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The phenomenological characteristics of autobiographical future thinking in dysphoric and non-dysphoric individuals

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ABSTRACT

Depressive symptoms are associated with deficits in objectively-rated detail and specificity in autobiographical future thinking for personally-relevant events. However, how depressive symptoms might affect the subjective, phenomenal characteristics of future thinking in general is not well understood. This study examined future thinking as self-reported by dysphoric (n = 79; probable major depression on the Patient Health Questionnaire and very or extremely difficult impact on functioning) and non-dysphoric adults (n = 79; as defined by normal range on the PHQ) that were matched on age and gender. The dysphoric group reported more frequent thoughts about their future in general, particularly for the long-term future, which persisted after controlling for emotional-valence. Dysphoric individuals perceived their future thinking as being more frequently vivid and detailed, more often involving mental imagery and inner speech, more often involuntary, more often unrealistic or implausible, more negatively-valenced, and more often from a third-person perspective. The findings indicate differences in the phenomenology of thinking about one's future among dysphoric individuals, some of which contrast with prior research findings. The implications for understanding autobiographical future thinking in depression are discussed, and studies are indicated to further clarify the content, function, and context of future thinking in altered affective states.

1. Introduction

Future thinking refers to the mental simulation of events in one's own future, and is implicated in a range of functions, such as planning, problem-solving, identity, and emotion regulation (Schacter et al., 2017). Among other changes in cognition, depression is known to be associated with disturbances in future thinking. In particular, depressed individuals have been shown to have difficulty imagining specific events and populating these with details (Hallford et al., 2018), generating possible positive future events (Bjärehed et al., 2010; MacLeod and Salaminiou, 2001; MacLeod et al., 1997), and using mental imagery in future thinking (Holmes et al., 2008; Morina et al., 2011). Although future-oriented cognition may be defined and categorized in a number of ways (Szpunar et al., 2014), the focus in this article is on future thinking in reference to mental representations of one's personal future, involving autobiographical events that are yet to be experienced.

Much previous research, including in depression, has examined autobiographical future thinking in terms of objectively-rated assessments, whereby participants are asked to provide descriptions of discrete anticipated or possible future events, which are then rated by an assessor for event-level specificity, or quantified in terms of episodic detail (e.g., Addis et al., 2016; Williams et al., 1996). The phenomenal characteristics of future thinking have been examined, but this has been predominantly in community, non-clinical samples (e.g., Barsics et al., 2016; D'Argembeau and Van der Linden, 2004, 2006, 2012; de Vito et al., 2012). Therefore, it is not well known if or how elevated depressive symptoms might change the phenomenology of thoughts that individuals have about their personal future.

A range of different characteristics of episodic thinking might be of interest in the context of clinically-significant levels of depressive symptoms, henceforth referred to as dysphoria. As a start, it is unknown whether dysphoric individuals perceive themselves as engaging more or less frequently in future thinking in general relative to non-dysphoric individuals. Some indication that it may be more frequent comes from research showing that depressive symptoms are related to increased rumination about past events (Nolen-Hoeksema, 2000) and worry about the future (Segerstrom et al., 2000). Some characteristics of episodic thinking have also already been researched in the context of episodic memory. For example, in relation to perspective-taking (that is, a first-person or third-person perspective), episodic memories are known to occur more frequently in the third-person in depression relative to healthy controls (Kuyken and Howell, 2006; Kuyken and Moulds, 2009). This is thought to be a means of distancing oneself from negative or distressing memories to down-regulate associated negative

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feelings (Williams and Moulds, 2008). Although not yet examined, similar findings might be expected in for autobiographical future thinking. The frequency of involuntary future thinking, that is, thoughts of the future that are evoked without any conscious effort, have not been studied in the context of defined negative affective states, although involuntary memories appear to be more frequent in the context of depression (Brewin et al., 1996). Other aspects of future thinking, such as how commonly inner-speech or self-talk is used, and how important or significant the content is to one's life may be of interest to study given their possible role in one's self-narrative and meaning. If future thinking is indeed different based on a dysphoric mood state then this may point to maladaptive cognitive processes that can be integrated into the understanding of how depression is maintained, and provide greater specificity for intervention.

The aim of the current study was to assess for differences in the frequency of phenomenological characteristics of autobiographical future thinking between dysphoric and non-dysphoric individuals. A range of different characteristics were assessed in terms of how frequently they were perceived as occurring across autobiographical future thinking in general, including vividness/detailedness, format of the content (visual imagery/inner speech), voluntary/involuntary nature, realism/plausibility, importance of content, emotional-valence, perspective, and how far into the future the future thinking content was in relation to (temporal distance). It was hypothesized that dysphoric individuals, relative to non-dysphoric individuals, would report more frequent autobiographical future thinking in general, and, based on previous research in episodic future thinking (Hallford et al., 2018), would be perceived as less frequently vivid and detailed. Based on previous research described above, it was also hypothesized that future thinking would be perceived as less frequently involving visual imagery, more frequently be involuntary, more often be negatively-valenced, and more frequently experienced from a third-person observer perspective. There were not specific hypotheses relating to the temporal distance of future thinking, nor the perceived realism or importance, and therefore analyses on these variables were exploratory in nature.

2. Methods

2.1. Participants

A mass screening ($N = 564$) was conducted online through advertising on social media (e.g., Facebook, Instagram), online groups, and forums based in Australia, in order to identify individuals that were dysphoric and non-dysphoric. The Patient Health Questionnaire – 9 item version (PHQ-9; Kroenke et al., 2010) was used. A cutoff of 11 points or higher on the PHQ-9 was used to identify dysphoric individuals, as this has demonstrated good psychometric properties in identifying probable cases of depression detected by clinical interview (specificity of .89 and sensitivity of .89; Manea et al., 2011). The computerised version retains excellent psychometric properties (Erbe et al., 2016). Also included was the criterion that participants report either a 2 (*very difficult*) or 3 (*extremely difficult*) on the functional impact item on the PHQ-9. This item asks participants how difficult the symptoms have made it for them to do their work, take care of things at home, or get along with other people. This was used to determine that the participants had depressive symptoms that were having significant functional impact, and therefore were likely to be clinically-depressed. Using this criteria, 79 dysphoric participants were identified (48.1% female). To sample the non-dysphoric group, the criteria of less than 5 points on the PHQ-9, indicating the normal range, and a 0 (*not at all*) or 1 (*somewhat difficult*) on the functional impact question were used. One hundred and seventy-four participants were in this range. Of these, 79 were selected, based firstly on gender, so that the proportion of males and females with the dysphoric group was equal, and secondly so that their age matched as closely as possible. Where there were instances of two or more potential matches, the first instance was selected.

2.2. Materials

Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2010). The PHQ-9 comprises nine self-report items referring to the Diagnostic and Statistical Manual for Mental Disorders 4th edition text revision criteria for a Major Depressive Episode (American Psychiatric Association, 2000). Participants rate each item in reference to the frequency of the symptoms over the last two weeks on a scale of 0 (*not at all*) to 3 (*nearly every day*). The PHQ-9 has excellent psychometric properties in assessing the severity of depressive symptoms (Kroenke et al., 2010), and computerised form shares these qualities (Erbe et al., 2016). The internal reliability was excellent in the current study (Cronbach's $\alpha = 0.95$).

Phenomenological Characteristics of Autobiographical Future Thinking. A series of questions were designed for this study to assess the frequency of future thinking on particular characteristics (see Supplemental File 1 for full items on the questionnaire). Initial instructions were presented, "*These questions relate to how you generally think about your personal future*", and participants then answered a series of questions assessing six characteristics (*vividness/detailedness, format of content, purposefulness, realism/plausibility, importance of content, emotional-valence,* and *perspective*). With the exception of vividness/detailedness, each characteristic was assessed on two dimensions. For example, "*How often is your future thinking on purpose?*", and "*How often is your future thinking not on purpose, or involuntary?*". The decision to use two items for most phenomenological characteristics was made to allow for a more nuanced assessment. For example, the frequency of important thoughts *and* trivial thoughts could be assessed for, rather than just whether future thinking tended to be they were more or less important. Further, some characteristics required multiple items as they did not represent a single dimension (e.g., inner speech and imagery, and first and third-person perspective). This made for a total of 13 questions. Table 1 presents the characteristics and dimensions. Responses were given on a 5-point scale labelled as 1 (*Never*), 2 (*Rarely*), 3 (*Sometimes*), 4 (*Often*), and 5 (*Very Often*). Inter-item correlations between the dimensional items within each characteristic were low (range of $r's = ^{-}.11–.24$) indicating the validity of assessing these dimensions separately.

Seven items were used to assess the temporal distance of future thinking, that is, how far into the future the imagined events take place. The instructions, "*These questions are about how far into your future you tend to think*", were followed by a series of stems, *"How frequently do you tend to think about your future for things that will happen…",* with the branches of "*later that day, tomorrow, over the next week, over the next month, over the next year, in over a year,* and *in over ten years*". Participants responded using the same 5-point scale as above. The items referring to short-term temporal distance were noted to very correlate highly together, as did those for long-term. To reduce the items down, and minimize redundancy in analyzing them separately, a factor analysis was conducted using maximum-likelihood extraction and oblimin rotation. The results showed a clear two-factor solution (eigenvalues of 3.3 and 1.8, with the next eigenvalue being 0.61) explaining 73.3% of the variance in responses. The short-term items (*later that day, tomorrow, over the next week*) loaded onto one factor (factor loadings of .82, .87, and .79, respectively) while the long-term items (next year, over a year, over ten years) loaded onto the second factor (factor loadings of .65, .91, and .81, respectively). Cross-loadings for these items were all below .15. The item "*over the next month*" loaded onto both factors (.46 and .37) and was removed. The items had good internal reliability (Cronbach's $\alpha = .86$, and .82, respectively). An average of the items was computed for the short-term and long-term future thinking subscales separately. They only modestly correlated with one another ($r = .21$, $p = .007$), indicating they assessed different dimensions of the temporal distance of future thinking. These scales were used in analyses.

Table 1
Descriptive statistics and ANOVA results for the frequency of each characteristic of autobiographical future thinking.

	Dysphoric (n = 79)	Non-dysphoric (n = 79)	Group effect (F, p, η^2)	Dimension effect (F, p, η^2)	Interaction effect (F, p, η^2)	Follow-up t-tests (t, p, d)
Age	30.7 (8.6)	30.8 (8.1)				.02, .977, .01
Depressive symptoms	16.7 (5.4)	1.7 (1.5)				**23.7, < .001, 3.78**
Vivid/detailed future thoughts	4.6 (1.2)	3.9 (1.2)	/	/		**3.5, < .001, .58**
Temporal distance			**37.8, < .001, .19**	**9.2, .003, .05**	**6.1, .015, .03**	Dysphoria group > on both dimensions, but significantly more on long-term, **6.3, < .001, 1.04,** relative to short-term, **2.9, .004, .52**
Short-term future	4.5 (1.1)	3.9 (1.2)				
Long-term future	4.4 (1.1)	3.2 (1.2)				
Format of EFT			**17, < .001, .10**	3.4, .065, .02	0.9, .333, .00	
Visual imagery	3.7 (1.0)	3.2 (1.2)				
Inner speech/self-talk	4.0 (0.9)	3.3 (1.1)				
Purposefulness			**22.7, < .001, .12**	**20.8, < .001, .12**	**14.1, < .001, .08**	Dysphoria group > on involuntary thoughts, **6.0, < .001, 1.0**, n.s. for purposeful/ voluntary thoughts, 1.0, .292, 10
On purpose	3.7 (1.0)	3.6 (1.0)				
Not on purpose/ involuntary	3.7 (1.0)	2.7 (1.0)				
Realism/Plausibility			**13.1, < .001, .07**	**40.6, < .001, .20**	**5.1, .024, .03**	Dysphoria group > on unrealistic/ implausible thoughts, **4.0, < .001, .69**, n.s. for realistic/plausible thoughts, 1.0, .283, .22
Realistic and plausible	3.9 (1.0)	3.7 (0.8)				
Unrealistic and implausible	3.4 (1.0)	2.7 (1.0)				
Importance of Content			**8.1, .005, .05**	**52.5, < .001, .25**	3.1, .079, .02	
Something important	3.9 (1.0)	3.7 (0.8)				
Something trivial and unimportant	3.3 (1.2)	2.7 (1.0)				
Emotional-valence			**11.1, .001, .06**	**40.1, < .001, .20**	**20.8, < .001, .11**	Dysphoria group > on sad, negative thoughts, **5.2, < .001, .85**, n.s. for happy, positive thoughts, 1.1, .263, .22
Happy or positive things	3.6 (1.0)	3.8 (0.8)				
Sad or negative things	3.4 (1.1)	2.5 (1.0)				
Perspective			**21.2, < .001, .12**	**39.9, < .001, .20**	**12.8, < .001, .07**	Dysphoria group > third person perspective, **5.5, < .001, .95**, n.s. for first-person perspective, 0.3, .756, .09
First-person/your own eyes perspective	3.8 (1.0)	3.7 (1.0)				
Third-person/observer perspective	3.5 (1.1)	2.5 (1.0)				

Note: all values in bold are significant following correction using the false discovery rate procedure. n.s. = not significant

2.3. Procedure

The study received ethics approval from the University Human Ethics Committee prior to commencing recruitment. The study was completely wholly online. Advertisements were posted online along with a link to the online survey that interested individuals could follow. After reading a plain language statement, they completed demographic questions, then the autobiographical future thinking characteristic questions, then the PHQ-9. Informed consent was given by submission of the responses. The survey questions took an estimated 15 minutes to complete. No incentives were provided for participation.

2.4. Data analysis

SPSS 25.0 was used for all statistical analyses. No more than 5% of data were missing from any variables, and were replaced using estimation maximization. No univariate outliers were detected (as indicated by $z > +$ or $-$ 3.3 standard deviations), nor multivariate outliers, as indicated by no Mahalanobis distance scores higher than 13.8 (on the basis of $\chi[df = 2] = 13.8$, $p < .001$). With respect to skewness and kurtosis statistics, each item was judged to be distributed normally, and met assumptions of the homogeneity of variance and sphericity for mixed ANOVA. To assess for differences between the groups, the dimensions of future thinking characteristics, and interaction effects, mixed ANOVAs were conducted with a between-groups factor of group (dysphoric; non-dysphoric) and within-groups factor of dimension on the future thinking characteristic (e.g., short-term future; long-term future), and t-test was used to test for differences on vividness/detailedness. Follow-up t-tests were used to probe significant interaction effects. The alpha level was set to .05, and to control for the risk of a Type 1 error we used the false discovery rate procedure for ANOVA across main effects, interaction effects, and follow-up t-tests. This controls for the expected proportion of rejected null hypotheses that are in fact false (Benjamini and Hochberg, 1995; Benjamini and Yekutieli, 2001). Cohen's (1988) guidelines were used whereby d's of 0.3, 0.5, and 0.8 were interpreted as small, medium, and large, respectively, and partial eta squares of .02, .13, and .26, as small, medium, and large.

3. Results

Table 1 shows the descriptive statistics and results of the mixed ANOVAs. As expected, there was no significant difference between the groups in age, and the dysphoric group was significantly higher on depressive symptoms. A chi-square analysis indicated no significant difference in highest education attainment between the groups, $\chi^2(4) = 4.1$, $p = .393$: 0.6% primary school, 13.3% high school, 13.9 diploma or certificate, 47.5% undergraduate/bachelor degree, 24.7% postgraduate degree.

Age and education level did not significantly correlate with any of the future thinking characteristics (all $r < .18$, $p > .05$). The only difference for gender was that women ($M = 4.8$, $SD = 1.1$), relative to men ($M = 4.2$, $SD = 1.4$), reported more frequent future thinking relating to important things in their life, $t(156) = 2.77$, $p = .006$, $d = .47$. However, entering gender as a covariate in subsequent analysis of this variable did not change the results.

For the main analyses (reported in Table 1), a main effect indicated that the dysphoric group reported having significantly more vivid and detailed thoughts about their future relative to the non-dysphoric group. There was a main effect for temporal distance and dimension, qualified by an interaction effect. This indicated that the dysphoric group thought more frequently about the short and long-term future relative to the non-dysphoric group, but that this effect was stronger for long-term future thinking.

For the format of the future thinking, a main effect for group indicated that dysphoric individuals thought about the future more frequently using visual imagery and inner speech relative to the non-

dysphoric group, with no main effect for dimension or interaction effect.

For purposefulness of future thoughts, there were main effects for group and dimension. This was qualified by an interaction effect showing that the dysphoric group had significantly more involuntary thoughts about their future, relative to the non-dysphoric group, but there was no significant difference for purposeful future thinking.

There were main effects for group and dimension on the realism/plausibility items, qualified by an interaction effect indicating that the dysphoric group reported more frequent unrealistic and implausible future thoughts relative to the non-dysphoric group, whereas no significant difference was found for realistic and plausible future thoughts.

For the importance of future thinking content, a main effect for group indicated that the dysphoric group again reported a higher frequency of future thinking relative to the non-dysphoric group, and a main effect for dimension indicated that both groups reported more future thinking with content that was viewed as important compared to that which was trivial and unimportant.

For emotional-valence, there was a main effect for group and dimension, but this was qualified by an interaction effect indicating that the dysphoric group reported more frequent thoughts about future events that were sad or negatively-valenced relative to the non-dysphoric group. No difference was found for positive thoughts. This exploratory analysis was followed up to assess whether the experience of significantly more sad or negative future thinking might account for differences in the overall frequency of future thinking between dysphoric and non-dysphoric group. A between-groups MANOVA with the frequency of short and long-term future thinking as the DVs, and frequency of sad or negative future thinking as the covariate, showed a significant multivariate effect for group, $F(2, 154) = 12.5$, $p < .001$, partial $\eta^2 = .14$. Follow-up ANOVAs showed that even when controlling for the frequency of sad and negative future thinking, the dysphoric group still were observed to report significantly more frequent future thinking of their long-term future relative to the non-dysphoric group, $F(1, 155) = 23.4$, $p < .001$, partial $\eta^2 = .13$, but differences in short-term future did not reach significance, $F(1, 155) = 3.1$, $p < .076$, partial $\eta^2 = .02$.

Lastly, for perspective there was a main effect of group and dimension, and an interaction effect. This indicated that future thinking from a first-person perspective was more frequent than third-person perspective for both groups, with the interaction effect indicating that those in the dysphoric group reported it was experienced significantly more frequently from a third-person, observer perspective relative to those who were not dysphoric. No difference was found for first-person perspective between the groups.

4. Discussion

The current study aimed to examine the phenomenological characteristics of autobiographical future thinking in individuals with and without dysphoria. The hypothesis of more frequent future thinking in dysphoria in general was supported, with a higher reported frequency of future thinking for the short and long-term future, and across characteristics. To the author's knowledge, this is the first study to show that future thoughts in general are self-reported as more frequently occurring in a dysphoric group relative to non-dysphoric. It is possible that this is accounted for by increased worry about negative outcomes of future events (Segerstrom et al., 2000), and more frequent thoughts of perceived problems or issues that are needing to be solved. However, even when controlling for the frequency of negatively-valenced thoughts, the dysphoric group were still found to report more frequent future thinking, and particularly so for their long-term future in terms of years ahead. In general then, it appears that those with clinically-significant depressive symptoms more frequently concern themselves with thoughts of possible events in their future relative to those without depressive symptoms. There may be a range of reasons for this. For example, dysphoric individuals generally have impaired psychosocial functioning (Gotlib et al., 1995) and reduced social interaction (McKnight and Kashdan, 2009), and therefore they may more often be in situations where they are alone or not engaged in tasks and in which stimulus-independent future thinking such as “mind-wandering” or “day-dreaming” are more likely to occur (Kucyi and Davis, 2014; Killingsworth and Gilbert, 2010). Further, a sense of low self-worth and personal failure that typically accompanies other functional impacts of depressive symptoms (Kuiper, 1978; Wenzlaff and Grozier, 1988), may give individuals uncertainty about their future, and trigger them to think more frequently about possible future events and their outcomes. The reason for a higher frequency of long-term future thinking is unclear, although it has been suggested that hopelessness, which can be a feature of depressive symptoms, arises when a person is preoccupied with thinking about long-term goals that are perceived as being unattainable (Baumeister, 1990).

Dysphoric individuals reported more often having vivid and detailed future thoughts compared to non-dysphoric. This is contrary to other studies showing that, compared to healthy controls, depressed individuals report similar levels of subjectively-perceived vividness in relation to specific future events (Hach et al., 2014), and dysphoric individuals reported significantly less vividness (Anderson and Evans, 2015). Further, depressed individuals have less objectively-rated detail in their episodic future thinking when they self-report the contents of their future thoughts, relative to healthy controls (Hallford et al., 2018). So, there appears to be some disparity between reports relating to future thinking for specific possible events, and the subjective perception of vividness and detail in autobiographical future thinking overall. Given that the dysphoric group reported more frequent sad and negative future thinking compared to non-dysphoric, it may be that they perceive their future thinking overall to be more frequently vivid on account of the stronger impact of negatively-valenced experiences (Baumeister et al., 2001). Indeed, differences in vividness may be accounted for by valence, with evidence suggesting that dysphoric individuals report more vividness in positive future thoughts, and less in negative future thoughts (Boland et al., 2018). There may be some confounding between frequency and detail also, whereby a higher frequency of future thinking might be perceived by individuals as being equated with more detail. Relatedly, Szpunar and Schacter (2013) also found that repeatedly simulating future events increased their perceived detail. Alternatively, it may be that participants actually have more detailed future thoughts in daily life, but other factors affect their ability to retrieve detailed episodic thoughts under laboratory conditions (e.g., executive functioning deficits being more manifest during timed tests, perceived social pressure). Assessing the detail and specificity of autobiographical future thinking in the daily life of those with elevated depressive symptoms seems necessary to reconcile these disparate findings, and clarify where and how any differences occur. Regardless of the context, the inclusion of subjective and objectively-rated aspects of future thinking will further the understanding of differences on this and other dimensions, and why they might occur.

Purposeful future thinking was not found to be higher in dysphoria relative to non-dysphoria, but involuntary future thinking was. This is consistent with some previous research showing higher depressive symptoms correlate with a higher frequency of involuntary future thoughts in a community sample (Berntsen et al., 2015), and clinical depression with more intrusive memories (Brewin et al., 1996; Patel et al., 2007). It is noted that involuntary future thinking here is not equated with intrusive thoughts. Much future thinking may be triggered by internal or external stimuli without conscious volition, but this does not necessarily denote they are negative in content. In the current study, dysphoric individuals reported a similar frequency of voluntary and involuntary thoughts, but non-dysphoric individuals reported significantly less involuntary future thinking relative to voluntary. Notably, diary study research in a normal population has shown that in

daily life people experience equal amounts of voluntary and involuntary future thinking (Finnbogadóttir and Berntsen, 2013). Therefore, another possible way of interpreting this finding is that when using retrospective, self-report methods, dysphoric individuals more accurately appraise the frequency of involuntary future thinking that occurs, perhaps due to increased realism and reduced sense of personal control (Benassi et al., 1988). Of course, future research using diary study methodology with a dysphoric and healthy group would be needed to test this question more directly. At the very least, it suggests that those with clinically-significant depressive symptoms perceive that thoughts of their personal future occur more frequently in an involuntary, automatic manner. This also supports previous research indicating that involuntary thoughts of specific future suicidal behaviours are common in depression ("flash-forwards"; Holmes et al., 2007), but extends this to the general case of future thinking and provides a comparison group to indicate elevated frequency relative to those who are not depressed.

Dysphoric individuals reported using more mental imagery and inner speech relative to non-dysphoric, the former of which contrasts with previous research in the context of dysphoric individuals' ratings of specific positively-valenced future events (Holmes et al., 2008). As above, the subjective experience of dysphoric individuals may be that they use more mental imagery in general given that they report more negatively-valenced future thinking, which are likely to be more emotionally evocative. Indeed, studies indicate that the use of imagery for negatively-valenced thoughts appears to remain intact in the context of depressive symptoms (Holmes et al., 2008). The dysphoric group also reported more frequent inner speech during future thinking relative to non-dysphoric, although this was similar in frequency to mental imagery, and may represent the generalized trend for higher frequency of future thinking in this group overall. Future thoughts were found to be more frequently important and trivial for dysphoric individuals, again perhaps reflecting a generally higher frequency of future thinking.

Evidence was found that dysphoric participants had relatively more thoughts of their future that were perceived as unrealistic and implausible. This may be reflective of relatively fewer concrete, goal-directed thoughts, such as planning, and in the context of low self-efficacy (Ahrens et al., 1988) or hopelessness about the future. It might also be reflective of fantastizing or daydreaming in order to avoid current problems, or to reduce boredom. Another possible interpretation is that a higher frequency of unrealistic thoughts might reflect the simulation of positive, successful events or outcomes that a dysphoric individual perceives as being unlikely to happen for themselves personally, rather than being more generally implausible or fantastical.

The dysphoric group did not differ from the non-dysphoric on the frequency of positively-valenced thoughts, but did report higher levels of negatively-valenced thoughts. There is mixed research in regards to the valence-bias of autobiographical future thinking in emotional disorders, with some studies showing that lower mood is related to generation of less possible positive future events (Bjärehed et al., 2010; MacLeod and Salaminiou, 2001; MacLeod et al., 1997), and others that the bias is towards generating more negative future events (MacLeod and Cropley, 1995). These findings indicate that dysphoric individuals experience their future thinking in general as being as frequently about positive content as those without clinically-significant depressive symptoms, but significantly more often about negative content. This supports a recent study showing that dysphoric individuals reported less positive bias in future thoughts, which was accounted for more negatively-valenced spontaneous future thoughts (Ji et al., 2018).

Overall, the participants reported using a field perspective more frequently than an observer perspective, replicating previous findings (De Brigard and Giovanello, 2012). The findings regarding group differences extends on previous work on perspective in autobiographical memories in depression (Kuyken and Howell, 2006; Kuyken and Moulds, 2009; Williams and Moulds, 2007) to show that those high in depressive symptoms also report relatively more future thinking from an observer perspective relative to controls. Adopting an observer perspective may function to down-regulate distress associated with negative episodic thinking (Williams and Moulds, 2008), and more need for negative affect-regulation is why the higher frequency is observed in the dysphoric sample.

These findings, taken collectively, indicate that dysphoric individuals report perceiving themselves as being more frequently engaged in autobiographical future thinking relative to non-dysphoric, and that this content is richer in detail, visual imagery, and self-talk. Given the content of autobiographical future thinking was not assessed here, it is not clear for what purpose dysphoric individuals are thinking more about their future, or what might be eliciting or provoking this. Further, autobiographical future thinking was assessed in terms of one's personal future in general, and therefore would likely have been considered by participants in terms of a combination of event-specific future thoughts (e.g., something happening in a place and time) and non-specific autobiographical events or states (e.g., completing university, or a week-long holiday). Diary/ecological momentary assessment studies assessing the content and perceived functions of autobiographical future thinking would be useful to clarify when, how, and why individuals who have clinically-significant depressive symptoms think more frequently about their personal future. Identifying the functions of this increased future thinking may clarify which processes could be adaptive or protective (e.g., planning, clarifying plausible current goals, up-regulating positive affect by thinking about positive experiences), and those that might maintain the affective condition (e.g., anticipating negative outcomes, fantasizing about unachievable aims in the context of hopelessness). This may help to generate further cognitive targets to optimize treatments.

Future studies may recruit a sample using a diagnostic interview to ascertain clinical depression. Despite not doing this in the current sample, well-evidenced cut-off scores on an established measure of depressive symptoms were used to detect probable depression, and the criteria were made to be more stringent by including the need for functional impact. Therefore, there can be confidence that the dysphoric sample represented a group of people suffering at least clinically-significant depressive symptoms. The reliability of single-item measures for the phenomenology of future thinking, despite often used in research on the phenomenology of episodic thinking (e.g., Johnson et al., 1988), could be questioned, and potentially improved with validated multi-item scales to assess characteristics of future thinking. The general nature of the items also restricts the interpretation of the meaning of the responses. As noted, the content, function, and context of future thinking could not be determined, and future research may ask more targeted and specific questions.

The current study investigated the perceived characteristics of autobiographical future thinking in a dysphoric group of individuals, indicating they have more frequent thoughts about their future in general, and these were perceived as more often being vivid and detailed, involving mental imagery and inner speech, more often involuntary, more often unrealistic and implausible, more often negatively-valenced, and more often from a third-person perspective. The findings of this study suggest there are differences in the subjective report of autobiographical future thinking between dysphoric and non-dysphoric individuals, some of which differ from other objective-rated assessments. This highlights the need to assess future thinking using multiple methods to clarify why these differences occur.

Declarations of interest

None

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.psychres.2018.12.100.

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