to 100 = *highly desirable*).

Depressive symptoms were measured using the CESD-R (Eaton et al., 2004), which consists of 20 items reflecting experiences and behaviors over the past 1–2 weeks (e.g., "I felt depressed," "I lost interest in my usual activities"). These reflect depressive symptoms as defined by the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 2013). Each item is answered on a 5-point scale reflecting frequency, from 0 (*not at all or less than one day*) to 4 (*nearly every day for 2 weeks*). Scores are summed to produce a total score of 0–80. The inventory has demonstrated strong psychometric properties in young adults (Van Dam & Earleywine, 2011).

Procedure

Participants accessed the study by following a link from the departmental research participation website to Qualtrics. They were then provided with full participant information (which they were able to download) before being asked to provide electronic consent by confirming that they had understood the information, were aware of their rights/how their data would be processed, and consented to take part.

The experiment consisted of three blocks, with participants viewing the same set of 16 vignette stimuli (in randomized order) in each block. The three blocks captured ratings of anticipated emotion, anticipatory emotion, and control measures (likelihood and desirability), with the order of the two emotion blocks counterbalanced, and the control measure block always occurring last. Afterwards, participants completed the CESD-R questionnaire assessing depressive symptoms and were debriefed, automatically redirected to the research participation system, and granted their credit via an anonymous completion code. Total study duration was approximately 30 min.

Results

Analysis Plan and Data Preparation

Multilevel linear models were estimated using the *lme4* package in R (Bates et al., 2015). Each model included eight fixed parameters: the two categorical independent variables (emotion type and event valence), a continuous predictor of CESD-R score, four resulting two- and three-way interaction terms, and a fixed intercept. Based on pilot data, they also included random intercepts at the participant level, but no random slopes (see also D'Argembeau et al., 2011; Ernst et al., 2018, for similar applications of intercept-only multilevel models). Restricted maximum likelihood estimation (REML) was used to compute a single model, with nine parameters in total, for each dependent variable.

Prior to analysis in R, data were cleaned and restructured in Microsoft Excel; a master data file outlining the steps involved is available at https://osf.io/zkqm7/?view_only=ed9059ce29ea488

[2] Sample demographics based on n = 92, as data were not provided by nine participants.

[3] Further demographic details were not elicited as they were not deemed pertinent to the research; the student cohort we sampled from was majority domestic (i.e., U.K. nationals) and majority Caucasian.

[4] The 32 vignettes were based on 16 original scenarios, modified into self- and other-caused variants (e.g., losing a bag vs. having a bag stolen). This distinction is omitted from the present article, but counterbalancing ensured that no participant saw both versions of a given scenario.

b83f1874c15921329. Based on criteria specified in the preregistration (https://doi.org/10.17605/OSF.IO/JN3VF), no exclusions were made (i.e., no individual arousal or valence values lay >3 *SD* from the grand mean, nor did any participant's CESD-R score lie >2.5 *SD* from the sample mean). CESD-R scores (range = 0–80; $M = 28.3$, $SD = 17.1$) were found to be moderately positively skewed ($S = 0.613$, $SE_S = 0.244$, $Z_{\text{Wald}} = 2.51$, $p < .05$; Tabachnick & Fidell, 2018). A square-root transformation was therefore imposed prior to analysis, producing a more symmetrical distribution ranging from 0 to 8.9 ($S = -0.448$, $SE_S = 0.244$, $Z_{\text{Wald}} = -1.84$, $p > .05$).

Descriptive Statistics and Preliminary Analysis

Table 1 presents participant-level ($n = 101$) summary data for key outcome variables, valence (split by event valence) and arousal, by emotion type. Correlations and paired samples *t* tests were first computed to assess zero-order relationships and differences between emotion types for each measure. Robust positive correlations were found between anticipated and anticipatory ratings for positive-event valence: $r(101) = .495$, $p < .001$, negative-event valence: $r(101) = .455$, $p < .001$, and arousal: $r(101) = .505$, $p < .001$. Furthermore, anticipated ratings were higher than anticipatory ratings for positive-event valence: $t(100) = 2.67$, $p = .009$, $d = .27$, and arousal: $t(100) = 3.88$, $p < .001$, $d = .39$, but did not differ significantly for negative-event valence, $t(100) = -1.25$, $p = .216$, $d = -.12$.

Valence Model

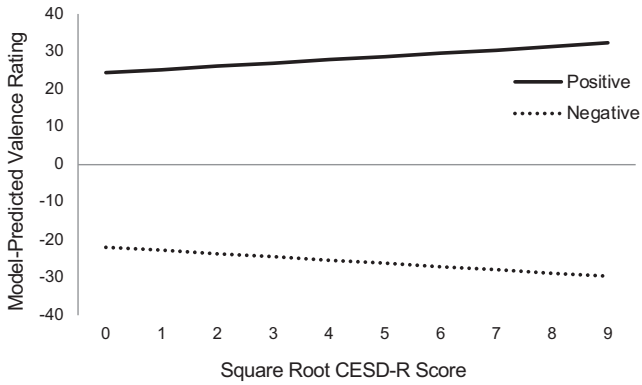
The multilevel model predicting valence (REML deviance criterion = 27915.1) produced a significant main effect of CESD-R score, $b = -0.85$, $t(609) = -2.18$, $p = .030$, with higher depressive symptom levels corresponding to more negative evaluations across all vignettes. It also produced a significant main effect of event valence, $b = 46.3$, $t(3125) = 17.4$, $p < .001$, with positive events rated as more positive than negative events by around 46 points on the 100-point (−50 to +50) scale and hence confirming the validity of the event valence manipulation. There was also a significant CESD-R × Event Valence interaction, $b = 1.73$, $t(3125) = 3.46$, $p < .001$: Those with higher depressive symptom levels gave more extreme valence ratings congruent with an event's intended valence (see Figure 1). The random intercept term was significant (likelihood ratio = 24.8, $p < .001$). Parameter estimates for all fixed effects are presented in Table 2 (see the "Valence" column).

Table 1
Mean (Standard Deviation) Valence and Arousal Ratings by Emotion Type

Variable	Emotion type	
	Anticipated	Anticipatory
Valence (positive events)	28.6 (10.9)	25.6 (11.9)
Valence (negative events)	−26.4 (11.6)	−25.0 (9.9)
Arousal (all events)	61.7 (11.7)	55.6 (18.2)

Note. Valence rated from −50 to +50; arousal rated from 0 to 100.

Figure 1
Emotional Valence Ratings as a Function of CESD-R and Event Valence



Note. CESD-R = Center for Epidemiologic Studies Depression Scale–Revised.

Arousal Model

The multilevel model predicting arousal (REML deviance criterion = 29094.5) produced a significant main effect of event valence, $b = 7.54$, $t(3125) = 2.42$, $p = .015$, with positive events rated as more intense than negative events. The effect of emotion type was not significant, $b = 5.61$, $t(3125) = 1.81$, $p = .071$. However, there was a significant CESD-R × Emotion Type interaction, $b = -2.41$, $t(3125) = 4.13$, $p < .001$: Anticipatory arousal ratings declined substantially as depressive symptom level increased, whereas anticipated arousal ratings did not (see Figure 2). Additionally, there was a significant CESD-R × Event Valence interaction, $b = -1.26$, $t(3125) = -2.16$, $p = .031$: The intensity of positive emotions decreased with increasing depressive symptoms, $r(1616) = -.102$, $p < .001$, 95% CI [−.150, −.054], whereas the intensity of negative emotions did not, $r(1616) = -.046$, $p = .063$, 95% CI [−.095, .002]. The random intercept term was significant (likelihood ratio = 708, $p < .001$). Parameter estimates for all fixed effects are presented in Table 2 ("Arousal" column).

Controlling for Event Likelihood and Desirability

To eliminate possible confounds, we checked for differences in event characteristics (likelihood and desirability) between the positive and negative vignettes, using participant-level averages. Likelihood was found to be higher for negative events ($M = 50.3$, $SD = 15.5$) than for positive events, $M = 46.9$, $SD = 15.0$, $t(100) = 2.14$, $p = .035$, $d = .21$. Desirability was (as expected) substantially higher for positive ($M = 63.5$, $SD = 13.7$) than for negative events, $M = 14.5$, $SD = 13.4$, $t(100) = 24.7$, $p < .001$, $d = 2.46$. Although both likelihood means are close to the scale midpoint of 50 and may therefore be seen as reflecting plausible moderately likely events, the significant difference indicates a degree of asymmetry between positive and negative. Similarly, while a pronounced difference in desirability would be expected, positive events were only placed 13.5 points to the right of the scale midpoint (i.e., around 1 *SD*), whereas negative events were placed 35.5 points to the left (almost 3 *SD*)—again indicating an asymmetry in interpretation of the positive and negative events.

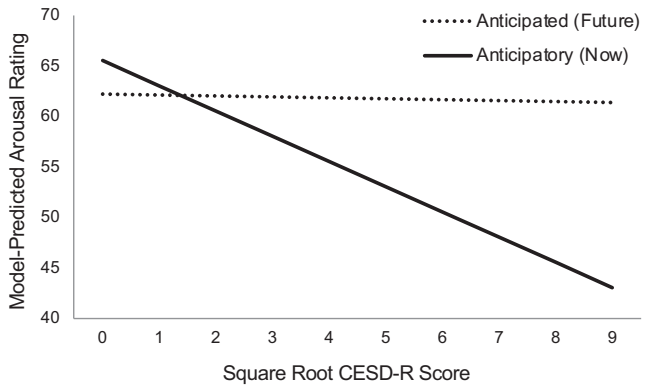
Table 2
Fixed Effect Estimates for Models Predicting Valence and Arousal

Predictor	Valence		Arousal	
	b [95% CI]	*p*	*b* [95% CI]	*p*
(Intercept)	**−22.07 [−26.16, −17.98]**	**<.001**	**58.41 [50.00, 66.83]**	**<.001**
CESD-R	**−0.85 [−1.62, −0.09]**	**.030**	0.54 [−1.05, 2.12]	.507
Emotion type	1.69 [−4.53, 6.91]	.527	5.61 [−0.48, 11.71]	.071
Event valence	**46.31 [41.07, 51.51]**	**<.001**	**7.54 [1.45, 13.64]**	**.015**
CESD-R × Emotion Type	−0.06 [−1.04, 0.93]	.910	**−2.41 [−3.56, −1.27]**	**<.001**
CESD-R × Event Valence	**1.73 [0.75, 2.72]**	**<.001**	**−1.26 [−2.41, −0.12]**	**.031**
Emotion Type × Event Valence	−1.15 [−8.58, 6.20]	.760	−5.25 [−13.95, 3.29]	.232
CESD-R × Emotion Type × Event Valence	−0.66 [−2.05, 0.73]	.352	1.18 [−0.44, 2.81]	.155

Note. CESD-R scores were square-root transformed prior to analysis; event valence (negative, positive) and emotion type (anticipated, anticipatory) were dummy coded (0, 1). Significant effects are presented in bold. CI = confidence interval; CESD-R = Center for Epidemiologic Studies Depression Scale–Revised.

We therefore reran the multilevel models for valence and arousal, exactly as specified above except with likelihood and desirability added as item-level continuous predictors to examine whether the previously detected effects would withstand controlling for these additional variables. In the valence model, the main effect of CESD-R ceased to be significant, $b = -.54$, $t(528) = -1.43$, $p = .153$; however, the main effect of event valence, $b = 33.6$, $t(3142) = 13.1$, $p < .001$, and the interaction of CESD-R × Event Valence, $b = 1.51$, $t(3121) = 3.23$, $p = .001$, remained significant. Additionally, desirability emerged as a significant positive predictor, $b = .28$, $t(3104) = 21.4$, $p < .001$. As before, no other effects were significant ($ps > .25$). In the arousal model, the main effect of event valence ceased to be significant, $b = 3.89$, $t(3125) = 1.22$, $p = .223$; however, the interactions of CESD-R × Event Valence: $b = -1.31$, $t(3121) = -2.25$, $p = .025$, and CESD-R × Emotion Type: $b = -2.41$, $t(3121) = -4.14$, $p < .001$, remained significant. Again, desirability emerged as a significant positive predictor, $b = .08$, $t(3185) = 4.75$, $p < .001$. The effect of emotion type remained nonsignificant, $b = 5.61$, $t(3121) = 1.81$, $p = .070$. As before, no other effects were significant ($ps > .22$). In summary, the three significant interactions listed in Table 2 withstood controlling for likelihood and desirability and will hence form the basis of subsequent interpretation and discussion.

Figure 2
Emotional Arousal Ratings as a Function of CESD-R and Emotion Type



Note. CESD-R = Center for Epidemiologic Studies Depression Scale–Revised.

Discussion

The present study aimed to test two theoretically derived hypotheses about anticipated and anticipatory forms of future-oriented emotion, using a novel paradigm in which participants viewed picture-and-text vignettes depicting everyday positive and negative future events. Our first hypothesis, based on existing literature, predicted more pronounced valence and/or greater intensity for anticipated emotions than for anticipatory feelings experienced while contemplating possible future events (Barsics et al., 2016; Ernst et al., 2018). This remained to be tested using standardized controllable event stimuli. Positive and negative future event vignettes were devised to achieve this objective while ensuring that participants would be rating emotions in relation to uniformly detailed episodic events (cf. D'Argembeau & Van der Linden, 2006). Our second hypothesis concerned the relationship between depressive symptoms and the two forms of future-oriented emotion. We predicted that both forms of emotion would be negatively related to depression level, but that anticipatory emotions, given their noted relationship to event expectations (Baumgartner et al., 2008; Carrera et al., 2012), would show a stronger negative relationship.

Participant-level analyses largely supported the first hypothesis, with anticipated emotion ratings being somewhat higher than anticipatory, both in terms of the valence attributed to positive events ($d = .27$) and the level of emotional arousal elicited across all events ($d = .39$). Furthermore, average anticipated and anticipatory ratings were robustly correlated on both valence and arousal ($rs > .45$, $ps < .001$). These preliminary findings are consistent with our prediction that one's present-moment emotional response to a possible future event should be correlated with, yet weaker than, the feelings one expects were the event really to transpire (Anderson et al., 2023; Ernst et al., 2018). Yet there was no significant difference between emotion types in the valence attributed to negative events, raising the possibility of an asymmetry in the processing of positive versus negative future-oriented emotions (cf. evaluative asymmetry for positive/negative stimuli in general; Peeters & Czapinski, 1990). Previous investigations of future-oriented emotions had often considered only positive emotions (Anderson

et al., 2023; Gamble et al., 2021; Hallford & Sharma, 2019; Hallford et al., 2022), leaving an open question as to the relationship between anticipated and anticipatory negative emotions. Our findings suggest that, while positive anticipatory emotions "lag" behind anticipated feelings for the same events, negative anticipatory emotions might more faithfully mirror their anticipated counterparts. Consistent with this, Barsics et al. (2016) found a *reduction in positivity bias* when categorizing freely sampled episodic future thoughts by anticipatory, as opposed to anticipated, ratings; hence, the two emotion types appear to be more differentiated at the positive end of the valence spectrum.

The results of our preregistered multilevel analyses qualify the straightforward differences between emotion types identified at the participant level. Neither valence nor arousal differed reliably as a function of emotion type when analyzing across events nested within participants (and accounting for depressive symptom levels). These more detailed, higher powered analyses therefore present a more complicated picture than that envisaged in Hypothesis 1.

For valence ratings, an interaction between CESD-R and event valence indicated that highly depressed individuals perceived events as more strongly valenced in both directions (i.e., further from the neutral point for both positive and negative events). This result suggests a depressive outlook which is not uniformly gloomy (per Hypothesis 2), but in fact more polarized, in its appraisal of hypothetical future events (cf. Alloy, 1988; Roepke & Seligman, 2016). When you are highly depressed, losing your bag might seem all the more catastrophic, yet simultaneously, receiving an unexpected gift or making a new friend might seem more pleasurable—in the subjectively unlikely event that it should actually occur. Meanwhile, arousal ratings showed a robust interaction between depressive symptoms and emotion type, with anticipatory emotions declining, yet anticipated emotions remaining constant, at higher symptom levels. This pattern confirms our prediction (Hypothesis 2) that anticipatory emotions, being more aligned with event expectations (Carrera et al., 2012), should be more closely related to depression level than anticipated emotions.

In fact, the results suggest that, at least in the present paradigm, the intensity of anticipated emotions is *not at all* sensitive to depressive symptoms. A person registering high depression symptoms of, say, 50 on the CESD-R (with or without clinical diagnosis) might therefore *imagine* the pleasure of positive future events, yet without *feeling* a pronounced jolt of positive emotion as they do so. Thus, the motivational problems associated with depression, inasmuch as they reflect problems with future thinking (Roepke & Seligman, 2016), may in part be attributable to a disconnect between anticipated and anticipatory emotion (and not simply an inability to imagine positive future events). This has important implications because it suggests that future thinking or imagery-based interventions might more profitably focus on "translation" between these two forms of emotion, rather than (exclusively) on the simulation of events or generation of positive imagery (Blackwell et al., 2015; Boland et al., 2018).

It remains to be seen what form such translation might take; it may, of course, be reliant on processes of episodic construction (see Addis, 2018) and/or feelings of being projected forward in time or "preexperiencing" events (i.e., *autonoesis*; Tulving, 2005). Such processes have correspondingly been shown to differ in contexts of high depressive symptoms (Anderson & Evans, 2015; Gamble et al., 2021; Hallford, 2019). Notably, Hallford et al. (2022) recently demonstrated increases in both anticipated and anticipatory pleasure when a nonclinical sample engaged in a guided episodic thinking task relating to specific positive future events they had selected. A follow-up study showed that if the events selected were not already planned (i.e., mere possibilities), increases in future-oriented pleasure were greater than after a control task involving episodic recollection of past events (Hallford et al., 2022, Study 2). This could indicate that interventions in depression should focus on the simulation of plausible, positive, yet unplanned possibilities (Boland et al., 2018)—boosting the general expectation that positive events will occur and, correspondingly, increasing the strength of associated anticipatory emotions (see also Hallford et al., 2020).

Methodologically, the present study makes a valuable contribution by introducing a new paradigm that minimizes the "noise" posed by high variability in naturally generated future events (D'Argembeau & Van der Linden, 2006, 2012) while avoiding oversimplicity or overreduction in the stimuli used. Valence analyses indicated that positive events yielded positive emotions and negative events negative emotions, as intended. This therefore presents a springboard from which to examine other facets of future-oriented emotion using the same materials or variations thereon.

One priority would be to establish the nature of the link between anticipated and anticipatory emotions, which have been shown here to be distinct yet strongly intercorrelated. For instance, a causal relationship might exist such that a possible future event is first appraised in terms of its likely valence and arousal (i.e., anticipated emotion), before evoking anticipatory feelings in line with this appraisal. Alternatively—or perhaps additionally—causation may flow in the reverse direction, such that some aspect of an imagined event cues an immediate present-moment emotional response (i.e., anticipatory emotion) that then informs one's expectations regarding the event's emotional value. In the context of the present, essentially correlational data, these are of course only speculative possibilities. However, our finding of differential relationships with depressive symptoms prompts the question as to how such person-level variables might operate within such a causal system.

To disentangle the various possibilities would require manipulation of one form of future-oriented emotion while measuring the other and vice versa, across a set of future possibilities. In the present paradigm, this could be achieved in two ways: first, by varying the starting position of response sliders so that, for instance, the anticipated–arousal slider showed a default value of 100 rather than 50 on certain trials (hence aiming to produce an upward anchoring effect; Tversky & Kahneman, 1974). When the same participant subsequently rates anticipatory arousal—assuming anticipated has a causal effect on anticipatory emotion—their response should be skewed upward in line with this experimenter-imposed bias. Alternatively, the manipulation could be achieved by preselecting the most extremely rated events in the first test block (whether anticipated or anticipatory) to be viewed a second time and rated for the opposite emotion type. Effect sizes could then be compared directly between the two groups (anticipated-first/anticipatory-first) to ascertain which causal influence is dominant.

Another important aspect concerns the psychophysiological basis of future-oriented emotions. Studies on short-term anticipation (i.e., of upcoming stimuli during an ongoing task) have

demonstrated synergy between physiological markers and self-reported ratings of emotional arousal (Herwig et al., 2007; Nasso et al., 2019). Thus, on a basic level there is evidence that more intense emotion (e.g., anxiety) in respect of a future occurrence will produce a measurable difference in physiological signals such as blink responses (Herwig et al., 2007) or heart rate variability (Nasso et al., 2019). Yet such methods have yet to be applied to future-oriented emotions in the present sense, that is, emotions relating to distinct future life events (Addis, 2018; Zacks et al., 2007). Is the jolt of positive emotion experienced when contemplating a holiday set to occur months away sufficient to be detected in real-time physiological responses? In seeking to answer this question, ratings of *anticipated* emotion could serve as a useful control variable. It could be, for example, that heart rate variability measures while imagining future events align with anticipatory, but not anticipated, arousal ratings. As remarked in the Introduction section, existing studies have often omitted to consider one of the two or distinguished them at a superficial, descriptive level rather than considering how they might be interrelated. Conducting studies on the physiological correlates of anticipated and anticipatory emotions would enable us to deepen and refine our characterization of them as linked yet dissociable affective processes.

Constraints on Generality

The present study was conducted in a fairly homogenous sample of university students (mostly Caucasian British). It is therefore possible that the mechanisms under investigation—perhaps specifically the experience and expression of depressive symptoms (Lin & Dmitrieva, 2019; Soto et al., 2011)—would operate differently in radically different sociocultural contexts. However, the stimuli used here were tailored to, and piloted on, a U.K. student demographic, which we believe justifies the focus of the present article. In future studies, it would be beneficial not only to test the vignettes paradigm (with stimuli modified as appropriate) in culturally diverse samples but also to investigate age-related changes in future-oriented emotions in line with existing research on the cognitive aspects of future thinking (Addis et al., 2008).

Conclusions

The present study utilized an innovative vignette paradigm to examine anticipated (future) and anticipatory (present) emotions relating to a uniform set of possible future events in a sample of UK students. Preregistered hypotheses were partially supported by the data; anticipated and anticipatory emotions were highly correlated, as expected, and anticipated emotion ratings were shown to be more strongly valenced (for positive events) and more intense than anticipatory emotion ratings. However, multilevel models accounting for the participants' depression level (CESD-R) suggested that anticipatory emotions, either positive or negative, were only weaker than anticipated *in more depressed participants*. In other words, background depressive symptoms predicted differences in current feelings about future events yet not in the perception of how one would feel, should they occur. This implies, first, that future-thought interventions for depression might benefit from considering *translation* between anticipated and anticipatory feelings, and second, that ongoing basic research should attempt to pinpoint the causal relationship(s) between the two forms of future-oriented emotion.

References

Addis, D. R. (2018). Are episodic memories special? On the sameness of remembered and imagined event simulation. *Journal of the Royal Society of New Zealand*, *48*(2–3), 64–88. https://doi.org/10.1080/03036758.2018.1439071

Addis, D. R., Wong, A. T., & Schacter, D. L. (2008). Age-related changes in the episodic simulation of future events. *Psychological Science*, *19*(1), 33–41. https://doi.org/10.1111/j.1467-9280.2008.02043.x

Alloy, L. B. (1988). *Cognitive processes in depression*. Guilford Press.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.).

Anderson, R. J., Clayton McClure, J. H., Boland, J., Howe, D., Riggs, K. J., & Dewhurst, S. A. (2023). The relationship between depressive symptoms and positive emotional anticipation of goal achievement. *Journal of Experimental Psychopathology*, *14*(1). https://doi.org/10.1177/20438087231164963

Anderson, R. J., & Evans, G. L. (2015). Mental time travel in dysphoria: Differences in the content and subjective experience of past and future episodes. *Consciousness and Cognition*, *37*, 237–248. https://doi.org/10.1016/j.concog.2014.05.006

Arnold, K. M., McDermott, K. B., & Szpunar, K. K. (2011). Individual differences in time perspective predict autonoetic experience. *Consciousness and Cognition*, *20*(3), 712–719. https://doi.org/10.1016/j.concog.2011.03.006

Bär, H. E., Werthmann, J., Paetsch, A., & Renner, F. (2023). The traces of imagination: Early attention bias toward positively imagined stimuli. *Psychological Research*, *87*(5), 1475–1483. https://doi.org/10.1007/s00426-022-01737-0

Barsics, C., Van der Linden, M., & D'Argembeau, A. (2016). Frequency, characteristics, and perceived functions of emotional future thinking in daily life. *Quarterly Journal of Experimental Psychology*, *69*(2), 217–233. https://doi.org/10.1080/17470218.2015.1051560

Bates, D., Maechler, M., Bolker, B. M., & Walker, S. C. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, *67*(1), 1–48. https://doi.org/10.18637/jss.v067.i01

Baumgartner, H., Pieters, R., & Bagozzi, R. P. (2008). Future-oriented emotions: Conceptualization and behavioral effects. *European Journal of Social Psychology*, *38*(4), 685–696. https://doi.org/10.1002/ejsp.467

Blackwell, S. E., Browning, M., Mathews, A., Pictet, A., Welch, J., Davies, J., Watson, P., Geddes, J. R., & Holmes, E. A. (2015). Positive imagery-based cognitive bias modification as a web-based treatment tool for depressed adults: A randomized controlled trial. *Clinical Psychological Science*, *3*(1), 91–111. https://doi.org/10.1177/2167702614560746

Boland, J., Riggs, K. J., & Anderson, R. J. (2018). A brighter future: The effect of positive episodic simulation on future predictions in non-depressed, moderately dysphoric & highly dysphoric individuals. *Behaviour Research and Therapy*, *100*, 7–16. https://doi.org/10.1016/j.brat.2017.10.010

Carrera, P., Caballero, A., & Muñoz, D. (2012). Future-oriented emotions in the prediction of binge-drinking intention and expectation: The role of anticipated and anticipatory emotions. *Scandinavian Journal of Psychology*, *53*(3), 273–279. https://doi.org/10.1111/j.1467-9450.2012.00948.x

Carretié, L., Kessel, D., Carboni, A., López-Martín, S., Albert, J., Tapia, M., Mercado, F., Capilla, A., & Hinojosa, J. A. (2013). Exogenous attention to facial vs. non-facial emotional visual stimuli. *Social Cognitive and Affective Neuroscience*, *8*(7), 764–773. https://doi.org/10.1093/scan/nss068

Clayton McClure, J. H. (2022, October 11). *Emotional anticipation of everyday events—Vignettes Study 1* [Pre-registration]. https://doi.org/10.17605/OSF.IO/JN3VF

Clayton McClure, J. H., Anderson, R. J., Dewhurst, S., & Riggs, K. J. (2023, July 19). *Emotional anticipation of everyday events* [OSF study materials]. https://osf.io/zkqm7/?view_only=ed9059ce29ea488b83f1874c15921329

D'Argembeau, A., Renaud, O., & Van Der Linden, M. (2011). Frequency, characteristics and functions of future-oriented thoughts in daily life. *Applied Cognitive Psychology*, *25*(1), 96–103. https://doi.org/10.1002/acp.1647

D'Argembeau, A., & Van der Linden, M. (2006). Individual differences in the phenomenology of mental time travel: The effect of vivid visual imagery and emotion regulation strategies. *Consciousness and Cognition*, *15*(2), 342–350. https://doi.org/10.1016/j.concog.2005.09.001

D'Argembeau, A., & Van der Linden, M. (2012). Predicting the phenomenology of episodic future thoughts. *Consciousness and Cognition*, *21*(3), 1198–1206. https://doi.org/10.1016/j.concog.2012.05.004

DeBruine, L. M., & Barr, D. J. (2021). Understanding mixed-effects models through data simulation. *Advances in Methods and Practices in Psychological Science*, *4*(1). https://doi.org/10.1177/2515245920965119

Dickson, J., & MacLeod, A. (2004). Brief report anxiety, depression and approach and avoidance goals. *Cognition and Emotion*, *18*(3), 423–430. https://doi.org/10.1080/02699930341000013

Eaton, W. W., Smith, C., Ybarra, M., Muntaner, C., & Tien, A. (2004). Center for Epidemiologic Studies Depression Scale: Review and revision (CESD and CESD-R). In M. E. Maruish (Ed.), *The use of psychological testing for treatment planning and outcomes assessment: Instruments for adults* (pp. 363–377). Lawrence Erlbaum.

Ernst, A., Philippe, F. L., & D'Argembeau, A. (2018). Wanting or having to: The role of goal self-concordance in episodic future thinking. *Consciousness and Cognition*, *66*, 26–39. https://doi.org/10.1016/j.concog.2018.10.004

Gaesser, B., Sacchetti, D. C., Addis, D. R., & Schacter, D. L. (2011). Characterizing age-related changes in remembering the past and imagining the future. *Psychology and Aging*, *26*(1), 80–84. https://doi.org/10.1037/a0021054

Gamble, B., Tippett, L. J., Moreau, D., & Addis, D. R. (2021). The futures we want: How goal-directed imagination relates to mental health. *Clinical Psychological Science*, *9*(4), 732–751. https://doi.org/10.1177/2167702620986096

Hallford, D. J. (2019). The phenomenological characteristics of autobiographical future thinking in dysphoric and non-dysphoric individuals. *Psychiatry Research*, *273*, 481–486. https://doi.org/10.1016/j.psychres.2018.12.100

Hallford, D. J., Farrell, H., & Lynch, E. (2022). Increasing anticipated and anticipatory pleasure through episodic thinking. *Emotion*, *22*(4), 690–700. https://doi.org/10.1037/emo0000765

Hallford, D. J., & Sharma, M. K. (2019). Anticipatory pleasure for future experiences in schizophrenia spectrum disorders and major depression: A systematic review and meta-analysis. *British Journal of Clinical Psychology*, *58*(4), 357–383. https://doi.org/10.1111/bjc.12218

Hallford, D. J., Yeow, J. J. E., Fountas, G., Herrick, C. A., Raes, F., & D'Argembeau, A. (2020). Changing the future: An initial test of Future Specificity Training (FeST). *Behaviour Research and Therapy*, *131*, Article 103638. https://doi.org/10.1016/j.brat.2020.103638

Hehman, E., Sutherland, C. A. M., Flake, J. K., & Slepian, M. L. (2017). The unique contributions of perceiver and target characteristics in person perception. *Journal of Personality and Social Psychology*, *113*(4), 513–529. https://doi.org/10.1037/pspa0000090

Herwig, U., Baumgartner, T., Kaffenberger, T., Brühl, A., Kottlow, M., Schreiter-Gasser, U., Abler, B., Jäncke, L., & Rufer, M. (2007). Modulation of anticipatory emotion and perception processing by cognitive control. *NeuroImage*, *37*(2), 652–662. https://doi.org/10.1016/j.neuroimage.2007.05.023

Li, X., Zhang, Y. T., Huang, Z. J., Chen, X. L., Yuan, F. H., & Sun, X. J. (2019). Diminished anticipatory and consummatory pleasure in dysphoria: Evidence from an experience sampling study. *Frontiers in Psychology*, *10*, Article 2124. https://doi.org/10.3389/fpsyg.2019.02124

Lin, J., & Dmitrieva, J. (2019). Cultural orientation moderates the association between desired affect and depressed mood among Chinese international students living in the United States. *Emotion*, *19*(2), 371–375. https://doi.org/10.1037/emo0000415

MacLeod, A. K., & Salaminiou, E. (2001). Reduced positive future-thinking in depression: Cognitive and affective factors. *Cognition and Emotion*, *15*(1), 99–107. https://doi.org/10.1080/02699930125776

MacLeod, A. K., Tata, P., Kentish, J., & Jacobsen, H. (1997). Retrospective and prospective cognitions in anxiety and depression. *Cognition and Emotion*, *11*(4), 467–479. https://doi.org/10.1080/026999397379881

Mellers, B. A., & McGraw, A. P. (2001). Anticipated emotions as guides to choice. *Current Directions in Psychological Science*, *10*(6), 210–214. https://doi.org/10.1111/1467-8721.00151

Miloyan, B., & Suddendorf, T. (2015). Feelings of the future. *Trends in Cognitive Sciences*, *19*(4), 196–200. https://doi.org/10.1016/j.tics.2015.01.008

Moran, E. K., & Kring, A. M. (2018). Anticipatory emotion in schizophrenia. *Clinical Psychological Science*, *6*(1), 63–75. https://doi.org/10.1177/2167702617730877

Morewedge, C. K., & Buechel, E. C. (2013). Motivated underpinnings of the impact bias in affective forecasts. *Emotion*, *13*(6), 1023–1029. https://doi.org/10.1037/a0033797

Nasso, S., Vanderhasselt, M. A., Demeyer, I., & De Raedt, R. (2019). Autonomic regulation in response to stress: The influence of anticipatory emotion regulation strategies and trait rumination. *Emotion*, *19*(3), 443–454. https://doi.org/10.1037/emo0000448

Nosek, B. A., Alter, G., Banks, G. C., Borsboom, D., Bowman, S. D., Breckler, S. J., Buck, S., Chambers, C. D., Chin, G., Christensen, G., Contestabile, M., Dafoe, A., Eich, E., Freese, J., Glennerster, R., Goroff, D., Green, D. P., Hesse, B., Humphreys, M., … Yarkoni, T. (2015). Promoting an open research culture: Author guidelines for journals could help to promote transparency, openness, and reproducibility. *Science*, *348*(6242), 1422–1425. https://doi.org/10.1126/science.aab2374

Peeters, G., & Czapinski, J. (1990). Positive–negative asymmetry in evaluations: The distinction between affective and informational negativity effects. *European Review of Social Psychology*, *1*(1), 33–60. https://doi.org/10.1080/14792779108401856

Posner, J., Russell, J. A., & Peterson, B. S. (2005). The circumplex model of affect: An integrative approach to affective neuroscience, cognitive development, and psychopathology. *Development and Psychopathology*, *17*(3), 715–734. https://doi.org/10.1017/S0954579405050340

Pyszczynski, T., Holt, K., & Greenberg, J. (1987). Depression, self-focused attention, and expectancies for positive and negative future life events for self and others. *Journal of Personality and Social Psychology*, *52*(5), 994–1001. https://doi.org/10.1037/0022-3514.52.5.994

Roepke, A. M., & Seligman, M. E. P. (2016). Depression and prospection. *British Journal of Clinical Psychology*, *55*(1), 23–48. https://doi.org/10.1111/bjc.12087

Schacter, D. L., Addis, D. R., Hassabis, D., Martin, V. C., Spreng, R. N., & Szpunar, K. K. (2012). The future of memory: Remembering, imagining, and the brain. *Neuron*, *76*(4), 677–694. https://doi.org/10.1016/j.neuron.2012.11.001

Soto, J. A., Perez, C. R., Kim, Y.-H., Lee, E. A., & Minnick, M. R. (2011). Is expressive suppression always associated with poorer psychological functioning? A cross-cultural comparison between European Americans and Hong Kong Chinese. *Emotion*, *11*(6), 1450–1455. https://doi.org/10.1037/a0023340

Tabachnick, B. G., & Fidell, L. S. (2018). *Using multivariate statistics* (7th ed.). Pearson.

Thimm, J. C., Holte, A., Brennen, T., & Wang, C. E. A. (2013). Hope and expectancies for future events in depression. *Frontiers in Psychology*, *4*, Article 470. https://doi.org/10.3389/fpsyg.2013.00470

Tulving, E. (2005). Episodic memory and autonoesis: Uniquely human? In H. S. Terrace & J. Metcalfe (Eds.), *The missing link in cognition: Origins of self-reflective consciousness* (pp. 3–56). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780195161564.003.0001

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, *185*(4157), 1124–1131. https://doi.org/10.1126/science.185.4157.1124

Van Dam, N. T., & Earleywine, M. (2011). Validation of the center for epidemiologic studies depression scale—Revised (CESD-R): Pragmatic depression assessment in the general population. *Psychiatry Research*, *186*(1), 128–132. https://doi.org/10.1016/j.psychres.2010.08.018

Wilson, T. D., & Gilbert, D. T. (2005). Affective forecasting: Knowing what to want. *Current Directions in Psychological Science*, *14*(3), 131–134. https://doi.org/10.1111/j.0963-7214.2005.00355.x

Wilson, T. D., Wheatley, T., Meyers, J. M., Gilbert, D. T., & Axsom, D. (2000). Focalism: A source of durability bias in affective forecasting. *Journal of Personality and Social Psychology*, *78*(5), 821–836. https://doi.org/10.1037/0022-3514.78.5.821

Wu, H., Mata, J., Furman, D. J., Whitmer, A. J., Gotlib, I. H., & Thompson, R. J. (2017). Anticipatory and consummatory pleasure and displeasure in major depressive disorder: An experience sampling study. *Journal of Abnormal Psychology*, *126*(2), 149–159. https://doi.org/10.1037/abn0000244

Zacks, J. M., Speer, N. K., Swallow, K. M., Braver, T. S., & Reynolds, J. R. (2007). Event perception: A mind-brain perspective. *Psychological Bulletin*, *133*(2), 273–293. https://doi.org/10.1037/0033-2909.133.2.273

Received July 19, 2023
Revision received February 5, 2024
Accepted February 13, 2024 ■