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Perfectionism, Mood, and Memory For Positive, Negative, and Perfectionistic Content

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ABSTRACT - The current study examined how negative and positive mood influence the recognition memory of people with varying levels of perfectionism. An experiment was conducted in which 314 students were assigned randomly to either a positive, negative, or neutral mood induction condition. Participants completed measures of perfectionism cognitions and trait perfectionism and were tested for their ability to accurately recognize and remember previously presented words that varied in type of content (i.e., positive, negative, neutral, or perfectionism-related words). Analyses revealed that while in a negative mood state, participants high in the cognitive salience of perfectionism (as reflected by the experience of automatic thoughts) and participants high in socially prescribed perfectionism had enhanced recognition memory for negative words. The results suggest that certain perfectionists are cognitively predisposed to process negative information that will highlight discrepancies from perfectionistic standards and ideals. The cognitive processes and structures involved in perfectionism are discussed.

Extensive research over the past 25 years has examined the effects of mood on memory. Much of this work has been guided by Bower's (1981) affect-cognition congruency hypothesis. According to Bower (1981), when people experience a

specific mood state, the corresponding emotion node is activated in the associative memory network, and cognitions associated with the emotion node became more accessible. Thus, a positive mood facilitates recall of positive cognitions and related memories, while a negative mood state facilitates the recall of negative cognitions and related memories. Overall, extensive research by various authors (e.g., Isen, Shalker, Clark, & Karp, 1978; Natale & Hantas, 1982) has provided extensive evidence of the hypothesized mood congruency effect (for reviews, see Forgas, 1995, 2000). However, it is also important to note that the expected mood congruency effect has not always been obtained (e.g., Erber & Erber, 1994; Sedikides, 1994).

Related research on mood and memory has examined the accuracy of cognitive processing and related judgments when people are in a positive versus negative mood state. Collectively, these studies indicate that a sad mood state yields a deliberative and more pain-staking information processing style while a happy mood state contributes to a more global, less analytical approach that often involves relying on cognitive "shortcuts" (Ambady & Gray, 2002; Forgas, 1998; Forgas & Bower, 1987; Schwarz, Bless, & Bohner, 1991). Additional research by Schwarz (1990) and his colleagues has focused on the role of positive versus negative mood as informational cues that influence subsequent judgments about the self and other people (for a review, see Schwarz & Clore, 2003).

The premise of the current paper is that the differences in cognition and information processing style that accompany the experience of positive versus negative mood states have important implications for the cognitive operations and memory performance of perfectionists. This premise is in keeping with a growing body of research that has linked personality and individual difference factors with cognitive processes (e.g., McFarland & Buehler, 1998; Smith & Petty, 1995; Tafarodi, Marshall, & Milne, 2003). The possibility that there are mood-related cognitive biases in the memory of perfectionists is suggested by recent research on cognitive rumination in perfectionism. This research and the theoretical reasoning for the current investigation are outlined below.

Most existing research on perfectionism has focused on the nature and correlates of trait perfectionism as a multidimensional personality construct. Research has established that the perfectionism construct consists of several dimensions that reflect personal and interpersonal concerns. For example, Frost and associates constructed their Multidimensional Perfectionism Scale (Frost, Marten, Lahart, & Rosenblate, 1990) to assess six components of perfectionism. This scale assesses the personal aspects of perfectionism (i.e., personal standards, concern over mistakes, doubts about actions, organization) and the familial aspects of perfectionism (i.e.,

unrealistic parental expectations and parental criticisms). Frost and associates (Frost et al., 1990; Frost, Heimberg, Holt, Mattia, & Neubauer, 1993) have shown that the concern over mistakes subscale is the element of the Frost scale that is linked most consistently with symptoms of depression.

At the same time, Hewitt and Flett (1991) developed another measure of perfectionism also known as the Multidimensional Perfectionism Scale. This scale assesses three dimensions of perfectionism— self-oriented, other-oriented, and socially prescribed perfectionism. Whereas self-oriented perfectionism entails a striving for personal standards of perfection, other-oriented perfectionism involves a focus on the capabilities of others. The third dimension of perfectionism — socially prescribed perfectionism — is the component of perfectionism that is related most consistently to maladjustment. Socially prescribed perfectionism is a stable trait that is based on the perception that others have unrealistic standards and perfectionistic motives for one's own behaviours and that others will be satisfied only when these standards are attained. Socially prescribed perfectionism is associated with health problems (Martin, Flett, Hewitt, Krames, & Szantos, 1996; Molnar, Reker, Culp, Sadava, & DeCourville, 2006) and a wide variety of psychological problems, including depression, anxiety, suicidal tendencies, and personality disorders (Flett, Hewitt, Blankstein, & Mosher, 1995; Flett, Hewitt, Endler, & Tassone, 1994; Frost et al., 1993; Hewitt & Flett, 1991, 1993; Hewitt, Flett, & Endler, 1995; Martin et al., 1996). The link between socially prescribed perfectionism and psychological distress has also been established when familiar others provide ratings of socially prescribed perfectionism and depression (Flett, Besser, & Hewitt, 2005).

Flett, Hewitt, Blankstein, and Gray (1998) advanced the perfectionism literature by demonstrating that in addition to the trait dimensions, the perfectionism construct also has a cognitive element in the form of salient individual differences in automatic thoughts reflecting the perfectionism theme. Flett et al. (1998) suggested that automatic thoughts involving the need to be perfect are experienced when perfectionists sense a discrepancy between their actual self and the ideal self, or between their actual level of goal attainment and their exceptionally high ideals (see Flett et al., 1998). It is believed that perfectionists with high levels of perfectionism cognitions are especially susceptible to distress because of a failure to attain perfection in the past, as well as distress about the likelihood of failing to attain perfection in the future.

Flett et al. (1998) measured automatic thoughts reflecting perfectionism with a scale known as the Perfectionism Cognitions Inventory (PCI). How does the PCI differ from other existing measures of perfectionism? As noted above, current measures of perfectionism (e.g., Frost et al., 1990; Hewitt & Flett, 1991, 2004) were

designed to assess enduring trait dispositions. For instance, the Multidimensional Perfectionism Scale (Hewitt & Flett, 1991, 2004) assesses trait perfectionism directed generally at the self (i.e., self-oriented and socially prescribed perfectionism) or at others (i.e., other-oriented perfectionism). In contrast, the PCI has been described as a measure that assesses perfectionism "… from a unique cognitive perspective" (Enns, Cox, & & Pidlubny 2002, p. 50). The PCI focuses on the frequency of recent thoughts involving themes of perfection and imperfection. Although the experience of these automatic thoughts can vary in a state-like manner as a function of current concerns and experiences, research indicates that scores on the PCI are relatively stable over time and do indeed reflect personality processes. This suggests that many perfectionists have chronic activation of these thoughts.

Individual differences in automatic thoughts related to perfectionism are a central focus of the current investigation. Research on this construct must be extended to include a focus on the cognitive processes associated with perfectionism. Until now, perfectionism research has been focused almost exclusively on perfectionism as a trait that people have, and the emphasis has been on the antecedents, correlates, and consequences of trait perfectionism. However, we know from the seminal writings of Allport (1937) and Cantor (1990), among others, that it is important to have a balanced approach that includes an emphasis on what people *actively do* on an ongoing basis in terms of their cognitive processes and mechanisms. As noted by Cantor (1990), the emphasis here is on the mechanisms that maintain and strengthen individual differences.

A central premise of the current study is that people who tend to experience frequent automatic thoughts involving perfectionistic themes are cognitively attuned to perfection and the mental aspects associated with trying to be perfect; the attainment of perfection or failing to attain perfection is very salient at a cognitive level for these individuals and perfectionistic thoughts are high in cognitive availability and accessibility. The main hypothesis of the current study is that these perfectionistic individuals have a memory bias that favors the processing and memory of negative information. For these people, the experience of a negative mood state is a signal that things (and perhaps the self) are not perfect and improvements need to be made. These individuals will be highly sensitive and particularly attentive to negative cues in their environment that further augment the sense that perfection has not been attained or there is a possibility of making mistakes in the future. That is, a negative mood state represents a sign of not "measuring up," and perfectionists in a negative mood state will pay close attention to other possible signs that thing are amiss. This tendency was observed by Burns (1980) in his work on the cognitive-behavioral aspects of perfectionism. Specifically,

he warned perfectionists that, "In your perfectionism you are undoubtedly great at focusing on all the ways you fall short. You have the bad habit of picking out things you haven't done and ignoring those you have. You spend your life cataloging every mistake and shortcoming" (Burns, 1980, p. 325-326).

The theoretical impetus for this study can be traced back to Hewitt and Genest (1990), who postulated an ideal self schema that is involved directly in the processing of perfectionistic content. That is, they introduced the notion that the ideal self has an element of cognitive processing associated with it, and the ideal self tends to function as a self-schema that facilitates the role of perfectionistic content. According to Hewitt and Genest (1990), the ideal self is especially likely to encode and process information that indicates that perfection has not been obtained. Their subsequent results confirmed this prediction.

An association among perfectionistic tendencies, negative mood, and enhanced memory for negative information would be expected on the basis of Beck's cognitive model of depression. This model links a negative self-schema with dysfunctional attitudes (including attitudes about the need to be perfect) and enhanced information processing and memory performance for negative self-relevant information (see Beck, 1967; Brown & Beck, 2002). As noted earlier, previous research with a variety of samples has shown that being induced into a negative mood is associated with enhanced memory for negative content, while being induced a positive mood is associated with enhanced memory for positive content. This general tendency for negative moods to be associated with memory for negative information should be exacerbated among high PCI scorers who are highly attuned to information which suggests that perfection is not being attained. Given that negative moods do indeed represent an important source of information (Schwarz & Clore, 2003), the negative mood induction should serve to arouse concerns about imperfections in the self because one byproduct of being induced into a negative mood is that it tends to lower self-evaluations, while a positive mood state increases feelings of self-efficacy (Brown & Mankowski, 1993; Kavanagh & Bower, 1985).

In addition to being highly attentive to negative information, people who experience frequent perfectionism-related automatic thoughts while in a negative mood state should also reflect continually on perfectionistic standards and goals, and they will also be attentive and showed enhanced memory for information cues that represent the perfection that is so desired and is pursued in a driven manner. The notion that perfectionistic people should have a memory bias for perfectionistic content is not surprising given that people have memory biases for personally meaningful content (see Williams, Mathews, & McLeod, 1996). Accordingly, the second hypothesis tested in our study was that people high in the frequency of

perfectionism cognitions would be characterized by elevated memory for perfectionistic content following a negative mood induction. Classic theorists such as Adler (1956) and Horney (1950) have suggested that people became more perfectionistic and focused on the attainment of perfectionism when they have been made to feel inferior and defensive. We also tested the possibility that this tendency to recall perfectionistic information is more general and is also evident when experiencing positive moods.

At this point, it should be noted that existing research on perfectionism and cognitive information processing is virtually nonexistent. However, some evidence supports the notion that that perfectionism involves related differences in cognition and memory. Socially prescribed perfectionism has been linked with deficits in prospective memory (Cuttler & Graf, 2007). Other experiments with the Stroop task have shown that trait perfectionism is associated with cognitive responses to threat stimuli (Lundh, & Öst, 1996, 2001) while another investigation of the state aspects of perfectionism used a verbal priming to show changes in perfectionistic thinking in response to socially evaluative cues (Saboonchi & Lundh, 1999). An investigation by Alloy and associates showed that cognitively vulnerable students, as determined by a depressive attributional styles and dysfunctional attitudes, were characterized by a negative memory bias (Alloy, Abramson, Murray, Whitehouse, & Hogan, 1997). This study is relevant to perfectionism because the dysfunctional attitudes construct includes dysfunctional attitudes about the need to be perfect (Brown & Beck, 2002). However, the Alloy et al. study did not include a manipulation of mood state and they focused on cognitive vulnerability in general so they did not distinguish between attributional style and dysfunctional attitudes.

A Role For Trait Perfectionism?

Although our primary focus was on individual differences in perfectionism cognitions, we also assessed trait perfectionism with the MPS (Hewitt & Flett, 1991, 2004). This measure was included for comparative purposes but also to test for possible differences related to socially prescribed perfectionism (SPP). As indicated above, socially prescribed perfectionism is linked consistently with psychological distress. There are several aspects of socially prescribed perfectionism that could promote enhanced recognition of negative stimuli when in a negative mood state. First, people with high socially prescribed perfectionism may be chronically high in negative mood states due to the inherent helplessness and hopelessness of trying to live up to impossibly high expectations, and their desire to please others who are very difficult to please (for a related discussion, see Hewitt, Flett, Sherry, & Caelien, 2006). Accordingly, it is quite plausible that people high in socially prescribed

perfectionism are essentially "on alert" and, as part of their distressed state, they are hypervigilant for negative information that they are not living up to expectations.

Second, socially prescribed perfectionism involves a sense of self that is highly contingent on the approval of others and, as a result, people with high levels of socially prescribed perfectionism tend to have low self-esteem and low unconditional self-acceptance (see Flett, Besser, Davis, & Hewitt, 2003; Hewitt & Flett, 1991). Work by Baldwin and his colleagues has demonstrated the link between low self-esteem and the cognitive processes associated with holding a contingent sense of self (see Baldwin, Baccus, & Fitzsimons, 2004; Baldwin & Sinclair, 1996). According to Baldwin et al. (2004), failure experiences for low self-esteem individuals prime a node or schema reflecting social rejection. In the current study, the experience of a negative mood state by socially prescribed perfectionists could activate a similar schema or construct that involves failing to live up to impossibly high expectations. If so, this ought to be reflected by greater attentiveness to negative stimuli. Accordingly, we also evaluated the hypothesis that socially prescribed perfectionism would interact with the mood induction and result in enhanced recognition memory for negative words.

Hypotheses of the Current Investigation

As noted above, the current study focused on the following hypotheses related to the associations between SPP and PCI and memory performance for negative and perfectionism-related word contents under induced negative mood state: both people with high levels of naturally occurring perfectionism cognitions (high PCI scores) as well as people with high SPP scores in a negative mood state will have enhanced memory for negative and for perfectionistic word content. Although PCI and SPP are expected to be correlated, it was hypothesized that these predicted effects would still be evident after taking into account the overlap between perfectionism cognitions and socially prescribed perfectionism.

The hypotheses were evaluated in an experiment in which participants varying in levels of perfectionism were induced into a positive, negative, or neutral mood. They then performed a task that tapped recognition memory for words that were positive, negative, neutral, or perfectionistic in their content.

Method

Participants

A sample of 314 Israeli undergraduates (166 women, 148 men) volunteered to participate in the study and received partial class credit. Their mean age was 24.01 years (SD = 3.68). Participants were divided randomly into three conditions with

104, 104 and 106 participants in the positive, negative and neutral mood conditions, respectively.

Measures and Procedure

Participants signed an informed consent to participate in a study of "cognitive performance on a computer" and completed the perfectionism questionnaires. The perfectionism questionnaires were presented in counterbalanced order. They then came to a second session on a different occasion which was conducted by a different research assistant blind to participants' perfectionism scores. We separated the two sessions to eliminate the possibility that the items on the questionnaires contaminate the information-processing task. Each participant was seated in a separate small cubicle facing a computer monitor — Participants were assigned randomly to one of three possible induced mood conditions (positive, negative, or neutral). The memory task followed immediately after the mood induction. Finally, participants were thoroughly debriefed. Note that the language of the trait personality measures and word stimuli was Hebrew.

The First Session: Personality Measures

Participants completed the following perfectionism questionnaires:

Perfectionism Cognitions Inventory (PCI). Participants completed the 25 PCI items. The PCI instructions were patterned after the previous ATQ measures, which have been shown to have adequate psychometric properties (Glass & Arnkoff, 1997). Specifically, participants were told the following: Listed below are a variety of thoughts that sometimes pop into people's heads. Please read each thought and indicate how frequently, if at all, the thought occurred to you *over the last week*. Please read each item carefully and circle the appropriate number, using the scale below. Participants made ratings from "0" to "4" with response options varying from "not at all" to "all of the time." Note that the 25 items of the PCI were selected on the basis of extensive item analyses, including ratings of the appropriateness of scale content by perfectionism researchers (see Flett et al., 1998). Extensive research attests to the validity of this measure in a variety of contexts (Flett, Greene, & Hewitt, 2004; Flett et al., 1998; Flett, Hewitt, Whelan, & Martin, in press; Flett, Madorsky, Heisel, & Hewitt, 2002). The PCI had an alpha of .88 in the current sample.

Multidimensional Perfectionism Scale (MPS). The MPS (Hewitt & Flett, 1991; 2004) has 3 subscales of 15 items each. Respondents make seven-point ratings of statements reflecting self-oriented perfectionism (e.g., One of my goals is to be perfect in every thing I do), other-oriented perfectionism (e.g., I have high

expectations for the people who are important to me), and socially prescribed perfectionism (e.g., My family expects me to be perfect). A growing body of evidence has confirmed the multidimensionality of the instrument as well as the reliability and validity of the subscales (Hewitt & Flett, 2004; Hewitt & Flett, 1991; Hewitt, Flett, Turnbull-Donovan, & Mikail, 1991). For instance, research with college students by Hewitt and Flett (1991b) has shown that the three subscales have adequate internal consistency (alphas of .82 or higher). Moreover, the MPS subscales are correlated significantly with concurrent measures such as the Frost Multidimensional Perfectionism Scale (see Flett, Sawatzky, & Hewitt, 1995; Frost et al., 1993; Hewitt et al., 1991). Moreover, the scores on all three MPS subscales are not influenced substantially by response biases (Hewitt et al., 1991). In the current study, the three dimensions had adequate levels of internal consistency, with respective alpha coefficients of .85, .79, and .85 for self-oriented, other-oriented, and socially prescribed perfectionism. The perfectionism questionnaires were presented in counterbalanced order.

The Second Session Part I - Induced Mood and Manipulation Check

Emotional states were induced with the same methods used by Halberstadt, Niedenthal, and Kushner (1995) and by Olafson and Ferraro (2001). We chose music to induce mood, although there are other methods. For example, reading statements rated as happy, sad, or neutral (Fox, Knight, & Zelinski, 1998; Seibert & Ellis, 1991a, 1991b; Velten, 1968) has been shown to be an effective method of mood induction.

Music. For both the positive and negative mood induction conditions, two musical segments each were played alternately for a 10-min period. The musical pieces for the positive mood condition were Eine Kleine Nachtmusik (5 min 10 sec) and Divertmento No. 136 (4 min 10 sec), both by Mozart. For the negative mood induction condition, Albinoni's Adagio in G Minor (6 min 32 sec) and Barber's Adagio pour Cordes (5 min 33 sec) were used. All pieces of music have been used in other experiments (e.g., Eich & Metcalfe, 1989) and have been reliably shown to alter mood in the desired manner.

Participants who received the mood induction were informed that they would be listening to music that should help them develop an elated/happy (depressed/sad) mood. Participants were told to concentrate on personally relevant experiences congruent with the requisite mood state and to attempt to recreate these experiences in great detail. The experimenter then played the mood-appropriate music at a comfortable listening volume for the next 10 minutes. Participants in the neutral

mood condition were preoccupied for the same period of time by reading statements rated as neutral (e.g. Seibert & Ellis, 1991a, 1991b).

Manipulation Check. Immediately after the mood induction had taken place, the effectiveness of this manipulation was assessed by asking participants to report on their current mood. Participants were asked to complete state measures of happy and sad moods. Specifically, participants reported their levels of sad and happy mood each on a 10-point scale of 0% [*not at all*]-100% [*very much*]. Other researchers (e.g., Clark & Teasdale, 1982) have also used this technique as a manipulation check. As part of this procedure, participants were asked to honestly report if their mood had changed.

The Second Session Part II - Information-Processing Task (Memory Performance)

Experimental Stimuli. Stimuli for the experimental task included lists of words, which were positive, negative, neutral, or perfectionistic in content. All participants were exposed to the four types of words. Each list was paired with a test stimulus, which was either a member of the list (In – target) or not a member of the list (Out – distractor). "In lists" were constructed so that the match to the test stimulus appeared equally often and the order of presentation was randomized between and within subjects. A list of 80 words, 20 for each load-type (valenced) comprised each set. These were randomly divided into two groups to create target (In) and distractor (Out) words for later test (see Appendix). The study phase included the computerized visual presentation of these words in random order. We developed two roughly equivalent lists (in which targets and distractors are exchanged in each version) and then randomly assigned one or the other list to each participant as the target list with the alternative list serving as the lures. Half of the participants in each group were randomly exposed to each list version. An independent list of 20 neutral words was used as practice; 10 were used for study and as targets in a later test and another 10 words served as distractor words at the test in the practice phase.

The positive and negative words were obtained by having 10 undergraduate students in psychology list as many positive and negative words as possible. The neutral words were ones that have been used in previous studies of cognitive processes and were taken from lists supplied by Balgur (1968) and were used in other memory research (e.g., Guez & Naveh-Benjamin, in press; Naveh-Benjamin, Guez, Kilb, & Reedy, 2004; Naveh-Benjamin, Guez, & Shulman, 2004). The perfectionistic words were drawn primarily from the perfectionistic words used by Hewitt and Genest (1990). These words were derived initially from a previous investigation in which 60 university students were given the task of listing adjectives

that described a perfectionistic person and a nonperfectionistic person. These words were then added to a pool of 60 additional adjectives used by Hammen, Miklowitz, and Dyck (1986). Hewitt and Genest (1990) then had a second sample of 94 university students rate the words in the pool on various criteria, including the extent to which a highly perfectionistic person would identify the adjective in question as self-descriptive.

Four independent judges rated all of the words. These judges were blind to the aims of the study. Judges were given a list of 200 randomly listed words and were asked to classify each of the words listed into one of the four possible groups (positive, negative, neutral or perfectionistic). The criterion was 100% agreement, so the word was not included in the experiment words stimulus' list if judges' ratings were not identical. The final list included 80 words (20 per type that were then randomly divided into 10 target and 10 distractor stimuli) as listed in the Appendix. Subsequently, these words were presented randomly and balanced within and between participants.

Memory Performance Task. Participants were told to study the words in preparation for an upcoming item recognition test. Each participant was exposed to the list of words in the study phase following a mood induction (exposure to either sad, happy or no music) depending on his/her group assignment. The words were presented on a computer screen. The presentation rate was one word every 2.5 sec at study. After reading the instructions and answering any questions the participants had, the experimental phase started. That is, participants in each group were presented with the 80 experimental words, randomly assorted, one at a time without pause.

After an interpolated activity of 35 seconds (participants had to count backward by 7 from a randomly generated 3 digit number that appeared on the screen), the memory test was administered to all participants. This interpolated activity was done in order to eliminate the recency effect on recognition (Glanzer& Cunitz, 1966).

Recognition Task. The words on the test appeared in random order. The test included 40 target single word presented at the study phase (10 of each load-type), and 40 distractors that included words not presented at the study phase (10 of each load-type). Each test item was presented on the screen and the participant responded by pressing a key. The participants were seated in front of computer screens placed at eye level. Response panels were directly in front of the screens, and these response panels had two buttons, both of which were easily manipulated with one hand. The buttons were labeled "In" and "Out" and were colored green and red, respectively, for the experimental task. All stimuli were presented by means of a PentiumI III at 900MHz IBM computer. Participants were instructed to decide whether the test

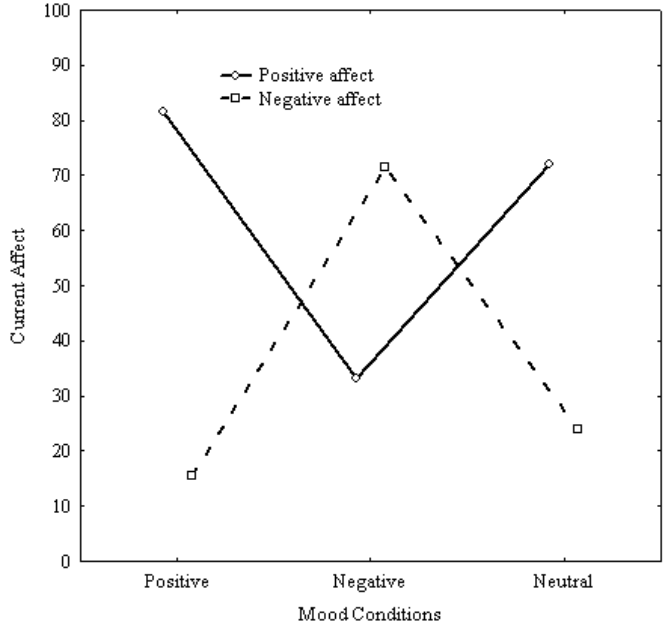
stimulus was "In" or "Out" of the list and push the appropriate button. The test stimulus remained on the screen for up to 2.5 sec or until all participants had responded. The experimental session typically required about 25 minutes. In the present study, the measure of recollective success was the proportion of Hits minus False Alarms that were computed for each participant and then averaged over each group for the yes-no item and associative recognition tests and was used to define participants memory performance (% of memory recognition).

Results

Mood Manipulation Check

In the present study, participants in all three conditions (positive, negative and neutral mood induction) reported both their positive and negative affect. A 3 × (2) MANOVA was conducted (See Figure 1).

Figure 1
Effectiveness of the Mood Induction Manipulation



The results indicated a significant main effect for Mood Induction condition, $F(2, 311)=8.99$, $p< .001$ (i.e. significant differences between the three mood induction conditions in overall reports of current affect), a significant within-participant main effect for current mood, $F(1, 311)=271.66$, $p< .00001$ (i.e., participants reported more positive than negative mood), and more importantly, a significant Mood Induction condition × Current Mood interaction, $F(2, 311)=443.63$, $p< .00001$ (i.e. significant differences between the three mood induction conditions in their relative reports of positive versus negative current moods). Planned comparisons confirmed that participants in the positive mood induction condition reported higher levels of positive current mood than participants in the negative mood induction condition, $F(1, 311)= 493.97$, $p< .0001$, and participants in the negative mood induction condition reported higher negative current affect than participants in the positive mood induction condition, $F(1, 311)= 654.66$, $p< .0001$.

Moreover, participants in the positive mood induction condition reported higher levels of positive current mood than participants in the neutral condition, $F(1, 311)= 19.08$, $p< .0001$ and participants in the neutral condition reported higher negative current affect than participants in the positive mood induction condition, $F(1, 311)= 15.76$, $p< .0001$. While the participants in the negative mood induction condition reported significantly higher levels of current negative mood than positive mood, $F(1, 311)= 210.05$, $p< .0001$, the participants in the positive mood induction condition reported significant higher levels of current positive than negative mood, $F(1, 311)= 619.61$, $p< .0001$. Participants in the neutral condition also reported more positive than negative mood, $F(1, 311)= 332.40$, $p< .0001$. However, the differences between the reports of positive and negative current mood were significantly higher for the positive mood induction group versus the neutral group $F(1, 311)= 23.57$, $p< .0001$. Thus, our manipulation was quite effective in creating the required differences in current mood states.

Note that we also evaluated the related possibility that perfectionists would have a heightened responsiveness to the mood induction (i.e., greater negative mood in the negative mood induction condition and greater positive mood in the positive mood induction condition). However, statistical analyses found no association between positive and negative moods and the measures of trait perfectionism and perfectionism cognitions.

Word Recognition

Three-step Hierarchical Multiple Regressions were conducted to test the role that perfectionism plays in interacting with the effects of mood on word recognition. The data were analyzed with interactions represented by product terms (Cohen &

Cohen, 1983). Thus, these analyses examined the unique and interactive effects of negative mood and perfectionism scores. In Step 1 of the regression, we introduced negative mood induction (a dummy variable contrasting negative to neutral mood conditions – coded negative = 1, neutral = -1 and positive = 0 and a dummy variable contrasting negative to positive mood conditions – coded negative = 1, neutral = 0 and positive = -1). In Step 2, the personality variables were entered (the PCI scores in the first series of regressions, and the MPS scales scores in the second series of regressions) as the predictors. In Step 3, we added the two-way interactions (i.e. each of the negative mood induction dummy variables × each of the personality variables). Each three-step regression was performed on four criterion variables: the participants' memory performance (The specific measure used tapped memory performance — proportion of Hits minus False Alarms, expressed as a percentage— for each category of words) for positive words, negative words, perfectionistic words, and neutral words. Figures illustrating significant interactions were plotted according to Cohen and Cohen's (1983) recommendations.

1) Mood Induction Condition and PCI as Predictors of Memory Performance (Word Recognition)

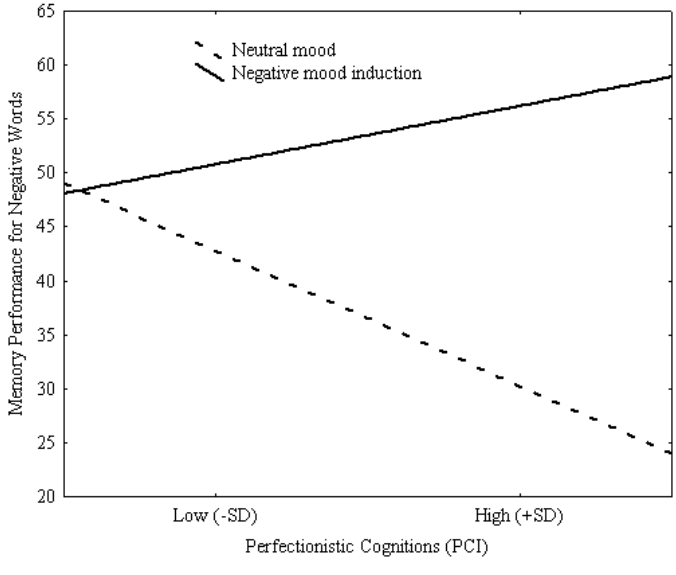
The first series of analyses were separate regression analyses with PCI score as the perfectionism term and the four outcome variables being the respective level of memory performance for the four word types. The regression for negative valenced words yielded a significant main effect for mood induction (see Table 1): under negative mood induction the memory performance for negative valenced words was significantly higher than under the neutral condition, (F (2, 311) = 12.75, p< .0001). The main effect of PCI was not significant (F Change (1, 310) = 3.26, p< .07). However, the regression yielded a significant two-way interaction for mood induction and PCI (see Table 1). As can be seen in Figure 2, for persons high in PCI, negative mood, relative to neutral mood, was associated with significantly higher memory performance for negative valenced words, (F Change (2, 308) = 5.81, p< .003).

The regression for positive valenced words yielded no significant main effect for mood induction (see Table 1) (F (2, 311) = .84, p= .43). The main effect of PCI was also not significant (F Change (1, 310) = .14, p= .71). However, the regression yielded two significant two-way interactions for mood induction and PCI (see Table 1). As can be seen in Figure 3, for persons high in PCI, positive mood, relative to neutral mood, led to significantly higher memory performance for positive valenced words. Also, for participants with high PCI scores, positive mood, relative to

negative mood also led to greater recognition memory for positively valenced words (F Change (2, 308) = 3.58, p< .03).

The regression for perfectionism words yielded no significant main effect of mood induction (see Table 1) (F (2, 311) = .64, p= .53). The main effect of PCI was also not significant (F Change (1, 310) = 1.54, p= .22). However, the regression yielded a significant two-way interaction of mood induction and PCI (see Table 1). As can be seen in Figure 4, for persons with elevated PCI scores, negative mood, relative to neutral mood, led to higher memory performance for perfectionism words (F Change (2, 308) = 3.02, p< .05). Recognition of perfectionistic content varied substantially according to mood state among high PCI scorers; surprisingly, however, contrary to expectations, low PCI scorers showed elevated recognition for perfectionistic content in both the neutral and negative mood conditions.

Figure 2
PCI × Mood Induction on the Memory Performance for Negative Words



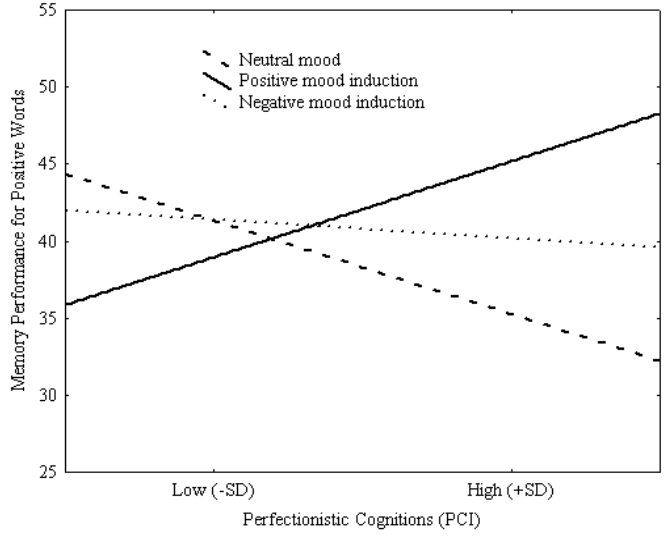
Finally, the regression for neutral words yielded no significant main effect for mood induction (F (2, 311) = 1.78, p= .17) or for the PCI (F Change (1, 310) = .29, p=.59) or for two-way interaction effects (F Change (2, 308) = .56, p= .58) (see Table 1).

Table 1
Regression Coefficients and Significant Tests of the Contributions of Mood Induction and PCI Scores to the Memory Performance (% Recognition of Words)

	Effect				
	Step 1		*Step 2*	*Step3*	
Variables	*Induced Mood* [a]	*Induced Mood* [b]	*PCI*	*PCI × Induced Mood* [a]	*PCI × Induced Mood* [b]
Negative Words					
β	-.11	.31	-.10	-.49	1.13
T	-1.81	4.99	-1.81	-1.55	3.39
p<	.07	.0001	.07	.12	.001
Positive Words					
β	-.03	.08	.02	-.70	.89
T	-.53	1.29	.38	-2.12	2.53
p<	.60	.20	.71	.04	.01
Perfectionism Words					
β	-.03	.07	-.07	-.39	.75
T	-.44	1.12	-1.24	-1.19	2.14
p<	.66	.26	.22	.23	.03
Neutral Words					
β	-.09	.12	-.03	-.28	.35
T	-1.35	1.81	-.54	-.85	.99
p<	.18	.07	.59	.39	.33

Note. (two-tailed tests)*;* N = 314; n = 104 induced negative mood; n = 104 induced positive mood and n = 106 neutral mood condition; Induced Mood [a] = a dummy variable contrasting negative to positive mood conditions*;* Induced Mood [b] = a dummy variable contrasting negative to neutral mood conditions

Figure 3
PCI × Mood Induction on the Memory Performance for Positive Words

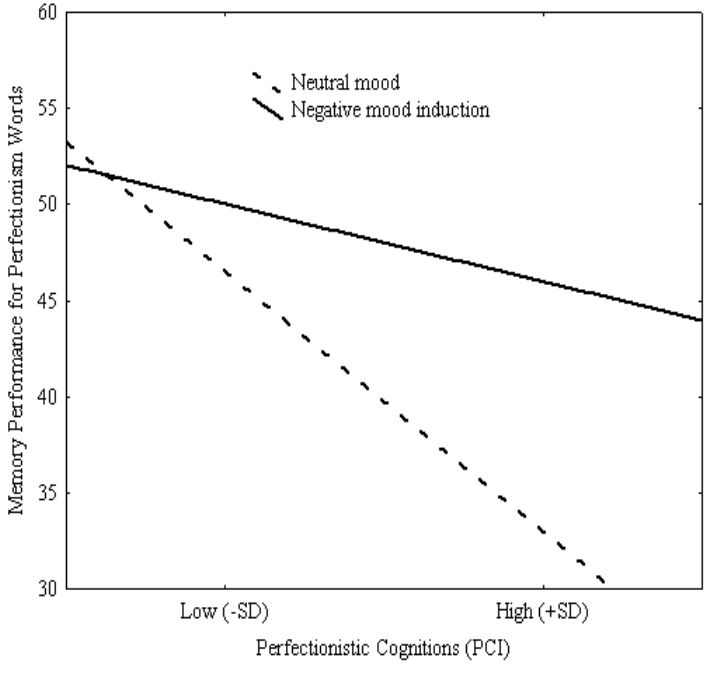


2) Mood Induction Condition and Trait Perfectionism Dimensions as Predictors of Memory Performance (Word Recognition)

Self-oriented and other-oriented perfectionism scales were not predictive based on preliminary HMR analyses; that is, no main effects or interactions with induced mood effects were found for self-oriented or other-oriented perfectionism in terms of the percentage of words recognized in each of the four word type categories. Accordingly, analyses were performed only with socially prescribed perfectionism.

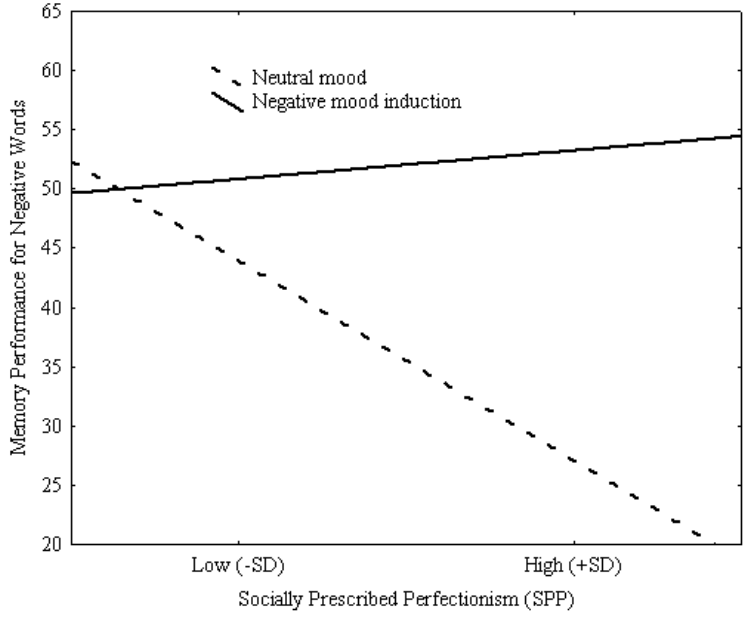
The regression for the memory performance for negative words yielded a significant main effect for SPP: participants with higher SPP scores had significantly lower memory performance for negative words (F Change (1, 310) = 4.85, $p < .03$). However, the analyses indicated that this was qualified by a significant two-way interaction for mood induction and SPP (see Table 2). As can be seen in Figure 5, for persons high in SPP, negative mood, relative to neutral mood, led to higher memory performance for negative words (F Change (2, 308) = 3.89, $p < .02$).

Figure 4
PCI × Mood Induction on the Memory Performance for Perfectionism Words



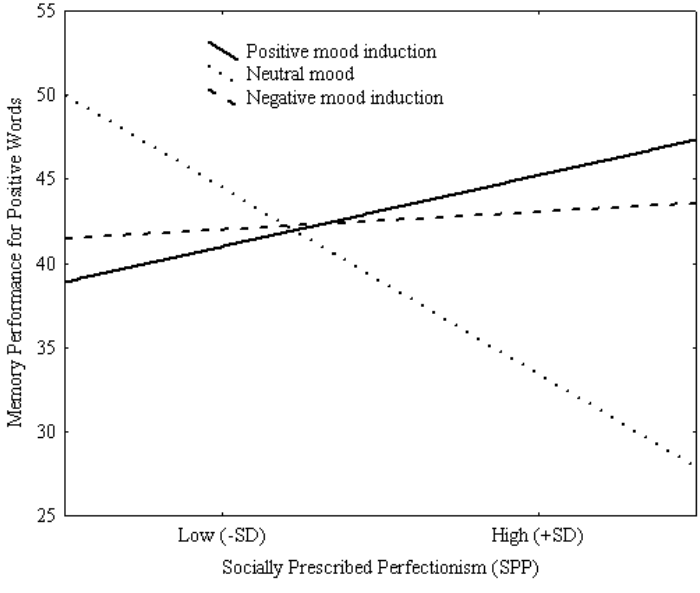
The regression for the memory performance for positive words yielded no significant main effect for SPP (*F* Change (1, 310) = .86, *p*= .36). However, the regression yielded two significant two-way interactions for SPP and mood induction (see Table 2). As can be seen in Figure 6, for persons high in SPP, positive mood, relative to both neutral mood and negative mood, resulted in higher memory performance for positive words (*F* Change (2, 308) = 3.26, *p*< .04). Also, low SPP and a neutral mood were linked with higher memory performance for positive words.

Figure 5
SPP × Mood Induction on the Memory Performance for Negative Words



The regression for the memory performance for perfectionism words yielded no significant main effect for SPP (*F* Change (1, 310) = 2.2, *p*= .10). However, the regression yielded a significant two-way interaction for SPP and mood induction (see Table 2). As can be seen in Figure 7, for persons high in SPP, negative mood, relative to neutral mood, led to higher memory performance for perfectionism-related words (*F* Change (2, 308) = 3.09, *p*< .05). Whereas those with relatively low levels of SPP had higher recognition for perfectionistic words in a neutral mood as opposed to a negative mood, those with higher levels of SPP had substantially greater recognition of perfectionistic words in negative mood as opposed to a neutral mood.

Figure 6
SPP × Mood Induction on the Memory Performance for Positive Words



Finally, the regression for the memory performance for neutral words yielded a significant main effect of SPP: participants with high levels of SPP had significantly lower recognition of neutral words (F Change (1, 310) = 5.27, p< .02). However, the regression yielded no significant two-way interaction effects (F Change (2, 308) = .34, p= .71).

It is important to note here that in the present study PCI and SPP were found to be significantly positively correlated ($r_{[314]}$ = .56, p<.0001). Accordingly we reanalyzed the regressions presented in Table 1 while controlling for SPP scores in Step 2 and the regressions presented in Table 2 while controlling for PCI scores in Step 2. The results presented in Tables 1 and 2 were not altered. Therefore, the effects of induced mood on the PCI and SPP effects on memory performance for the various word types is beyond the association between the PCI and SPP. Thus, although the perfectionism measures are correlated, each has unique effects.

Table 2
Regression Coefficients and Significant Tests of the Contributions of Mood Induction and SPP Scores to the Memory Performance (% Recognition of Words)

Variables	*Effect*				
	Step 1		*Alt. Step 2*	*Alt.Step3*	
	Induced Mood [a]	*Induced Mood* [b]	*SPP*	*SPP × Induced Mood* [a]	*SPP × Induced Mood* [b]
Negative Words					
β	-.11	.31	-.12	-.35	.71
T	-1.81	4.99	-2.20	-1.30	2.78
p<	.07	.0001	.03	.19	.006
Positive Words					
β	-.03	.08	-.05	-.65	.57
T	-.53	1.29	-.93	-2.30	2.15
p<	.60	.20	.36	.02	.03
Perfectionism Words					
β	-.03	.07	-.09	-.12	.53
T	-.44	1.12	-1.65	-.42	1.99
p<	.66	.26	.10	.67	.05
Neutral Words					
β	-.09	.12	-.13	-.06	.21
T	-1.35	1.81	-2.30	-.20	.79
p<	.18	.07	.02	.84	.43

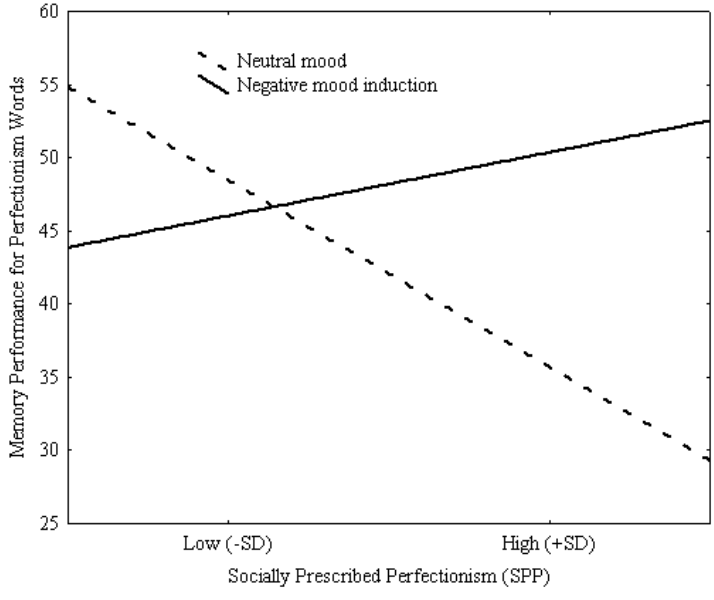
Note. (two-tailed tests). $N = 314$; $n = 104$ induced negative mood, $n = 104$ induced positive mood and $n = 106$ neutral mood condition; *SPP* = MPS Socially Prescribed Perfectionism; Induced Mood [a] = a dummy variable contrasting negative to positive mood conditions; Induced Mood [b] = a dummy variable contrasting negative to neutral mood conditions

Discussion

The current study evaluated the effects of positive versus negative mood on the recognition memory of participants varying in levels of perfectionism. The main hypothesis tested was that that perfectionists induced into a negative mood state would have greater recognition memory for negative content and perfectionism-related content (i.e., words reflecting these categories), and this would be particularly evident when perfectionists had elevated levels of perfectionism cognitions and trait socially prescribed perfectionism. Individual differences in perfectionism were measured in terms of the frequency of automatic thoughts reflecting perfectionistic

themes and in terms of trait dimensions of perfectionism (i.e., self-oriented, other-oriented, and socially prescribed perfectionism).

Figure 7
SPP × Mood Induction on the Memory Performance for Perfectionism Words



Our results provided support for the contention that there is a salient cognitive aspect to perfectionism that involves specific cognitive biases. Our main finding was that participants high in perfectionistic automatic thoughts, as measured by the PCI, had greater recognition memory for negative words when in a negative mood state than did high PCI scorers in a neutral mood; this enhanced recall for negative words when in a negative mood was not found among low PCI scorers. This significant interaction between the PCI and mood induction condition supports the concept of a dynamic relation between the cognitive manifestations of perfectionism and the experience of negative mood states. Thus, distressed perfectionists who are ruminating about the need to be perfect and their inability to be perfect appear to have a tendency to be attentive and to remember negative stimuli that are

incongruent with desires for the self and the situation to be perfect. This enhanced recognition memory suggests that certain perfectionists engage in elaborative processing of negative information when in a negative mood state in a manner that is very much in keeping with evidence of a negative cognitive diathesis for depression that becomes activated among distressed individuals in stressful circumstances (see Scher, Ingram, & Segal, 2005).

This tendency to remember negative information while in a negative mood state may have important implications for perfectionists. Cognitive research suggests that not attending to and not recalling negative information are effective ways of regulating negative moods and emotions (Parkinson & Totterdell, 1999). Certain perfectionists may simply be less able to regulate negative moods. The current findings suggest that cognitive processes and underlying cognitive mechanisms that may help explain why perfectionism tends to be associated with chronic forms of depression. Past research has linked perfectionism with chronic symptoms of depression (Hewitt, Flett, Ediger, Norton, & Flynn, 1998). Other research on the treatment of perfectionism indicates that even though general improvements in depression can occur as a result of treatment, perfectionism is difficult to treat and requires long-term interventions (see Blatt & Zuroff, 2002). Our data suggest that perfectionists who are in a negative mood state are oriented toward negative content and remember this negative information in a way that may serve to maintain or enhance their negative mood states and negative orientation.

The current study also revealed that perfectionists also had a tendency to recognize more words with perfectionistic themes when these participants were induced into a negative mood state. These data accord with a theory advanced by Hewitt and Genest (1990), who posited that perfectionistic themes are represented in a schema that incorporates the ideal self, and perfectionists are particularly attentive to negative information and characteristics that indicate that the self is not perfect. The finding that perfectionistic participants in a negative mood state have enhanced recognition for both negative words and perfectionism-related words suggests that these individuals are being highly attentive to negative information as it relates to perfectionistic goals and standards. This continuing focus on what it means to be perfect while distressed may add to the distress of perfectionists.

Conclusions about the tendency for high PCI scorers to recall more perfectionism content while in a negative mood state must be qualified, however. Other results showed that low PCI scorers, relative to high PCI scorers, actually had greater recognition memory for perfectionistic words with this superior performance being especially evident in the neutral mood induction condition. What is most interesting for our purposes though is the fact recognition memory performance did

not vary by mood state for the low PCI scorers, but it did vary by mood state for high PCI scores, with negative mood facilitating greater recognition memory of perfectionistic content for these individuals.

Analyses involving trait dimensions of perfectionism revealed that socially prescribed perfectionism did interact with negative mood to produce increased recognition memory of negative content (see Figure 5). Thus, the same pattern found for high PCI scorers was found among participants with high socially prescribed perfectionism, though the interaction effect was not as robust with socially prescribed perfectionism. Nevertheless, this association with socially prescribed perfectionism is an intriguing finding given that socially prescribed perfectionism has been linked consistently with indices of maladjustment, including measures of depression and anxiety (Hewitt & Flett, 1991, 2004) and it has been suggested that socially prescribed perfectionism may involve chronic feelings of negative affect due to the sense of helplessness and hopelessness experienced by someone who feels and perceives that extreme demands for perfection have been imposed on the self (see Hewitt et al., 2006). It is quite possible that people high in socially prescribed perfectionism have a naturally occurring negative mood state that promotes a cognitive focus on negative information and the perfectionistic standards that have been imposed on them.

It was also found with socially prescribed perfectionism that this dimension interacted with negative mood to produce enhanced memory of words with perfectionistic content. Although this effect was not explicitly predicted, it makes sense in that when they are distressed, socially prescribed perfectionists may be quite attentive to information that reflects the impossibly high expectations that they perceive as having been imposed on them. Unfortunately, by continually attending to the prescribed standards of others and society in general, socially prescribed perfectionists may be exposing themselves to information that exacerbates their negative mood states.

Although our main focus was on the differences in recognition memory for negative and perfectionistic content, significant differences were also detected when analyses examined the recognition memory of positive content. Specifically, it was found that participants high in perfectionism cognitions and socially prescribed perfectionism had enhanced recognition for positive words when induced into a positive mood. Thus, we found only partial evidence of a mood congruency effect – that is, negative moods facilitated recognition of negative stimuli, but the link between positive moods and recognition of positive stimuli was less evident and seemed to depend, in part, on the additional influence of the perfectionistic personality style.

Regarding this finding, it seems that perfectionistic individuals may also be quite attentive to positive information when they are experiencing feelings of happiness and pleasantness. However, this leads to the important question of the extent to which positive mood is experienced by these people on a natural basis. It has been suggested that for some perfectionists, conditions need to be absolutely certain and "just right" in order for positive affect to be experienced and anxiety to be lessened (see Coles, Frost, Heimberg, & Rheaume, 2003). Extreme perfectionists have been described as being highly dissatisfied even when they are highly accomplished performers (see Mor, Day, Flett, & Hewitt, 1995), and this lack of dissatisfaction probably stems from failure to continually meet impossibly high goals and standards (also see Besser, Flett, & Hewitt, 2004). Unfortunately, at present, there is no empirical evidence of a link between positive mood states and either perfectionistic automatic thoughts or socially prescribed perfectionism. Research has not investigated the association between the PCI and naturally occurring mood, but a diary study included socially prescribed perfectionism as part of a construct measuring self-critical perfectionism, and the results across one week of daily mood reports showed that socially prescribed perfectionism was associated with naturally occurring negative moods and it was associated negatively with naturally occurring positive moods (see Dunkley, Zuroff, & Blankstein, 2003). Subsequent researchers have included socially prescribed perfectionism as a component in a construct identified as self-critical perfectionism and this construct is linked with depression and anxiety in clinical patients (Clara, Cox, & Enns, 2007).Thus, the experience of positive moods is probably not a common occurrence among extreme perfectionists with high levels of socially prescribed perfectionism.

We would be remiss at this juncture if we did not mention the fact that our positive mood induction did not result in improved recognition memory for perfectionism-related words; rather, it was the negative mood induction in combination with elements of perfectionism that tended to result in enhanced recognition memory for perfectionism-related words. This pattern of findings is reminiscent of the seminal work of classic theorists such as Adler (1956) and Horney (1950) who regarded perfectionism as a compensation for feelings of inferiority and hostility. According to these theorists, perfectionism is adopted as a defensive strategy, and, as such, it is perhaps not too surprising that it was the negative mood induction that facilitated the memory of perfectionistic content among perfectionistic participants.

It could perhaps be argued that the negative mood induction facilitated memory of perfectionism words and not the positive mood induction because some of the perfectionism words used in this study had a clear negative connotation (e.g., words

such as "imperfect" and "picky"). Although this is conceivable, we conducted a supplementary analysis of perfectionism words with obvious positive versus negative connotations and our findings held across positively-toned and negatively-toned perfectionism words. Thus, it seems that it is simply the case that negative moods promote a heightened awareness of material and information that reflects a perfectionistic ideal.

Before closing, some caveats about the current findings should be noted. First, and foremost, it is important to reiterate that the current experiment was based on induced moods, and it will be important to test the replicability of these findings with naturally occurring mood states, and moods experienced following failure experiences. If viewed from this perspective, it is plausible that the significant findings obtained in the current study actually underestimate the differences that exist. Presumably, the perfectionist who is induced into a negative mood as a result of a highly salient personal threat (i.e., a looming failure or a previously experienced ego-involving failure) may be even more attentive to negative information, as well as information that is relevant to their perfectionistic standards. The current study likely involved some degree of ego involvement for our participants because they were required to attempt a performance task, but no attempt was made to highlight the possible ego-involving aspects of the task. Future research should explore this directly by examining cognitive performance in high versus low ego involvement conditions.

Second, on a related note, the words used in this study were general reflections of the four categories of interest (positive, negative, neutral, and perfectionism-related), but in future research, it will be important to examine the ability of perfectionists to recall positive versus negative *self-relevant* information. The importance of examining self-relevant information is underscored by our initial assumption that a negative mood state influences the cognitive processes of perfectionists, in part, because it highlights a discrepancy between self-characteristics and the perfectionistic ideal. Given that induced moods are clearly linked with self-esteem (Tafarodi et al., 2003), it seems that subsequent research on memory for self-related information is a logical extension of the current investigation.

Third, it is important to note that participants in the neutral mood condition reported state levels of affect that were positive overall. It can be seen in Figure 1 that the neutral mood condition contributed to a preponderance of positive mood overall though certainly not to the extent that was reported by those participants in the positive mood induction condition. Future research on perfectionism and induced mood should consider other methods of mood induction so that participants in the

neutral condition have a mood state on average that is neither positive nor negative. Past work has shown that it is not uncommon for people receiving a neutral mood induction to maintain a positive mood overall that reflects their initial positive mood state when they arrived for the experiment (see Goldstein, Wall, McKee, & Hinson, 2004; Rowe, Hirsch, & Anderson, 2007). Thus, the limitation that the neutral mood manipulation yielded a more positive mood state than is desirable is not unique to our study

Finally, future research in this area should examine the possible differences associated with the type of negative mood being experienced. It would also be of interest, for example, to examine cognitive processing among perfectionists who have been induced into an angry mood. People high in socially prescribed perfectionism likely experience a sense of resentment because of a sense that unfair expectations have been imposed on them, and they would likely be highly attentive to informational cues when induced into an angry or frustrated mood state.

In conclusion, the current study extends the existing perfectionism literature in several unique ways. Most existing research thus far in the perfectionism field has involved the typical self-report questionnaire studies that are common in the overall personality field. Past research on perfectionism has established that there are meaningful individual differences in perfectionism and the experience of automatic thoughts reflecting perfectionistic themes, but the paucity of controlled experimental research has translated into a lack of investigation of specific cognitive and motivational processes and mechanisms related to these individual differences. The current study highlighted the cognitive manifestations of the perfectionism construct by demonstrating that a negative mood state combines with perfectionism at the cognitive level to influence recognition memory for negative content and for perfectionistic content. Our evidence indicates that the memory performance of people with certain aspects of perfectionism varies as a function of their current mood states. Thus, there is an identifiable cognitive aspect to perfectionism and an important goal for future research will be to examine this cognitive component in greater detail.

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Appendix

Perfectionistic			
1.	Precise	11.	Flawless
2.	Demanding	12.	Diligent
3.	Competitive	13.	Exceptional
4.	Persevering	14.	Ambitious
5.	Picky	15.	Strict
6.	Complete	16.	Achieving
7.	Orderly	17.	Imperfect
8.	Exacting	18.	Proper
9.	Organized	19.	Thorough
10.	Driven	20.	Critical
Positive			
1.	Happy	11.	Enthusiastic
2.	Amusing	12.	Enjoyable
3.	Calm	13.	Carefree
4.	Friendly	14.	Cheerful
5.	Energetic	15.	Excite
6.	Pleasant	16.	Contented
7.	Relaxed	17.	Gaiety
8.	Courageous	18.	Certain
9.	Decisive	19.	Courteous
10.	Wonderful	20.	Polite
Negative			
1.	Embarrassed	11.	Sadness
2.	Terrible	12.	Horrible
3.	Depressed	13.	Miserable
4.	Desperate	14.	Worried
5.	Pain, suffering	15.	Tragedy
6.	Rejected	16.	Guilt
7.	Stupid	17.	Lonely
8.	Hesitant	18.	Fragile
9.	Sad	19.	Tense
10.	Testy	20.	Hostile
Neutral			
1.	Butter	11.	Orange
2.	Factory	12.	Car
3.	Guest, visitor	13.	Swimming-pool
4.	Liquid	14.	Table
5.	Pianist	15.	Cake
6.	Wagon	16.	Computer
7.	Vitamin	17.	Lamp
8.	Cheetah	18.	Linen
9.	Shirt	19.	Elections
10.	Dollar	20.	Green

Note: The study was conducted in Hebrew in which all of the words are single words (e.g. #5 negative and #3 neutral are single words in Hebrew, the two words represent synonyms) same length of syllables - we counterbalanced the words in terms of written frequency.