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Attentional Bias to Reminders of the Deceased as Compared With a Living Attachment in Grieving

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ABSTRACT

BACKGROUND: Grieving individuals demonstrate attentional bias toward reminders of the deceased versus neutral stimuli. We sought to assess bias toward reminders of the deceased versus a living attachment figure and to evaluate similarities and differences in the neural correlates of deceased- and living-related attention. We also sought to identify grief process variables associated with deceased-related attentional bias.

METHODS: Twenty-five subjects grieving the death of a first-degree relative or partner within 14 months performed an emotional Stroop task, using words related to a deceased or a living attachment figure, and a standard Stroop task, to identify general selective attention, during functional magnetic resonance imaging. Subjects rated word sadness, complicated grief symptoms, depression severity, attachment style, emotional pain, nonacceptance, yearning, and intrusions.

RESULTS: We identified an attentional bias to deceased-related versus living-related words, independent of age, depression severity/history, loss type, word sadness, medication use, and time since loss. Attentional bias correlated with complicated grief severity and intrusive thinking. A conjunction analysis identified joint activation in the fusiform gyrus, posterior cingulate, and temporal parietal junction across living- and deceased-related attention versus general selective attention. Insecure-avoidant attachment style correlated with decreased engagement of this network in deceased-related attention.

CONCLUSIONS: We have demonstrated an attentional bias to reminders of the deceased versus a living attachment in grieving. Overlapping neural circuits related to living- and deceased-related attention suggest that the bereaved employ similar processes in attending to the deceased as they do in attending to the living. Deceased-related attentional bias appears to be linked primarily to intrusive thinking about the loss.

Keywords: Attachment, Attention bias, Complicated grief, Fusiform, Grieving, Intrusive thinking

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During the first year following the loss of a loved one, reminders of the deceased occupy attention and provoke thinking about the loss (1). This salience has been operationalized as attentional bias, the unintentional and disproportionate allocation of attention to reminders of the deceased versus neutral stimuli, and related to the pathological grief response known as complicated grief (CG) (2–5).

It remains unclear if attentional bias to reminders of the deceased versus neutral stimuli reflects a bias to the deceased specifically or a more general process of emotional attachment seeking. Close attachment relationships evoke attention regardless of whether the individuals are living or deceased (6,7). Attentional biasing toward attachment reminders may also reflect attention toward the predominant emotions related to that attachment (8), such as sadness in the case of grieving. We therefore sought to demonstrate a bias to reminders of the deceased as compared with a living attachment and to demonstrate the independence of this bias from sadness evoked by reminders of the deceased and living attachments.

Prior studies have correlated attentional bias to CG (3,5). However, CG is an amalgam of cognitive, emotional, and functional processes related to grieving (9). Intrusive thinking, nonacceptance, yearning, and emotional pain are all core components of CG (10). People who do not accept the loss, lack control over the contents of their mind, or are overcome with pain or yearning may all demonstrate greater bias to the deceased. It is unknown which, if any, of these components demonstrates a specific relationship with attentional bias. For this reason, we tested the role of all four grief process variables, as well as CG, in attentional bias.

We next sought to determine the degree of similarity or difference in the processes underlying attention to the deceased and to a living attachment. Freud's grief work hypothesis states that the bereaved must sever their connections with the deceased during grieving in a process of decathexis that is unique to loss and grieving (11). By contrast, the attachment theory of grieving suggests that the bereaved reform and restructure their relationship with the deceased so that it may continue to exist in the postdeath reality (12–17). Accordingly, a relationship with the deceased may be maintained in much the same way that a relationship with a living attachment exists (15). This latter perspective would imply

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greater similarity between attention to the deceased and attention to living attachments.

Prior functional magnetic resonance imaging (fMRI) studies have shown increased rostral anterior cingulate and orbital frontal cortex engagement in deceased versus neutral attention in bereaved versus nonbereaved subjects, as well as altered frontal-limbic connectivity related to intrusive thinking in grieving (2,4). These findings suggest unique neural substrates for deceased-related attention. However, the comparison of neural activity across the deceased and neutral conditions may correspond to processing emotional attachments in general. It remains unclear if the bereaved would process living and deceased attachments in a similar or different way. Therefore, we used fMRI to evaluate common or separate neural circuitry underlying deceased-related versus living-related attention. The continuing bonds model, as compared with decathexis, has gained significantly greater research greater support (12–17). We therefore expected to find greater similarity rather than difference in neural correlates of living- and deceased-related attention.

We administered an emotional (8) and cognitive (18) Stroop task during fMRI to grieving subjects. The emotional conditions comprised deceased-related words and living-related words. The emotional Stroop task measures attentional bias to reminders of the deceased because it pits task instructions (i.e., respond as fast as possible) against the tendency to focus on reminders of the deceased or living attachment, which would slow reaction time (RT). It is therefore more likely to tap into control impairments characteristic of CG. The cognitive Stroop task allows for the comparison between neural activity associated with attachment-related attention in the deceased and living-related conditions and general selective attention.

METHODS AND MATERIALS

Subjects

We recruited 25 people bereaved of a first-degree relative or partner within the past 3 to 14 months. Subjects were between 18 and 65 years of age, had normal color vision, and spoke English as a first language. Subjects were recruited as part of a broader study of suicide bereavement. Recruitment was done through social media websites and contacting people listed as relatives in obituaries. Nineteen of these 25 people were bereaved of a loss by suicide while the others were bereaved of a nonsuicide death. While time since loss ranged from 3 to 14 months, no subjects were interviewed or scanned during the 12th month. This was done to avoid anniversary reactions.

All subjects were medically healthy as determined by medical history, examination, and standard blood and urine tests. Exclusion criteria were manic episode within the past year, current substance use disorder (i.e., met criteria within past 6 months), current obsessive-compulsive disorder, lifetime schizophrenia or schizoaffective disorder assessed with the Structured Clinical Interview for DSM-IV Axis I Disorders (19). Psychiatric medication use was required to be stable for 2 weeks prior to scanning. The New York State Psychiatric Institute Institutional Review Board approved this study and all subjects gave written informed consent.

Procedure

Subjects underwent a prescan interview, an MRI scan, and then a postscan interview. Both interviews always occurred within 1 week of the scan. During the prescan interview subjects presented a living person with whom they had a similar relationship as they did with the deceased. Subjects provided 15 deceased and 15 living-related words. Word valence was rated as follows: 1 (very sad), 2 (sad), 3 (neutral), 4 (happy), and 5 (very happy). To produce a sadness rating, emotion ratings were recoded as follows: 4 or 5 = 0, 3 = 1, 2 = 2, and 1 = 3. During the postscan interview subjects completed all structured interviews and questionnaires.

Measures

CG severity was measured with the Inventory of Complicated Grief (ICG) (Cronbach's α = .85) (1,20), which consists of 19 Likert-type items measuring frequency of complicated grief symptoms on a scale of 0 (never) to 4 (always). Yearning was measured by a single item asking subjects how much they yearn for their loss on a scale of 1 to 10, with 10 being the most (4,21). Emotional pain and nonacceptance were measured through the emotional pain and nonacceptance factors of the Texas Revised Inventory of Grief (emotional pain: α = .75; nonacceptance: α = .75) (22). Intrusive thinking was measured with the intrusion subscale of the Impact of Event Scale–Revised (α = .74) (23). The Impact of Event Scale–Revised is a 21-item scale measuring distress related to symptoms of posttraumatic stress in the past seven days on a scale of 0 = Not at all to 4 = Extremely. Depression severity was measured with the Center for Epidemiologic Studies Depression short scale (α = .83) (24) and the Beck Depression Inventory (α = .83) (25). Avoidant attachment style was measured with the avoidant-attachment subscale of the Adult Attachment Scale (26), on which higher scores (0–7) indicate more avoidant attachment. This scale was introduced after the start of the study and only completed by 17 subjects. The total count of major depressive episodes was determined as part of the Structured Clinical Interview for DSM-IV Axis I Disorders interview. Psychiatric medication use was coded as a binary variable indicating the presence or absence of current medication use.

Stroop Task

During the scan, subjects completed four runs of a cognitive and emotional Stroop task. Each run consisted of four blocks of words: deceased, living, congruent, and incongruent. The design for the Stroop task is presented in Figure 1. In all blocks, subjects were presented with words and instructed to identify the color of the word font as fast as possible using a right hand–held button box. Training was conducted until subjects reached 100% accuracy and speed of color-button pressing dropped to under 1 second for 10 consecutive practice trials. All 15 words were presented for 1.5 seconds and followed by a randomly jittered fixation cross averaging 2 seconds. A 10-second fixation cross was presented in between each block. Word presentation and color pairings were randomized within a block and block order was permuted across runs.