# A Test of the Depressive Evenhandedness Hypothesis: Attentional Biases for Pictorial & Linguistic Stimuli

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## INTRODUCTION

Beck's cognitive theory of depression posits that depressed individuals, as well as people at risk of developing depression, possess negative cognitive schemas that lead to mood-congruent biases in information processing. These biases are thought to contribute to the onset and maintenance of depression.

However, uncertainty remains as to whether this negative bias includes attention (e.g., Mogg & Bradley, 2005).

The Deployment of Attention (DOAT) task is one way to assess negative attentional biases. In this paradigm:

- Participants are shown two words, one above the other, on a computer screen.
- When the words disappear each word is replaced by a colored bar.
- Participants are misinformed that one line will appear slightly before the other and are asked to indicate which bar appeared first.
- In reality both lines appear at the same time and the line that the participant selects is thought to reflect the location of the participants attention.

Several studies using the DOAT paradigm with word stimuli (e.g., Gotlib et al., 1988; McCabe et al., 2000; McCabe & Gotlib, 1995; McCabe & Toman, 2000) have found:

- Dysphoric participants do NOT show an attentional bias for negative stimuli, but instead, attend to negative and positive stimuli in an unbiased manner
- Participants who are not dysphoric avoid the negative stimuli and attend to the positive or neutral stimuli in the DOAT task.

The primary goal of this study was to examine whether these results would be replicated with stimuli that are images rather than words.

### Hypotheses:

The dysphoric participants would select the negative stimulus more than the non-dysphoric group for:

1) all stimulus pairs combined.
2) for words and images examined individually.

The non-dysphoric participants would show a protective whereas the dysphoric participants would show no bias for:

3) all stimulus pairs combined.
4) for words and images examined individually.

## PROCEDURE

180 (132 women) undergraduate students completed the BDI-II and DOAT task:

*1) The Beck Depression Inventory-II (BDI-II):* A 21-item self-report measure of symptoms of depression (Beck, Steer, & Brown, 1996).

BDI II scores < 7 = non-dysphoric
BDI II scores 14-63 = dysphoric

*2) The DOAT task with a set of image pairs and a set of word pairs.*

Participants were asked to indicate which line (top or bottom) appeared first.

*Table 1.*
*One-Sample t-tests Examining whether the Dysphoric or Non-Dysphoric Groups Showed an Attentional Bias for any of the Stimuli Pairs.*

| | All Trials | | | | Images | | | | Words | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *M* (*SD*) | *t* (*df*) | *p* | *d* | *M* (*SD*) | *t* (*df*) | *p* | *d* | *M* (*SD*) | *t* (*df*) | *p* | *d* |
| Dys | .51 (.09) | 1.28 (75) | ns | .30 | .48 (.14) | -.97 (75) | ns | .22 | .52 (.10) | 1.86 (75) | ns | .43 |
| Non-Dys | .45 (.10) | -3.65 (52) | <.001 | 1.01 | .42 (.18) | -3.38 (52) | .001 | .94 | .46 (.11) | -2.85 (52) | .006 | .79 |

Note. Dys = Dysphoric; Non-dys = Non-dysphoric. The mean is a proportion of the number of times the participants selected the line that replaced the negative stimuli (e.g., .60 means that they selected the lines that replaced the negative stimuli in 60% of the trials). These tests are examining whether the group selected the negative stimulus more or less than 50% of the time (i.e. did they show an attentional bias). $p < .05$ suggests that they were showing a bias.

## RESULTS

### Group Differences:

A 2 (Group: dysphoric/non-dysphoric) x 2 (stimulus type: words/images) ANOVA was conducted.

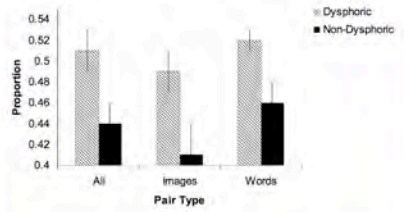
**Hypothesis 1 and 2 were supported:** As predicted there was a main effect for group ($p<.001$) but no significant Group x Type interaction, indicating that the dysphoric group selected the negative stimuli more than the non-dysphoric group for both image and word pairs (See Figure 1).

### Attentional Biases:

*T*-tests were conducted to examined whether the groups were selecting the line corresponding to the negative stimulus more or less than 50% of the time.

**Hypotheses 3 and 4 were supported:** As predicted the dysphoric group did not show an attentional bias whereas the non-dysphoric group demonstrated a protective bias (See Table 1).

*Figure 1.*
*Proportion of trials that the dysphoric and non-dysphoric groups selected the line that replaced the negative stimulus and standard errors for all experimental trials, image trials, and word trials.*




## DISCUSSION

Overall, the results of this study corresponded favorably to findings of previous DOAT studies (Gotlib, McLachlan, & Katz, 1988; McCabe, & Gotlib, 1995; McCabe, Gotlib, & Martin 2000; McCabe & Toman, 2000). The dysphoric participants showed no attentional bias and the non-dysphoric participants showed a protective bias and avoided the negative stimuli.

These results suggest that people who are not depressed avoid negative stimuli in their environment. Presumably, by avoiding negative stimuli, non-dysphoric people fail to fully process the unattended stimuli and thus their mood is not negatively affected. Instead, they attend to and process the positive and neutral stimuli which helps maintain their positive mood.

People who are dysphoric however, seem to attend to all stimuli in their environment in an unbiased manner. Although this evenhandedness gives dysphoric individuals a more accurate picture of the world, it may also increase their negative mood because they have more exposure to negative stimuli as compared to people who are not depressed. This extra exposure increases the probability that a person will elaborate upon and remember the negative information.

### Future Directions:

- Replication in a clinical population.
- Replication using eye-tracking equipment. This would allow us to measure attentional biases in a continuous and more direct manner.
- Replication using more complex stimuli (e.g., video clips) in order to gain information about information about whether people who are depressed actually attend to information in their environment differently from people who are not depressed.