Overgeneral past and future thinking in dysphoria: The role of emotional cues and cueing methodology

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Abstract

Overgeneral memory, where individuals exhibit difficulties in retrieving specific episodes from autobiographical memory, has been consistently linked with emotional disorders. However, the majority of this literature has relied upon a single methodology, in which participants respond to emotional cue words with explicit instructions to retrieve/simulate specific events. Through use of sentence completion tasks the current studies explored whether overgenerality represents a habitual pattern of thinking that extends to how individuals naturally consider their personal past and future life story. In both studies, when compared with controls, dysphoric individuals evidenced overgeneral thinking style with respect to their personal past. However, overgeneral future thinking was only evident when the sentence stems included emotional words. These findings highlight the importance of investigating the overgenerality phenomenon using a variety of cueing techniques and results are discussed with reference to the previous literature exploring overgenerality and cognitive models of depression.

Keywords: autobiography; overgeneral memory; future thinking; depression

Overgeneral past and future thinking in dysphoria: The role of emotional cues and cueing methodology

Emotional difficulties, such as depression, are typically accompanied by biases in cognition. Beck (1967, 1983, 1987, 2008), in his cognitive model of depression, argued for a triad of negativity focused on the self, the world and the future. One area in which these cognitive biases have been investigated is autobiographical thinking, which incorporates the individual's concept of self and how they view both their personal history and potential future life story. The ability to mentally 'time travel' forms an important component of autobiographical thinking; through the process of recalling and manipulating episodic information held within autobiographical memory, individuals can mentally place themselves in both past, and potential future, experiences.

One key bias evidenced by depressed individuals relates to the accessibility of information from within autobiographical memory. Termed overgeneral memory (OGM), this bias is characterised by difficulties retrieving memories for specific episodes (single events that occurred on one particular day in the past). Instead, experiences are often recalled at a more general level, often referring to categories of repeated events. OGM has been consistently found in a number of emotional disturbances, including parasuicide, major depressive disorder and naturally occurring dysphoric mood (see Williams, et al., 2007 for a review).

Conway and Pleydell-Pearce's (2000) model of autobiographical memory suggest that memories are stored hierarchically and that retrieval often involves an effortful and generative search process whereby general memories precede recall of specific episodes. However, instead of proceeding through the hierarchy, the search can be prematurely aborted. Williams and colleagues' CaR-FA-X model (Williams,

2006; Williams, et al., 2007) suggests three factors that serve, individually or in combination, as the critical mechanisms underlying overgeneral retrieval. A truncated search may result from reduced executive capacity (X) or as an adaptive coping mechanism, termed functional avoidance (FA), whereby the negative affect associated with specific events is minimised by retrieval of more general memories. Finally, capture and rumination (CaR) refers to the proposition that retrieval processes can be 'hijacked by semantic overlap between current concerns and the cues that are being used to search memory, triggering rumination' (Williams, 2006, p. 561).

OGM may, in the short term, serve an adaptive function with respect to minimising negative affect; however, it is believed, in the long-term, to be maladaptive. For instance, evidence suggests that an overgeneral retrieval style hinders the generation of effective problem-solving strategies (e.g. Evans, Williams, O'Loughlin, & Howells, 1992; Goddard, Dritschel, & Burton, 1996, 1997; Williams, et al., 2006) and that both OGM and poor problem-solving act as vulnerability factors for the onset and maintenance of emotional difficulties (e.g. Anderson, Goddard, & Powell, 2010, 2011; Gibbs & Rude, 2004; Nezu & Ronan, 1988; Sumner, Griffith, & Mineka, 2010). Furthermore, OGM in depression does not seem to occur exclusively as a mechanism for avoiding unpleasant memories, with numerous studies finding overgenerality in response to both negative and positive cues (e.g. Park, Goodyear, & Teasdale, 2002; Williams & Broadbent, 1986; Williams & Dritschel, 1988).

Overgenerality also seems to extend across mental time travel abilities more generally, with depressed individuals also having difficulty simulating specific episodes that could happen in the future (Dickson & Bates, 2006; Williams, 1996). Thus, it is feasible that, if overgenerality is a habitual style or retrieval and simulation, it may limit the extent to which depressed individuals can make use of other mood

regulating strategies; for instance, evidence suggests that retrieving and simulating positive events can be useful in terms of repairing low mood and challenging negative perceptions that an individual may hold about themselves, their personal history and what the future may hold (e.g. Joormann, Siemer, & Gotlib, 2007; Parrott & Sabini, 1990; Pictet, Coughtrey, Mathews, & Holmes, 2011).

Despite the consistent findings linking emotional difficulties and overgeneral recall/simulation, a number of questions and issues still remain. One concern is that the vast majority of our knowledge regarding overgeneral thinking in depression has been derived from a single methodological paradigm; this approach, using the Autobiographical Memory Test (AMT) and its future oriented equivalent - the Future Event Task (FET), focuses on voluntary recall/simulation directed by emotional cues. Early work in this domain drew comparisons between events produced in response to positive vs. negative cues. Currently, however, these comparisons are made less frequently due to an array of mixed findings (Williams et al., 2007) and recent confirmatory factor analyses suggesting that the AMT represents a one-dimensional instrument (Griffith et al., 2009; Heron, Crane, Gunnell, Evans, & Williams, 2012). Research using AMT, and to a lesser extent the FET, has yielded a wealth of information regarding the relationship between overgenerality and emotional distress, however it is not without its limitations; indeed, Williams et al. (2007) called for a diversification in the methodologies used to investigate the overgenerality phenomenon.

One limitation of emotional cue-word tasks is that they do not necessarily provide a clear representation of the pattern of retrieval/simulation that an individual uses in everyday life. The occasions when individuals are required to recall/simulate with an explicitly positive/negative cue are limited; instead, events are selected, as

they come to mind, in response to a myriad of cue types that are situation dependent. The type of cue used to elicit memories and simulations may impact both ease of generation and the type of events produced. For instance, Watson, Berntsen, Kuyken and Watkins (2013) have shown that involuntary memories, which by definition are not cued by the researcher, do not evidence the same overgenerality in depression. Therefore, it is important to investigate whether alternative cueing methodologies yield the same findings, with respect to overgenerality of past and future thinking, as are elicited by the traditional emotional cue-word methodology.

A further limitation of the cueing technique is that it often lacks the sensitivity to detect overgenerality within non-clinical participants; whilst some studies examining OGM in dysphoria have found similar relationships to those evidenced in clinical depression, others have not (Raes, Hermans, Williams, & Eelen, 2007). It has been argued that such samples may be able to overcome habitual tendencies towards overgenerality because of the detailed instructions, and repeated prompting, regarding the need for specific events. As a result, a number of authors have designed more sensitive measures of memory specificity for use within non-clinical samples; these tasks remove explicit specificity instructions and/or require participants to employ cognitive flexibility to alternate between specific and categoric retrieval (Debeer, Hermans, & Raes, 2009; Dritschel, Beltsos, & McClintock, 2014; Raes et al., 2007). Taken together these studies suggest that OGM could have a similar relationship with non-clinical levels of depressive symptomatology, and associated variables such as rumination, as has been found in clinical samples. Furthermore, these studies suggest that OGM can be elicited with methods other than the traditional emotional cue-word methodology.

However, to date, research exploring the relationship between depression and

overgeneral thinking, using alternative forms of assessing overgenerality, has primarily focused on memory retrieval. Two previous studies, both using an emotional cue-word methodology, suggest that depressed individuals do evidence overgeneral *future* thinking (Dickson & Bates, 2006; Williams et al., 1996). In contrast, recent work from our own lab, using different lifetime periods as retrieval/simulation cues, failed to evidence past or future overgenerality in dysphoria (Anderson & Evans, 2014). It is important to note that all three of these studies provided participants with explicit instructions to recall/simulate specific events. However, how an individual habitually considers the future is more likely to emerge when the assessment method is not presented in the form of a 'test' with explicit instructions guiding simulation towards specific events. Interestingly, research with high functioning autism suggests that deficits evidenced when using such explicit retrieval/simulation instructions do not emerge with tasks measuring spontaneous past and future specificity (Crane, Lind, & Bowler, 2013; Lind & Bowler, 2010; Lind, Williams, Bowler, & Peel, 2014). As yet, no studies have used methodologies without explicit retrieval/simulation instructions to explore spontaneous future thinking within depressed/dysphoric samples. This forms the key aim of the studies presented here.

Thus, the current studies investigate the suggestion that the overgenerality evidenced in depression represents a pervasive cognitive style that, extending beyond laboratory-based cueing tasks, affects how individuals spontaneously think about their personal past and future. One alternative measure of memory specificity, developed by Raes et al (2007), is the Sentence Completion for Events from the Past Test (SCEPT). Participants are provided with 11 sentence stems, each probing for thoughts relating to the past. The instructions tell participants to complete each sentence however they wish, provided that each sentence is on a different topic. When

compared with a traditional cue word paradigm the SCEPT demonstrated a significantly higher proportion of overgeneral responses, suggesting that levels of habitual overgenerality may be higher within non-clinical samples than research using the cueing paradigm has previously suggested. In order to examine the relationship between habitual patterns of thinking in the past and the future a further eleven sentence stems were developed to create the Sentence Completion for Events in the Future Test (SCEFT; Anderson & Dewhurst, 2009). In both cases the proportion of completed sentence stems that refer to specific events represents the level of specificity of past/future thought. These two measures are used in Experiment 1.

The notion that overgenerality is a habitual style of thinking in depression would lead us to hypothesize that dysphoric, compared with non-dysphoric controls, would be less specific when referring to both their personal past and future on the SCEPT and SCEFT tasks respectively. However, previous work exploring the relative nature, and functions, of past and future thought might lead us to hypothesise a more complex picture. Future thinking is naturally more abstract than past thought; fewer specific events are generated and, when they are, they are rated as less detailed (e.g. Anderson & Dewhurst, 2009; Anderson, Dewhurst, & Nash, 2012; Berntsen & Bohn, 2010; D'Argembeau & van der Linden, 2004). These differences may arise because future episodic simulation is more effortful than memory retrieval (e.g. Addis, Wong, & Schacter, 2007; D'Argembeau, Ortoleva, Jumentier, & Linden, 2010) and, as such, it is less cognitively demanding to consider the future in terms of overarching concepts, expectations and schemata (e.g. Addis & Schacter, 2008; Berntsen & Bohn, 2010; Rasmussen & Berntsen, 2013; D. C. Rubin, 2014). Thus, one considers specific future events only when required, such as for the purposes of future planning. Spontaneous future thought that is not directed towards any particular purpose or

function, as is arguably the case when completing the SCEPT and SCEFT, may promote particularly low levels of specificity in all participants. Thus, under such circumstances, we could hypothesise that no differences would emerge between the dysphoric and non-dysphoric participants with respect to specificity of their future thought.

Experiment 1

Method

Design & Participants. A mixed 2x2 design was employed. Temporal direction (past vs. future) was manipulated within-subjects, whilst mood group (dysphoric vs. control) between-subjects. All participants were undergraduate students who were recruited in exchange for course credits. In an unrelated study, conducted within our laboratory, we obtained measures of depressive symptoms and self-reported history/current treatment for mood related disorders (depression or anxiety); based upon these responses a selection of participants were invited to take part in the current investigation. Individuals who reported high levels of depressive symptomatology, irrespective of history/current treatment status, were selected as potential dysphoric participants. Individuals who reported low levels of depressive symptoms *and* reported no history/treatment of depression/anxiety were invited to participate as non-dysphoric controls.

Participants' depressive symptomatology was reassessed at the time of testing and, again, all individuals indicated whether they had a history, or were currently in receipt, of treatment for depression/anxiety. Participants who, at the time of testing, scored 16+ on the Centre for Epidemiological Studies Depression Scale (CES-D) and reported no current treatment for depression/anxiety were assigned to the dysphoric group. The resultant dysphoric group comprised 30 individuals (4 males), with a

mean age of 20.87 years (*SD* = 2.91). Participants who had a CES-D score <16 and no self-reported previous or current treatment for depression/anxiety were assigned to the non-dysphoric control group; this group comprised 31 participants (6 males), with a mean age of 20.29 (*SD* = 3.20). An independent samples *t*-test established a significant difference, $t(46.70) = 12.41$, $p < .001$, in CES-D scores between the dysphoric ($M = 25.20$, $SD = 6.28$) and control ($M = 8.74$, $SD = 3.70$).

Materials.

Centre for Epidemiological Studies Depression Scale (CES-D). The CES-D (Radloff, 1977) is a 20-item inventory assessing the presence of depressive symptoms over the past week. The CES-D was chosen because it was specifically designed to assess symptoms of depression in adult community samples; this is in contrast with other instruments, such as the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), that were designed to assess depression severity within clinical populations. Each of the items represents a potential indicator of depressive symptomatology, with participants asked to indicate the frequency of experience within the past week on a 4-point Likert scale. For example, *'I was bothered by things that usually don't bother me'* (*0 = rarely or none of the time, 3 = most or all of the time*). Scores range from 0 to 60, with higher scores indicating increasing severity of symptoms. Radloff (1977, 1991) suggested that a cut-off of 16+ is indicative of depression. A number of alternative cut-off scores have been suggested and used by various researchers; however, a cut-off of 16+ remains the most consistently used. The inventory has demonstrated strong internal consistency across a wide variety of psychiatric and community samples (e.g. Chabrol, Montovany, Choucha, & DuConge, 2002; Lewinsohn, Seeley, Roberts, & Allen, 1997).

Sentence Completion for Events from the Past Test (SCEPT). The SCEPT (Raes, et

al., 2007) is a sentence completion task probing for past experiences (e.g. ‘‘Last week I . . . ’’ and “When I think back to…”). Participants were presented with 11 sentence stems, with instructions to complete each sentence stem any way they wanted provided that each was on a different topic. The first author, who remained blind to the participants’ mood group status, coded all sentence completions into one of four categories: specific (referring to a particular place at a particular time, not lasting more than 1 day), categoric (referring to a category of events containing a number of specific episodes), extended (referring to one specific event lasting longer than 1 day), or a semantic associate (personal overgeneral semantic information). If a participant did not complete a sentence stem, an omission was recorded. A second rater coded responses from a randomly selected sample of 15 participants; inter-rater reliability was acceptable (Cohen’s Kappa = .88).

Sentence Completion for Events in the Future Test (SCEFT). The SCEFT (Anderson & Dewhurst, 2009) comprises 11 sentence stems that probe for possible future experiences (e.g. “Next week…” and “When I look forward to…”). Instructions were identical to those provided for the SCEPT and responses were coded into the same categories. A second rater coded responses from a randomly selected sample of 15 participants; inter-rater reliability was acceptable (Cohen’s Kappa = .89).

Procedure. Participants were tested in small groups of 4-6. Participants were provided with standardized instructions prior to each sentence completion task and, in each case, given a maximum of six minutes to complete as many stems as possible. The presentation of the SCEPT and SCEFT were counterbalanced across all participants, and followed by the CES-D.

Results

An initial 2x2 mixed ANOVA examined whether the number of omissions (where the sentence stem was left incomplete) differed as a function of mood group (control vs. dysphoric) and temporal direction (past vs. future). The mean number of omissions was 0.97 (*SD* = 1.49) and 0.70 (*SD* = 1.37) on the SCEPT, and 1.29 (*SD* = 1.71) and 0.77 (*SD* = 1.33) on the SCEFT, for the control and dysphoric groups respectively. No significant main or interaction effects emerged (*Fs* ≤ *.1.36, p*s ≥. 25, η_p^2s ≤ .02). This suggests that any subsequent differences between the two mood groups or tasks were not a function of motivational deficits.

The number of specific events, categoric events, extended events, and semantic associates were calculated as a proportion of the number of responses on each task (i.e. excluding omissions). The mean proportions for each response category across temporal direction and mood group are presented in Table 1.

A 2 (Mood Group) x 2 (Temporal Direction) mixed ANOVA examined the proportion of specific events generated. Significant main effect of temporal direction, $F(1,59) = 45.09$, $p<.001$, $\eta_p^2 = .43$, and mood group, $F(1,59) = 4.10$, $p = .047$, $\eta_p^2 = .07$, emerged; fewer specific events were generated in the future, compared with the past, task and by the dysphoric, compared with the control, participants. However, these significant main effects were further qualified by a significant interaction, $F(1,59) = 4.99$, $p = .03$, $\eta_p^2 = .08$. Bonferroni-adjusted pairwise comparisons revealed that whilst the dysphoric, compared with control, participants reported significantly fewer specific events in the past task ($p = .02$), no differences emerged between the two mood groups with respect to the future task ($p = .97$).

To establish whether differences in the proportion of specific events were the result of any one particular type of overgeneral thought, three further 2x2 mixed ANOVAs examined the proportion of categoric events, extended events and semantic

associates in turn. With respect to the proportion of categoric events, no significant main effects or interactions emerged (*Fs* ≤ *.1.92, p*s ≥. 17, η_p^2s ≤ .03). The analysis of semantic associates revealed a significant main effect of temporal direction, $F(1,59) = 25.30$, $p<.001$, $\eta_p^2 = .30$; a higher proportion of semantic associates were provided in response to future, compared with past, sentence stems. Neither the main effect of mood group, nor the interaction effect, was significant (*Fs* ≤ *.0.84, p*s ≥. 22, η_p^2s ≤ .03). Finally, with respect to the proportion of extended events, a significant main effect was evidenced for temporal direction, $F(1,59) = 7.14$, $p = .01$, $\eta_p^2 = .11$, but not mood group. $F(1,59) = .03$. $p = .86$, $\eta_p^2 = .001$. This was further qualified by a significant interaction effect, $F(1,59) = 4.19$, $p = .045$, $\eta_p^2 = .07$. Bonferroni-adjusted pairwise comparisons revealed that dysphoric, compared with the control, participants provided more extended events; however, this difference was evident in response to past-oriented ($p = .07$), but not future-oriented ($p = .25$), sentence stems.

Discussion

Experiment 1 assessed the specificity of spontaneous past and future thought in dysphoria; it made use of previously published sentence stem completion tasks (Anderson & Dewhurst, 2009; Raes et al., 2007) that were developed as alternatives to the commonly utilised cue word methodology. In line with previous literature using the SCEPT (Raes et al., 2007), dysphoric participants produced fewer specific responses than controls when considering their personal past. However, contrary to the prediction that overgenerality is a habitual style of thinking in depression, the same effect was not found in the future task; no significant difference emerged between the two mood groups with respect to specificity of future thought.

The current finding suggests that dysphoric individuals do not evidence overgenerality with respect to spontaneous future thought. This is contrary to the

previous literature using a word cueing paradigm (Dickson & Bates, 2006; Williams et al., 1996). As discussed within the introduction, evidence for overgenerality in depression has relied heavily on a single paradigm, whereby participants are instructed to recall/simulate specific events in response to emotional cue words. The current findings further highlight the need to move beyond this paradigm to assess the presence, and nature, of overgenerality in depression.

The discrepancy between our findings and the previous literature suggests that dysphoric individuals are not overgeneral when they spontaneously consider, rather than being explicitly cued to think about, their future. However, the extent to which we can draw conclusions about the relevance of this finding is limited because it is unclear which of the variations between the methodologies is responsible for the observed effect. It is possible that overgenerality is not evident in spontaneous future thought because participants are no longer receiving explicit instructions to be specific. Alternatively, it is feasible that the removal of emotional cues, as used in both previous studies evidencing overgenerality in future thought, is responsible. Experiment 2 was designed to differentiate between these two possibilities by incorporating positive and negative words within the sentence stems that probe for past and future thoughts. If Experiment 2 finds no evidence of overgenerality in future thought it would suggest that the removal of specificity instructions underlies the discrepancies; conversely, if an overgenerality bias emerges it would suggest that the removal of emotional cues is responsible.

Experiment 2

Method

Design & Participants. A 2x2x2 mixed design was employed, with temporal direction (past vs. future) and sentence stem valence (positive vs. negative)

manipulated within-subjects. Mood group (dysphoric vs. control) was manipulated between-subjects. Similar to Experiment 1, all participants were undergraduate students whose initial invitation to participate was based on depression inventory scores in unrelated studies. Identical inclusion criteria to Experiment 1 were employed for determining the two mood groups. 27 individuals (8 males), with a mean age of 20.70 years (*SD* = 1.87) met criteria for dysphoria. 26 participants (13 males), with a mean age of 20.12 (*SD* = 1.37) comprised the non-dysphoric control group. An independent samples *t*-test established a significant difference, $t(36.64) = 12.10$, $p < .001$, in CES-D scores between the dysphoric (*M* = 26.56, *SD* = 7.12) and non-dysphoric control (*M* = 8.27, *SD* = 3.24) groups.

Materials & Procedure. The procedure remained identical to that employed in Experiment 1, except that the SCEPT and SCEFT were adapted to include positively and negatively valenced words within the sentence stems. This created two new sentence completion tasks assessing past (E-SCEPT) and future emotional thoughts (E-SCEFT), each of which comprised twenty sentence stems.

To create these new sentence completion tasks twenty emotional adjectives were divided into four word lists; positive A, positive B, negative A and negative B (each list comprised five words). Using norms provided by Bradley and Lang (1999) the four lists did not differ with respect to emotional arousal (*F*s<1) or word frequency (*F*s<1). Furthermore, the two positive lists did not differ from each other with respect to emotional valence, nor did the two negative lists (*F*s<1). The emotional adjectives were embedded into sentence stems that probed past and future thought (e.g. '*In the past/future my biggest achievement….'* and *'Looking back/forward the loneliest…'*). The four word lists were fully counterbalanced across the past and future tasks. The sentence stems were carefully created to ensure that

each could be completed by referring to a specific event but could also, equally, be completed by referring to other types of events (i.e. categoric and extended) or more personal semantic information.

The first author, who remained blind to the participants' mood group status, coded all sentence completions into the same four categories as used in Experiment 1. A second rater coded responses from a randomly selected sample of 16 participants; inter-rater reliability was acceptable for both the E-SCEPT (Cohen's Kappa =.81) and E-SCEFT (Cohen's Kappa =.85).

Results

An initial 2x2x2 mixed ANOVA examined whether the number of omissions differed as a function of mood group (control vs. dysphoric), sentence stem valence (positive vs. negative) and temporal direction (past vs. future). Mean numbers of omissions were low across both control (Positive E-SCEPT, *M*=.07, SD=.27; Negative E-SCEPT *M* = .08, SD=.39; Positive E-SCEFT, *M* = .19, SD=.49; Positive E-SCEFT, M=.31, SD=.62) and dysphoric (Positive E-SCEPT, *M*=.18, SD=.40; Negative E-SCEPT *M* = .14, SD=.36; Positive E-SCEFT, *M* = .22, SD=.42; Positive E-SCEFT, M=.15, SD=.46) participants. A trend towards significance emerged for the Mood Group x Valence interaction, $F(1,51) = 3.06$, $p = .09$, $\eta_p^2 = .06$. Dysphoric participants failed to complete more positive, compared with negative, sentence stems, whilst control participants evidenced the reverse pattern. However, no significant difference emerged in any bonferroni adjusted pairwise comparisons (all $ps \geq .22$). All other main effects and interactions effects were not significant ($Fs \leq 2.43$, $ps \geq .13$, $\eta_p^2 s \leq .05$). The lack of any clear significant findings in the number of omissions suggests that any subsequent differences between the two mood groups or tasks were not a function of motivational deficits.

The mean proportions for each response category were calculated as in Experiment 1; they are presented as a function of mood group, sentence stem valence and temporal direction in Table 2.

A 2 (mood group) x 2 (sentence valence) x 2 (temporal direction) mixed ANOVA examined the proportion of specific events generated. A significant main effect of mood group emerged, $F(1,51) = 10.38$, $p = .002$, $\eta_p^2 = .17$; dysphoric, compared with control, participants reported fewer specific events. A significant main effect of temporal direction also emerged, $F(1,51)=29.27$, $p < .001$, $\eta_p^2=.37$; fewer specific events were generated in the future, compared with the past, task. In contrast to Experiment 1, the Mood Group x Temporal Direction was not significant, $F(1,51) = 0.33$, $p = .57$, $\eta_p^2=.01$. Dysphoric, compared with control, participants were less specific in their responses in both past and future tasks. All other main and interaction effects were not significant ($Fs \leq .2.17$, $ps \geq .15$, $\eta_p^2s \leq .04$).

To explore whether the lower level of specific responses evidenced in the dysphoric group was the result of any one particular type of overgeneral response, three further 2x2x2 ANOVAS were conducted. Across all three ANOVAs the main effect of mood group was not significant ($Fs \leq .2.02$, $ps \geq .16$, $\eta_p^2s \leq .04$). Furthermore, all mood group x temporal direction, mood group x valence and the three-way interaction effects were all not significant ($Fs \leq .2.05$, $ps \geq .16$, $\eta_p^2s \leq .04$). The only significant effects to emerge related to temporal direction and sentence stem valence. With respect to categoric events, the main effect of valence was significant, $F(1,51) = 5.36$, $p = .03$, $\eta_p^2 = .10$, whilst the main effect of temporal direction approached significant, $F(1,51)=3.23$, $p = .08$, $\eta_p^2 = .06$; these main effects were qualified by a significant valence x temporal direction interaction, $F(1,51) = 6.85$, $p = .01$, $\eta_p^2=.12$. Bonferroni-adjusted pairwise comparisons revealed that a higher

proportion of categoric responses were provided in response to negative, compared with positive, sentence stems; however, this effect was only evidence within the future (p = .76), but not the past (p = .001), task. With respect to extended events, main effects of temporal direction, $F(1.51)= 15.51$, $p <.001$, $\eta_p^2= .23$, and valence, $F(1,51) = 5.67$, $p = .02$, $\eta_p^2=.10$, were evident. Extended events were provided more frequently in completion of future, compared with past, sentence stems. Furthermore, they were provided more frequently in response to positive, compared with negative, sentence stems.

Discussion

Experiment 2 investigated the specificity of past and future thought using a modified sentence stem completion procedure, whereby emotional words formed part of each sentence stem. In contrast to Experiment 1, we found that dysphoric, compared with control, participants exhibited reduced specificity for both spontaneously generated past and future thought. In Experiment 1 reduced specificity only emerged when dysphoric individuals considered their personal past. Thus, these findings lend support to our argument that the nature of the cues, rather than the absence of instructions to be specific, underlies the findings of Experiment 1. Specifically, when sentence stems include emotional words, dysphoria is associated with reduced specificity in both past and future thought.

General Discussion

Previous work, using a word cueing paradigm, has evidenced reduced specificity of future thought in depression and dysphoria (Dickson & Bates, 2006; Williams et al., 1996). The current findings, using sentence stem completion tasks, found overgenerality of future thought in dysphoria; however, the bias was only evident when sentence stems included emotional words. To date, therefore, the

majority of work that has evidenced overgenerality of future thought in depression has involved emotional cues, either as explicit or implicit cues for simulation. Conversely, research examining memory biases suggests that the relationship between overgenerality and depression is more pervasive; research using a variety of assessment methods, including the findings reported here, have evidenced overgenerality (e.g. Dritschel et al., 2014; Raes et al., 2007).

Our findings, therefore, suggest that biases found within memory processes are not always mirrored within future-oriented thought. Support for this notion can be drawn from Dalgleish, Hill, Golden, Morant and Dunn's (2011) investigation of past and future life stories in depression. Participants were asked to generate, and attribute positive/negative adjectives to, themes/chapters within their personal life story. Depressed individuals attributed more negative, and fewer positive, attributes to past, but not future, life chapters. Thus, the depressogenic structuring that is evident when thinking about their personal past was not evident when they considered their future life story. Therefore, taken together, it appears that the depressive biases in future thought are more subtle than those evidenced in memory recall. In order to fully elucidate on these subtle deficits we, therefore, need to ensure that methodologies are suitably sensitive; measures such as the E-SCEFT, rather than the original SCEFT, appear to be more sensitive to future-oriented biases in dysphoria/depression.

With regards to the current investigation, we must consider why differences emerged between past and future overgenerality and, in particular, why dysphoric participants only evidence overgenerality of future thought under certain parameters. As discussed in the introduction, it has been proposed that past and future thought serve different functions (e.g. Berntsen & Bohn, 2010; Rasmussen & Berntsen, 2013); furthermore, whilst they both make use of the same autobiographical knowledge base,

they may do so in subtly different ways (e.g. Addis et al., 2007; Anderson et al., 2012; D'Argembeau et al., 2010). We propose that it is these differences between past and future thinking that lead to the findings presented here.

As discussed within the introduction, Williams' (2006) CarFAX model suggests that OGM arises due to one, or a combination, of three processes; cognitive avoidance, reduced executive resources and rumination. Thus, whilst OGM might arise as a function of avoiding negative affect, it is maintained by ruminative processes and/or limited executive resources; as a result it becomes a habitual cognitive style and deficits in specificity tend to pervade across all aspects of past thought. Our findings are in line with this model.

However, as discussed within the introduction, previous research has shown that future thinking is, naturally, less specific than past thought (e.g. Anderson & Dewhurst, 2009; Anderson et al., 2012; Berntsen & Bohn, 2010; D'Argembeau & van der Linden, 2004). This reduced specificity, arguably, serves a functional purpose. Considering specific events, both in the past and future, is considered useful because it allows one to analyse past mistakes and plan future actions (e.g. Szpunar, 2010); however, research has shown that it is more complex and effortful to think about specific future, compared with past, events (e.g. Addis et al., 2007; D'Argembeau et al., 2010). The array of possible future events is limitless, yet the number of past events is finite; if an individual consistently thought about their future at the level of specific events then they would, arguably, overload limited cognitive resources. Moreover, consistently considering our personal future at the level of specific events is, potentially, unnecessary; previous research suggests that we tend to consider the future in terms of overarching concepts, timelines and categories of events (e.g. Berntsen & Bohn, 2010; D. C. Rubin, 2014). Thus, it is likely that we, only when

required for the purposes of future planning, extend these general thoughts to specific event simulations. Thus, our natural tendency with respect to future thought is *not* to be specific unless the situation requires us to be. Thus, in a task that assesses spontaneous future thought the tendency, across all participants, is to lean towards general, rather than specific, responses. This is evidenced in Experiment 1 where only 17% of responses were specific in the future task; this figure was identical across both mood groups and is in line with data reported in previous work using the SCEFT (Anderson & Dewhurst, 2009).

We argue that depressed and dysphoric participants experience difficulties when circumstances require them to move away from thinking about their future in terms of overarching concepts, timelines and categories of events. Reduced executive resources and/or ruminative processes make it more difficult for them, compared to their non-depressed counterparts, to overcome the general tendency towards non-specificity of future thought. Cueing methodologies explicitly express this need for specificity, hence why previous studies using this methodology evidenced depressive overgenerality in future thought (e.g. Dickson & Bates, 2006; Williams et al., 1996). However, other aspects of a task could cue the need for specificity implicitly; with respect to the E-SCEFT, we suggest that the emotional words form this implicit cue. In Experiment 2 the dysphoric participants produced a similar proportion of specific responses to those evidenced in Experiment 1 (16% and 18% for positive and negative sentence stems respectively), yet the proportion of specific response provided by control participants' almost doubled (30% and 35% for positive and negative sentence stems respectively). Therefore, it was not the case that dysphoric participants produce fewer specific responses in the emotional tasks per se, but rather that the presence of emotional cues within the sentence stems seems to encourage

non-dysphoric participants to be more specific about their personal future.

Recent research has suggested that goals form an overarching structure that organises and guides our future thoughts (D'Argembeau & Demblon, 2012; D'Argembeau & Mathy, 2011; Demblon & D'Argembeau, 2014). Furthermore, emotions and goals are intrinsically linked. Theories of emotion posit that positive emotions are linked to approach goals and represent desired states signifying achievement of, or progress towards, a goal. Conversely, negative emotions are linked to avoidance goals and represent undesired states that motivate action (Elliot, Eder, & Harmon-Jones, 2013). Thus, we posit that the emotional words within the E-SCEFT activate goal hierarchies and, as a result, individuals are motivated to think about specific events that would represent achievement of these goals. However, for the reasons previously discussed, this task is more difficult for depressed participants and, as a result, they evidence overgenerality on this task. These ideas are supported by recent work suggesting that depressed individual are able to generate similar numbers of goals as their non-depressed counterparts, yet the goals they produce are less specific and perceived to be less obtainable (Dickson & Moberly, 2013; Dickson, Moberly, & Kinderman, 2011). Future research could explore a number of tenets of this goal-based explanation. For instance, it would predict that explicitly goal-related sentence stems would lead to a similar pattern of overgenerality as emotional word stems. Furthermore, emotional words would activate higher levels of goal-related thinking in non-depressed, compared with depressed/dysphoric, individuals.

It is of interest to note that when overgenerality was evidenced it did not occur as a function of an increased reporting of categoric events, as is generally evidenced in event cueing tasks. In Experiment 1 the overgenerality was due to the dysphoric participants reporting more extended events in relation to the past. In Experiment 2,

no one type of general event emerged as more prominent within the responses provided by dysphoric participants. This anomaly may reflect the difference in instructions between the present studies and the cueing tasks used in previous studies, whereby the current studies did not ask participants to actively search for a specific event. In the cueing task participants make their best effort to search through the hierarchy to retrieve/simulate specific episodic information but, as is seen in depression, often stop short and instead retrieve a summary of repeated events. However, in the current tasks they are not forced to begin the effortful search process and respond at whichever level of the hierarchy naturally comes to mind.

The findings presented here raise important issues regarding the methods used to assess overgenerality of thought within depression. In particular, they reiterate the importance of using a wide range of assessment techniques, rather than relying on the commonly used word cueing paradigm. Furthermore, they further highlight that memory biases within depression are not necessarily mirrored in future thought; future work must continue to use a wider range of assessment techniques to fully elucidate on the conditions under which future thinking biases are, and are not, evident. It also needs to consider how this overgenerality of future thought may relate to the development and maintenance of both clinical and non-clinical levels of depression. Finally, whilst we have speculated on the potential mechanisms underlying future thinking biases, further research is required to fully establish the validity of these proposed mechanisms.

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Table 1.

Mean proportions of different response categories as a function of temporal direction and mood group (SDs in parentheses)

	Control (n=31)		**Dysphoric** (n=30)	
	Past	*Future*	*Past*	*Future*
Specific Events	.41 (.11)	.17 (.11)	.29 (.19)	.17 (.10)
Categoric Events	.20 (.15)	.20 (.11)	.29 (.19)	.19 (.13)
Extended Events	.29 (.15)	.43 (.18)	.35 (.14)	.37 (.19)
Semantic Associates	.12 (.10)	.21 (.20)	.12 (.11)	.28 (.19)

Table 2.

Mean proportions of different response categories as a function of temporal direction, sentence valence, and mood group (SDs in parentheses)

		Control (n=26)		***Dysphoric*** (n=27)	
		Past	*Future*	*Past*	*Future*
Specific	*Positive*	.50 (.28)	.30 (.21)	.42 (.22)	.16 (.18)
Events	*Negative*	.49 (.28)	.35 (.28)	.34 (.24)	.18 (.18)
Categoric	*Positive*	.29 (.29)	.28 (.21)	.37 (.22)	.37 (.19)
Events	*Negative*	.37 (.23)	.44 (.21)	.32 (.25)	.49 (.24)
Extended	*Positive*	.11 (.17)	.30 (.23)	.18 (.19)	.28 (.21)
Events	*Negative*	.10 (.14)	.15 (.16)	.14 (.19)	.24 (.21)
Semantic	*Positive*	.03 (.09)	.03 (.09)	.03 (.08)	.02 (.07)
Associates	*Negative*	.01 (.04)	.01 (.04)	.04 (.09)	.04 (.08)