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**Relationship Between Dysphoria  
and Stereotype Utilization**

**by**

**Judith A. Francis**

**Submitted in partial fulfillment of the requirements  
for the degree of Doctor of Philosophy**

**at**

**Dalhousie University  
Halifax, Nova Scotia  
October, 1998**

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by Judith Ann Francis

in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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## Abstract

Three studies investigated the relationship between dysphoria and stereotype use. In each study, dysphorics and non-dysphorics estimated the heights of male and female targets from photographs. The degree to which participants used the stereotype that men are taller than women to complete their height estimates was examined. In Study 1, dysphorics made less use of the stereotype than non-dysphorics. When analyzed as a between subjects design, participants' stereotype scores were higher under conditions of greater task complexity (ie. for sitting rather than standing targets, and under conditions of high rather than low cognitive load).

In Study 2, degree to which stereotype use is under volitional control was examined. Half of the dysphoric and non-dysphoric participants were instructed not to use the sex of the target as a cue for judging heights. Overall, dysphorics made less use of the height/gender stereotype than non-dysphorics. Furthermore, participants who received stereotype discounting instructions made less use of the stereotype than those who did not receive such instructions.

In Study 3, the relationship between stereotype use on the height estimation task and stereotype use on a social judgement task was investigated. Relationship between stereotype use and social problem solving ability was also examined. After completing the height estimation task, participants read vignettes describing male and female targets. They rated targets on a number of personality characteristics that are consistent or inconsistent with gender stereotypes. Participants also completed a self-report measure of social problem solving ability. Level of depressive symptoms was negatively correlated with stereotype use on the height estimation task (for standing targets) and stereotype use on the vignette rating task. Furthermore, degree of stereotype use on the height estimation task was positively correlated with stereotype use on the vignette rating task. Stereotype use on the height estimation and vignette rating tasks was not related to self-reports of social problem solving ability.

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## Introduction

### Overview

Depression is a serious mental health problem with a lifetime prevalence rate between 12 and 17% (Angst, 1997). Not only is depression one of the most prevalent of all mental disorders, but the associated risk of suicide makes it one of the most lethal.

Although a diagnosis of clinical depression depends on the presence of various affective, behavioural, cognitive, and physiological symptoms, researchers and clinicians have recognized that social dysfunction is also a prominent feature of this disorder (Feldman & Gotlib, 1993). Depressed patients report having fewer social contacts and experiencing less satisfaction with relationships than non-depressed individuals (Gotlib & Lee, 1989). Depressed individuals have also been found to have less effective social skills than non-depressed individuals (Dykman, Horowitz, Abramson, & Usher, 1991).

It has been suggested that the social deficits associated with depression may be the result of specific impairments in information processing (Conway & Giannopoulos, 1993; Sullivan & Conway, 1989). For example, research has shown that depressed individuals do not spontaneously initiate heuristic strategies such as clustering or categorization to facilitate performance on complex information processing tasks (Weingartner et al.,

1980). According to Weingartner and his colleagues, depressed individuals appear to be unable or unwilling to make use of heuristics to maximize the efficiency of information processing (cf. Hasher & Zacks, 1979).

The present research was designed to address whether depressed individuals differ from non-depressed individuals in their use of heuristic strategies to facilitate performance on social information processing tasks. Specifically, the research examined whether depressed individuals made less use of social stereotypes than non-depressed individuals. Social stereotypes have been discussed as cognitive heuristics that individuals invoke to facilitate or maximize the efficiency with which they process social information (Bodenhausen et al., 1991; Fiske & Neuberg, 1990). The research also addressed the relation between stereotyping and social problem solving in depressed and non-depressed subjects.

Prior to presenting a detailed account of the current research it is necessary to clarify the term depression and describe the manner in which depression has been classified and measured by researchers.

#### Symptoms of Depression

Major Depression is a complex psychiatric disorder that is characterized by a number of affective, behavioural, cognitive, and somatic symptoms (APA, 1994). Affective symptoms may include sadness, feelings of disappointment,

and hostility. Behaviourally, the depressed individual may exhibit psychomotor retardation and less commonly, agitation. Speech of the depressed individual may be slow and show a paucity of content. Depressed patients frequently report sleep disturbances (typically insomnia and early morning waking), loss of appetite, gastro-intestinal problems, fatigue, and loss of sexual interest. Changes in cognitive functioning are frequently reported by depressed patients and can include concentration and memory difficulties as well as indecision (Beck, Rush, Shaw & Emory, 1979). Furthermore, depressed individuals think about themselves in self-deprecating ways, holding extremely negative thoughts concerning their ongoing experience and chances for future happiness (Beck, 1967).

#### Classification of Depression

Researchers interested in studying the psychosocial correlates of depression have utilized a number of different procedures for classifying and quantifying depressive symptoms. Some have chosen to study depression as a nosologic category and have classified individuals as depressed or non-depressed according to formal diagnostic criteria. Others have been interested in studying the correlates of depressive symptomatology and have made use of self-report measures to assess level of depressive symptoms.

Depression as a psychiatric disorder. In North America, clinical depression is most commonly diagnosed according to



criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders, currently in its fourth revision (DSM-IV; American Psychiatric Association, 1994). In order to receive a diagnosis of Major Depression, an individual must be experiencing depressed mood and/or loss of interest in activities that were at one time pleasurable, along with four of the following symptoms: significant weight loss or weight gain; insomnia or hypersomnia; psychomotor retardation or agitation; fatigue or loss of energy; feelings of worthlessness; difficulties concentrating or indecisiveness; and suicidal ideation. Symptoms must represent a change from the previous level of functioning, cause significant distress, and interfere with important areas of functioning (DSM-IV; American Psychiatric Association, 1994). Individuals are diagnosed by mental health professionals (physicians, psychiatrists, or psychologists) who make judgements about the presence and duration of each symptom on the basis of a clinical interview.

Dysthymic Disorder is a Depressive Disorder that is characterized by depressed mood that lasts for at least two years. During periods of depressed mood individuals must also experience two of the following symptoms: poor appetite or overeating; insomnia or hypersomnia; low energy or fatigue; low self-esteem; poor concentration or difficulty making decisions; or feelings of hopelessness. During the

two year period, the individual must never have experienced a Major Depressive Episode, or been without the symptoms for longer than two months.

Depression as classified by self-report measures. A significant number of depression researchers have studied individuals, usually college students, who obtain elevated scores on self-report measures of depressive symptoms. Perhaps the most commonly used measure for such purposes is the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock & Erbaugh, 1961). The BDI contains 21 items which assess the intensity of negative attitudes towards the self (e.g. I am disappointed in myself), somatic disturbances (e.g. I get tired more easily than I used to), and performance impairments (e.g. It takes an extra effort to get started at doing something). Individuals rate the degree to which each symptom or attitude is present by endorsing one of four possible statements. Each rating is scored from 0-3. Ratings are summed and higher scores indicate greater depression.

Over the past few years there has been an ongoing debate in the depression literature over the use of individuals (usually college students) who obtain elevated scores on self-report depression inventories as analogues for clinically depressed patients (e.g. Coyne, 1994; Vredenburg, Flett, & Krames; Weary, Edwards, & Jacobson, 1995). It has been suggested college students who obtain

high scores on measures such as the Beck Depression Inventory differ from depressed patients in terms of number, severity, and duration symptoms experienced. Furthermore these groups may differ on a number of important demographic variables (Coyne, 1994).

Researchers have therefore been encouraged to use the term "dysphoric" to refer to individuals who have obtained elevated scores on self-report measures to distinguish them from those to have been diagnosed as depressed according to formal psychiatric criteria (Kendall, Hollon, Beck, Hammen, & Ingram, 1987). This convention will be followed in the remainder of the text. The appropriateness of making generalizations about clinical depression from results of studies using dysphoric college students will be explored further in the General Discussion.

#### Cognitive Deficits Associated with Depression

Over the past 3 decades, a significant amount of research has accumulated documenting the cognitive deficits associated with depression. Much of this research has been concerned with identifying the types of cognitive tasks on which depressed individuals reliably show performance deficits relative to non-depressed controls or relative to their own performance in a non-depressed state. Depression has been associated with impairments on tests of intellectual functioning, on various tasks assessing problem solving, and on certain types of memory tasks (Hartlage,

Alloy, Vazquez, & Dykman, 1993). For many cognitive tasks, degree of impairment has been found to be positively correlated with severity of the depression and performance frequently improves with the remission of depressive symptoms (Johnson & Margaro, 1987; Silberman, Weingartner, & Post, 1983).

Intellectual functioning. On tests of intellectual functioning, researchers have found evidence of depressive deficits in verbal skills. Martin, Oren, & Boone (1991) found that the Verbal IQ's of depressed and dysphoric patients were significantly lower than those of the non-depressed controls. Crawford et al. (1987) found that depressed inpatients scored significantly lower than non-psychiatric controls on the vocabulary subtest of the Wechsler Adult Intelligence Scale.

Depressive deficits in visual spatial skills have also been reported. Brumback (1985) found that depressed children were more likely than non-depressed children to show impairments on performance subtests of the Wechsler Intelligence Scale for Children (WISC-III) subtests assessing visual-spatial skills than non-depressed children. Children were identified as having a performance deficit if their Performance IQ was 15 points or more lower than their Verbal IQ (Brumback, 1985).

There is evidence that intellectual functioning improves as severity of depression decreases. Brumback and

Stanton (1980) found that the Full Scale, Verbal, and Performance IQ's of two children were significantly higher following the remission of their depressive symptoms. Although the authors acknowledge that some improvement might be attributable to practice effects, they suggest that practice effects could not account for the magnitude of the changes in subtest scores, nor could they account for the fact that the boys improved on similar subtests. In another study, Staton, Wilson, & Brumback (1981) found that children who initially met the DSM-III criteria for major depression with melancholia obtained significantly higher Full Scale, Verbal, and Performance IQ's following treatment with tricyclic antidepressants.

Problem solving. Depression has been associated with deficits in problem solving. A number of researchers have found that depressed individuals perform more poorly than non-depressed individuals on concept formation tasks. On these tasks, subjects are asked to determine the correct rule which governs a card sorting task. In one such study, Silberman et al. (1983) presented depressed patients and non-depressed controls with cards, each containing two stimuli which could differ along the dimensions of colour, shape, size, and position. Participants were told that one of the features was correct and they had to guess the correct feature by pointing to the side of each card that contained that feature. Participants were periodically told

whether they were correct or incorrect and were required to integrate the feedback to determine the correct feature. It was found that depressed patients generated fewer correct hypotheses than non-depressed controls. Depressed patients also demonstrated poorer "focusing". That is, they had difficulty integrating feedback from the examiner to narrow down the set of potentially correct responses and were less likely to reject incorrect hypotheses than non-depressed controls.

Martin, Oren, and Boone (1991) found differences between depressed and dysthymic patients and non-depressed controls on the Wisconsin Card Sorting Task. On this task, participants are shown four stimulus cards which contain different designs. Cards differ in terms of the number of designs on each card, the colour of design(s), and the shape of the design(s). Participants are given a deck of cards and asked to sort the cards into piles in front of the stimulus cards. They are to guess whether they should be sorting the cards according to colour, number, or shape from feedback provided by the examiner. After the participant correctly guesses the rule, the examiner changes the rule without telling the participant and the participant has to guess the new rule. Martin, Oren, and Boone found that higher levels of depression were associated with a greater number of total errors, failures to maintain set (continue sorting according

to the correct rule), and greater perseveration on incorrect responses.

Memory. Depressed individuals have also shown performance deficits on a variety of memory tasks. Consistent with research on intellectual functioning and problem solving, memory deficits have been found to be related to the severity of depression.

A number of researchers have found evidence of depressive deficits on overall memory functioning as assessed by the Wechsler Memory Scale (WMS; Wechsler, 1945). For example, Stromgren (1977) found that Memory Quotient of depressed patients was negatively correlated with severity of depression prior to ECT treatment. Following ECT treatment, significant improvements were noted in level of depressive symptoms and in Memory Quotient. Furthermore, degree of change in depressive symptoms between first and last treatments was correlated with degree of change in Memory Quotient between first and last treatments.

Bornstein, Baker, and Douglass (1991) administered the WMS to 23 patients diagnosed with major depressive disorder and found that level of depression as assessed by a self-report rating scale was negatively correlated with overall Memory Quotient. Higher levels of depression were associated with lower scores on memory tests.

Depressed individuals have also shown impairments on tests of free recall. Cohen, Weingartner, Smallberg, Pickar,

and Murphy (1982) found that severely depressed patients were impaired relative to normal controls in their ability to recall nonsense trigrams. Memory performance was negatively correlated with severity of depression as assessed by self-report depression inventories.

Roy-Byrne, Weingarten, Biermer, Thompson, and Post (1986) found evidence of a depressive deficit on free recall of words lists on two separate tasks. In one procedure, depressed patients and non-depressed controls were read a list of 32 noun pairs and asked to make one of four comparative judgements about each pair (e.g. more or less valuable, large, etc.). In a subsequent test of free recall for the word list, depressed patients recalled fewer words than did non-depressed controls. In the second procedure, depressed patients and non-depressed controls were read a list of 18 words, six of which had been repeated twice. Participants were then read a list of 24 words, 12 of which had been presented before and 12 of which were new. When subsequently asked to recall the original list, depressed patients remembered fewer words than non-depressed controls.

Calev, Korbin, Shapira, and Kugelmass (1986) found that depressed patients were impaired on free recall of both verbal and visual material. In this study, depressed patients, euthymic patients<sup>1</sup>, and non-depressed controls

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<sup>1</sup>Euthymic patients had suffered from a past episode of Major Depression but were in remission at the time of the study.



were, asked to read a word list aloud and then write down as many words as they could remember. In a second test of free recall for visual material, participants were shown 24 geometric designs and then asked to reproduce as many designs as possible. Depressed patients remembered both fewer words and fewer designs than non-depressed and euthymic participants. Euthymic patients remembered as many designs and words as non-depressed controls, suggesting that memory impairment may disappear with remittance of depressive symptoms.

Depressed patients have also been found to be impaired relative to non-depressed controls in their ability to recall a passage of prose. Watts and Sharrock (1987) played a recording of a prose passage to depressed patients and non-depressed controls and had participants try to freely recall as much of the passage as possible. It was found that depressives remembered less of the passage than did controls.

Deficits in free recall have also been found in depressed children. Lauer, Giordani, Boivin, Halle, Glasgow, Alessi, and Berent (1994) presented a list of 16 categorically similar words to depressed and non-depressed children. On a test of immediate recall, severely depressed children recalled fewer words than non-depressed children.

Further evidence for depressive deficits on tests of free recall comes from a meta-analysis of 99 studies

conducted by Burt, Zembar, & Niederehe (1995). A significant relationship between depression and poorer recall was found. Results further indicated that the association between depression and impairments in free recall is greater for younger than for older subjects, for inpatients rather than outpatients, and when depressed groups contain unipolar and bipolar patients rather than just unipolar patients.

Many of the cognitive deficits observed in depressed patients have also been observed in dysphoric individuals who obtain elevated scores on self-report measures of depressive symptoms. For example, dysphoric deficits have been documented on a number of problem solving tasks. Dobson and Dobson (1981) found that dysphoric college students were impaired relative to non-dysphoric students at solving a concept formation task. Similar to the Silberman, Weingartner and Post (1983) study, participants were asked to determine an operating rule for a card sorting task. Each card differed in terms of the number of figures on the card, number of borders around the card, shape of the figures, and colour of the figures. Participants had to sort the cards and, using feedback from the examiner, determine which one of 3 rules was in effect. The first rule (and easiest) was conjunctive (e.g. correct rule was "red and square"). The second rule was inclusive disjunctive (red and/or square). The third rule was biconditional (red figures are exemplars if, and only if, they are square- objects that are not red

and not square are also correct). No differences were found between dysphorics and non-dysphorics in terms of the number of cards required to figure out the easiest (i.e., conjunctive) rule. However, dysphoric participants required more cards to figure out the two more difficult (i.e., inclusive and biconditional) rules. Furthermore, dysphoric participants were less efficient in problem solving than non-dysphoric participants: dysphorics were more likely to choose cards which confirmed previous information but which provided no new information to help determine the rule.

In another study examining the relationship between dysphoria and problem solving, Abramson, Alloy, and Rosoff (1981) had dysphoric and non-dysphoric participants complete a contingency learning task. Participants had to discover the "correct" button pressing response that would result in the onset of the green light 75% of the time. Half of the dysphoric and non-dysphoric participants were assigned to a condition in which they had to generate their own hypotheses for controlling the green light. The remaining participants were assigned to a condition in which they were provided with a number of hypotheses, including the correct one, which they were to test out for themselves. When participants were required to generate hypotheses for themselves, dysphorics were less likely to perform the controlling response, and judged that they had less control over the onset of the light, than non-dysphorics. However,

when participants were provided with hypotheses by the experimenter, dysphorics performed as many correct responses, and judged that they had as much control over the light, as non-dysphorics. The findings suggest that dysphoric individuals may have difficulty generating problem solving strategies on their own but that they are able to use such strategies as well as non-dysphoric individuals when they are provided for them.

Dysphoric individuals have also demonstrated impairments on anagram solving tasks. On these tasks, participants are presented with words in which letters are scrambled. The participants's job is to unscramble the letters to determine each of the words. Miller, Martin, and Seligman (1975) had dysphoric and non-dysphoric participants complete an anagram solving task in which the words were scrambled in a standard pattern. Each anagram could be solved individually but a faster and more efficient way to complete the task was to figure out the pattern and use this information to solve subsequent anagrams. The results indicated that dysphorics failed to solve as many anagrams as non-dysphorics and required a greater number of trials to learn the pattern. Dysphorics also took longer to solve the anagrams and required more consecutive correct responses before solving the pattern than non-dysphorics.

As with patients suffering from clinical depression, the severity of cognitive deficits displayed by dysphorics

has been linked to the severity of depressive symptoms. For example, Miller, Martin, and Seligman (1975) found that higher levels of dysphoria were associated with fewer correctly solved anagrams, longer lengths of time required to solve anagrams, a greater number of trials to determine the anagram pattern, and a greater number of consecutive correct responses required to determine the anagram pattern.

In summary, depressive deficits have been found on tests assessing intellectual functioning, problem solving, and memory. Many of these deficits have also been observed in individuals who obtain elevated scores on self-report measures of depressive symptoms. In each of these domains, there is evidence to suggest that the degree of impairment is related to severity of depression and that impairments disappear with remittance of depressive symptoms.

#### Depression and Use of Information Processing Strategies

The focus of more recent investigations has turned from simply trying to document depressive deficits to trying to determine the mechanism responsible for such deficits. That is, more attention is currently being devoted to identifying qualitative differences in the way that depressed and non-depressed individuals process information. A number of researchers have suggested that deficits result from a failure on the part of depressed or dysphoric individuals to initiate information processing strategies that are used by non-depressed individuals (e.g. Abramson et al., 1981;

Dobson & Dobson, 1981; Silberman et al., 1983). Depressive's failure to initiate information processing strategies has been demonstrated most directly on tasks related to memory functioning. For example, a number of researchers have found that depressives fail to make use of organizational strategies used by non-depressed individuals to facilitate recall.

In an early study, Levy and Maxwell (1968) demonstrated that clinically depressed patients had more difficulty than non-depressed controls in making use of the organization inherent in text to facilitate recall. In this study, clinically depressed patients, non-depressed controls and non-depressed psychiatric controls memorized word lists which varied in their degree of organization or contextual constraint. Lists with no constraint were composed of completely random words that had no relationship to each other. Lists with high constraint were comprised of words that were closely associated to each other (i.e., sentences taken from written text). It was found that for both groups, recall of the word lists improved as the lists more closely approximated text (i.e. as contextual constraint or degree of organization increased). However, non-depressed and psychiatric controls were significantly better than depressed patients at improving their recall for words as degree of contextual constraint increased.

Another finding in memory research has been that depressed individuals are less likely than non-depressed individuals to make use of categorization as an organizational strategy to facilitate recall. For example, Weingartner, Cohen, Murphy, Martello, and Gerdt (1981; Study 3) presented depressed patients and non-depressed controls with lists of words that could be clustered into categories. When the word lists were presented in unclustered form, depressed patients clustered less at recall and remembered fewer words than non-depressed controls.

Channon, Baker, and Robertson (1993) similarly found that depressed individuals were less likely than non-depressed individuals to make use of categorization to facilitate recall. They compared depressed and non-depressed participants' memory for a list of categorizable words that were presented in a random (unclustered) order. It was found that depressed participants clustered words less at recall and remembered fewer words than non-depressed participants.

Backman, Hill, and Forsell (1986) found a negative relationship between level of depressive symptoms and degree of clustering at recall in a sample of elderly adults. Participants between the ages of 75 and 96 were tested on free recall of unrelated words and on free recall of words that could be organized into categories. Overall, they remembered more words from the organizable word list than from the list of unrelated words. However, the researchers

found that the number of motivational symptoms of depression experienced by participants (including lack of interest, concentration difficulties, psychomotor change, and loss of energy) was a (marginally) significant predictor of amount of clustering at recall. Clustering was found to decrease as the number of motivational symptoms increased.

Although depressed individuals may not spontaneously make use of categorization to facilitate recall of a word list, the available evidence suggests that they are able to make use of this strategy when word lists are presented in clustered form. Weingartner, et al. (1981; Study 3) found that degree of clustering at recall and number of words remembered was similar in depressed and non-depressed individuals when the words were initially presented in categorized format. Channon, Baker, and Robertson (1993) also found that the recall of depressed individuals was equal to that of non-depressed individuals when the word list was initially presented in clustered form.

A number of researchers have examined the organizational strategies used by depressed patients when they are specifically asked to categorize word lists (Russell & Beekhuis, 1975; Weingartner et al., 1981). The available evidence suggests that depressed individuals categorize words in a manner similar to non-depressed individuals when words are highly typical exemplars of their categories. However, the evidence is mixed as to whether or



not depressives are able to make use of their categorization to facilitate recall.

Weingartner, et al. (1981; Study 2) presented depressed patients and non-depressed controls with 32 words that could be sorted into 8 possible categories. They were asked to sort the words into categories and were then given a test of free recall. It was found that depressed patients and non-depressed controls sorted the words into the same number of categories. Furthermore, no differences were found between depressed patients and non-depressed controls for amount of clustering at recall or number of words recalled.

In another study, Russell and Beekhuis (1975) had psychotic depressives and non-depressed controls sort 30 words into categories and then write down as many of the words as they could remember. Participants continued to sort and recall words until they reached a criterion of 20 words remembered. Similar to the findings of Weingartner et al (1981; Study 2), Russell and Beekhuis found that depressed and non-depressed participants categorized the words into a similar number of categories. However, contrary to the findings of Weingartner et al. (1981; Study 2), depressed patients demonstrated less clustering at recall and remembered fewer words over successive recall trials than non-depressed controls. Discrepancies between the findings of Weingartner et al. (1981) and Russell and Beekhuis (1975) may be due to differences in the characteristics of patients

studied. Weingartner et al. studied unipolar depressives whereas Russel and Beekhuis studied psychotic depressives who were described as being in an acute state of their illness.

Such findings suggest that depressed individuals are just as capable as non-depressed individuals of categorizing words that are highly typical exemplars of their categories. However, when items do not obviously fit into categories and individuals are required to categorize according to more abstract principles, depressed patients may not categorize in a manner similar to non-depressed individuals. Evidence for this view is provided by Savard, Rey, and Post (1980) who had depressed patients and non-depressed controls complete the Halstead-Reitan Category Test. On this task, participants are shown variety of stimulus figures that vary in size, shape, number, intensity, colour, and location. Stimulus figures can be grouped according to various abstract principles and participants are required to determine the method of categorization. Savard et al. found that patients suffering from Major Depressive Disorder made more errors in categorization than the non-depressed controls.

Further evidence that depressives have more difficulty categorizing when items are not highly typical of their categories is provided by Weingartner et al. (1981; Study 2). When asked to categorize a list of unrelated words,

depressed patients sorted the unrelated words into fewer categories than did non-depressed controls. Furthermore, depressed patients subsequently remembered fewer words than non-depressed controls. Results of Weingartner et al. (1982; Study 2) suggest that non-depressed individuals may be better than depressed individuals in judging the optimum number of categories in which words should be clustered to facilitate recall.

In summary, results of a number of studies suggest that depressed individuals do not spontaneously make use of organizational strategies that are used by non-depressed individuals to facilitate recall. More specifically, depressed individuals are less likely than non-depressed individuals to make use of categorization. Furthermore, when material is presented in unclustered form, depressives may have more difficulty implementing effective methods of categorization than non-depressed individuals.

#### Possible Mechanisms Responsible for Depressives' Decreased Reliance on Organizational Strategies

There are a number of possible explanations for the finding that depressed individuals make less use of organizational strategies such as categorization. In order to discuss these in more detail, it is necessary to make a distinction between automatic and effortful processing.

It has been proposed that cognitive processes vary along a continuum in terms of the demands that they place on

attentional resources (Kahneman, 1973). At one end of the continuum are highly complex tasks which require considerable attentional resources; the cognitive processes required to complete such complex tasks have been referred to as controlled (Schneider & Schiffrin, 1977), effortful (Hasher & Zacks, 1979) or conscious (Posner & Snyder, 1975) processes. At the other end of the continuum are tasks which require minimal attentional resources; the processes required to complete such tasks have been referred to as automatic (Hasher & Zacks, 1979).

Within this conceptualization, people are viewed as having a limited capacity to process information (Hasher & Zacks, 1979). Because effortful processes require attentional resources, they can be disrupted by concurrent cognitive tasks which also require effortful processing. Automatic processes occur without intention or conscious awareness and because they require minimal attentional resources, they do not interfere with other ongoing automatic or effortful processes (Posner & Snyder, 1975; Schneider, Dumais, & Shiffrin, 1984; Kahneman & Treisman, 1984).

Ellis and Ashbrook (1988) have suggested that depression is associated with a reduction in the amount of cognitive resources available for task-related information processing. As a function of limited cognitive resources, depressed individuals perform more poorly on tasks requiring

controlled or effortful processing, while performance on tasks requiring more automatic processing remains relatively intact.

At present, the mechanism responsible for depression-related reductions in cognitive resources is unclear. However, Ellis and Ashbrook (1988) have suggested that depression may be associated with increases in irrelevant-task processing or with increases in extra-task processing. Irrelevant-task processing refers to processing or allocating attentional resources to aspects of the task that are irrelevant in terms of completing the task. Extra-task processing refers to processing or allocating attentional resources to tasks other than the criterion task at hand. Both extra-task processing and irrelevant-task processing may require expenditure of resources which then cannot be allocated to the criterion task. Ingram (1984) has suggested that depression may be associated with increases in self-focused attention (a form of extra-task processing) which in turn compromises the ability of the depressed individual to allocate resources to a concurrent criterion task.

Depression-related reductions in cognitive resources could explain the failure of depressed individuals to make use of organizational strategies used by non-depressed individuals. Strategies such as categorization that involve actively elaborating and re-organizing material require controlled processing (Hasher & Zacks, 1979). Depressed

individuals may simply not have the resources available to make use of such strategies.

Hertel and her colleagues (e.g. Hertel, 1994; Hertel & Hardin, 1990; Hertel & Rude, 1991) have proposed an alternative explanation for the depressives' decreased reliance on controlled information processing strategies. Because depressives are often capable of using controlled strategies such as categorization when such strategies are provided for them, Hertel et al. argue that depressed individuals do not suffer from a depletion of cognitive resources. They propose instead, that depressives suffer from a deficit in processing initiative. Hertel and her colleagues (Hertel & Hardin, 1990; Hertel & Rude, 1991) have conducted several studies which suggest that while non-depressed individuals spontaneously invoke controlled information processing strategies, depressed individuals only make use of such strategies when constrained to do so by the nature of the task.

In one such study (Hertel & Hardin, 1990), clinically depressed and non-depressed individuals completed a computerized incidental learning task. Participants were shown a word followed by a sentence with one word missing. They were asked to decide whether the word fit sensibly into the sentence. In the focused condition, the word did not remain in view as participants made their decision about whether the word fit sensibly into the sentence.

Participants in this condition, would therefore have to effortfully maintain their attention to the task and rehearse the word in order to be able to make a judgement. In the unfocused condition, the word remained in view while participants made their decision about fit. Participants in this unfocused condition would not need to rehearse the word as it remained on the screen throughout the judgement task. Following the learning task, participants were asked to write down as many of the words as they could remember.

Results indicated that depressed participants recalled more words in the focused than unfocused condition. However, non-depressed participants did not differ between focused and unfocused conditions. Hertel and Hardin (1990) suggest that non-depressed individuals may spontaneously invoke strategies (such as rehearsal) to help them process information while depressed individuals only make use of these strategies if they are constrained to do so by the nature of the task.

It should be noted that Hertel and Hardin's (1990) reduced initiative hypothesis is not necessarily incompatible with resource allocation theory. It is possible that depression related reductions in cognitive resources are responsible for depressives' inability to invoke useful strategies; however, depressives may be able to allocate the

resources necessary to utilize such strategies if they are invoked for them.

### Social Deficits Associated with Depression

In addition to the cognitive deficits noted previously, depression has also been associated with deficits in social functioning. Depressed individuals report that they have fewer close relationships (Gotlib & Lee, 1989), participate in fewer social activities and rate social interactions as less rewarding (Nezlek, Imbrie, & Shean, 1994), and rate the quality of significant relationships more poorly (Gotlib & Lee 1989; Fredman, Weissman, Leaf, & Bruce, 1988) than do non-depressed individuals.

Depression is also associated with social skills deficits. Depressed and dysphoric people have been evaluated as less socially skilled than non-depressed people according to their own self-ratings and the ratings of individuals with whom they are interacting (Dykman, Horowitz, Abramson, & Usher, 1991; Haley, 1982; Youngren & Lewinsohn, 1980) as well as by independent observers (Dykman et al. 1991; Segrin, 1992; Youngren & Lewinsohn, 1980).

Not only are depressed people rated impaired relative to non-depressed individuals on global measures of social functioning, but they also have been found to differ from non-depressed individuals in performance of more specific verbal and non-verbal behaviours while engaged in social interactions. For example, the speech content of depressed



and dysphoric individuals has been found to be more negative than the speech content of non-depressed individuals.

Dysphoric individuals have been found to make fewer verbal responses (Gotlib & Robinson, 1982; Segrin, 1992); smile less frequently (Gotlib & Robinson, 1982; Segrin, 1992); gaze at their partners less frequently (Segrin, 1992); and present with a less pleasant facial expression (Gotlib & Robinson, 1982) than non-depressed individuals.

Depressive deficits have been found in the area of social problem solving. Both depressed and dysphoric individuals have been found to perform more poorly than non-depressed people on a pencil and paper measure of social problem solving called the Means End Problem Solving Task (MEPS; Platt & Spivak, 1975). On this task, participants are given a description of an interpersonal problem and then given the outcome. Their task is to describe the steps that one might follow to bring about the given outcome. Marx, Claridge, and Williams (1992) found that the solutions generated by depressed patients contained fewer steps than those generated by non-clinical controls. Furthermore, the solutions of clinically depressed patients were evaluated by independent raters (who were blind to the experimental condition of the participants) as less effective than the solutions generated by non-clinical controls. In a second study, participants were asked to describe how they handled a specific interpersonal problem in the past and also to

describe how they would have ideally liked to handle the problem. Once again, the actual and ideal solutions of depressed patients were rated as less effective than those of non-depressed controls.

Gotlib and Asarnow (1979) tested dysphoric and non-dysphoric students on the MEPS and found that the solutions generated by dysphoric students contained fewer steps. Furthermore, dysphoric participants were less likely to elaborate upon their solutions, generated a greater number of irrelevant steps and no-response answers, and obtained significantly lower scores for relevancy of their solutions. Similar results were found when researchers compared the responses of depressed and non-depressed students who were seeking help for emotional problems at the university counselling centre (i.e. individuals who were even more likely to be clinically depressed).

Conway and Giannopoulos (1993) showed that dysphoric individuals may be limited in the amount of social information they are able to process. In this study, dysphoric and non-dysphoric participants were asked to evaluate a number of different jobs which were described along five different dimensions (closeness of supervision, flexibility of work schedule, friendliness of coworkers, job significance, and variety of tasks performed). Each dimension was described by one of 5 possible evaluative statements which conveyed the degree to which each dimension

was characteristic of the particular job. Participants were asked to read each job description and then make an overall evaluation of the job, on a likert-type rating scale with endpoints 1 (very bad) and 7 (very good). Although dysphoric and non-dysphoric participants were provided with the same information, dysphoric participants actually utilized fewer pieces of information to make their evaluations. The authors suggest that one possible explanation for their findings is that non-dysphoric participants were able to initiate organizational strategies which maximized the amount of information they were able to use. Dysphoric participants may have been unable to initiate such strategies or been less effective at using them.

Findings of a recent study by Edwards and Weary (1993) provide more direct evidence to suggest that dysphoric individuals do not make use of organizational strategies used by non-depressed individuals to process social information. Edwards and Weary examined the degree to which dysphoric and non-dysphoric individuals would make use of social category information versus individual attributes to make judgements about various target people. Dysphoric and non-dysphoric participants attended two testing sessions. During the first session, they were asked to rate the likability of people who had chosen a variety of different college majors. They were also asked to rate the likability of people who were described as having certain character

traits. Thus for each participant, experimenters were able to determine the relative likability of a variety of academic majors and character traits.

In a second session, participants were asked to rate the likability of a number of target people who were each described by four character traits used in the first testing session. Traits were chosen so they could be categorized according to the academic majors rated for likability in the first session (e.g. intelligent, studious, disciplined and precise were character traits chosen to suggest a mathematics major). Half of the participants were asked to guess each target's academic major prior to making likability ratings for each target. This served to activate a category label for each target before ratings of likability were made. The remaining participants were asked to make their likability ratings before guessing the academic major of the target person. Thus for these participants, a category label was not activated for each target before likability ratings were made. Because participants had rated the likability of the academic majors and individual character traits during the first experimental session, it was possible to determine whether participants' likability ratings for the targets were based on their liking for the category label (academic major) or the individual personality traits.

Edwards and Weary (1993) found that when non-dysphoric individuals were asked to guess targets' academic majors prior to rating their likability, their likability judgements were more highly related to overall likability of the social category rather than the individual traits. When non-dysphoric participants did not guess the academic major prior to rating likability, likability ratings were more similar to likability of the individual traits rather than the academic major implied by the traits. However, for depressed participants, ratings of likability were more similar to likability ratings for traits than academic majors, regardless of whether they guessed the academic major of the target before or after making their likeability rating.

Unlike studies of category use in the performance of memory tasks, dysphorics' decreased reliance on category information in performing this social judgement task cannot be easily explained by resource allocation theory. Edwards and Weary (1994) found no difference between dysphoric and non-dysphoric participants' ratings of how difficult it was to assign targets to an academic major. This is not consistent with a resource allocation explanation that dysphorics make less use of category information than non-dysphorics because they have difficulty invoking or using the categories due to limited cognitive resources.

In fact, Edwards and Weary (1993) suggest that dysphoric participants were actually engaging in a more effortful and detail oriented style of information processing than were non-dysphorics. Making judgements about others on the basis of individual attributes (referred to as piecemeal processing) is viewed as a detail-oriented and effortful approach to social information processing because it requires that perceivers pay attention to individual attributes and integrate these attributes in order to make a judgement. Forming an impression of another on the basis of his/her social category (referred to as categorical processing) is viewed as less effortful but more efficient than piecemeal processing since once a target has been assigned to a social category, the perceiver can use general knowledge about the features of the category (i.e. stereotypes) to make a judgement.

Weary and her colleagues (e.g. Weary, Marsh, Gleicher, & Edwards, 1993) have invoked control motivation theory to explain depressive's decreased reliance on category information in the processing of social information.

#### Control Motivation Theory

Control motivation theory was developed from the early work of attribution theorists (e.g. Heider, 1958; Kelly, 1967) which proposes that people have a need to understand and feel in control of their social environment. It has been well documented however, that depressed individuals feel

that they lack control over events in their lives (e.g. Lewinsohn, Hoberman, & Rosenbaum, 1988; Weisz, Weiss, Wasserman, & Rintoul, 1987). According to control motivation theory, feelings of uncontrollability lead to an uncertainty about one's ability to understand and predict causal relationships in the social environment (Yost & Weary, 1996; Edwards & Weary, 1993). Feelings of uncertainty related to one's ability understand and predict social relationships influence the manner in which depressed individuals process information about others. The theory proposes that depressed individuals attempt to become more accurate in their interpretations of the social environment in an effort to regain a sense of control. In turn, this accuracy goal leads to greater sensitivity to and more detail-oriented processing of social information (Weary, Marsh, Gleicher, & Edwards, 1993).

Weary et al. (1993) propose that enhanced processing of social information occurs only at mild to moderate levels of depression but not at more severe levels of depression. It is expected that severely depressed individuals who presumably have more extensive experience with uncontrollable events come to believe that no amount of effort will render the social world more predictable and understandable. Therefore, severely depressed individuals are not expected to engage in a more detail oriented style of social information processing.

While control motivation theory suggests that mildly to moderately depressed people are more sensitive to social information, more motivated to understand social information, and engage in more effortful processing of social information, it does not predict that depressed people are necessarily more accurate social information processors than non-depressed individuals or that their enhanced processing successfully reduces their uncertainty or feelings of lack of control. Weary et al. (1993) suggest it is possible that a) the additional information gathered by depressed individuals may not be useful or relevant to the social judgement task at hand, b) depressed people may be biased in the way they search for or process social information and c) the level of confidence that depressed people desire in their social judgements is so high that it cannot realistically be attained.

#### Consequences of Not Using Categorical Information in the Processing of Social Information

Historically, the use of social categories to make judgements about others has been viewed by social psychologists as undesirable (McCauley, Stitt, & Segal, 1987). Utilization of stereotypes associated with social categories involves making judgements about others on the basis of perceived group characteristics which may be exaggerated or inaccurate. However, social categorization and stereotype utilization have more recently come to be



viewed as a natural consequence of the fact that people have a limited capacity to process information (Fiske & Neuberg, 1990; Macrae, Milne, & Bodenhausen, 1994). Just as categorization of words in a memory tasks facilitates recall of the words, categorization of social information facilitates processing of social information. In trying to understand how dysphorics' decreased use of categorical processing may place them at a disadvantage in social information processing it is helpful to consider the conditions under which non-depressed individuals are likely to make use of category information in the processing of social information.

Early theories of social perception were concerned with describing the processes by which observers make use of individual attributes to form impressions of others (see Edwards & Weary, 1993). However, more recently it has been recognized that observers often fail to make use of individual attributes when forming impressions of others. In many cases, observers assign a target to a social category and then use stereotypes associated with the category to form impressions or make judgements about the target (Fiske & Neuberg, 1990).

According to Fiske and Neuberg (1990), the processes by which people form impressions of target others lie on a continuum according to the degree to which the perceiver utilizes individuating information (individual attributes).

Categorical and piecemeal processing represent opposite ends of this continuum. At the categorical end of the continuum, perceivers' impressions of target others are based on the social category to which the target belongs; the observer does not make use of the target's individual attributes. At the piecemeal end of the continuum, perceivers form impressions by considering a target's individual attributes; the perceiver does not rely on category information at all (or the category label becomes just one more piece of information).

According to Fiske and Neuberg (1990), categorization represents the first stage of impression formation. When perceivers are confronted with a target, they immediately try to categorize the target. Often this categorization is based on physical features (e.g. race, gender, etc.) because these are immediately apparent to the perceiver. Categorization is viewed as a rapid, perceptual process which occurs automatically.

Fiske and Neuberg (1990) further state that in many judgement situations, perceivers do not move beyond forming impressions of a target on the basis of the initial category information. In their view, movement from categorical processing to more piecemeal processing is mediated by both the perceiver's motivation to form an accurate judgement and by the amount of attention that the perceiver has available to devote to the judgment process. Only if the perceiver has

sufficient attentional resources and the target is interesting or personally relevant will the perceiver pay attention to individuating information.

Fiske and Neuberg (1990) argue that categorization makes social information processing more efficient. They suggest that in most cases, people do not have the time, motivation, or attentional resources to engage in piecemeal processing. Social interactions typically take place rapidly and people are exposed to information from a number of different sources simultaneously. Categorization requires fewer resources than piecemeal processing because once an observer has assigned an individual to a social category, stereotypes associated with the category provide a rich framework for understanding and predicting the behaviour of the individual.

In fact, it has been argued that social stereotypes function as cognitive heuristics. Heuristics have been defined as "energy saving" rules or principles that are invoked to simplify complex information processing tasks (Tversky & Kahneman, 1982; Chaiken, Liberman, & Eagly, 1989). Support for the view that stereotypes function as cognitive heuristics can be found in research demonstrating that people are more likely to make use of stereotypes when cognitive resources are taxed (due to task difficulty or competing demands for cognitive resources) and in research suggesting that the use of stereotypes does in fact "free

up" attentional resources which can then be devoted to a concurrent task (e.g. Bodenhausen, 1990; Bodenhausen & Lichtenstein, 1987; Kruglanski & Freund, 1983; Macrae, Milne, & Bodenhausen, 1994; Pratto & Bargh, 1991).

A number of researchers have manipulated task difficulty by varying the amount of time that subjects have to complete a task. Added time pressure has been found to increase reliance on stereotypes. In one such study, Kruglanski and Freund (1983) had Israeli student teachers evaluate, under conditions of high or low time pressure, a Hebrew composition ostensibly written by an eighth grade student. The eighth grade student was described as being of Ashkenazi (occidental) origin, of Sepharadi (Oriental) origin, or was ethnically unidentified. Overall, the Ashkenazi student was assigned a higher grade than the Sepharadi and unidentified students. However, it was found that the Ashkenazi student (but not the Sepharadi student or the racially unidentified student) was assigned a higher grade under conditions of high time pressure than under conditions of low time pressure. Results suggest that when the task was made more difficult by decreasing the amount of time available for completion, participants relied more heavily on a racial stereotype concerning intelligence to make their evaluation of the Ashkenazi student.

In another study conducted by Pratto and Bargh (1991), participants read about a male or female target performing

behaviours that were consistent or inconsistent with stereotypes for their gender. Task difficulty was manipulated by varying the speed of presentation of behavioral information. The tendency of subjects to stereotype targets at both a trait level and at a more global level was then assessed. Results showed that when presentation speed was slower, trait and global level impressions of the target were relatively independent. However, when the task was made more difficult by increasing the speed of presentation, global stereotypes seemed to guide trait level impressions. That is, participants were less likely to make use of individuating information when cognitive resources were taxed.

Bodenhausen and Lichtenstein (1987) found that individuals' expectations with respect to task difficulty can also affect stereotype use. In their study, participants were presented with a description of a defendant facing assault charges. For half the participants, the defendant's name identified him as Hispanic and the crime (assault) was stereotypically consistent with his ethnicity. For the remaining participants, name of the defendant was ethnically non-descript. Prior to reading the case description, participants were told that they would be asked to make a relatively simple trait judgement about the target's aggressiveness, or a more complex judgement about the target's guilt. After reading the case description, all

participants were asked to make judgements about target guilt and aggressiveness. When participants believed from the outset that they would be required to make a complex judgement about guilt, the Hispanic defendant was rated as more aggressive, more likely to engage in future aggression, more likely to be guilty, and more likely to commit future assaults than the racially non-descript defendant. However, the Hispanic and racially non-descript defendant were not rated differently on any of these variables when participants believed from the outset that they would be asked to make a more simple judgement about the defendant's aggressiveness. Thus, participants relied more heavily on a racial stereotype to make judgements about a target when they had the expectation that they would be asked to make a complex judgement about guilt than when they expected to make a relatively simple judgement about a target trait.

Manipulations aimed at reducing available cognitive resources have also been shown to increase reliance on stereotypes. For example, Bodenhausen (1990) examined how circadian variations in level of arousal affected utilization of a stereotype. It has been suggested that arousal levels affect information processing capacity (Hasher & Zacks, 1979). In this study, "morning" people (those who claim they function best in the morning) and "night" people (those who claim to function best in the evening) were asked to read descriptions of college student

targets accused of misconduct. In some cases, the student targets were described as members of a certain social group and the offenses of which they were accused were stereotypically consistent with their social group (e.g. student athlete accused of cheating, Hispanic student accused of assault, African-American student accused of selling drugs). In the remaining cases, students were not identified as belonging to any particular social group. After reading the case descriptions, participants were asked to make judgements about each target's guilt. It was found that participants were most likely to use stereotypes to infer guilt when tested at their non-optimal time of day. That is, "night" people rated stereotyped targets as more likely to be guilty when they were tested in the morning than when tested at night. "Morning people" rated stereotyped targets as more likely to be guilty when tested late in the day than when tested in the morning. At non-optimal times of day when arousal levels were presumably low (and therefore, fewer cognitive resources were available), participants were more likely to use a stereotype to simplify the decision making task.

Gilbert and Hixon (1991) found that a manipulation aimed at reducing cognitive resources decreased the probability that a stereotype was activated. However, they also found that such a manipulation increased the chance that a previously activated stereotype was utilized. This

study consisted of two phases. During the first "activation" phase of the experiment, participants completed a word fragment completion task. A number of the fragments could be completed to form words that are consistent with stereotypes associated with Asian people (e.g. SH-RT could be completed as SHORT). For half of the participants, the word fragments were presented by an Asian assistant. For the remaining participants, word fragments were presented by a Caucasian assistant. During the word fragment completion task, half of the participants were made "cognitively busy" by having them simultaneously rehearse an eight digit number. The rehearsal task was included to further reduce the cognitive resources of these participants.

During this phase of the experiment it was found that participants who were not "cognitively busy" generated more stereotypic completions when the word fragments were presented by the Asian assistant than when word fragments were completed by the Caucasian assistant. However, participants who were "cognitively busy" generated the same number of stereotypic completions regardless of whether they were exposed to the Asian or Caucasian Assistant. Thus only participants who were not "cognitively busy" when exposed to an Asian assistant showed signs of stereotype activation.

In a second phase of the study, the application phase, the same participants listened to an audiorecording of the Asian or Caucasian assistant describing a day of her life.



Participants then rated the assistant on a series of attributes that were synonyms or antonyms of stereotypes for Asian people. Half of the participants were made "cognitively busy" during this task by having them complete a visual search task while they listened to the assistant describe a day of her life.

Of particular interest here is how "cognitive busyness" (i.e. increased demands for attentional resources posed by the visual search task) affected participants' use of Asian stereotypes to complete the rating task. It was found that participants who were "cognitively busy" rated the Asian assistant higher than the Caucasian assistant on traits that are consistent with stereotypes of Asian people. However, this was true only when participants were "cognitively busy" during the application phase but were not "cognitively busy" during the activation phase of the experiment. Results suggest that increased demands for cognitive resources increased reliance on stereotypes; however, this was true only if the stereotype had been activated in the first phase of the study.

Recent research conducted by Macrae, Milne, and Bodenhausen (1994) provides more direct evidence that stereotypes function as heuristics and that their use actually facilitates performance on a secondary task. In this study, participants completed a computerized impression formation task while simultaneously monitoring information

played over a tape recorder. In the impression formation task, participants were presented with the name of a target and then with a number of trait descriptors. In one condition, participants were given a stereotype label consistent with the trait information and in another condition, no such label was provided. It was found that participants remembered more of the trait descriptors when they had been provided with the stereotype label to facilitate the organization of trait information. Furthermore, when stereotype labels were presented during the impression formation task, participants remembered more of the information that was presented during the concurrent monitoring task. These findings provide compelling evidence that stereotypes do function as energy saving devices and preserve cognitive resources in the face of demanding information processing tasks.

In summary, recent theories of social perception as well as research related to stereotype utilization suggest that social categorization and use of category information (i.e. stereotypes) facilitates social information processing. Categorization helps people to organize and integrate information about a particular target. Furthermore, the use of stereotypes associated with social categories may "free up" cognitive resources and maximize the efficiency with which social information is processed.

Although there is some evidence that depressed and dysphoric individuals make less use of categorization when completing cognitive and social judgement tasks (Edwards & Weary, 1993; Weingartner et al., 1981) little research has been devoted to investigating dysphorics' and depressives' use of stereotypes as heuristics in the processing of social information. Given the role that stereotype use plays in maximizing the efficiency of social information processing, this is an important question to address. The available evidence suggests that dysphoric and depressed individuals are not very efficient social information processors. When interacting with others, depressed and dysphoric individuals are slower to respond and make fewer verbal responses than their non-depressed counterparts. Depressed individuals also have a tendency to withdraw from social contact. These deficits could reflect difficulties organizing and interpreting social information which could result from a decreased reliance on social category information (i.e. stereotypes).

#### Purpose of Investigation

Three studies were conducted to investigate whether dysphoric individuals differ from non-dysphoric individuals in their use of stereotypes as heuristic strategies in the processing of social information. Specifically, the research examined whether dysphoric individuals made less use of social stereotypes than non-dysphoric individuals.

In each of the three studies, a procedure previously developed by Nelson, Beirnat, and Manis (1990) was used to investigate stereotype utilization. In this procedure, dysphoric and non-dysphoric participants were asked to estimate the heights of male and female target persons depicted in photographs. Participants were shown full-length pictures of different target individuals who were standing or sitting near some familiar frame of reference. Of interest was the degree to which dysphoric and non-dysphoric participants would utilize the stereotype that men are taller than women to make their judgements. Male and female targets were actually matched for height so stereotype utilization could be assessed by examining the discrepancy between height estimates for male and female targets.

This methodology was viewed to have several advantages over methods that have been used previously to study stereotype utilization. In much of the previous research on stereotype use, researchers have had subjects rate target others on what Biernat (1995) has referred to as subjective response scales. Subjective response scales are rating scales for which the meaning of the points along the scale are open to the subjective interpretation of the individual participant. For example, participants may be asked to rate a target's aggressiveness on a 7 point Likert type scale with endpoints 1 (not at all aggressive) to 7 (very aggressive). The meanings of "not at all aggressive" and

"very aggressive" can vary depending on the subject and the particular target for whom the judgement is to be made.

Biernat (1995) has suggested that a particular difficulty associated with the use of subjective rating scales is they are subject to what she has termed "standard shifts in judgment". That is, perceivers use different standards of comparison to make judgements about targets from different social groups. When perceivers are asked to make a judgement about a member of certain social group on a stereotype relevant attribute, they will use a within group standard of comparison to make the judgement. For example, if individuals are asked to make judgments about a man and a women on various characteristics or traits, they will compare the male target to a "male standard" and the female target to a "female standard". Consider a situation in which perceivers are exposed to a male and a female target performing an aggressive behaviour. Even if the behaviours of the male and female target are described in exactly the same way, observers may not perceive the male and female target to be equally aggressive. By male standards, the male might be judged as not very aggressive. However, a female performing the exact same behaviour may be seen as very aggressive for a women. Because the perceivers are using different scales or frames of reference to judge the behaviour of the male and the female target, the scores that they are given may not be directly comparable. Differences

(or similarities) in ratings of different groups on stereotype relevant attributes therefore become difficult to interpret.

The use of the height estimation task to study stereotype utilization overcomes many of the interpretive difficulties associated with the use of subjective rating scales. This is because height estimates are made on what Biernat (1995) has referred to as an objective rating scale. Objective rating scales are those for which the units of measurement for a particular characteristic or trait are similar regardless of the social group to which the target belongs. For example 5 feet, 9 inches means the same, regardless of whether the estimate is made about a male or female target person.

The use of the height estimation task offers several other advantages over subjective rating scales. First, use of height estimation task makes it possible to calculate an index of stereotype utilization for each participant. While subjective rating scales may illuminate group differences on ratings of particular characteristics of traits, it is not possible to determine "how much" individuals are making use of the stereotype. However, an index of stereotype utilization can be calculated for each participant who completes the height estimation task by subtracting the female estimates from the male estimates. A discrepancy of 0 indicates no stereotype utilization while a discrepancy of

+5 would indicate that males are perceived to be five inches taller than women. Biernat (1995) has argued that ratings made about a target on an objective rating scale are more likely to reflect the perceiver's "true mental representation" than those made on subjective rating scales.

Biernat (1995) has outlined several other advantages associated with the height estimation task methodology. First, previous research conducted by Nelson et al. (1990) demonstrated that it is very difficult for individuals to overcome their use of the stereotype that men are taller than women. This finding combined with the fact that the stereotypes associated with height are not particularly controversial helps to eliminate concerns that participants will make an effort to respond in a socially desirable manner.

Another advantage of the height estimation task, according to Biernat (1995), is that most adults believe in the stereotype that men are taller than women. Strength of the stereotype is therefore, not likely to vary much between individuals. Furthermore, because the relative accuracy of the stereotype is known (on average, men are taller than women), participants' beliefs concerning the stereotype can be compared against an objective standard.

In addition to the methodological advantages outlined above, the height estimation task allows for the investigation of a number of issues of theoretical

importance. Weary et al. (1994) have suggested that dysphorics' decreased reliance on category information in the processing of social information represents a more detail oriented and effortful style of processing. However, this is difficult to determine through the use of subjective rating scales which do not allow for an assessment of the accuracy of subjects' judgements. If dysphoric participants rate a target individual as less likely to possess stereotype relevant trait than non-dysphoric participants, this could mean that they are engaging in a more effortful style of information processing. However, it could also mean that dysphoric participants are more conservative in their judgements (i.e. are less likely to make use of extreme points on the rating scale). Because the accuracy of participants' height estimates can be determined, the height estimation task makes it possible to distinguish between these two possibilities. If dysphorics obtain lower stereotype scores than non-dysphorics because of a conservative response style (in this case a tendency to estimate all targets to be very similar in height), accuracy of height estimates will be affected so that stereotype scores are unrelated to accuracy.

#### Study 1

The purpose of the first study was to investigate the use of stereotypes by dysphoric and non-dysphoric individuals. As stated previously this was done by having



all participants estimate the heights of various male and female targets and assessing the degree to which each dysphoric and non-dysphoric participant made use of the stereotype that men are taller than women to complete their height estimates.

Another purpose of Study 1 was to establish the validity of the height estimation task. If this task provides a valid index of stereotype utilization, patterns of stereotype use on the height estimation task should follow patterns of stereotype use that have been observed in previous research. More specifically, stereotype use on the height estimation task should be sensitive to manipulations of task complexity; as the task is made more difficult or cognitive resources are taxed, participants should rely more heavily on the stereotype that men are taller than women when making their height estimates.

In Study 1, complexity of the height estimation task was manipulated in two different ways. First, position of the target person was varied. Half of the pictures depicted male and female targets in a sitting position; the other half depicted male and female targets in a standing position. Nelson et al. (1990) suggest that it is more difficult for individuals to estimate the heights of sitting targets than standing targets because the full length of the body is not clearly visible for sitting targets.

Another way in which task complexity was manipulated was by varying the number of tasks that participants had to complete while estimating the heights of targets. Under conditions of low cognitive load, participants only completed the height estimation task. Under conditions of high cognitive load, participants completed the height estimation task and simultaneously listened to a word list. They were asked both to estimate the heights as accurately as possible and to remember as many words as possible.

The following hypotheses were tested in Study 1. Based on the preliminary work of Edwards and Weary (1993) it was hypothesized that dysphoric participants would be less likely than non-dysphoric participants to rely on the gender/height stereotype when completing their height estimates.

It was also expected that degree of stereotype utilization for all participants would be dependent on level of task difficulty. Thus participants were expected to rely more heavily on the height/gender stereotype when estimating the heights of sitting targets than when estimating the heights of standing targets. Furthermore, it was expected that participants would make more use of the stereotype under conditions of high cognitive load (when completing the height estimation task in combination with the memory task)

than under conditions of low cognitive load (when only completing the height estimation task).

### Method

#### Participants

Twenty male and thirty female students enrolled in an introductory psychology course at Dalhousie University served as participants. They were invited to participate based on their scores on the Beck Depression Inventory (BDI; Beck et al., 1961) obtained approximately three months prior to testing. Dysphoric participants (10 male, 15 female) obtained a score 9 or above at time of screening and at the time of testing. A minimum BDI score of 9 has been used by a number of previous researchers to categorize participants as dysphoric (e.g. Gotlib & Robinson, 1982; Segrin, 1992; Segrin & Dillard, 1993). Non-dysphoric participants (10 male, 15 female) obtained scores of 4 or less at screening and at time of testing. A BDI cutoff score of 4 or less has been used by a number of other researchers to categorize participants as non-dysphoric (e.g. Hertel & Rude, 1991; Segrin, 1992; Segrin & Dillard, 1993).

Mean BDI scores of dysphoric and non-dysphoric participants at time of testing were 15.0 and 1.7, respectively. Participants received partial course credit for their participation.

## Materials

Slides for height estimation task. Slides were of male and female university students in a sitting or standing position. Targets were photographed from a variety of distances and angles but were always next to some familiar frame of reference. The height of each target (including footwear) was measured. Two sets of slides, referred to as Set A and Set B were constructed. Participants viewed one set when completing the height estimation task alone and viewed the other set when completing the height estimation and memory tasks simultaneously. Each slide set contained 32 slides. Sixteen male (8 sitting and 8 standing) and sixteen female (8 sitting and 8 standing) appeared in each set. Targets were chosen so that the average heights of the male and female targets within each set were similar. Targets in each set ranged in height from 62.5 inches to 72.5 inches. Mean heights of male and female sitting targets in Set A were both 68.38 inches. Mean heights of male and female standing targets in Set A were 68.25 inches and 68.38 inches, respectively. For Set B, the mean heights of male and female sitting targets were both 67.63 inches. For standing targets, the mean height of the male targets was 69.13 inches and the mean height of the female targets was 69.00 inches.

Word lists for memory task. Two word lists were constructed, each containing 26 concrete nouns (see Appendix

A). Six of the words in each list were repeated twice so that each list contained a total of 32 words. Words within and between each list were matched for length, frequency of usage, and degree of concreteness according to norms provided by Pavio, Yuille, and Madigan (1968).

Beck Depression Inventory (BDI; Beck et al. 1961). The BDI assesses the severity of 21 symptoms and attitudes associated with depression. Participants rate the degree to which each symptom or attitude is present by endorsing one of four possible statements. Each rating is scored from 0-3. Total BDI score is calculated by summing the ratings for each item. Higher scores indicate greater depression. This measure has been found to have good internal consistency. Beck, Steer, and Gorbin (1988) reviewed 15 studies investigating internal consistency of the BDI in non-psychiatric samples and found that the mean alpha was .81, with a range from .73 to .92. The BDI has also been found to have good concurrent validity. In a review of 35 studies, Beck et al. (1988) found that the BDI was highly correlated with both clinical ratings of depression (correlations ranged from .55 to .96) and other self-report measures of depression (e.g. correlations with the Hamilton Rating Scale of Depression (Hamilton, 1960) ranged from .61 to .86 in psychiatric samples and ranged from .73 to .80 in non-psychiatric samples).

### Participant Ratings of Task Related Variables.

Dysphoric and non-dysphoric participants were asked to estimate the percentage of heights that they were able to accurately estimate within two inches. Dysphoric and non-dysphoric participants were also asked to rate the difficulty of the task, the importance of the task, and how hard they tried to accurately complete the task on 8 point Likert-type scales. Endpoints of ratings of task difficulty were, 0 (not at all difficult) and 7 (extremely difficult). For ratings of task importance, endpoints of scale were 0 (not at all important) and 7 (extremely important). Endpoints for ratings of how hard participants tried to accurately complete the task were 0 (not at all) and 7 (extremely hard). The last item on this questionnaire requested that participants list the strategies that they employed when completing the height estimation and memory tasks. These questions were included in order to identify potential mediating variables accounting for the hypothesized relation between dysphoria and decreased stereotype utilization. Rating scales for all task related variables are illustrated in Appendix B.

### Procedure

Dysphoric and non-dysphoric participants were asked to complete the height estimation task alone, the memory task alone, and the height estimation task in combination with the memory task. Order of tasks was counterbalanced across

participants in each dysphoria condition. The slide set (A or B) used in the height estimation task alone and the height estimation task in combination with the memory task was counterbalanced across participants in each dysphoria condition. Version of word list (A or B) used in the memory task alone and the memory task in combination with the height estimation task was also counterbalanced across participants in each dysphoria condition.

Following completion of the height estimation and memory tasks, participants completed the questionnaire assessing a number of task-related variables and also completed the BDI. Subjects were fully debriefed as to the purpose and hypotheses of the study at the end of the testing session.

Height Estimation Task Alone. A Caramate slide projector was used to project slides onto a wall approximately five feet in front of the participant. The projector advanced the slides at 10 second intervals.

Instructions for the height estimation task were adapted from Nelson et al. (1990). They were written on a piece of paper and participants followed along as the experimenter read them aloud. Instructions were as follows:

In this study, you will be shown 32 slides of different people. Your job is to estimate the height of each person to the nearest half inch (wearing the shoes or boots in which he or she is shown). Write each height

estimate down on the piece of paper provided. You will have approximately ten seconds to view each slide. Participants wrote their height estimations down on a piece of paper beside numbers which corresponded to the number of each slide.

Memory task alone. Dysphoric and non-dysphoric participants were asked to listen to a list of 32 words that were presented over an audio cassette recorder. Words were presented at a rate of 1 word every 10 seconds. Participants were asked to try and remember as many of the words as they could and were given a test of free recall for the word list immediately following presentation.

Memory task and height estimation task in combination. In the third task, dysphoric and non-dysphoric participants were asked to complete the memory task and the height estimation task simultaneously. The procedure for the height estimation part of this task was identical to the procedure for the height estimation task alone. However, as participants were completing the height estimation task, they also listened to one of the word lists (A or B) and were asked to simultaneously try to remember as many of the words as possible. Presentation of the word list was timed so that one word was presented with the offset of each slide. Following the presentation of the slides and words, participants were given a test of free recall for word list.



Instructions for this task were typed on paper and participants followed along as they were read aloud by the experimenter. The instructions were as follows:

In this study, you will be shown 32 slides of different people. Your job is to estimate the height of each person to the nearest half inch (wearing the shoes or boots in which he or she is shown). Write each height estimate down on the piece of paper provided. You will have approximately ten seconds to view each slide. As you are viewing each slide, you will hear one word presented with each slide. While you are completing the height estimation task, listen to the words and try to remember as many as you can.

## Results

### Stereotype Utilization

Stereotype utilization scores were calculated for each participant by subtracting participants' mean height estimate for female targets (in inches) from their mean height estimate for male targets (in inches). Degree of stereotype utilization was analyzed as a 4-way mixed factorial with dysphoria condition (dysphoric or non-dysphoric) and sex of participant as between subjects variables. Position of target (sitting or standing) and cognitive load (height estimation task completed alone or simultaneously with the memory task) as within subjects variables. Preliminary analyses did not reveal any

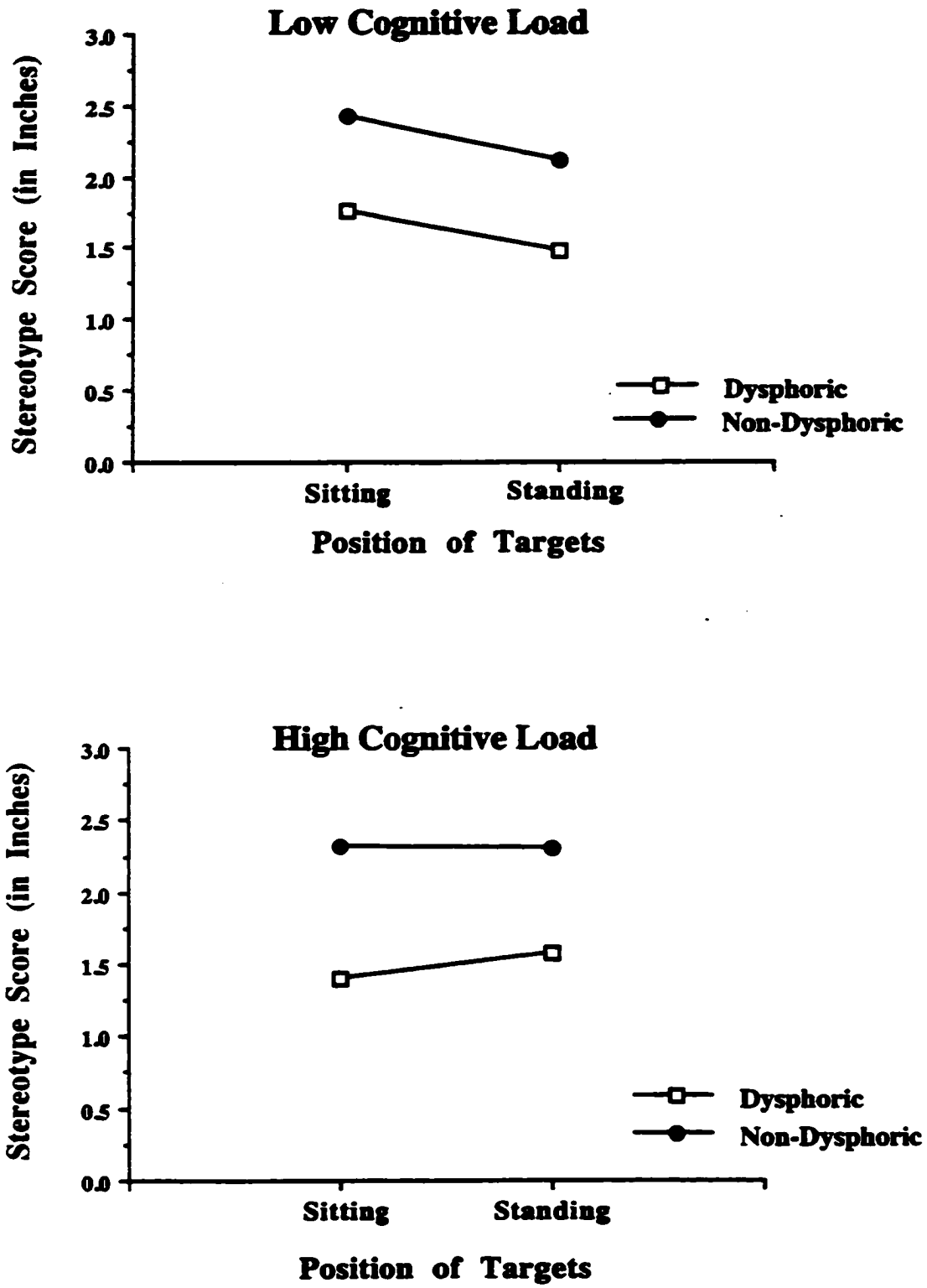
significant effects of sex of participant. Results are therefore reported collapsed across this variable.

A significant main effect of dysphoria condition (dysphoric or non-dysphoric) was found,  $F(1,48)=5.29$ ,  $p<.03$ . Overall, dysphoric participants obtained lower stereotype utilization scores ( $M=1.55$ ,  $SD=1.00$ ) than non-dysphoric participants ( $M=2.29$ ,  $SD=1.25$ ). No other significant main effects or interactions were found. Stereotype utilization scores for dysphoric and non-dysphoric participants for sitting and standing targets in each cognitive load condition are shown in Figure 1.

#### Error in Height Estimations

For each participant, the absolute difference between each height estimate and each target's actual height was calculated. These differences were averaged to obtain an error score (in inches) for each participant in each cognitive load condition. Higher scores indicate greater error.

Error scores were analyzed as a three way mixed factorial with dysphoria condition (dysphoric or non-dysphoric) as a between subjects variable. Position of target (sitting or standing), and cognitive load condition (height estimation task completed alone or with memory task) were within subjects variables. The main effect of dysphoria condition was not significant,  $F(1,48)=1.80$ ,  $p=.186$ . However, a significant main effect of cognitive load was



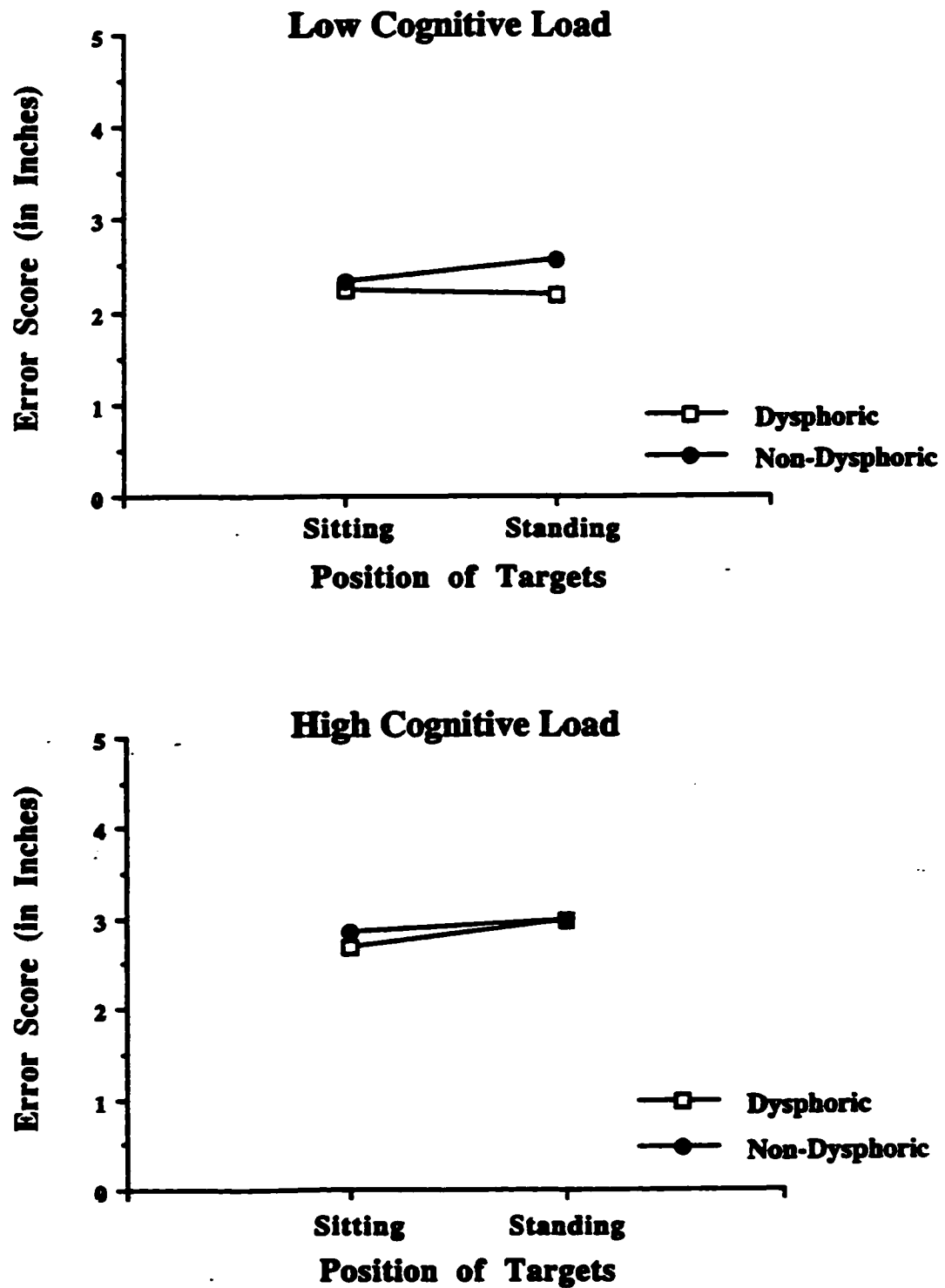
**Figure 1.** Effects of position of target and cognitive load on stereotype scores of dysphoric and non-dysphoric participants (Study 1).

found,  $F(1,48)=105.10$ ,  $p<.001$ . Participants were more accurate when they completed the height estimation task alone ( $M=2.32$ ,  $SD=.40$ ) than when they completed the height estimation task with the memory task ( $M=2.88$ ,  $SD=.49$ ). A significant main effect of target position was also found,  $F(1,48)=11.19$ ,  $p<.002$ . Participants were more accurate in their estimates for sitting targets ( $M=2.52$ ,  $SD=.43$ ) than they were in their estimates for standing targets ( $M=2.68$ ,  $SD=.44$ ). Error scores for dysphoric and non-dysphoric participants for sitting and standing targets in each cognitive load condition are shown in Figure 2.

#### Relationship Between Stereotype Use and Accuracy

In order to investigate the relationship between stereotype utilization scores and error scores, correlations were calculated between these two variables for dysphoric and non-dysphoric participants under conditions of both high and low cognitive load. When dysphoric participants completed the height estimation task on its own, the correlation between stereotype utilization scores and error scores was marginally significant,  $r=.32$ ,  $p=.06$  (onetail). Similarly, a marginally significant correlation was found between stereotype and error scores when dysphoric participants completed the height estimation task under conditions of high cognitive load,  $r=.33$ ,  $p=.055$  (onetail).

For non-dysphoric participants, a significant correlation was found between stereotype and accuracy scores



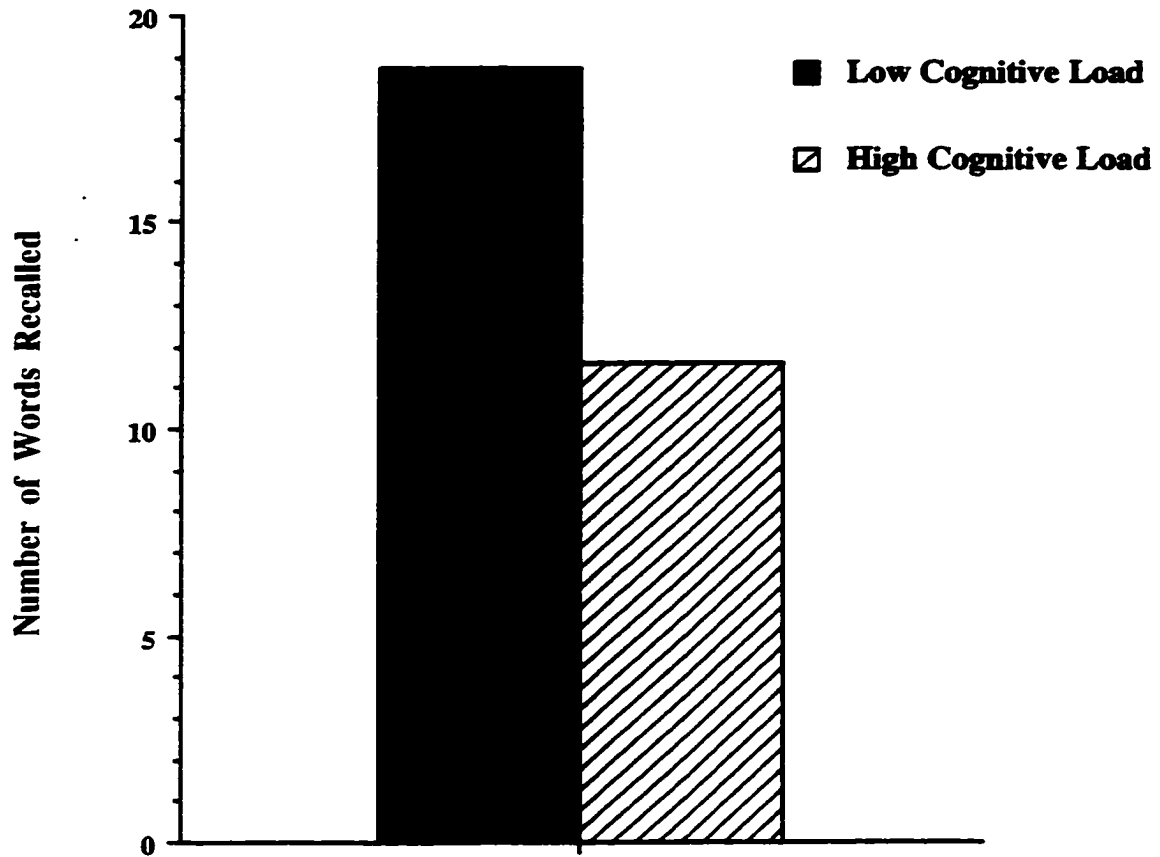
**Figure 2.** Effects of position of target and cognitive load on error scores of dysphoric and non-dysphoric participants (Study 1).

when the height estimation task was completed alone,  $r=.40$ ,  $p<.05$  (onetail). No significant correlation was found between non-dysphorics' stereotype scores and error scores when the height estimation task was completed under conditions of high cognitive load,  $r=-.02$ ,  $p>.05$  (onetail).

For both dysphoric and non-dysphoric participants, direction of the significant correlations between stereotype and error scores indicates that higher stereotype utilization scores were associated with higher error scores (i.e. less accurate height estimates).

### Memory

Number of words remembered during the test of free recall of the word lists was analyzed as a two-way factorial with dysphoria condition (dysphoric or non-dysphoric) as a between subjects variable and cognitive load condition (memory task presented alone or with height estimation task) as a within subjects variable. A main effect of cognitive load condition was found,  $F(1,48)=135.70$ ,  $p<.001$ . Participants remembered more words when they completed the memory task alone ( $M=18.74$ ,  $SD=3.82$ ) than when they completed the memory task in combination with the height estimation task ( $M=11.62$ ,  $SD=4.18$ ). No other significant main effects or interactions were found. Effects of cognitive load on recall scores are illustrated in Figure 3.



**Figure 3.** Number of words recalled in each cognitive load condition.

Re-analysis of Data: Cognitive Load as Between Subjects'  
Variable

In Study 1, it was expected that participants would be more likely to rely on the stereotype to complete their height estimations under conditions of high cognitive load than low cognitive load. However, the load manipulation did not affect stereotype use for either dysphoric or non-dysphoric participants. This may be related to the fact that load manipulation was a within subjects variable. All participants completed the height estimation task alone and in combination with the memory task. This may have introduced a potential confound in that prior performance of one task could have influenced subsequent performance on another task. While order of task performance was counterbalanced, the additional error variance contributed by previous task involvement may have reduced the power necessary to observe differences in stereotype utilization between the different cognitive load conditions.

Because of the potential flaws associated with a within subjects design, stereotype use and accuracy were re-analyzed in a between subjects design. Participants who completed the height estimation task first were included in the no load condition. Participants who completed the height estimation task in combination with the memory task first were included in the high cognitive load condition. This resulted in 8 non-dysphoric and 9 dysphoric participants in



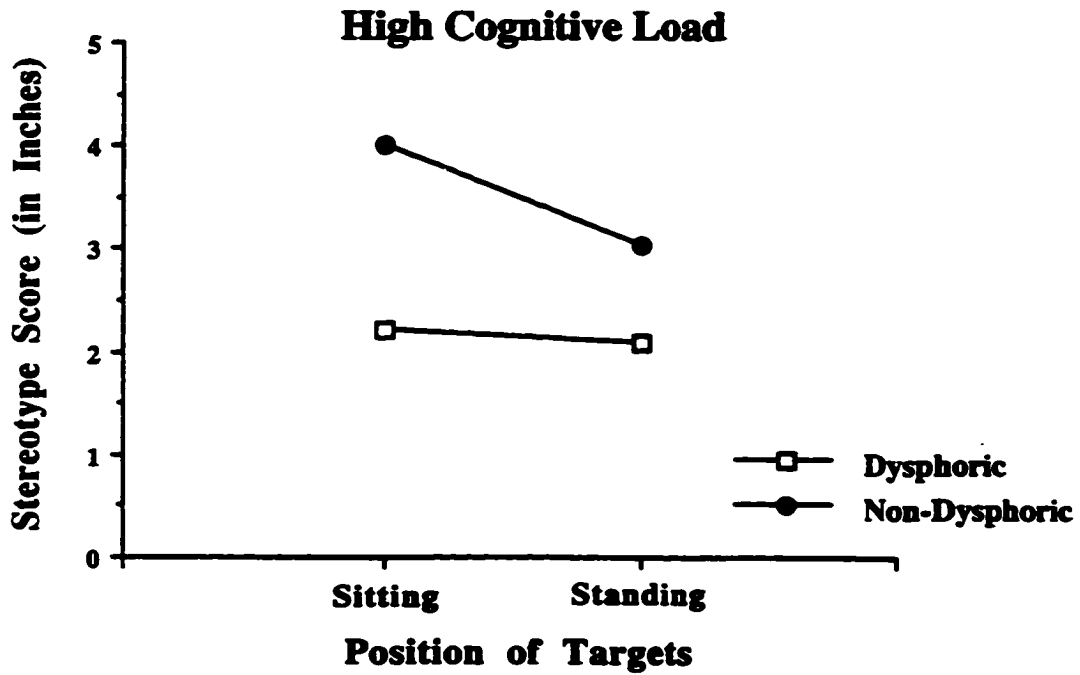
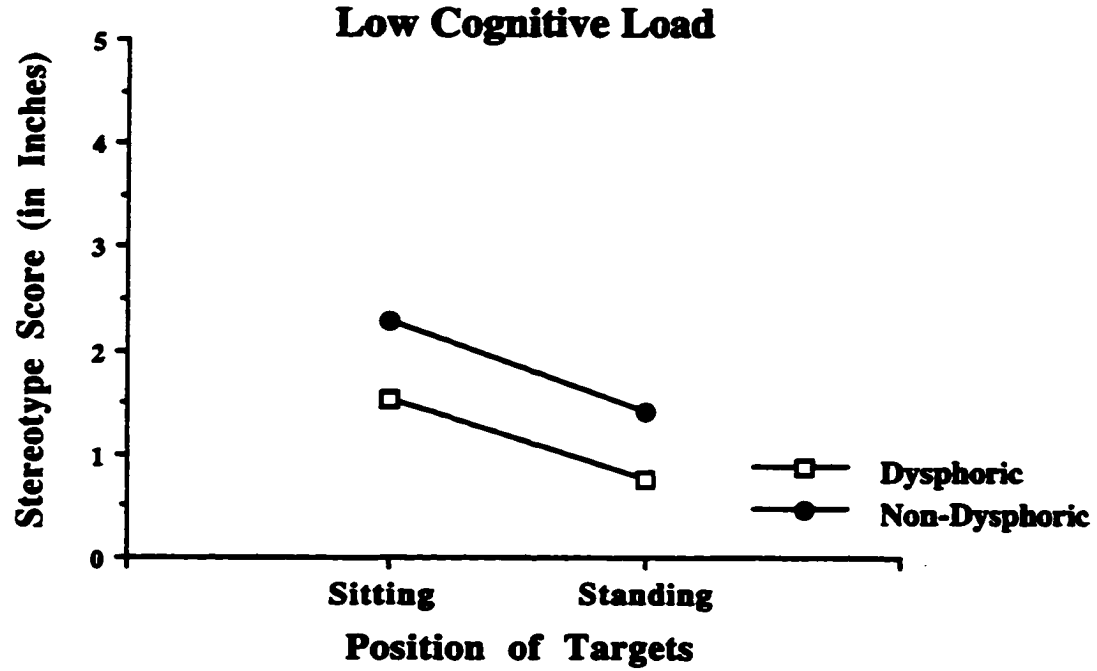
the no load condition, and 9 non-dysphoric and 10 dysphoric participants in the high load condition.

It was also expected that participants would rely more heavily on the stereotype when estimating the heights of sitting targets than standing targets. However no effects of target position were found. Further contrary to predictions was the finding that participants were more accurate in estimating the heights of sitting than standing targets. Upon re-examining the slides, it was found that a number of the sitting pictures were taken in profile. That is, a number of sitting targets were posed so that participants could clearly see the full length of the targets' bodies. It could be that estimating the height of a sitting target was no more difficult than estimating the height of a standing target when the full length of the sitting target's leg was visible.

Before stereotype and accuracy scores were re-analyzed in a between subjects design, pictures of sitting targets shown in profile were removed from each set of slides. Corresponding matches (i.e. sitting targets of the opposite sex who were similar in height) were also removed so that the average height of male and female targets would remain equal. In all, 5 male and 5 female sitting targets had to be removed from slide set B, while 4 male and 4 female sitting targets were removed from set A.

Stereotype utilization. Stereotype utilization was re-analyzed as a 3-way analysis of variance with dysphoria condition and cognitive load condition (height estimations completed alone or with memory task) as between subjects variables. Position of target (sitting or standing) was a within subjects variable. Consistent with predictions, significant main effects were found for dysphoria condition,  $F(1,32)=5.13$ ,  $p=.03$ ; cognitive load condition,  $F(1,32)=8.61$ ,  $p=.006$ ; and position of target,  $F(1,32)=8.57$ ,  $p=.006$ . Dysphoric participants ( $M=1.67$ ,  $SD=1.49$ ) obtained lower stereotype utilization scores than non-dysphoric participants ( $M=2.73$ ,  $SD=1.51$ ). Participants relied less on the gender/height stereotype when estimating the heights of standing targets ( $M=1.84$ ,  $SD=1.49$ ) than when estimating the heights of sitting targets ( $M=2.50$ ,  $SD=1.93$ ). Participants who completed the height estimation task alone obtained lower stereotype utilization scores ( $M=1.47$ ,  $SD=1.30$ ) than participants who completed the height estimation task simultaneously with the memory task ( $M=2.80$ ,  $SD=1.56$ ). No other significant effects were found. Stereotype utilization scores for dysphoric and non-dysphoric participants for sitting and standing targets in each cognitive load condition are shown in Figure 4.

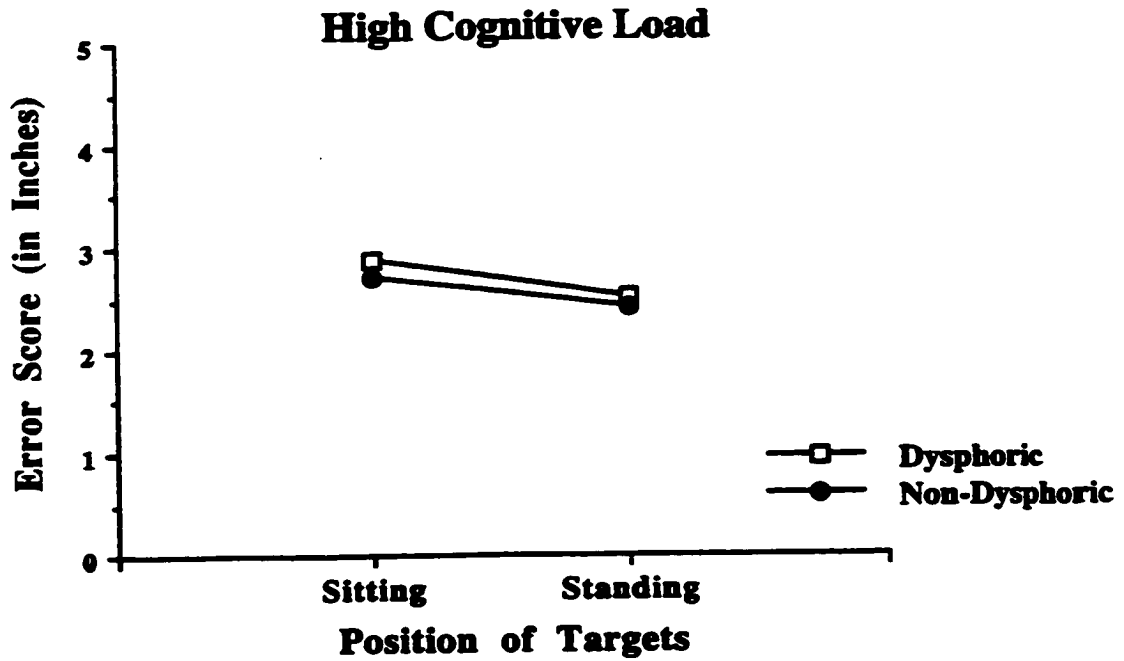
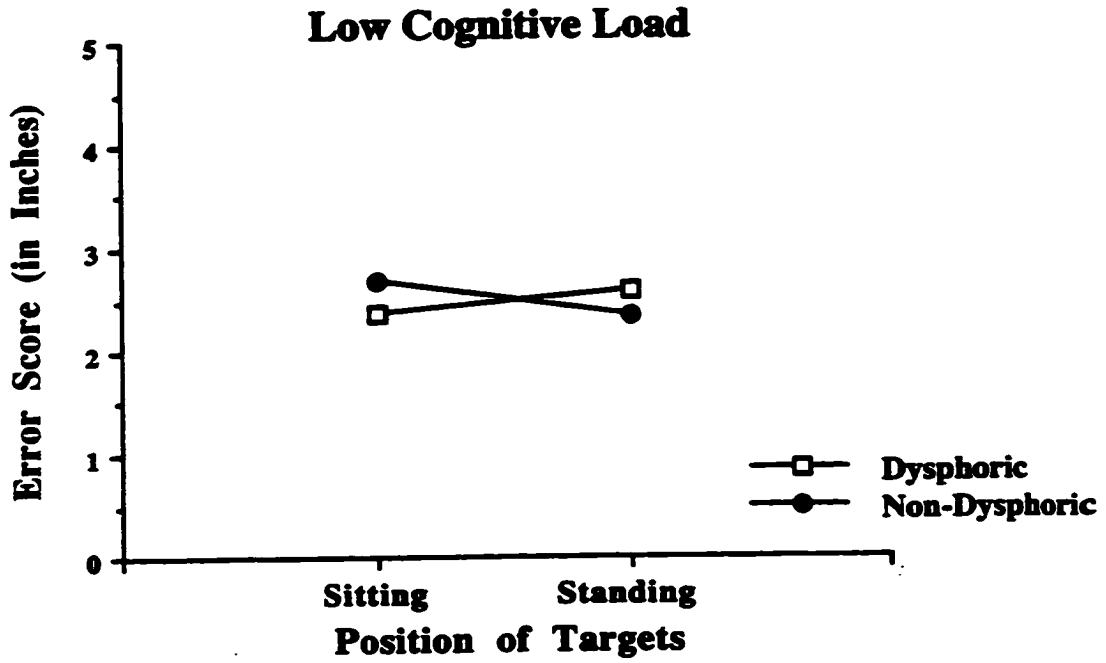
Error in height estimates. Error scores were re-analyzed as a 3-way analysis of variance with dysphoria condition and cognitive load condition (height estimation



**Figure 4.** Effects of position of target and cognitive load on stereotype scores of dysphoric and non-dysphoric participants (between subjects design; Study 1).

task completed alone or with memory task) as between subjects variables. Position of target (sitting or standing) was a within subjects variable. A marginally significant main effect of position was found,  $F(1,32)=3.21$ ,  $p=.083$ . Participants were slightly more accurate when estimating the heights of standing ( $M=2.47$ ,  $SD=.59$ ) than sitting targets ( $M=2.65$ ,  $SD=.68$ ). No other significant main effects or interactions were found. Error scores for dysphoric and non-dysphoric participants for sitting and standing targets in each cognitive load condition are shown in Figure 5.

Processes involved in stereotype use. Although dysphoric participants obtained lower stereotype utilization scores than non-dysphoric subjects, the examination of error scores did not reveal significant differences between the two groups in terms of the accuracy of their height estimates. Dysphorics' lower stereotype scores could therefore be interpreted in a number of different ways. Dysphorics could have been engaging in more detail oriented and effortful processing, they could have been more random in their responses, or they could have been more likely than non-dysphoric participants to guess all targets to be of similar height. An effort was made to distinguish between these possible explanations in a number of different ways. First, t-tests were conducted to determine whether dysphorics' and non-dysphorics' stereotype scores differed significantly from zero. If dysphorics' lower stereotype



**Figure 5.** Effects of position of target and cognitive load on error scores of dysphoric and non-dysphoric participants (between subjects design; Study 1).

scores were the result of guessing all male and female targets to be of similar height, their stereotype scores should not be significantly different from zero. Under conditions of low cognitive load, it was found that dysphorics' stereotype scores were significantly different from zero,  $t(7)=3.17$ ,  $p<.01$ , as were the stereotype scores of non-dysphorics,  $t(8)=3.47$ ,  $p<.01$ . Under conditions of high cognitive load, the stereotype scores of dysphorics and non-dysphorics were also significantly different from zero,  $t(9)=3.98$ ,  $p<.01$ ; and  $t(8)=10.06$ ,  $p<.01$ , respectively. Thus dysphorics' lower stereotype scores do not seem to be the result of guessing all targets to be of similar height.

To further investigate the possibility that dysphorics' lower stereotype scores were the result of random responding, accuracy of dysphorics' and non-dysphorics' height estimates were also assessed by examining dysphoric and non-dysphoric participants' mean height estimates for male and female targets of a variety of different heights. To conduct this analysis, targets who were 66.5 inches or shorter were included in target group 1; targets who were 67.0 to 69.0 inches were included in target group 2; and targets who were 69.5 inches and above were included in target group 3. The effects of dysphoria condition and target group on height estimates for male and female targets were analyzed as two separate 3-way ANOVAS with dysphoria

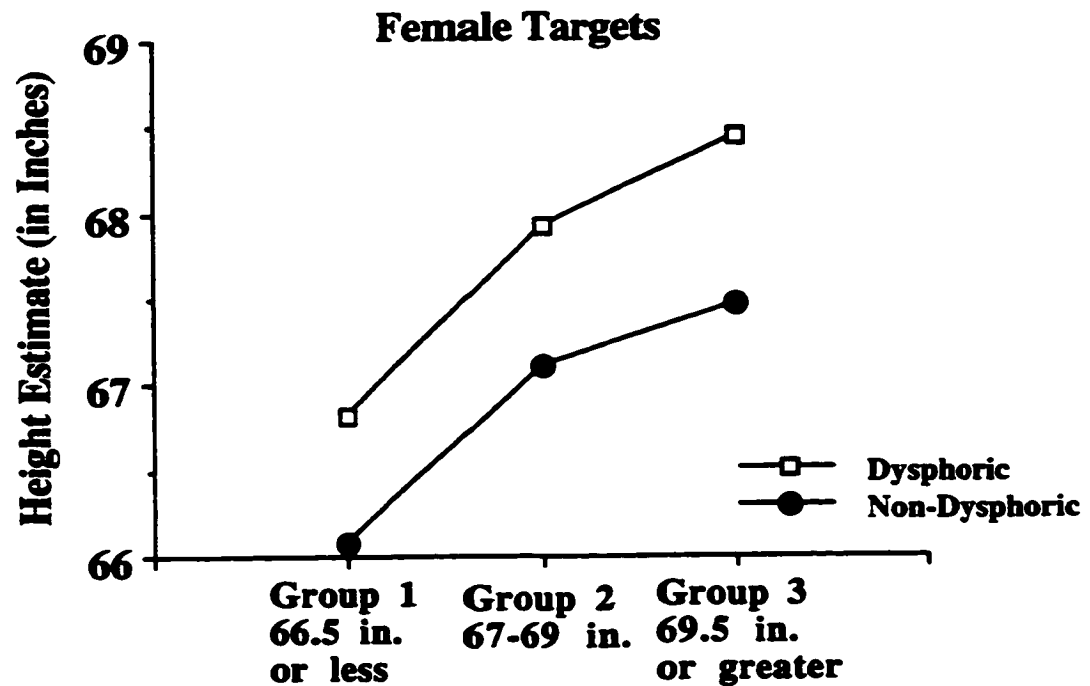
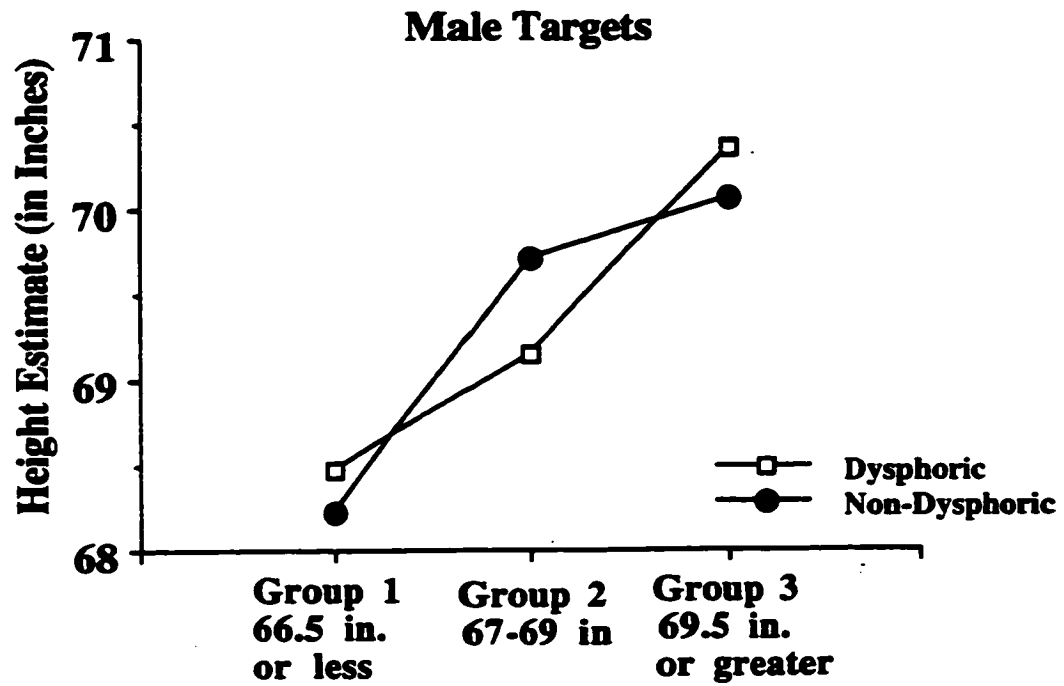
condition and cognitive load condition as between subjects variables and target group as a within subjects variable.

Height estimates for male targets of various heights.

For male targets, no significant main effect of dysphoria condition was found,  $F(1,32)=.20$ ,  $p=.66$ . However, a significant main effect of cognitive load condition was found,  $F(1,32)=13.55$ ,  $p=.001$ . Participants who completed the height estimation task under conditions of high cognitive load estimated male targets to be taller ( $M=69.96$   $SD=1.47$ ) than did participants who completed the height estimation task under conditions of low cognitive load ( $M=68.22$ ,  $SD=1.58$ ).

A significant main effect of target group was also found,  $F(2,64)=29.08$ ,  $p<.01$ . Male targets in group 1 ( $M=68.25$ ,  $SD=1.88$ ) were estimated to be shorter than male targets in group 2 ( $M=69.11$ ,  $SD=1.94$ ),  $t(35)=-3.70$ ,  $p=.001$ , as well as male targets in group 3 ( $M=70.04$ ,  $SD=1.60$ ),  $t(35)=-7.89$ ,  $p<.001$ . Furthermore, male targets in group 2 ( $M=69.11$ ,  $SD=.94$ ) were estimated to be shorter than male targets in group 3 ( $M=70.48$ ,  $SD=1.60$ ),  $t(35)=-3.71$ ,  $p=.001$ .

Dysphorics' and non-dysphorics' height estimates for male targets in each height group are shown in Figure 6. Because cognitive load condition did not interact with either dysphoria condition or target group, results are shown collapsed across cognitive load condition.



**Figure 6.** Dysphoric and non-dysphoric participants' estimates for targets in groups 1, 2, and 3 (Study 1).



Height estimates for female targets of various heights.

For female targets, a marginally significant main effect was found for dysphoria condition,  $F(1,32)=3.83$ ,  $p=.059$ .

Dysphoric participants tended to estimate female targets to be taller ( $M=67.49$ ,  $SD=1.41$ ) than did non-dysphoric participants ( $M=66.70$ ,  $SD=.83$ ). A significant main effect of target group was also found for female targets,  $F(2,64)=21.68$ ,  $p<.01$ . Female targets in group 1 ( $M=66.30$ ,  $SD=1.43$ ) were estimated to be shorter than female targets in group 2 ( $M=67.31$ ,  $SD=1.43$ ),  $t(35)=-4.40$ ,  $p<.001$ ; and female targets in group 3 ( $M=67.75$ ,  $SD=1.51$ ),  $t(35)=-5.09$ ,  $p<.001$ . Female targets in group 2 ( $M=67.31$ ,  $SD=1.43$ ) were estimated to be shorter than female targets in group 3 ( $M=67.75$ ,  $SD=1.51$ ),  $t(35)=-2.89$ ,  $p=.007$ .

Dysphorics' and non-dysphorics' height estimates for female targets in each height group are shown in Figure 6. Because cognitive load condition did not interact with either dysphoria condition or target group, results are shown collapsed across cognitive load condition.

Results of these analyses indicate that dysphoric and non-dysphoric participants were indeed sensitive to differences in height between shorter and taller targets. This helps to rule out the possibility that dysphoric participants obtained lower stereotype utilization scores than non-dysphoric participants because their height

estimates were random or they estimated all male and female targets to be of similar height.

#### Strategies Used to Complete Height Estimation and Memory Task

A list of all the different strategies reported by dysphoric and non-dysphoric participants was compiled. The number of dysphoric and non-dysphoric participants who reported using each strategy was recorded. A second independent rater was also asked to review participants' responses and determine the number of dysphoric and non-dysphoric participants who reported using each strategy. There was 97% agreement between raters with respect to the number of dysphoric and non-dysphoric participants who reported using each strategy. Disagreements were resolved through discussion. Descriptions of the different strategies and examples of participants' responses are shown in Appendix C.

The number and types of strategies that dysphoric and non-dysphoric participants reported using to complete the height estimation task are shown in Table 1. The frequencies with which dysphoric and non-dysphoric participants made use of each strategy were analyzed using separate chi square analyses. No differences were found between dysphoric and non-dysphoric participants for any of the strategies. No differences were found between dysphoric and non-dysphoric participants in terms of the number of strategies they

Table 1

Number of Dysphoric and Non-dysphoric Participants Who Reported Use of Various Strategies to Complete the Height Estimation Task (Study 1)

Strategies	Dysphoria Condition		X <sup>2</sup>	df	p
	Dysphoric (N=24)	Non-dysphoric (N=22)			
1. Compared target to other objects in picture	17	17	.25	1	.62
2. Compared target to self	10	10	.07	1	.80
3. Compared target to others well known to subject	3	5	.84	1	.36
4. Used stereotype that men are taller than women	1	1	.003	1	.95
5. Considered body build of target	5	4	.05	1	.82
6. Considered angle/position of target	3	0	2.94	1	.08
7. Compared targets to other targets	1	0	.94	1	.33
8. Guessed	3	0	2.94	1	.09

(table continues)

Dysphoria Condition

Strategies	Dysphoric (N=24)	Non-dysphoric (N=22)	$\chi^2$	df	p
9. Considered the visual angle or distance at which photo taken	1	0	.94	1	.33
10. Considered clothing	1	0	.94	1	.33
Mean number of strategies	1.88 (SD=.80)	1.68 (SD=.95)			

Note. Most participants did not differentiate between strategies used for height estimation task under conditions of low cognitive load and under conditions of high cognitive load. Reports of strategies are therefore collapsed across load condition.

reported using,  $t(44) = -.75$ ,  $p = .46$ .

Interestingly, only one participant in each condition mentioned using the stereotype that men are taller than women to complete the height estimation task. This suggests that very few of the dysphoric or non-dysphoric participants were very aware of the fact that they were making use of the height/gender stereotype.

#### Participants' Ratings on Task-Related Variables

Dysphoric and non-dysphoric participants' mean ratings on task-related variables are shown in Table 2. No differences were found between dysphoric and non-dysphoric participants in their estimates of the percentage of photos for which they believed they were able to accurately guess the target's height within 2 inches,  $t(48) = -.19$ ,  $p = .85$ . Similarly, no differences were found between dysphorics' and non-dysphorics' ratings of task importance,  $t(48) = .10$ ,  $p = .92$ ; and how hard they tried to accurately complete their height estimates,  $t(48) = -.26$ ,  $p = .80$ . Non-dysphoric participants rated the height estimation task as less difficult than did non-dysphoric participants,  $t(48) = -2.39$ ,  $p = .02$ .

#### Discussion

The primary purpose of Study 1 was to investigate differences in stereotype use between dysphoric and non-dysphoric individuals. Another purpose was to establish the validity of the height estimation task as a measure of

Table 2

Means (SD) for Dysphoric and Non-dysphoric Participants on Each of the Task Related Variables (Study 1)

Task Related Variable	Dysphoria Condition	
	Non-Dysphoric (N=25)	Dysphoric (N=25)
1) Percentage of Photos Accurately Guessed within 2 inches	58.64 (19.48)	59.72 (20.66)
2) Difficulty of Task	3.72 (1.60) <sup>a</sup>	4.64 (1.08) <sup>a</sup>
3) Importance of Task	3.56 (1.39)	3.52 (1.50)
4) How hard subject tried	5.68 (1.15)	5.76 (1.01)

Note. Variables 2 through 4 were rated on 7 point scales. Higher numbers indicate greater difficulty, greater importance and greater effort, respectively.

<sup>a</sup>  $p < .05$ .

stereotype utilization. Findings related to validity will be discussed first since such findings determine whether differences in stereotype use can be meaningfully interpreted.

In order to establish the validity of the height estimation task, it was necessary to demonstrate that patterns of stereotype use on the height estimation task were consistent with patterns of stereotype use found in previous research. Specifically, it was necessary to demonstrate that stereotype use on the height estimation task was sensitive to manipulations of task complexity. Task complexity was manipulated in Study 1 by varying the position of the target person, and by varying the number of tasks that subjects completed while estimating the heights of the targets (i.e. by manipulating cognitive load).

When examined as within subjects variables, cognitive load and target position had no effect of stereotype scores. However, when effects of cognitive load and target position on stereotype scores were analyzed in a between subjects design, and when pictures of sitting targets taken in profile were removed, participants obtained higher stereotype scores under conditions of high cognitive load (when completing the height estimation task simultaneously with the memory task) than low cognitive load (when the height estimation task was completed alone). Furthermore, participants obtained higher stereotype scores and were less

accurate when estimating the heights of sitting targets than standing targets.

Consistent with previous research investigating stereotype use (e.g. Bodenhausen & Lichtenstein, 1987; Gilbert & Hixon, 1991; Kruglanski & Freund, 1983), participants in the current study relied on the stereotype more under conditions of high task complexity than low task complexity. Thus the results of Study 1 suggest that the height estimation task provides a valid index of stereotype utilization.

The other primary purpose of Study 1 was to investigate dysphoria-related differences in use of the stereotype that men are taller than women when estimating the heights of male and female targets. In Study 1, dysphoric participants obtained lower stereotype utilization scores than non-dysphoric participants on the height estimation task. This was true regardless of whether participants completed the height estimation task under conditions of low cognitive load (alone) or under conditions of high cognitive load (simultaneously with the memory task). These results are consistent with previous research conducted by Edwards and Weary (1993) suggesting that dysphoric individuals make less use of social category information than non-dysphoric individuals when making judgements about others.

There are a number of possible explanations for dysphorics' lower stereotype scores relative to non-



dysphorics. One possibility is that dysphoric participants did not categorize targets according to gender. Perhaps they did not categorize targets at all or used a used a social category other than gender to categorize targets. However, it seems highly unlikely that dysphoric participants did not categorize according to gender. It has been suggested that certain categories such as age, race, and gender function as "primitive" categories. They are used by all people, regardless of culture, and may be automatically activated upon exposure to a target (Brewer, 1988; Fiske & Neuberg, 1990). Furthermore, an effort was made to depict male and female targets who were from similar social groups (e.g. same age, race) so gender would be the only obvious way in which targets could be categorized.

Another possible explanation for dysphorics' lower stereotype scores is that the height stereotype associated with gender was not activated in dysphoric participants. A number of conditions might prevent stereotype activation. Stereotype activation would not occur if dysphoric participants had never learned the stereotype. Also, proponents of resource allocation theory might argue that depression-related reductions in cognitive resources prevented stereotype activation. Recent findings suggest that an individual must have sufficient attentional resources during exposure to a target for stereotypes to be activated (Gilbert & Hixon, 1992).

However, the data are not consistent with the view that the height/gender stereotype was not activated in dysphoric participants. Dysphoric participants obtained stereotype scores greater than zero under conditions of high and low cognitive load (indicating some degree of use). Furthermore, dysphoric participants' stereotype scores were affected by the manipulations of task complexity. Dysphoric participants were induced to rely most heavily on the stereotype under conditions of high cognitive load and when estimating the heights of sitting rather than standing targets. If dysphoric participants had never learned the height/gender stereotype or depression-related reductions in cognitive resources prevented stereotype activation, manipulations of task complexity should have no effect on stereotype scores.

Results of the current study suggest that the social category (gender) and the height/gender stereotype were activated in both dysphoric and non-dysphoric individuals. However, dysphoric individuals made less use of the height/gender stereotype associated with the category than non-dysphoric participants when making their height estimates. Edwards and Weary (1993) suggest that dysphoric individuals may advance further along Fiske and Neuberg's (1990) impression formation continuum than non-dysphorics when making judgements about others. Dysphoric participants in the current study may have obtained lower stereotype scores than non-dysphoric individuals because they moved

farther beyond the initial categorization stage and made more use of individuating information than non-dysphorics.

To suggest that dysphorics moved further along the information processing continuum than non-dysphorics implies that they were engaging in a more detail oriented and effortful style of information processing. While this is one possible interpretation of the present results, dysphoric participants' lower stereotype scores could also reflect more random responding or a tendency to guess all targets to be of similar height.

An effort was made to distinguish between these possibilities by examining dysphorics' and non-dysphorics' estimates for targets of various heights. Male and female targets were divided into three groups according to their heights (from shortest to tallest). When participants' mean height estimates for targets in these groups were compared, it was found that the shortest targets were estimated to be shorter than targets of medium (relative to other targets) height; in turn, targets of medium height were estimated to be shorter than the tallest targets. Thus dysphoric and non-dysphoric participants did distinguish between targets of different heights. These findings argue against random responding or estimating all targets to be similar in height as explanations for dysphorics' lower stereotype scores relative to non-dysphorics.

Further evidence against random responding as an explanation for dysphorics' lower stereotype utilization scores is provided by analyses of error scores. Dysphorics' stereotype utilization scores under conditions of both low and high cognitive load were (marginally) positively correlated with error scores. If dysphorics' lower stereotype scores were the result of random responding, stereotype and error scores would not be significantly correlated.

According to the Fiske's and Neuberg's (1990) continuum model of impression formation, an important factor that determines whether a perceiver will move beyond the initial categorization towards the piecemeal end of the processing continuum is the perceiver's motivation to form an accurate impression. Proponents of control motivation theory (e.g. Edwards & Weary, 1993) suggest that dysphoric individuals are more motivated to accurately process social information to overcome feelings of uncontrollability and uncertainty with respect to their social relationships. However, no differences were found between dysphoric and non-dysphoric participants' ratings of task importance or the degree of effort that they expended on the task. This could mean that dysphoric participants were no more motivated to accurately complete the height estimation task than non-dysphoric participants. If this is the case, results of the current

study do not support the mechanism proposed by the continuum model of impression formation and control motivation theory.

Results of the current research extend the findings of previous research conducted by Edwards and Weary (1993). They found that dysphoric individuals tend to engage in piecemeal processing even under conditions that promote categorical processing in non-dysphoric individuals. However, the current findings suggest that dysphorics under certain conditions may be induced to rely more heavily on category information. Dysphoric and non-dysphoric participants obtained higher stereotype utilization scores under conditions of high rather than low cognitive load. It may be that the cognitive resources of dysphoric individuals need to be taxed to a greater degree than those of non-dysphoric individuals before they rely on stereotypes to the same extent as non-dysphorics.

The strategies which dysphoric and non-dysphoric participants reported using to complete the height estimation task were similar. Only one participant in each dysphoria condition mentioned using the height/gender stereotype as a strategy. This finding is consistent with research suggesting that stereotype use is fairly automatic (e.g. Devine, 1989) and in most cases people may be unaware that they are using them to process information.

## Study 2

A main purpose of Study 2 was to try to refine the height estimation task and to try to replicate the basic findings of Study 1. It was proposed in Study 1 that stereotype use on the estimation task should be sensitive to manipulations of task complexity if the height estimation task in fact provides a valid index of stereotype use. However, the effects of target position and cognitive load on stereotype use were significant only when these manipulations of task complexity were analyzed as between subjects variables and when pictures of sitting targets that were taken in profile were removed. After these modifications to the design were made, the number of subjects in each condition was significantly reduced (from 25 subjects per condition to 8-10 per condition), as were the number of height estimates included in the analyses, thus reducing power to detect true differences.

In Study 2, new sets of photographs were created. As in Study 1, target position was varied in order to manipulate task complexity. The new sets of photos contained an equal number of male/female and sitting/standing targets. Furthermore, sitting pictures were not taken in profile (i.e. subjects could not see the full length of sitting targets' legs) to ensure that it would be more difficult for subjects to estimate the heights of sitting than standing targets.

While reductions in attentional resources increase reliance on stereotypes, there is research to suggest that under certain conditions, individuals are able to reduce reliance on stereotypes. When individuals are aware that stereotypes may influence their judgements, they are able to somewhat inhibit their use. Devine (1989; Study 2) found that when individuals who were either high or low in prejudice were unaware that a racial stereotype had been activated, they subsequently made use of the stereotype in making judgements about others. However, when they were explicitly made aware that the investigator was interested in stereotype use, low prejudice individuals were able to inhibit their use of a racial stereotype. Nelson et al. (1990) found that when participants were warned that male and female targets were matched for height, they were able to reduce the extent to which they used the stereotype that men are taller than women to make to estimate the heights of targets. Such findings suggest that people do have some degree of volitional control over stereotype use. They can decrease their reliance on stereotypes when they are consciously aware that the stereotype may influence their judgements.

An important purpose of Study 2 was to determine whether dysphoric and non-dysphoric individuals could reduce their reliance on the height gender stereotype when given stereotype discounting instructions similar to those

given to participants by Nelson et al. (1990). Such a finding would suggest that both dysphoric and non-dysphoric individuals have some degree of volitional control over stereotype use.

In Study 2, another sample of dysphoric and non-dysphoric participants were asked to estimate the heights of the new set of male and female targets from photographs. Half of the dysphoric and non-dysphoric participants were assigned to a control instruction condition in which they were simply asked to estimate the heights of the targets as in Study 1. The remaining dysphoric and non-dysphoric participants were assigned to a stereotype discounting condition in which they were asked to estimate the heights of the targets but were also informed that the male and female targets had been matched for height and were instructed not rely on the targets' sex as a cue. The ability of dysphoric and non-dysphoric participants to further reduce stereotype use after receiving the discounting instructions was examined.

It was hypothesized that overall, dysphoric participants would obtain lower stereotype scores than non-dysphoric individuals. However, it was further hypothesized that both dysphoric and non-dysphoric individuals who received the stereotype discounting instructions would obtain lower stereotype scores than those assigned to the control instruction condition.



## Method

### Participants

Forty male and forty female students enrolled in undergraduate psychology courses at Dalhousie University served as participants. They were invited to participate based on scores obtained on the BDI (Beck et al., 1961) during an initial screening held approximately 3 months prior to testing. Dysphoric participants (20 males and 20 females) obtained BDI scores of 9 or above at the time of screening and at the time of testing. Non-dysphoric participants (20 males and 20 females) obtained BDI scores of 4 or less at the initial screening and at the time of testing. Mean BDI scores for dysphoric and non-dysphoric participants at testing were 16.23 and 1.70, respectively. Participants received partial course credit for their participation.

### Materials

Photographs. Stimuli consisted of 3.5 X 5 inch black and white photographs of 24 male and female university students. Each target was photographed in a standing and sitting position and their height (including footwear) was measured. Targets were photographed from different distances and angles but always near some familiar frame of reference (e.g. a doorway, chair, table, car, etc.). Photographs were assembled into two photo albums. Twelve male targets (6 standing and 6 sitting) and 12 female targets (6 standing

and 6 sitting) appeared in each book. Photos were fixed to the right hand page of the book, one per page so that only one photo was visible at a time. Each target appeared once in each album so that the sitting photograph was in one book and the standing photograph in the other. Male and female targets were matched for height so that for every male of a particular height, somewhere in the book there was a female of the same height. Targets ranged in height from 62.00 inches to 71.00 inches with a mean of 67.44 inches.

Beck Depression Inventory (BDI; Beck et al. 1961). As in Study 1, the BDI was used to assess the level of depressive symptoms at time of testing.

Participant Ratings of Task Related Variables. As in Study 1, dysphoric and non-dysphoric participants were asked to estimate the percentage of heights that they were able to accurately estimate within two inches. Participants were also asked to rate task difficulty, task importance, and how hard they tried to accurately complete the task on 8 point Likert-type scales. Endpoints of ratings of task difficulty were, 0 (not at all difficult) and 7 (extremely difficult). For ratings of task importance, endpoints of scale were 0 (not at all important) and 7 (extremely important). Endpoints for ratings of how hard participants tried to accurately complete the task were 0 (not at all) and 7 (extremely hard). As in Study 1, the last item on this questionnaire requested that participants list the

strategies that they employed when completing the height estimation task. Rating scales for task related variables are indicated in Appendix B.

### Procedure

Dysphoric and non-dysphoric participants were randomly assigned to receive one of two levels of instruction and view one of the two photo albums. All participants were given the following instructions (adapted from Nelson et al., 1990) for the height estimation task:

In this study, you will be shown a series of photographs of different people. Your job is to estimate the height of each person (wearing the shoes or boots in which he or she is shown) to the nearest half inch. Look at each page of the booklet one at a time and write your height estimate down on the piece of paper provided. Look at each picture in the order that it is presented and do not go back and change any of your answers.

Participants assigned to the control instruction condition received only these instructions. Participants assigned to the stereotype discounting condition were given the following additional instructions:

In this booklet, the men and women are actually of equal height. We have taken care to match the heights of the men and women pictured. That is, for every woman of a particular height, somewhere in the booklet there

is also a man of that same height. Therefore, in order to make as accurate a height judgement as possible, try to judge each photograph as an individual case; do not rely on the person's sex.

These additional instructions were identical to those given by Nelson et al. (1990) to participants in their study who were warned against using the stereotype that men are taller than women to complete their height estimates.

Instructions for both conditions (stereotype discounting instructions and control instructions) were printed on sheet of paper and read to the participants. The instruction sheet was left with the participant while he or she was engaged in the height estimation task. Participants proceeded with the estimation task at their own pace. Participants wrote their height estimates on strips of adhesive paper affixed to each page of the photo album. After completion of the task, responses were transferred by the experimenter to a record form.

Following the height estimation task, participants completed the BDI and the task-related rating scales.

## Results

### Stereotype Utilization

As in Study 1, stereotype utilization scores were calculated for each participant by subtracting the mean height estimate of female targets (in inches) from the mean height estimate of male targets (in inches). Degree of

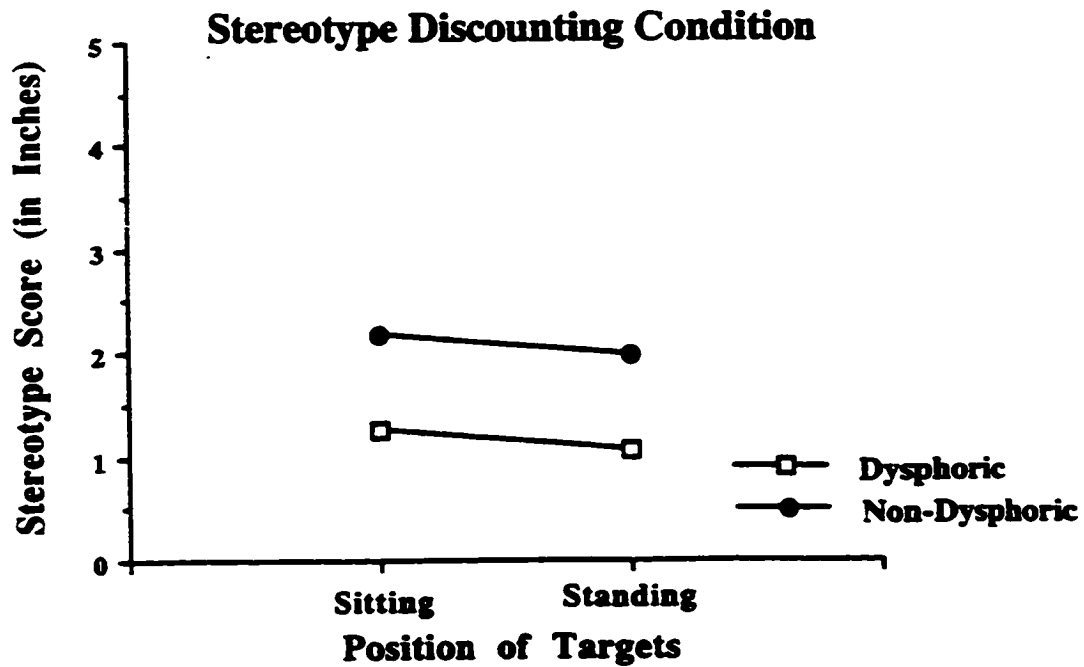
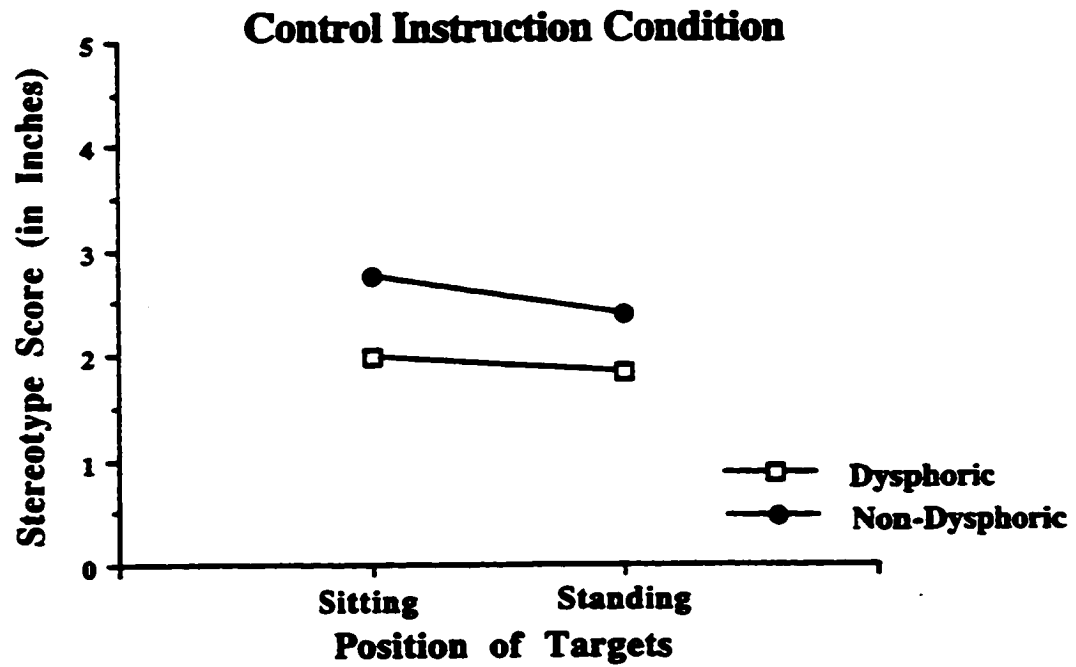
stereotype utilization for height estimates was initially analyzed as a four way mixed factorial with dysphoria condition (dysphoric or non-dysphoric), sex of participant, and instruction condition (stereotype discounting instructions or control instructions) as between subjects factors. Position of target (sitting or standing) was a within subjects factor. Results of this preliminary analysis did not reveal any significant effects of sex of participant. Results are therefore reported for analyses which have collapsed across this factor.

The results of a three way analysis of variance revealed significant main effects for dysphoria condition,  $F(1,76)=8.72$ ,  $p=.004$ ; and instruction condition,  $F(1,76)=5.23$ ,  $p=.025$ . A marginally significant main effect of target position was also found,  $F(1,76)=2.48$ ,  $p=.12$ . Dysphoric participants obtained lower stereotype utilization scores ( $M=1.53$ ,  $SD=1.29$ ) than non-dysphoric participants ( $M=2.32$ ,  $SD=1.17$ ). Participants who received stereotype discounting instructions (i.e. were told that male and female targets were matched for height) obtained lower stereotype utilization scores ( $M=1.62$ ,  $SD=1.21$ ) than participants who received the control instructions ( $M=2.23$ ,  $SD=1.29$ ). Furthermore, participants obtained higher stereotype scores for sitting ( $M=2.04$ ,  $SD=1.43$ ) than for standing ( $M=1.81$ ,  $SD=1.43$ ) targets. The effects of dysphoria

condition, instruction condition, and target position on height estimates are illustrated in Figure 7.

### Error in Height Estimates

As in Study 1, accuracy of dysphoric and non-dysphoric participants' height estimates was assessed by calculating error scores for each participant. For each participant, the absolute difference between each estimate and each target's actual height was calculated. These differences were averaged to obtain an error score (in inches) for each participant. Higher numbers indicate greater error. Error scores were analyzed as a four way factorial with dysphoria condition (dysphoric or non-dysphoric) and instruction condition (stereotype discounting instructions or control instructions) as between subjects factors. Sex of target and position of target were within subjects factors. Significant main effects were found for instruction condition,  $F(1,76)=3.68$ ,  $p=.059$ ; position of target,  $F(1,76)=16.69$ ,  $p<.001$ ; and target sex,  $F(1,76)=36.59$ ,  $p<.001$ . Participants who received the stereotype discounting instructions (i.e. who were told that male and female targets were matched for height) obtained lower error scores ( $M=2.11$ ,  $SD=.55$ ) than participants who received the control instructions ( $M=2.34$ ,  $SD=.52$ ). Lower error scores were obtained for standing targets ( $M=2.08$ ,  $SD=.63$ ) than for sitting targets ( $M=2.37$ ,  $SD=.63$ ). Finally, lower error scores were obtained for female targets ( $M=1.90$ ,  $SD=.61$ ) than for male targets



**Figure 7.** Effects of instruction condition and position of target on stereotype scores of dysphoric and non-dysphoric participants.

( $\underline{M}$ =2.55,  $\underline{SD}$ =.82).

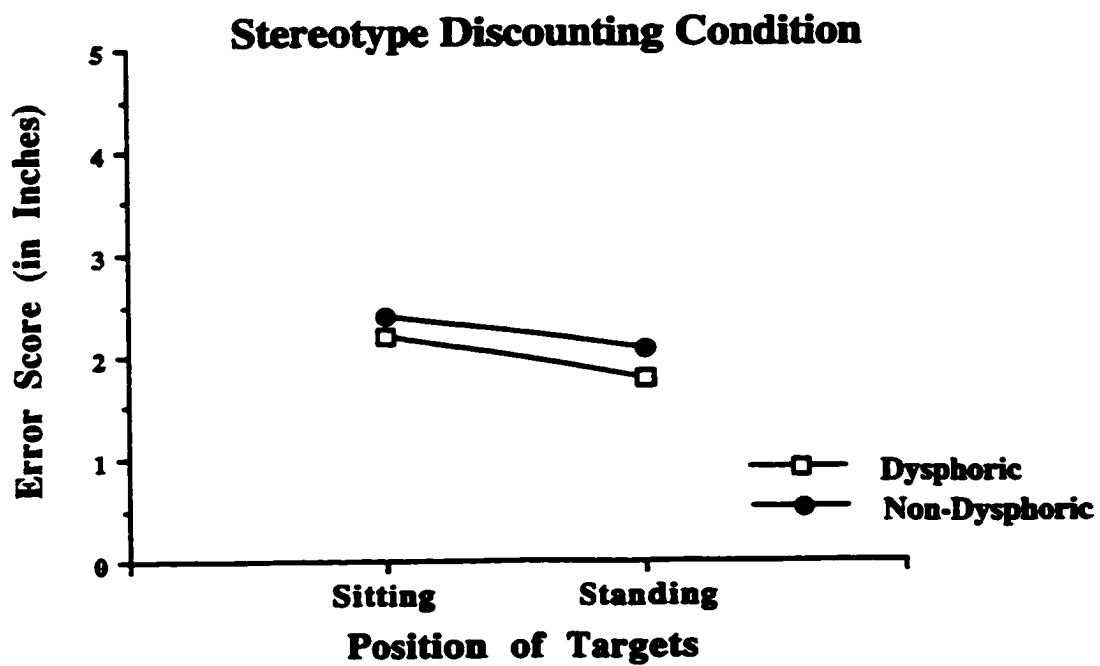
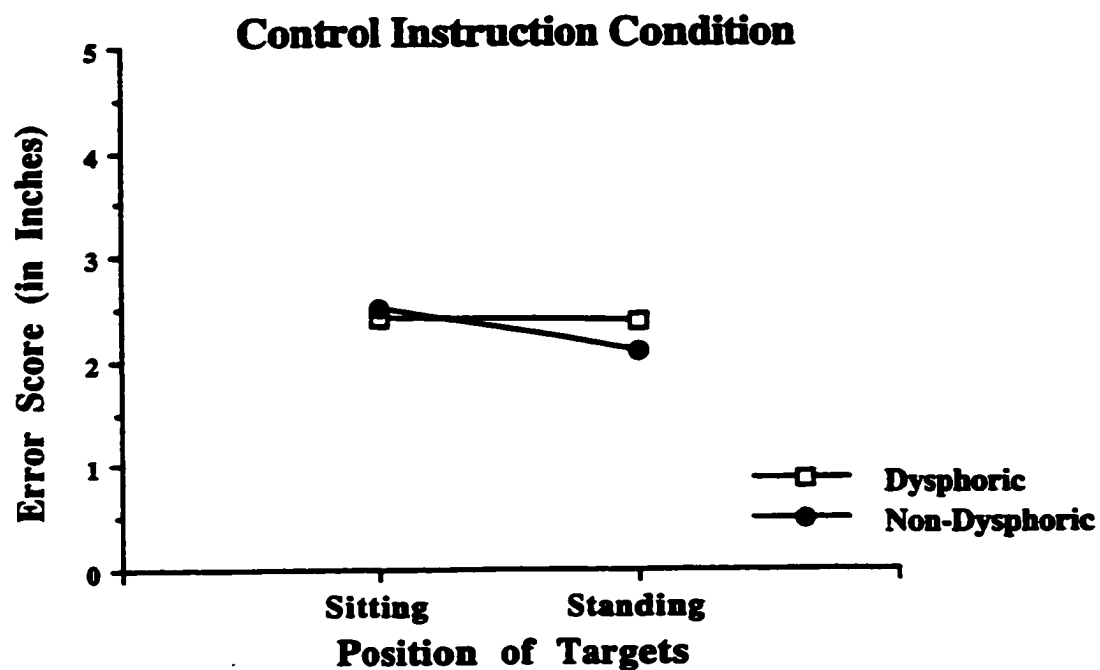
The main effects of target sex and position were qualified by a significant two-way interaction  $F(1,76)=31.15$ ,  $p<.001$ . Tests of simple effects revealed that participants obtained lower error scores for their estimates of standing males ( $\underline{M}$ =2.23,  $\underline{SD}$ =.90), than sitting males ( $\underline{M}$ =2.88,  $\underline{SD}$ =1.01),  $t(79)=-5.86$ ,  $p<.001$ . However, no significant difference was found between error scores for standing female targets ( $\underline{M}$ =1.93,  $\underline{SD}$ =.78) and error scores for sitting female targets ( $\underline{M}$ =1.87,  $\underline{SD}$ =.64),  $t(79)=.78$ ,  $p=.44$ .

The effects of instruction condition and target position on the error scores of dysphoric and non-dysphoric participants are shown in Figure 8.

#### Relationship Between Stereotype Use and Accuracy

Accuracy of dysphoric and non-dysphoric participants' height estimations was also assessed by computing correlations between stereotype use and error scores. For non-dysphoric participants, significant correlations were found between stereotype use and error scores when these participants received the stereotype discounting instructions ( $\underline{r}$ =.53,  $p<.01$ , onetail) and when they received the control instructions ( $\underline{r}$ =.52,  $p<.01$ , onetail). For dysphoric participants, a significant correlation was found between stereotype scores and error scores when these participants received the stereotype discounting conditions





**Figure 8.** Effects of instruction condition and position of target on error scores of dysphoric and non-dysphoric participants.

( $r=.60$ ,  $p<.01$ , onetail). A marginally significant correlation was found between stereotype scores and error scores for dysphoric participants assigned to the control instruction condition ( $r=.36$ ,  $p=.06$ , onetail). The significant correlations between stereotype use and error scores indicate that the more participants used the stereotype that men are taller than women, the less accurate they were in estimating targets' heights (i.e. the greater the error score). The results of correlational analyses also suggest that dysphorics' lower stereotype utilization scores were not simply the result of random responding or guessing all targets to be of similar height.

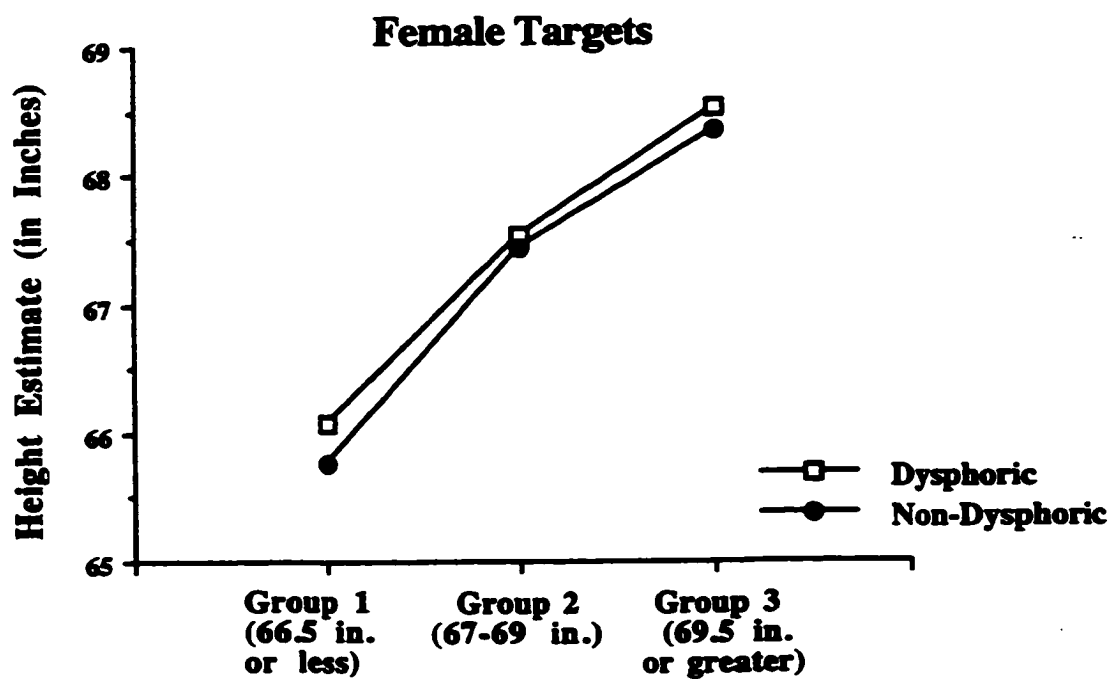
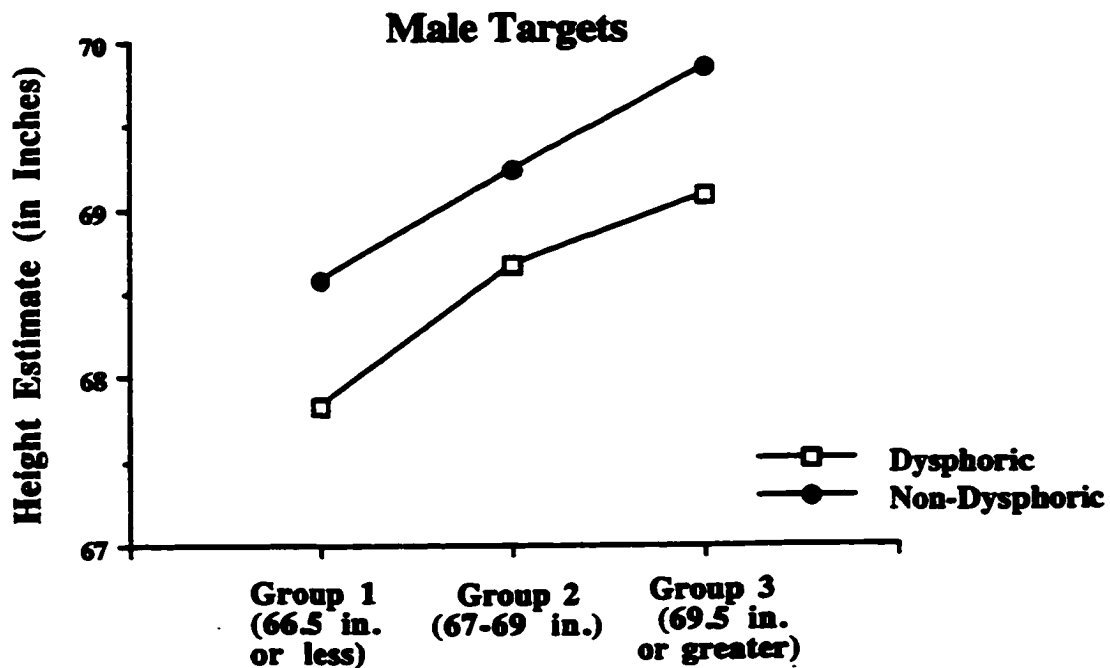
#### Processes Involved in Stereotype Use

As in Study 1, an effort was made to rule out the possibility that dysphoric participants' lower stereotype utilization scores were the result of random responding or guessing all targets to be of similar height. First, t-tests were conducted to determine whether dysphorics' and non-dysphorics' height estimates differed significantly from zero. The stereotype scores of dysphorics differed significantly from zero in both the control instruction condition,  $t(19)=5.94$ ,  $p<.001$ , and the stereotype discounting condition,  $t(19)=5.04$ ,  $p<.001$ . Similarly, the stereotype scores of non-dysphorics also differed significantly from zero in the control instruction condition,  $t(19)=11.13$ ,  $p<.001$ , and stereotype discounting

condition  $t(19)=7.70$ ,  $p<=.001$ , condition. Because dysphoric participants in each instruction condition obtained stereotype scores greater than zero, this helps to rule out the possibility that their lower stereotype scores were the result of guessing all targets to be of similar height.

Participants' height estimates for targets of various heights were also examined. As in Study 1, targets who were 66.5 inches or shorter were included in target group 1; targets who were 67 to 69 inches were included in target group 2; and targets who were 69.5 inches and above were included in target group 3. The effects of dysphoria condition, instruction condition, and target group on height estimates for male and female targets were analyzed in two separate 3-way analyses of variance with dysphoria condition and instruction condition as between subjects variables and target group as a within subjects variable. Dysphoric and non-dysphoric participants' mean height estimates for male and female targets in each target group are depicted in Figure 9.

For male targets, a significant main effect of target group was found,  $F(2,142)=26.28$ ,  $p<.001$ . Results of t-tests indicated that male targets in group 1 were perceived as shorter than male targets in group 2,  $t(75)=-4.96$ ,  $p<.001$ . Furthermore, male targets in group 2 were perceived as shorter than male targets in group 3,  $t(77)=-2.45$ ,  $p=.017$ . A significant main effect of dysphoria condition was also



**Figure 9.** Dysphoric and non-dysphoric participants' estimates for targets in groups 1, 2, and 3 (Study 2).

found,  $F(1,71)=24.34$ ,  $p<=.057$ . Dysphoric participants' height estimates for male targets ( $M=68.53$ ,  $SD=1.62$ ) were lower than those of non-dysphoric subjects ( $M=69.22$ ,  $SD=1.31$ ).

For female targets, a significant main effect of target group was found,  $F(2,148)=117.50$ ,  $p<.001$ . Results of t-tests indicated that female targets in group 1 were perceived as shorter than female targets in group 2,  $t(78)=-12.13$ ,  $p<.001$ . Furthermore, female targets in group 2 were perceived as shorter than female targets in group 3,  $t(77)=-6.18$ ,  $p<.001$ .

Results of these analyses suggest that dysphoric and non-dysphoric participants were sensitive to differences in height between shorter and taller targets. This provides further evidence that dysphorics' lower stereotype utilization scores were not simply the result of random responding or guessing all targets to be of similar height.

Participants' Ratings of Task Related Variables

Dysphoric and non-dysphoric participants' mean ratings on all task-related variables are indicated in Table 3. Results of a t-test for independent samples revealed no significant differences between dysphoric and non-dysphoric participants on their estimates of the percentage of heights that they accurately guessed within two inches,  $t(77)=.96$ ,  $p=.34$ . Similarly, no differences were found between dysphoric and non-dysphoric participants on their ratings of

Table 3

Means (SD) for Dysphoric and Non-dysphoric Participants on Each of the Task Related Variables (Study 2)

Task Related Variable	Dysphoria Condition	
	Non-Dysphoric (N=40)	Dysphoric (N=40)
1) Percentage of Photos Accurately Guessed within 2 inches	56.72 (16.94)	52.65 (20.37)
2) Difficulty of Task	4.23 (1.27)	4.45 (1.54)
3) Importance of Task	3.26 (1.39)	3.25 (1.84)
4) How hard subject tried	5.51 (0.97) <sup>a</sup>	5.03 (1.17) <sup>a</sup>

Note. Variables 2 through 4 were rated on 7 point scales. Higher numbers indicate greater difficulty, greater importance and greater effort, respectively.

<sup>a</sup>  $p < .05$

task difficulty,  $t(77)=-.69$ ,  $p=.49$ ; and task importance,  $t(77)=.02$ ,  $p=.97$ .

Differences were found between dysphoric and non-dysphoric participants' ratings of how hard they tried to accurately complete the height estimation task. Non-dysphoric participants reported trying harder to be accurate than did dysphoric participants,  $t(77)=2.02$ ,  $p<.05$ .

#### Strategies Used By Dysphoric and Non-Dysphoric Participants

As in Study 1, a list of all the different strategies reported by dysphoric and non-dysphoric participants was compiled. Examples of the different strategies and examples of participants' responses are shown in Appendix A. The number of dysphoric and non-dysphoric participants in each instruction condition who reported using each strategy was recorded. A second independent rater was also asked determine the number of dysphoric and non-dysphoric participants who reported using each strategy. There was 98% agreement between raters. Disagreements were resolved through discussion.

The number of strategies reported by each participant was analyzed as a two-way factorial with dysphoria condition and instruction condition as between subjects variables. The main effect of dysphoria condition was non-significant,  $F(1,75)=.46$ ,  $p=.50$ , as was the main effect of instruction condition,  $F(1,75)=1.73$ ,  $p=.20$ .

Results of Chi Square analyses suggest that the types of strategies reported by dysphoric and non-dysphoric participants in each instruction condition were for the most part similar. However, dysphoric participants in the control instruction condition were more likely to report that they considered targets' clothing than dysphoric participants who received the discounting instructions and non-dysphoric participants who received the control or discounting instructions. As in Study 1, very few participants indicated that they used the height/gender stereotype to complete their estimates. The number and types of strategies reported by dysphoric and non-dysphoric participants in each of the instruction conditions, as well as results of Chi Square analyses are shown in Table 4.

#### Discussion

Results of Study 2 provide further support for the validity of the height estimation task in providing an index of stereotype utilization. Consistent with results of Study 1 and previous research on stereotype use, participants obtained higher stereotype scores under conditions of higher rather than lower task complexity. Both dysphoric and non-dysphoric participants relied more on the height/gender stereotype to complete their height estimates for sitting targets than for standing targets. Also consistent with results of Study 1, dysphoric participants in Study 2 obtained lower stereotype utilization scores than non-



Table 4

Number of Dysphoric and Non-dysphoric Participants in Each Instruction Condition Who Reported Use of

Various Strategies to Complete the Height Estimation Task (Study 2)

Strategies	Dysphoria Condition				X <sup>2</sup>	df	p
	Dysphoric		Non-dysphoric				
	Instruction Condition Control (N=20)	Instruction Condition Discounting (N=20)	Instruction Condition Control (N=19)	Instruction Condition Discounting (N=20)			
1. Compared target to other objects in picture	17	15	17	17	1.61	3	.66
2. Compared target to self	8	12	8	8	2.27	3	.52
3. Compared target to others well known to subject	5	6	6	4	.83	3	.84
4. Used stereotype that men are taller than women	5	1	3	1	5.04	3	.17
5. Considered body build of target	10	13	10	8	2.54	3	.47

(table continues)

Dysphoria Condition

Strategies	Dysphoric		Non-dysphoric		$\chi^2$	df	p
	Instruction Condition Control (N=20)	Instruction Condition Discounting (N=20)	Instruction Condition Control (N=19)	Instruction Condition Discounting (N=20)			
6. Considered angle/position of target	7	5	5	6	.58	3	.90
7. Compared targets to other targets	1	0	1	4	6.37	3	.10
8. Guessed	2	0	0	2	4.11	3	.25
9. Considered the visual angle distance at which photo take	2	1	2	3	1.10	3	.78
10. Considered Clothing	5	1	2	0	7.70	3	.05
Mean (SD) number of strategies	3.10(1.17)	2.70(1.08)	2.84(1.02)	2.65(0.75)			

dysphoric participants. This was true regardless of whether participants were given the control instructions or they were explicitly told not to rely on sex of target as a cue. Dysphoric participants' lower stereotype scores relative to non-dysphoric participants do not appear to be the result of random responding or guessing all targets to be of similar height. As in Study 1, dysphoric participants clearly distinguished between targets of different heights. In both the control instruction and stereotype discounting conditions, dysphoric and non-dysphoric participants estimated the shortest targets to be shorter than targets of medium (relative to other targets) height and estimated the tallest targets to be taller than the targets of medium height. Furthermore, stereotype utilization scores and accuracy scores were correlated for both dysphoric and non-dysphoric participants. This pattern of findings would not be expected if dysphoric participants' lower stereotype scores were the result of random responding or estimating targets to be of similar height.

Results suggest that the height/gender stereotype was activated in both dysphoric and non-dysphoric individuals. Both groups of participants obtained stereotype scores greater than zero and both groups obtained lower stereotype scores when instructed not to rely on target sex as a cue. If dysphoric participants obtained lower stereotype scores because the stereotype had not been activated, the

discounting instructions would have no effect on their stereotype use. The results suggest therefore that the stereotype was activated in both dysphoric and non-dysphoric participants but that dysphoric participants made less use of the stereotype when making their judgements.

As in Study 1, results of Study 2 suggest that dysphoric participants may have advanced further beyond initial categorization and made more use of individuating information than non-dysphoric participants. The results are therefore consistent with control motivation theory (Weary et al., 1993) which proposes that dysphoric individuals engage in more detail oriented and effortful processing of social information. However, it remains unclear at this point whether the mechanism proposed by control motivation theory is responsible for dysphorics' lower stereotype scores. According to control motivation theory, dysphorics are more motivated to accurately process social information in an effort to regain a sense of control and feelings of certainty with respect to social relationships. However, non-dysphoric participants reported that they expended more effort on the task than did dysphoric participants. Furthermore, no differences were found between dysphoric and non-dysphoric participants' ratings of task importance.

Another purpose of Study 2 was to investigate the degree to which stereotype utilization on the height estimation task was under volitional control of dysphoric

and non-dysphoric participants. Participants were able to obtain lower stereotype scores and were more accurate in their height estimates when instructed not to rely on the sex of the target as a cue. This suggests that stereotype use on the height estimation task is not fully automatic.

However, results suggest that participants were not capable of fully overcoming their use of the height/gender stereotype as they continued to use the stereotype to a certain degree (i.e. obtained stereotype scores greater than 0 in both the stereotype discounting and control instruction conditions). Similar findings were reported by Nelson et al. (1990). They also found that participants reduced their reliance on the height/gender stereotype when given the stereotype discounting instructions but were not able to overcome its use completely.

Fiske and Neuberg (1990) have suggested that perceivers' movement along the information processing continuum is mediated by the amount of attention that perceivers pay to individual attributes. It may be that the stereotype discounting instructions had the effect of increasing participants' attention to individual attributes as well as the strategies they were using to complete the judgement task.

Consistent with the findings of Study 1, very few participants spontaneously reported that they used the height/gender stereotype as a strategy to help them make

their height estimates. Furthermore, no differences in reports of stereotype use were found between participants who received the stereotype discounting instructions and those who did not. These findings are consistent with the view that stereotypes are automatically activated and that very often people are not aware of the effect that stereotypes have on their judgements.

### Study 3

In Studies 1 and 2, dysphoric individuals made less use of a height/gender stereotype to estimate the heights of male and female targets than non-dysphoric subjects. However, it is not clear whether the processes involved in estimating heights are at all related to the processes involved in making other types of social judgements. Biernat (1995) has argued that judgements about height differ in a number of ways from the other types of stereotype based judgements that observers make about people. In contrast to the gender stereotype involving height, the relative accuracy of many stereotypes is unknown. Furthermore, most stereotypes used in social judgements are more affectively laden than the stereotypes concerning the relationship between gender and height.

A primary purpose of Study 3, therefore, was to investigate whether stereotype use on the height estimation task would be related to stereotype use on a social judgement task that more closely resembles the types of

everyday judgements that perceivers make about others. In this study, participants completed the height estimation task. They also completed a vignette rating task in which they were asked to rate male and female targets on a variety of characteristics that were either consistent or inconsistent with stereotypes for their gender.

Another purpose of Study 3 was to further investigate the mechanism responsible for dysphorics' decreased reliance on the height/gender stereotype to make their height estimates. According to control motivation theory (Weary et al., 1993) dysphorics' decreased use of social categories reflects a more detail oriented and effortful approach to information processing that is adopted in an attempt to regain a sense of control over events in their lives and reduce feelings of uncertainty about their ability to predict and understand social relationships. If this is the case, stereotype utilization scores should be related to the extent to which individuals feel in control over events in their lives, and feelings of certainty about their opinion, judgements, and decisions. That is, the less control an individual feels that they exert over events, the more motivated they should be to accurately process social information, and the less they should rely on the height/gender stereotype to make their height estimates. Similarly, greater feelings of uncertainty should be associated with decreased reliance on the stereotype to make

judgements. In Study 3, the relationship between stereotype utilization scores, perceptions of control over life events, feelings of uncertainty, and severity of depressive symptoms was examined in more detail.

A final purpose of Study 3 was to investigate the relationship between performance on the height estimation task and performance on a measure of social problem solving. One of the assumptions of the current research is that stereotype utilization is an important component of social problem solving. That is, stereotype use helps one to organize and integrate information, improving the efficiency with which social information is processed. If decreased stereotype use is responsible for some of the social deficits associated with depression, decreased reliance on stereotypes may be associated with poorer social problem solving skills. In order to examine the relationship between stereotype use and social problem solving ability, all participants completed a self-report measure of social problem solving ability following completion of the height estimation and vignette rating tasks.

The social problem solving measure chosen for this purpose was the Problem Solving Inventory (PSI; Heppner & Petersen, 1982). This measure was chosen because PSI scores have been found to be significantly correlated with observer ratings of social problem solving ability (Heppner, Hibel, Neal, Weinstein, & Rabinowitz, 1982) and scores obtained on



the Means End Problem Solving Task (Heppner & Petersen, 1982) but unrelated to social desirability (Heppner & Petersen (1982). Furthermore, clinically depressed individuals have been found to obtain higher scores on the PSI than non-depressed controls (Nezu, 1986). As well, higher levels of depressive symptoms as assessed by the BDI have been found to be related to higher scores on the PSI (i.e., less effective problem solving; Heppner, Baumgardner, & Jackson, 1985; Nezu, 1985).

The specific hypotheses tested in Study 3 were as follows: 1) It was hypothesized that level of depressive symptoms would be correlated with stereotype scores on the height estimation task so that higher levels of depressive symptoms would be associated with lower stereotype scores; 2) It was also expected that higher levels of depressive symptoms would be associated with lower stereotype scores on the vignette rating task; 3) It was hypothesized that higher levels of depressive symptoms would be associated with greater feelings of lack of control over life events; 4) It was expected that feelings of uncontrollability and uncertainty would be associated with stereotype use on the height estimation and vignette rating tasks. Greater feelings of uncontrollability and uncertainty should be related to lower stereotype scores; 5) It was hypothesized that stereotype scores obtained on the height estimation task would be significantly correlated with stereotype

scores on the vignette rating task so that higher stereotype scores on one task would be associated with higher scores on the other; and 6) it was hypothesized that self reports of problem solving ability would be correlated with stereotypes scores on the height estimation and vignette ratings tasks; that is, lower stereotype utilization scores would be associated with higher PSI scores (i.e. poorer perceptions of problem solving ability).

### Method

#### Participants

Participants included 34 male and 32 female students enrolled in undergraduate psychology courses at Dalhousie University. Participants in Study 3 were not preselected on the basis of BDI scores. They received partial course credit for their participation.

#### Materials

Photographs. Photographs used in Study 2 were used again in this study. However, the pictures were re-arranged so that a different combination of pictures appeared in each of the two photo albums. Each photo album once again contained 24 pictures. As in Study 2, twelve male targets (6 standing and 6 sitting) and twelve female targets (6 standing and 6 sitting) appeared in each book. Photos were arranged in albums so that the mean heights of standing and sitting male and female targets were matched within and between the two books.

Vignettes. Two vignettes were created, each describing the typical activities of a male or female undergraduate. Vignettes were constructed to be relatively neutral in terms of gender stereotypic behaviours, and described fairly equivalent activities (e.g. both described conscientious students intending on applying to graduate school, both students were involved in extra-curricular activities, both were considering part-time jobs, and both saw relationships with family and friends as important to them). Two versions of each vignette were created: in one version, the student was named "Bethany" and in the other, the student was named "William". Participants read both vignettes. The order of vignettes and version of each vignette were counterbalanced. The vignettes are indicated in Appendix D.

Gender stereotype rating scales. After reading each vignette, participants were asked to rate the extent to which the character in the vignette (Bethany or William) possessed four stereotypically masculine traits and four stereotypically feminine traits. These traits were randomly selected from a sex role inventory entitled the Personal Attributes Questionnaire (Spence & Helmreich, 1978). Participants rated the how aggressive, dominant, competitive, and ambitious they believed the character to be (stereotypically masculine traits) and also how gentle, tender, affectionate, and compassionate they perceived the character to be (stereotypically feminine traits). All

ratings were made on 7 point Likert-type scales with endpoints 1 (never or almost never true) and 7 (almost or almost always true). The masculine and feminine trait rating scales were randomly interspersed. The rating scales are indicated in Appendix D.

For each participant, the ratings for the four stereotypically masculine traits were summed separately for Bethany and William. Ratings for the four stereotypically feminine traits were also summed separately for Bethany and William. The overall masculine rating for Bethany was subtracted from the overall masculine rating of William to provide a masculinity stereotype score. The overall feminine rating of William was then subtracted from the overall feminine rating of Bethany to provide a femininity stereotype score. An overall index of stereotype utilization was calculated for each subject by adding the masculinity stereotype score to the femininity stereotype score.

Beck Depression Inventory (BDI; Beck et al. 1961). As in Studies 1 and 2, the BDI was used to measure the severity of depressive symptoms.

Problem Solving Inventory (PSI; Heppner & Petersen, 1982). The Problem Solving Inventory is a 35 item inventory that assesses an individual's perceptions of their problem solving abilities. Each item loads on one of three factors. The problem solving confidence factor includes items which assess degree of confidence to engage in problem solving

activities (e.g. I trust my ability to solve new and difficult problems). The approach-avoidance style factor contains items which reflect the degree to which an individual avoids or approaches problem solving activities (e.g. When confronted with a problem I tend to do the first thing that I can to solve it). The personal control factor contains items which reflect self-control during problem solving (I make snap judgements and then later regret them). Each item is rated on a 6 point scale where 1=strongly agree, 2=moderately agree, 3=slightly agree, 4=slightly disagree, 5=moderately disagree, and 6=strongly disagree. Higher scores indicate lower perceived problem solving ability.

Heppner and Petersen (1982) report good internal consistency for the total inventory (coefficient alpha=.90). This measure was also found to have good test re-test reliability over a two week period ( $r=.89$ ). The total score correlates significantly with other measures of problem solving including: students' ratings of their levels of problem solving skills, and perceived satisfaction with problem solving skills (Heppner & Petersen, 1982).

Control over life events and feelings of certainty.

Participants rated the extent to which they have a feeling of personal control or power over the events in their own lives. This rating was made on an 8 point Likert-type scale with endpoints 0 (I have no power or control) and 7 (I have

a great deal of power or control). Participants also rated how confident or certain they are about their own opinions, judgements and decisions in general. This rating was made on an 8 point Likert- type scale with endpoints 0 (not at all confident) and 7 (extremely confident). Perceptions of control and feelings of certainty were assessed using Likert-type scales as this is the method that has been used by proponents of control motivation theory (e.g. Marsh & Weary, 1994). Wording of the scales was taken from Marsh and Weary (1994) and are indicated in Appendix E.

Participant Ratings of Task-Related Variables. As in Studies 1 and 2, participants were asked to estimate the percentage of heights that they were able to accurately estimate within two inches. They were also asked to rate the difficulty of the task, the importance of the task, and how hard they tried to accurately complete the task on 8 point Likert type scales. Endpoints for ratings of difficulty were 0 (not at all difficult) and 7 (extremely difficult). For ratings of task importance, endpoints of the scale were 9 (not at all difficult) to 7 (extremely difficult). Endpoints for ratings of how hard participants tried to accurately complete the task were 0 (not at all) and 7 (extremely hard). Rating scales for task related variables are indicated in Appendix E.

### Procedure

Participants completed the height estimation task first, and then completed the vignette rating task. Following these two tasks, participants completed the BDI, the PSI, and rated themselves on the other task related variables.

Height Estimation Task. Participants were randomly assigned to view one of the two photo albums. Instructions and procedure for completion of the height estimation task were identical to those used in the minimal instruction condition in Study 2.

Vignette Rating Task. Participants were asked to read both Vignettes. After reading each vignette, subjects rated the character (Bethany or William) on selected items from the Personal Attributes Questionnaire (Spence & Helmreich, 1978). Order of the vignettes, as well as the version (Bethany or William) of each paragraph was randomized across participants.

### Results

Sample means for all dependent variables are indicated in Table 5. Correlations between BDI scores, stereotype scores, error scores, PSI scores, degree of confidence in judgements, and perceived control over life events, are shown in Table 6. Correlations between BDI scores, stereotype scores, error scores and ratings on task related variables are shown in Table 7.

Table 5

Sample Means and Standard Deviations (SD) for Dependent Variables in Study 3

Variable	Sample Mean (N=66)	SD
1. Beck Depression Inventory Score	7.12	5.08
2. Stereotype Score (Height Estimation Task; In inches)	2.04	1.19
3. Accuracy of Height Estimates (In inches)	2.38	0.48
4. Stereotype Score (Vignette Rating Task)	0.14	0.97
5. Problem Solving Inventory Score	98.77	10.02
6. Percentage of Photos Accurately Guessed within 2 inches	55.39	18.85
7. Certainty about own judgements	4.79	1.09
8. Perceived control over life events	5.12	1.28
9. Difficulty of Task	3.97	1.81
10. Importance of Task	2.76	1.60
11. How hard subject tried	5.03	1.07

Note. Variables 7 through 11 were rated on 7 point scales. Higher numbers indicate greater certainty, greater control, greater difficulty, greater importance and greater effort, respectively.



Table 6

Correlations Between BDI Scores, Stereotype Scores, Error Scores, Problem Solving Inventory (PSI) Scores, Certainty About Own Judgements and Perceived Control Over Life Events (Study 3)

	BDI Score	Stereotype Score (height estimations)	Error Score (height estimations)	Stereotype Score (vignette task)
BDI Score		-.10	-.07	-.33**
Stereotype Score (height estimations)			.38**	.22*
Stereotype Score (vignette task)			.35**	
PSI Score	.28**	-.05	.12	.14
Certainty about own judgements	-.32**	.14	-.07	-.05
Control over life events	-.48**	.09	-.14	.05

\*  $p < .05$

\*\*  $p < .01$

Table 7

Correlations Between BDI Scores, Stereotype Scores, Error Scores, and Ratings of Task Related Variables

(Study 3)

	BDI Score	Stereotype Score (height estimations)	Error Score (height estimations)	Stereotype Score (vignette task)
‡ of Heights guessed within 2"	-.04	.13	.03	-.12
Difficulty of height estimation task	-.02	-.03	.001	.05
Importance of height estimation task	.06	-.12	-.33**	-.12
Effort expended on height estimation task	-.21*	.11	-.04	.07

\*  $p < .05$

\*\*  $p < .01$

### Effects of Target Position on Stereotype Utilization Scores

As in Studies 1 and 2, an index of stereotype utilization was calculated for each participant by subtracting the mean height estimate of female targets from the mean height estimate of male targets. Differences between participants' stereotype utilization scores for sitting and standing targets were analyzed with a t-test. Consistent with the results of Studies 1 and 2, stereotype scores were higher for sitting targets ( $M=2.04$ ,  $SD=1.83$ ) than for standing targets ( $M=1.67$ ,  $SD=1.57$ ),  $t(65)=1.80$ ,  $p=.007$ .

### Relationship Between Dysphoria and Stereotype Use

Height estimation task. The relationship between dysphoria and stereotype use was first assessed by examining correlations between BDI scores and overall stereotype scores. However, this correlation was not significant,  $r=-.10$ ,  $p=.21$ , onetail (see Table 6). Because this correlation was not significant, separate correlations were than calculated between BDI scores and stereotype scores for sitting and standing targets. A significant correlation was found between BDI scores and stereotype scores for standing targets,  $r=-.21$ ,  $p=.05$  (onetail) but not for sitting targets,  $r=-.10$ ,  $p=.22$  (onetail). The direction of the correlation between BDI scores and stereotype scores for standing targets indicates higher BDI scores were associated with lower stereotype scores (see Table 6).

In order to further investigate the reason that BDI scores were not significantly correlated with overall stereotype scores participants were divided into groups on the basis of BDI scores. Dysphoric participants were those who obtained BDI scores of 9 or above. Non-dysphoric participants were those who scored below 9. Stereotype scores were then analyzed as a two-way factorial with dysphoria condition as a between subjects variable and position of target as within subjects variable.

A significant main effect of target position was found. Participants obtained lower stereotype scores when estimating the heights of standing rather than sitting targets,  $F(1,64)=4.85$ ,  $p=.03$ . This main effect was qualified by a marginally significant interaction between dysphoria condition and position of target,  $F(1,64)=3.12$ ,  $p=.08$ . Tests of simple effects revealed that when estimating the heights of standing targets, dysphoric participants obtained lower stereotype scores ( $M=1.23$ ,  $SD=1.10$ ) than non-dysphoric participants ( $M=1.94$ ,  $SD=1.76$ );  $t(64)=2.01$ ,  $p=.049$ . However, no significant differences were found between the stereotype scores of dysphorics ( $M=2.06$ ,  $SD=1.30$ ), and non-dysphoric participants ( $M=2.03$ ,  $SD=1.12$ ) for their estimates of sitting targets;  $t(64)=-.10$ ,  $p=.92$ . The reason that no differences were found between dysphoric and non-dysphoric participants on their stereotype scores for sitting targets was that non-dysphoric participants did not rely any more

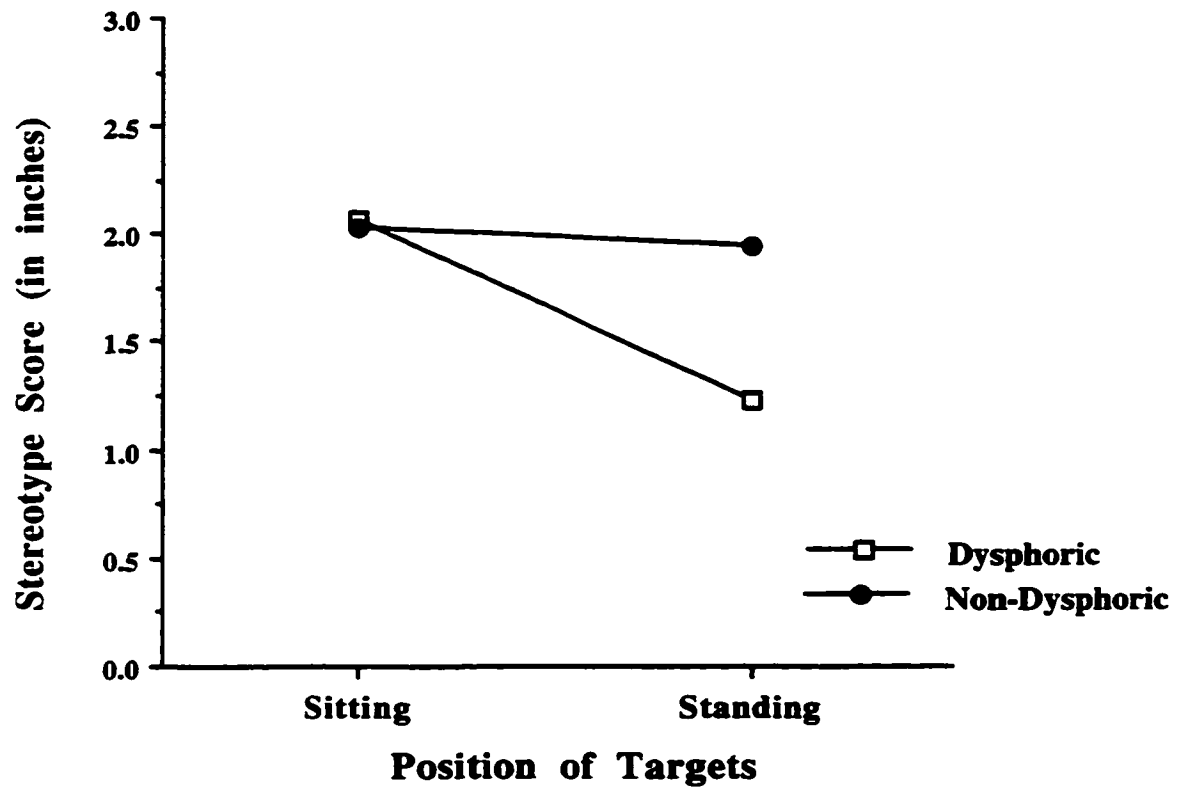
heavily on the stereotype when estimating the heights of sitting than when estimating the heights of standing targets,  $t(40) = .34$ ,  $p = .75$ . However, dysphoric participants did rely more heavily on the stereotype when estimating the heights of sitting targets than when estimating the heights of standing targets,  $t(24) = 2.72$ ,  $p = .012$ .

Results of these analyses suggest that BDI scores and overall stereotype scores were not correlated because non-dysphoric individuals did not increase their reliance on the stereotype when estimating the heights of sitting targets. Dysphoric individuals did increase their use of the stereotype when estimating heights of sitting targets. Because of this their stereotype for sitting targets did not differ from non-dysphorics' stereotype scores for sitting targets (see Figure 10).

Vignette rating task. A significant correlation was found between BDI scores and degree to which participants used gender stereotypes to complete the vignette rating task,  $r = -.33$ ,  $p = .004$  (onetail). As BDI scores increased, participants were less likely to rate Bethany and William in a manner consistent with gender stereotypes (see Table 6).

#### Relationship Between Stereotype Use on the Height Estimation Task and Stereotype Use on the Social Judgement Task

A significant correlation was found between the degree to which participants utilized the stereotype that men were taller than women to complete the height estimation task and



**Figure 10.** Effect of target position on stereotype scores of dysphoric and non-dysphoric participants (Study 3).

the degree to which they rated vignette characters in a gender stereotype consistent manner on the vignette rating task,  $r=.22$ ,  $p=.038$  (onetail). This indicates that higher stereotype utilization scores on the height estimation task were related to greater reliance on stereotypes to complete the vignette rating task (see Table 6).

#### Perceptions of Control and Feelings of Uncertainty:

##### Relationship to Dysphoria and Stereotype Use

According to control motivation theory, depression is associated with increased feelings of uncontrollability and uncertainty. To test this, a correlation was computed between BDI scores and participants' ratings of the degree to which they have a feeling of personal control over the events in their lives. Similarly, a correlation was computed between level of dysphoria and participants' ratings of how certain they feel about their opinions, judgements and decisions in general.

Level of dysphoria was negatively correlated with perceptions of control over life events,  $r=-.48$ ,  $p<.001$  (onetail) and feelings of certainty,  $r=-.32$ ,  $p=.005$  (onetail). The direction of these correlations indicates that increasing levels of depressive symptoms were associated with lower ratings of perceived control over life events and decreased feelings of certainty (see Table 6).

In order to determine whether participants' perceptions of control might mediate the relationship between dysphoria

and stereotype use, correlations were computed between participants' ratings of control and stereotype scores on both the height estimation and vignette rating tasks. Participants' ratings of the degree to which they have a feeling of control over events in their lives were not significantly correlated with stereotypes scores on the height estimation task,  $r=.09$ ,  $p=.23$  (onetail). Ratings of control were also unrelated to stereotype scores on the vignette rating task,  $r=.05$ ,  $p=.33$ , onetail (see Table 6).

Correlations were also calculated between participants' ratings of certainty and stereotype scores on the height estimation and vignette rating tasks. Ratings of certainty were not significantly correlated with stereotype use on the height estimation task,  $r=.14$ ,  $p=.13$  (onetail) or vignette rating task,  $r=-.05$ ,  $p=.36$ , onetail (see Table 6).

These findings suggest neither perceptions of control over life events nor feelings of certainty mediated the relationship between level of depressive symptoms and stereotype use.

#### Problem Solving Ability: Relationship to Dysphoria and Stereotype Use

A significant correlation was found between level of dysphoria and PSI scores,  $r=.28$ ,  $p=.01$  (onetail). Consistent with hypotheses, higher levels of dysphoria were associated with higher scores on the PSI (i.e. poorer perceptions of problem solving ability).



Because stereotypes have been discussed as useful heuristics that facilitate problem solving, it had been hypothesized that lower stereotype scores would be associated with poorer self-perceptions of problem solving ability.

In order to examine the relationship between self-perceptions of problem solving ability and stereotype use, correlations were calculated between PSI scores and stereotype scores on the height estimation and vignette rating tasks. The correlation between PSI scores and stereotype scores on the height estimation task were non-significant,  $r = -.05$ ,  $p = .36$  (onetail), as was the correlation between PSI scores and stereotype scores on the vignette rating task,  $r = .14$ ,  $p = .13$ , onetail (see Table 6).

#### Additional Analyses

##### Relationship between Stereotype Use and Error Scores.

As in studies 1 and 2, the relationship between stereotype scores and error scores obtained on the height estimation task was examined. For each participant, the absolute difference between each estimate (in inches) and each target's actual height (in inches) was calculated. As in Studies 1 and 2, these differences were averaged to obtain an error score for each participant. A significant correlation was found between stereotype utilization scores for sitting targets and error scores for sitting targets,  $r = .27$ ,  $p = .013$  (onetail). Similarly, a significant

correlation was found between stereotype utilization scores for standing targets and error scores for standing targets,  $r=.44$ ,  $p<.001$  (onetail). Results of these correlational analyses indicate that the more participants used the stereotype that men are taller than women to complete their height estimates, the higher their error scores (i.e. the less accurate their estimates became). Results of these correlational analyses are indicated in Table 6.

Relationship between dysphoria and other task related variables. A significant correlation was found between level of depressive symptoms and how hard participants tried to accurately complete the height estimation task,  $r=-.21$ ,  $p=.042$  (onetail). Higher BDI scores were associated with less effort expended on the height estimation task. BDI scores were not significantly correlated with participants' estimates of the percentage of heights they accurately estimated within 2 inches ( $r=.04$ ,  $p=.38$ , onetail); ratings of task difficulty ( $r=-.02$ ,  $p=.44$ , onetail); and ratings of task importance ( $r=.06$ ,  $p=.32$ , onetail). Results of these correlational analyses are indicated in Table 7.

#### Discussion

Consistent with the results of Studies 1 and 2, higher levels of depressive symptoms were associated with lower stereotype utilization scores on the height estimation task (for standing targets). Furthermore, higher levels of depressive symptoms were also associated with lower

stereotype scores on the vignette rating task. Dysphoric individuals' decreased reliance on stereotypes does not seem to be restricted to the height estimation task; dysphoric participants made less use of stereotypes than non-dysphoric participants when making judgements about personality characteristics as well.

Contrary to predictions of the current study, higher BDI scores were not related to lower stereotype scores for sitting targets. The results of follow-up analyses indicate that the lack of significant relation between BDI scores and stereotype utilization scores for sitting targets was due to the fact that individuals with lower BDI scores did not differ in degree of stereotype utilization for standing and sitting targets.

Results of Study 3 provide further evidence that the height estimation task is a valid measure of stereotype use. Stereotype scores obtained on the height estimation task were significantly correlated with stereotype scores obtained on the vignette rating task. This suggests that the processes involved in using stereotypes to complete the height estimation task are relevant to processes involved in stereotype use on more everyday social judgement tasks. The finding that overall, participants relied more heavily on the height/gender stereotype to estimate the heights of sitting rather than standing targets also provides further support for the validity of the task. It suggests that

stereotype use was sensitive to manipulations of task complexity and is consistent with patterns of stereotype use reported by other investigators (Bodenhausen & Lichtenstein, 1987; Gilbert & Hixon, 1991; Kruglanski & Freund, 1983).

One of the purposes of Study 3 was to further investigate the mechanism(s) that might be responsible for dysphoric participants' decreased use of stereotypes (relative to non-dysphoric participants) on both the height estimation and vignette rating tasks. According to control motivation theory (Weary et al. 1994), dysphoric individuals' decreased reliance on the use of social categories represents a more detail-oriented or effortful style of information processing that is employed in an attempt to regain a sense of control over life events and increase feelings of certainty about one's ability to predict and understand social relationships. Weary and her colleagues propose that dysphorics' perceptions of control and heightened feelings of uncertainty mediate the relationship between level of depressive symptoms and the degree to which they engage in this more effortful style of processing. In Study 3, level of depressive symptoms was related to perceptions of control over life events and feelings of certainty about opinions, judgements, and decisions. More severe symptoms were related to greater feelings of lack of control and lower feelings of certainty. However, perceptions of control and feelings of certainty

were unrelated to stereotype scores on the height estimation task and to stereotype scores on the vignette rating task. Thus no support was found for the mechanism proposed by Weary et al. (1993).

The possibility that feelings of control and uncertainty mediate the relationship between stereotype use and dysphoria cannot be ruled out at this point. In the current research, perceptions of control and uncertainty were assessed using self-report rating scales. Weaknesses associated with this methodology may be responsible for the lack of significant relationships between stereotype use, feelings of control, and feelings of uncertainty. First, the scales did not specify the domains for which participants were supposed to rate their feelings of control and uncertainty (cf Stone, Greenberg, Kennedy-Moore, & Newman, 1991). Participants may have made their ratings for non-social as well as social events in their lives. Second, the wording of the scales did not specify the time frame for which participants were supposed to rate their feelings of lack of control and uncertainty. Participants could have made these ratings according to how they felt on the day of participation or according to how they had been feeling over the last few months. It is also possible that participants were not able to accurately reflect on their feelings of control and uncertainty (Nisbett & Wilson, 1977).

In spite of these limitations, it is important to note that the measures of control and certainty used in the current research were similar to those used in previous research by Marsh and Weary (1994). Weary and her colleagues have previously found that ratings of control and certainty are positively correlated with an increased tendency to engage in effortful social information processing (Edwards & Weary, 1993; Yost & Weary, 1996).

In future, the relationship between feelings of control and stereotype use could be examined more directly by using experimental manipulations designed to influence perceptions of control. For example, Pittman and his associates (D'Agostino & Pittman, 1982; Pittman & D'Agostino, 1989; Pittman & Pittman, 1979; Swann, Stephenson, & Pittman, 1981) have induced feelings of lack of control in non-dysphoric individuals by engaging them in a concept formation task and providing them with non-contingent feedback on their performance. Participants were shown cards containing stimulus patterns that varied in terms of the letter depicted, the colour of the letter, the case of the letter, the boarder around the letter, and the underline. Participants were told that the experimenter had chosen one feature as correct. They were to guess the correct feature by pointing to the stimulus pattern that contained that feature. With each card, the experimenter would tell participants whether they were correct or incorrect.

In the control deprivation condition, participants were told they were correct on 50% of the trials and that they were incorrect on 50% of the trials, regardless of their actual responses. Participants were therefore unable to learn the correct feature despite managing to give some correct responses. This was proposed to induce feelings of lack of control.

This methodology could be used in combination with the height estimation task to determine whether feelings of lack of control are responsible for reductions in stereotype use. If dysphorics' feelings of lack of control lead them to rely less on the height/gender stereotype, non-dysphorics should rely less on the height gender stereotype (i.e., obtain stereotype scores similar to those of dysphorics) after receiving the non-contingent feedback on the card sorting task. Non-dysphorics who receive no feedback on the card sorting task (i.e. do not experience feelings of lack of control) should obtain higher stereotype scores than both dysphorics and control deprived non-dysphorics.

In Study 3, the relationships among dysphoria, social problem solving, and stereotype use were also examined. Consistent with the findings of previous research (e.g. Heppner, Baumgardner, & Jackson, 1985; Nezu, 1985), higher BDI scores were associated with self-reported problem solving difficulties. However, participants' perceptions of their problem solving abilities were not related to

stereotype use on either the height estimation task or vignette rating task. Because stereotypes have been discussed as useful heuristics that facilitate information processing it had been hypothesized that lower stereotype scores would be associated with greater perceptions of problem solving difficulties.

One reason why PSI scores may not have been correlated with stereotype scores is that the PSI is not a concurrent measure of social problem solving. The PSI is a self-report measure that assesses individuals' attitudes towards problem solving and beliefs about the behaviours that they employ in social problem solving. Individuals are required to reflect on how they have approached social problem solving in the past. However, perceptions of how one has generally approached social problem solving in the past may or may not be related to how one solves specific problems in specific situations.

To address the relation between stereotype use and social problem solving, it may be necessary to employ a paradigm that requires participants to actively solve social problems. One task that has been used in the past is the Means End Problem Solving Test (MEPS; Platt & Spivak, 1975). This task, mentioned previously, requires participants to generate a series of steps which lead up to the successful resolution of hypothetical interpersonal problems. A variant of the task is one where the hypothetical problems included



in the MEPS are substituted with current problems faced by these individuals (a procedure previously used by Marx et al., 1992). Post task interviews could be used to elucidate the strategies used by participants to solve social problems. Transcripts of interview could be examined for evidence of category or stereotype use or the application of generalized problem solving rules.

Researchers could also study the relationship between dysphoria, use of category information, and social problem solving by observing dysphoric and non-dysphoric individuals work out a real life interpersonal problem with a partner or friend. Following the interaction, participants could be interviewed about the strategies they were using. Transcripts of the interaction could also be examined to determine the extent to which each participant relied on social category information or general knowledge structures.

#### General Discussion

Across all three studies, dysphoric participants consistently obtained lower stereotype utilization scores than non-dysphoric participants. Dysphorics' lower stereotype utilization scores indicate that they made less use of the stereotype that men are taller than women when estimating the heights of male and female targets. Furthermore, higher levels of depressive symptoms in Study 3 were associated with decreased utilization of gender

stereotypes to make judgements about personality characteristics as well.

The results of the three studies are consistent with research conducted by Edwards and Weary (1993). To summarize, Edwards and Weary had dysphoric and non-dysphoric participants read about targets who were described by various traits. Traits were specifically chosen so that they could be categorized according to various social categories (academic majors) but so that they would not automatically activate the social category upon presentation. Edwards and Weary investigated whether dysphorics' and non-dysphorics' likability ratings for targets more closely resembled their liking for the traits used to describe the targets or their liking for the social category (academic major) that was suggested by the traits. In the categorical processing condition, category labels for targets were made available to participants before they rated targets' likability. This was accomplished by having participants guess the academic major of the target prior to making likability ratings. In the piecemeal processing condition, category labels for targets were not available to participants before they made their likability ratings as they guessed targets' academic majors after making their ratings.

When a category label (academic major) was available to non-dysphorics prior to making their likability ratings, non-dysphorics' likability ratings of targets more closely

resembled their liking for targets' social categories than their liking for the individual traits used to describe the target. When a category label for each target was not available to participants prior to making their likability judgements, non-dysphoric participants' likability ratings more closely resembled their liking for the traits used to describe the targets than their liking for the social category to which the target belonged. However, for dysphoric individuals, likability ratings for targets more closely resembled their liking for individual traits used to describe the targets, regardless of whether or not a category label was available prior to making likability ratings for targets. Thus, dysphoric individuals were more likely to make judgements about others on the basis of individual attributes rather than on the basis of the social category to which the individual belongs even under conditions which promoted use of category information in non-dysphoric participants.

Similar to findings of Edwards and Weary (1993), results of the current research suggest that dysphoric individuals rely less on social category information than non-dysphorics when making judgements about others. However, results of the current studies extend the findings of Edwards and Weary (1993). Edwards and Weary demonstrated that dysphorics are less likely to rely on social category information when social categories are not automatically

activated (target traits were chosen specifically so that they did not automatically activate academic majors upon presentation). However, the current findings suggest that dysphorics rely less on social category information than non-dysphorics even when the social category is automatically activated. This is important because researchers who have investigated the cognitive correlates of depression have generally concluded that depressed individuals perform more poorly than non-depressed individuals on tasks requiring effortful processing but perform similarly to non-depressed individuals on tasks requiring more automatic processing (Roy-Byrne et al., 1986). Thus the results suggest that dysphoric individuals may perform differently than non-dysphoric individuals on certain tasks requiring automatic processing. Results also suggest that although dysphoric individuals and non-dysphoric individuals differ in their use of stereotypes, they may be affected similarly by manipulations designed to increase or decrease stereotype use. Participants relied more heavily on the height/gender stereotype under conditions of high rather than low cognitive load. In addition, participants were able to decrease their reliance on the height/gender stereotype when they were aware that stereotype use would result in inaccurate judgements.

### Methodological Implications

Because dysphorics consistently obtained lower stereotype scores than non-dysphorics on the height estimation task, reductions in stereotype use on this task may prove to be a useful marker of depression. The identification of markers for depression is important for several reasons. State markers (present only during a depressive episode; Cowan & Wood, 1991) could be useful in assessing severity of depressive symptoms and for evaluating response to treatment (Koyama & Yamashita, 1992). Trait markers of depression (present prior to the development of a depressive episode and following remission; Cowan & Wood, 1991) could be used to identify individuals who are at risk for developing depression (Cowan & Wood, 1991).

Over the last few years, a large number of potential biological markers of depression have been identified. Two of the most extensively studied markers are the dexamethasone suppression test (DST) and abnormalities of sleep electroencephalogram (EEG; Koyama & Yamashita, 1991). The DST involves measuring secretions of hydrocortisone following the ingestion of dexamethasone. Although non-depressed individuals show a suppression of hydrocortisone following ingestion of dexamethasone, a significant number of depressed individuals show an oversecretion (or non-suppression) of hydrocortisone (Ansseau, 1997). Non-suppression of hydrocortisone is considered to be a state

marker of depression and is used to help diagnose depression.

Abnormalities of sleep EEG have also been studied as potential biological markers of depression. For example, researchers have consistently found that the sleep of depressed individuals is characterized by the shortened latency to the onset of rapid eye movement (REM) sleep (Van Bommel, 1997; Cowan & Wood, 1991; Koyama & Yamashita, 1990).

The utility of the DST and EEG sleep abnormalities as markers of depression may be limited as both of these markers have been demonstrated to lack sensitivity and specificity. For example, only 50-70% of depressed patients will show non-suppression of hydrocortisone during the DST. Thus a significant number of depressed people would not be identified as depressed on the basis of the DST. Furthermore, the non-suppression of hydrocortisone and shortened latencies to REM sleep have both been observed in patients with other psychiatric disorders (Asseau, 1997; Cowen & Wood, 1992).

In a recent review of the literature, Cowen and Wood (1992) concluded that no biological marker has been identified that reliably distinguishes depressed patients from non-depressed controls and non-depressed psychiatric patients (Cowen & Wood, 1992). Thus the continued search for potential markers of depression is important.

If reductions in stereotype use represent a state marker, and levels of stereotype use vary within individuals as a function of level of depression, the height estimation task may be useful as an objective method of assessing changes in the severity of depressive symptoms. Currently, researchers and clinicians rely primarily on the self-reports of patients when establishing symptom severity. However, self-reports may be affected by social desirability concerns (the desire to present one's self in a positive light; Tanka-Matsumi & Kameoka, 1986), as well as by demand characteristics in experimental situations (Weary, Edwards, & Jacobson, 1995). However, performance on the height estimation task is less likely to be affected by social desirability and demand characteristics. Even if people are aware that performance on this task assesses severity of depression, it is unlikely that they would know how to respond in a depressed or non-depressed fashion.

If reductions in stereotype use represent a trait marker of depression, the height estimation task could be used to identify individuals who are at risk of developing depression before they display any signs of the actual illness (Cowan & Wood, 1991). Such individuals could then be closely monitored by their physicians or other health care providers. This would ensure that depression is diagnosed quickly and treatment could be provided at an early stage in the illness. This is important because full recovery becomes

less likely as the duration of the depressive episode increases (Gotlib, 1990).

### Theoretical Implications

In previous research, resource allocation theory has been invoked to explain depressed individuals' failure to spontaneously make use of categorization to facilitate recall. According to this theory, depression depletes attentional resources required to engage in effortful processing. Assuming that categorizing words in a word list requires actively elaborating and re-organizing information, use of categorization to facilitate recall may require a greater amount of attentional resources than depressed people have available.

It is difficult to argue that dysphorics in the current studies obtained lower stereotype scores because depletions in cognitive resources interfered with their ability to invoke or make use of categorization as a strategy for making height estimates. Social categorization is proposed to occur automatically (Fiske & Neuberg, 1990). There is some evidence to suggest that stereotypes associated with well defined social categories are also automatically activated (Devine, 1989).

Indeed there is evidence to suggest that the height gender stereotype was activated for both dysphoric and non-dysphoric participants. Both dysphoric and non-dysphoric participants obtained stereotype scores greater than zero



(indicating some degree of use). Furthermore, the stereotype scores of both dysphoric and non-dysphoric participants were affected by manipulations designed to increase (Study 1) or decrease (Study 2) stereotype use. If dysphorics obtained lower stereotype scores relative non-dysphorics because the stereotype or category had not been activated, such manipulations would not have affected their stereotype scores.

One way to explain dysphorics' lower stereotype scores is to invoke Fiske's and Neuberg's (1990) continuum model of impression formation. According to the model, both dysphoric and non-dysphoric participants would have engaged in the initial categorization of the target. Categorization is proposed to represent the first stage in impression formation. However, dysphorics then advanced further than non-dysphorics along the impression formation continuum and made greater use of individuating information.

The possibility that dysphorics were engaging in a more detail oriented and effortful style of processing could not be tested directly in the current research. However, an effort was made to rule out a number of competing explanations. For example, dysphoric individuals could have obtained lower stereotype scores if they were random in their height estimates or if they guessed all targets to be similar in height. However, dysphoric participants in Studies 1 and 2 were found to be sensitive to variations in

targets' heights. The shortest targets were estimated to be shorter than targets of medium height (relative to other targets) and the tallest targets were estimated to be taller than targets of medium height. Furthermore, stereotype scores were found to be correlated with error scores in all three studies. These findings would not be expected if dysphoric participants' lower stereotype scores were the result of random responding or guessing all targets to be similar in height. Although dysphoric and non-dysphoric differences in processing could not be examined directly, results of the current research are consistent with the view that dysphorics' lower stereotype scores were associated with a more detail oriented and effortful style of information processing.

Fiske and Neuberg (1990) suggest that motivation to form an accurate judgement is an important factor influencing the extent to which perceivers move beyond the initial categorization of the target and pay attention to individuating information. According to control motivation theory (e.g. Weary et al. 1993), dysphoric individuals are in fact more motivated to accurately process social information than non-dysphoric individuals in order to regain a sense of control over events in their lives and overcome feelings of uncertainty. It is proposed that dysphorics' increased motivation to accurately process social information results in greater sensitivity to social

information and a more effortful, detail oriented style of information processing.

Although the finding that dysphorics rely less on stereotypes to make judgements about others is consistent with control motivation theory's proposal that dysphoria is associated with a more detail oriented style of information processing, no evidence was found for the mechanism proposed by control motivation theory. Results of all three studies suggest that dysphoric participants may have been no more motivated than non-dysphoric participants when completing the height estimation task. Dysphoric and non-dysphoric participants did not differ with respect to their ratings of how hard they tried to accurately complete the height estimation task in Study 1. In Studies 2 and 3, lower levels of depressive symptoms were actually related to self-reports of greater effort expended on the height estimation task.

Furthermore, feelings of control and uncertainty were unrelated to stereotype use in Study 3. Although a relationship was found between level of depressive symptoms and perceptions of control over life events, results of study 3 failed to find a relationship between participants' ratings of personal control over life events and their stereotype scores on the height estimation and vignette rating tasks. Similarly, a relationship was found between level of depressive symptoms and feelings of certainty concerning opinions, decisions, and judgements in general.

However, no relationship was found between feelings of certainty and stereotype scores on the height estimation and vignette rating tasks. Thus feelings of lack of control and uncertainty may not have mediated the relationship between dysphoria and stereotype use.

A number of explanations were put forth to explain the non-significant relations between feelings of control, certainty, and stereotype scores. First, it is possible that the single item scales used to assess feelings of control and certainty were not reliable measures of these constructs. Second, it is quite possible that dysphoric and non-dysphoric individuals were unable to accurately report on their own internal cognitive processes (Nisbett & Wilson, 1977). However, it is also possible that feelings of control and certainty were unrelated to stereotype use because the height estimation and vignette rating tasks were not perceived by participants to be tasks that would afford them an opportunity to regain a sense of control and increase feelings of certainty with respect to social relationships. If this is the case, factors other than feelings of control and certainty may have mediated the relation between dysphoria and stereotype use.

Recently, Bless and his colleagues (Bless, Clore, Schwarz, Golisano, & Rabe, 1996) have proposed a different model to explain the apparent tendency of sad individuals to engage in a more detail oriented or effortful style of

information processing. They suggest that sad mood signals to an individual that he or she is experiencing problems in the environment and that these problems need to be addressed. Sad moods may further indicate that the strategies an individual has been using to process information are not effective. As a result, sad individuals may be less confident about relying on general knowledge structures and become more detail oriented and effortful in their approach to information processing (Bless et al., 1996).

On the other hand, it is proposed that positive mood informs individuals that all is well, that there are no problems in the environment that require attention (Bless et al. 1996). Happiness may signal that the usual strategies and processing heuristics are working. As a result, happy individuals engage in a less effortful, more heuristic style of processing, characterized by a greater reliance on general knowledge structures (Bless et al. 1996).

This model, termed the "mood and general knowledge assumption" (Bless et al. 1996) differs from control motivation theory in several ways. Unlike control motivation theory, it does not propose that sad individuals are necessarily more motivated to accurately process social information than non-dysphoric individuals. Rather it proposes that sad individuals may discount the utility of previously used heuristics. Furthermore, the mechanisms

proposed to be responsible for the more effortful style of information processing associated with sadness differ according to each theory. According to control motivation theory, feelings of lack of control and uncertainty mediate the relationship between depressed mood and increases in effortful processing. However, according to the mood and general knowledge assumption, sad mood is responsible for increases in effortful processing. Sad mood itself (rather than feelings of uncontrollability or uncertainty) signals that something is wrong and causes individuals to rely less on general knowledge structures.

The current data do not permit the favouring of one explanation over another. However, the utility of the mood and general knowledge assumption to explain dysphoria related reductions in stereotype use might be tested by employing mood induction procedures. The stereotype scores of individuals who have undergone an temporary negative mood induction could be compared to stereotype scores of individuals who have undergone a neutral mood induction. If sad individuals obtain lower stereotype scores than neutral individuals, this could indicate that sad mood associated with dysphoria causes reductions in stereotype use. This would not necessarily rule out feelings of control and uncertainty as mediators of the dysphoria/stereotype use relationship. However, it would suggest that feelings of

control and uncertainty are not the only causes of reductions in stereotype use.

### Implications for Social Functioning

Over the years, there has been a growing consensus that the use of stereotypes and other types of heuristics may serve an adaptive function (Fiske & Neuberg, 1990; Macrae et al., 1994; Epstein et al. 1993). Social interactions are inherently complex, with many stimuli competing for limited attentional resources. Fiske and Neuberg (1990) suggest that social categorization helps individuals to organize and integrate incoming information. Fiske and Neuberg (1990) also suggest that social categorization helps to make social interactions more efficient. Social categorization enables people to identify their roles in relation to each other. Once roles are identified, specific social scripts may be activated that provide people with knowledge of appropriate behaviour.

Despite the growing belief that stereotype use may be adaptive, there is little direct evidence to support this view. Most of the stereotype research has focused on how perceivers' use of stereotypes negatively affects the targets of stereotyping; few studies have examined how stereotype use affects the perceiver (Macrae et al., 1994). This is likely due to the fact that researchers interested in stereotypes have historically been concerned with addressing problems of prejudice and racism (Funder, 1995).

However, there is some indirect evidence for the adaptive role that use of social category information may play in social functioning.

Macrae et al. (1994) demonstrated that use of stereotypes "frees up" cognitive resources and allows individuals to perform a number of different tasks simultaneously. They found that when individuals were able to make use of stereotype labels to complete an impression formation task, their memory performance on a secondary task was enhanced. Although the researchers did not directly examine how stereotype use affects social functioning, it is possible that the presence of additional cognitive resources would enable an individual to attend to a greater variety of social cues during an interaction. This may facilitate social comprehension and/or memory for the interaction.

There is also evidence to suggest that categorization plays an important role in problem solving. Much of this research has been conducted within the area of expertise. It seems that experts in a variety of different areas (e.g. chess, mathematics, physics) simplify problems by perceiving large patterns rather than individual pieces of information within their domains (Glaser & Chi, 1988). For example, expert chess players do not look at individual chess pieces on the board and analyze the consequences of each possible move. Instead, they recognize complex patterns of chess pieces and it has been suggested that an appropriate move



comes to mind automatically upon recognition of a particular pattern (Charness, 1991). By analogy, "experts" in social problem solving may be individuals who recognize and respond to complex patterns in social interactions rather than engaging in an extensive evaluation of individual pieces of information.

In addition to research suggesting that use of category information can enhance performance on certain tasks, there is some suggestion that engaging in effortful or detail oriented processing may negatively affect task performance under certain conditions. In one study, Langer and Weinman (1981) found that when individuals were asked to think effortfully about an intellectual task that had been overlearned (making a speech on a very familiar topic), their performance on the task suffered as a result.

Based on the review above, it seems possible that reductions in the use of social category information could lead to difficulties remembering and comprehending social interactions, less efficient problem solving, difficulties understanding others and decreased fluency in social interactions. These types of difficulties could lead to a number of the social deficits that have been observed in depression and dysphoria. They could, for example, be responsible for dysphoric or depressed individuals' tendency to respond more slowly (Gotlib & Robinson, 1982; Libet & Lewinsohn, 1973) and emit fewer responses (Gotlib &

Robinson, 1982; Segrin, 1992) during interactions. This interactional style could lead to feelings of frustration for the dysphoric or depressed individual and the person with whom he/she is interacting. In turn, these feelings of frustration could be responsible for the social withdrawal associated with depressive symptoms (Feldman & Gotlib, 1993) as well as the rejection that depressed individuals sometimes experience from others (Marcus & Nardone, 1992).

### Clinical Implications

If reductions in stereotype use are a consequence or concomitant of depressive symptoms, any associated difficulties in maintaining rewarding relationships could contribute to the maintenance of depressive symptoms. In support of this view, Billings and Moos (1985) found that the number of close relationships that depressed patients reported at treatment intake was a significant predictor of whether they were in remission twelve months later. Similarly, Lara, Leader, & Klein (1997) found that higher levels of social support at an initial assessment were associated with lower levels of depressive symptoms and greater recovery from depression at a six month follow-up.

However, it is also possible that reductions in stereotype use are an antecedent of depression. In this case, associated social deficits could make one more vulnerable to developing depression. For example, there is also some evidence to suggest that poor social problem

solving skills might be a risk factor for depression. Nezu and Ronan (1985) found that individuals who self-reported more effective problem solving skills on the PSI obtained lower BDI scores during times of stress than individuals who self-reported less effective problem solving skills. Furthermore, Zemore and Dell (1983) found that poorer performance on a measure of social problem solving (the Means End Problem Solving Test) was associated with a greater tendency to become depressed (as assessed by self-ratings of the frequency, length, and severity of past episodes of depression).

If reductions in stereotype use lead to social deficits which interfere with one's ability to sustain rewarding relationships with others, this too may put one at risk for developing depression. Individuals with little social support may be more vulnerable to developing depression when facing negative life events (Pagel, Erdly, & Becker, 1987; Weissman, 1987).

If reductions in stereotype use lead to social deficits that exacerbate or contribute to the development of depressive symptoms, a logical question to consider is whether reductions in stereotype use should be targeted for intervention. It is premature to make firm recommendations for the treatment of depression based on the current findings since it is unclear at this point whether the current findings obtained with dysphoric college students

generalize to clinically depressed patients. Even if future research reveals that reductions in stereotype use are observed in clinically depressed patients, recommendations for treatment would still have to be made with caution. It is difficult to argue that depressed individuals should be persuaded to make more use of stereotypes to make judgements about others. As of yet researchers do not have a full understanding of when it is adaptive for people to rely on stereotypes and when it is not. Furthermore, clinicians and patients alike would likely perceive such a suggestion as highly suspect.

It has been argued that reductions in the use of social category information reflect a broader tendency to engage in a more detail oriented and less heuristic style of information processing (Edwards & Weary, 1993). Depressed individuals could therefore be encouraged to make more use of categorization and other types of heuristics without specifically being instructed to stereotype others more. For example, in their problem-solving therapy for depression, Nezu, Nezu, & Perri (1989) teach individuals to make use of categorization when generating solutions to problems. They suggest that people initially generate a set of very general strategies for solving a particular problem prior to identifying more specific tactics or ways to implement each strategy. An example offered by Nezu et al. (1989) concerns solving the problem of improving one's grades. General

strategies might include "study harder" or "take care of my health". Specific tactics for "study harder" could include "take better notes in class", "do more homework", or "see teacher for help". Tactics for "take care of my health" could include "get more sleep" and "eat healthier foods". Nezu et al. (1989) suggest that by generating general strategies before focusing on specific tactics, one might generate a greater variety of different solutions to a problem.

The suggestion that depressed individuals rely less heavily on stereotypes may seem at odds with current theories of depression. According to Beck's cognitive model of depression (Beck et al., 1979), depressed individuals become overly reliant on general knowledge structures or schemata that contain highly negative, stereotypic thoughts related to themselves, their world, and their future. Depressed individuals stereotype themselves as inadequate and defective, unable to meet the demands the world places on them, and they anticipate that their difficulties will continue to plague them in the future (Beck et al., 1979). An important emphasis of Beck's cognitive therapy for depression is on teaching patients to challenge these negative stereotypes concerning the self.

Although there is evidence that depressed individuals hold negative stereotypes about themselves, there is not much evidence that they view others in the same way (Weary &

Edwards, 1994). Effective therapy for depression may include teaching depressives to see themselves in more complex ways but also teaching them when to rely more heavily on general knowledge structures in the course of social interactions and problem solving.

#### Directions for Future Research

A number of questions concerning the relationship between dysphoria and stereotype use remain unanswered and will need to be addressed in future research.

#### Processes responsible for reductions in stereotype use.

Although dysphorics consistently obtained lower stereotype scores than non-dysphorics, the processes responsible for differences in stereotype scores remain unclear. According to control motivation theory (e.g. Weary et al., 1993), dysphorics' decreased reliance on social category information reflects a more detail oriented or effortful style of information processing. However, this possibility has not been directly examined.

A particular advantage associated with using the height estimation task to study stereotype use is that the task could be modified so that researchers can study processes involved in stereotype use. In future work this could be investigated by systematically varying the number of cues in each of the photographs (such as pieces of furniture). If dysphorics' are engaging in a detail oriented style of processing, one might expect their stereotype scores to be

sensitive to (i.e. negatively correlated with) the number of cues in the photographs.

Another way to determine the extent to which participants are engaging in detail oriented processing might be to track their eye movements during the height estimation task. This would enable researchers to determine the number of cues that each participant examines and to determine how long participants examine each cue before making their judgements.

It might also be informative to record the amount of time that dysphoric and non-dysphoric individuals take to estimate the height of each target. If dysphoric individuals are more detail oriented and effortful than non-dysphoric individuals, they might be expected to take longer to make their estimates.

Relevance of findings to clinical depression. Future research will be necessary to determine whether reductions in stereotype use are also associated with clinical depression. This will be essential in order to demonstrate that reductions in stereotype use are a valid marker for depression. It will also be important to determine that reductions in stereotype use are associated with clinical depression before recommendations can be made for treatment on the basis of this finding.

Although the dysphoric university students in the current research obtained elevated scores on a self-report

measure of depressive symptoms, they were not diagnosed as depressed according to formal psychiatric criteria.

Recently, there has been much debate in the literature about whether findings obtained with dysphoric college students can be generalized to clinically depressed patients. Those opposed to the use of dysphoric students as analogues have argued that although the BDI is a highly sensitive measure of depression, it lacks specificity (e.g. Coyne, 1994; Tennen, Hall, & Affleck, 1995). This means that although clinically depressed individuals will generally obtain elevated scores on the BDI, it is quite possible to obtain an elevated score without meeting the diagnostic criteria for depression.

Furthermore, Coyne (1994) has argued that dysphoric college students differ from depressed patients in a number of key ways which limit the extent to which findings obtained with dysphoric students can be generalized to depressed patients. He suggests that dysphoric college students are younger, better educated, and come from more advantaged socioeconomic backgrounds than depressed patients. Coyne also argues that the distress experienced by college students tends to be milder and more transient than the distress experienced by depressed patients.

In studies 1 and 2, an effort was made to ensure that the depressive symptoms experienced by dysphoric participants were not transient by assessing level of



depressive symptoms at two time points (following the guidelines of Kendall et al., 1987). Dysphoric individuals were included only if they obtained elevated BDI scores at both administrations. However, the fact that that dysphoric students tend to obtain lower BDI scores than clinically depressed patients (Kendall et al., 1987) may make it particularly important to replicate the current research with a sample of clinically depressed patients.

According to control motivation theory (e.g. Weary et al., 1993), the more detail oriented approach to social information processing occurs only at mild to moderate levels of depression. Severely depressed individuals who presumably have more extensive experience with uncontrollable events, will not engage in more detail oriented processing because they come to believe that no amount of effort will help render their social world more predictable and understandable. Weary and her colleagues have presented some evidence that is consistent with this view. In one study, Marsh and Weary (1989) found a curvilinear relationship between BDI scores and participants' degree of motivation for understanding the behaviour of others. Mildly dysphoric individuals rated themselves as more motivated to engage in a complex analysis of others' behaviour than did mildly dysphoric individuals and more severely dysphoric individuals. In another study, Marsh and Weary (1994) found that mildly dysphoric

individuals were more sensitive to information that a target had violated a social norm than were non-dysphoric and more severely dysphoric individuals.

According to control motivation theory, severely dysphoric or depressed individuals should be more likely to make use of stereotypes to make judgements about others than mildly depressed or dysphoric individuals. In fact, the stereotype scores of severely depressed individuals should not differ or should be higher than those of non-depressed individuals. This could not be tested in the current research because very few dysphoric participants obtained BDI scores in the moderate and severe ranges (ie. above 16) according to the depth of depression cutoff scores for the BDI (Kendall et al., 1987).

Direction of the relationship between stereotype use and depressive symptoms. Due to the cross-sectional nature of this research, it could not be determined whether reductions in stereotype use are an antecedent, concomittant, or consequence of depressive symptoms. The direction of this relationship will need to be established in order to determine whether reductions in stereotype might represent a state or trait marker for depression. Such an investigation would also have important theoretical implications since Weary and her colleagues (e.g. Weary et al., 1993) argue that the more detail oriented approach to

information processing observed in depression is a concomitant of depressed mood.

There is some evidence that reductions in the use of social category information can be a consequence of sad mood. Bless, Hamilton, & Mackie (1992) induced happy, sad, or neutral moods in participants and then asked them to read a series of sentences describing the behaviour of a target. When participants had been led to believe that their task was to form an impression of the target, sad mood participants demonstrated less clustering of traits during an incidental test of free recall than neutral and happy participants. It is possible that the sad mood associated with depression is responsible for dysphorics' reductions in stereotype use.

However, Epstein, Pacini, Denes-Raj, & Heier (1996) have found that individuals differ in the degree to which they characteristically prefer to engage in detail oriented and effortful processing versus engage in more heuristic processing. It is unclear whether stronger preferences for engaging in effortful processing and lower preferences for engaging in heuristic processing are associated with an increased risk of developing depression. However, Epstein et al. found that preferences for these styles of processing were related in different ways to self-reports of social functioning. Greater preferences for engaging in heuristic processing were positively correlated with security in

relationships with intimate partners. Moreover, stronger preferences for engaging in effortful processing were positively associated with reports of early abuse and, in women, a tendency to avoid close emotional relationships. If social dysfunction is a risk factor for depression, individuals who have a strong preference to engage in effortful processing and avoid heuristic processing may be more vulnerable to developing depression.

The direction of the relationship between depressive symptoms and reductions in stereotype use could be tested in future research by investigating stereotype use in individuals who are depressed, individuals who have never been depressed, and in individuals whose depressive symptoms are in remission. If reductions in stereotype use are a consequence or concomitant of depressed mood, stereotype use in recovered individuals should resemble stereotype use in those who have never been depressed.

It would also be possible to determine whether reductions in stereotype use are an antecedent of depressive symptoms by administering both the height estimation task and the BDI at two points in time, at least several months apart. An analysis of covariance could then be conducted to determine whether stereotype scores at time 1 predict BDI scores at time 2, when BDI scores at time 1 are partialled out.

Specificity of findings to depression. Future research will be needed to determine whether reductions in stereotype use are specific to depression or related to other forms of psychopathology. Anxiety in particular may also be associated with reductions in stereotype use. It has been noted that self-report measures of depressive symptoms such as the BDI correlate highly with self-report measures of anxiety (cf Clark & Watson, 1991). It has been suggested that rather than assessing symptoms unique to depression, the BDI may actually measure level of general distress or negative affectivity which is common to both anxiety disorders and depression (e.g. Clark & Watson, 1991). If reductions in stereotype use are related to symptoms that are common to both disorders rather than symptoms uniquely related to depression, anxious individuals might also show reductions in stereotype use.

Indeed, anxious individuals have been found to display a number of social deficits that have been associated with depression. While there are some inconsistencies in the literature, a number of studies have found that socially anxious individuals are rated by themselves and others as less social skilled than non-anxious controls (Rapee & Lim, 1992; Stopa & Clark, 1993). Furthermore, socially anxious individuals have been found to exhibit less socially skilled behaviour than non-anxious controls and controls who suffer from a variety of other anxiety disorders (Stopa & Clark,

1993). Anxiety, like depression, has been associated with social problem solving deficits. Higher levels of anxiety symptomatology are related to lower scores on the Problem Solving Inventory (i.e., poorer perceptions one's own problem solving skills; Heppner, 1997; Nezu, 1985). Similar to depression, anxiety has also been associated with poorer performance on pencil and paper tests of social problem solving such as the Means End Problem Solving Test (Marx, Williams, & Claridge, 1992).

Weary and Edwards (1994) suggest that anxious individuals, like dysphoric individuals might be more motivated to accurately process social information than non-dysphoric, non-anxious individuals because feelings of lack of control are central to anxiety as well as depression. They propose that anxious individuals, like dysphoric individuals, might engage in more detail oriented and effortful processing of social information in order to regain a sense of control over events in their lives and increase feelings of certainty about their ability to understand and predict social relationships.

In future the specificity of the current findings could be investigated by having dysphoric and non-dysphoric participants complete the height estimation task and also complete a measure which assesses symptoms uniquely related depression, symptoms uniquely related to anxiety, and symptoms that are common to both disorders. Watson, Clark,

Weber, Smith Assenheimer, Strauss, & McCormick (1995) have recently reported on the development of such a measure called the Mood and Anxiety Symptom Questionnaire (MASQ). This measure contains items which assess: the general distress common to both anxious and depressed mood; the low positive affect and loss of interest or pleasure uniquely related to depression; and the somatic concerns and symptoms of autonomic arousal uniquely related to anxiety (Watson et al., 1995). Researchers could use a measure such as the MASQ to determine which cluster of symptoms is the best predictor of stereotype scores.

### Conclusions

Across all three studies, dysphoric individuals made less use of a stereotype to make judgements about others than non-dysphoric individuals. This finding is important for several reasons. First, it is possible that reductions in stereotype use represent a marker for depression. If so, the height estimation task might provide an objective measure of symptom severity or help identify individuals who are at risk for developing depression. Second, it was proposed that reductions in stereotype use might lead to certain deficits in social functioning. If this is the case, reductions in stereotype use could play a role in the development or maintenance of depressive symptoms. Further research will be necessary to determine the processes that are responsible to dysphoric/non-dysphoric differences in

stereotype use and to determine more directly how reductions in stereotype use are related to social functioning and clinical depression.



## Appendix A

### Word Lists Used in Memory Task

#### List A

sky  
trumpet  
coin  
ship  
door  
tower  
piano  
frog  
shoes  
cat  
letter  
clock  
tool  
sky  
harp  
grass  
hoof  
car  
butter  
bowl  
tool  
bottle  
tower  
fork  
gold  
plant  
sugar  
piano  
doll  
ticket  
clock  
butter

#### List B

hall  
apple  
house  
rock  
pipe  
arm  
king  
money  
peach  
ocean  
hall  
bird  
truck  
book  
skin  
river  
library  
flag  
arm  
king  
pupil  
umbrella  
lake  
fire  
cabin  
chair  
string  
truck  
baby  
pole  
bird  
cabin

**Appendix B**

**Rating Scales for Task Related Variables (Studies 1 and 2)**

1. For what percentage of the photos do you think that you were able to accurately guess the height of the person within 2 inches?

\_\_\_\_\_ %

2. How difficult was this task?

	0-----1-----2-----3-----4-----5-----6-----7	
Not at all		Extremely
Difficult		Difficult

3. How important was this task?

	0-----1-----2-----3-----4-----5-----6-----7	
Not at all		Extremely
Important		Important

4. How hard did you try to accurately complete this task?

	0-----1-----2-----3-----4-----5-----6-----7	
Not at all		Extremely
		Hard

5. On the back of this page, list the strategies that you used to help you complete this task.

## Appendix C

### Height Estimation Strategies Listed By Participants

Strategies Reported by Participants	Examples of Participant Responses
1. Compared target to other objects in picture	"I tried to compare the people's heights the objects around them."
2. Compared target to self	"I tried to determine their heights according to how their physical size resembles myself."
3. Compared target to others well known to subject	"I tried to think of people that I know who looked about the same height."
4. Used stereotype that men are taller than women	"I would compare men to tall people that I know. I would compare most of the women to myself". (Response of female subject).
5. Considered body build of target	"I looked at leg length, or arm length... if they were long then they are usually tall."
6. Considered angle/position of target	"I tried to estimate the change in people's size using different angles."
7. Compared targets' heights	(I estimated heights by) "comparing different slides."
8. Gussed	(I) "really just gussed as best as I could."
9. Considered the visual angle or distance at which photo taken	"I took into consideration the angle of the photograph."
10. Considered clothing	"...I looked at their footwear as well."
-----	
N.B. Strategies and descriptions of strategies provided by participants were similar in Studies 1 and 2. Separate Appendices illustrating examples of strategies are therefore not provided for each study.	

## Appendix D

### Vignette Rating Task

Please read the following passage and rate the individual on the listed characteristics.

Bethany has been thinking about what programs she wants to apply to when she completes her undergraduate degree at Dalhousie. She always makes time for the important people in her life without limiting her participation in various activities or clubs. She is hoping to make the school swim team and also meet new friends through activities like this. She always makes time for her school work so she feels that she can juggle the extras in her life. In fact, she is considering working in the library a little after school.

#### **Aggressive**

1	2	3	4	5	6	7
never or or almost never true	usually true	rarely true	occasionally true	often true	usually true	always or almost always true

#### **Gentle**

1	2	3	4	5	6	7
never or or almost never true	usually true	rarely true	occasionally true	often true	usually true	always or almost always

#### **Affectionate**

1	2	3	4	5	6	7
never or or almost never true	usually true	rarely true	occasionally true	often true	usually true	always or almost always

#### **Dominant**

1	2	3	4	5	6	7
never or or almost never true	usually true	rarely true	occasionally true	often true	usually true	always or almost always

**Tender**

1	2	3	4	5	6	7
never or or almost never true	usually true	rarely true	occasionally true	often true	usually true	always or almost always

**Competitive**

1	2	3	4	5	6	7
never or or almost never true	usually true	rarely true	occasionally true	often true	usually true	always or almost always

**Compassionate**

1	2	3	4	5	6	7
never or or almost never true	usually true	rarely true	occasionally true	often true	usually true	always or almost always

**Ambitious**

1	2	3	4	5	6	7
never or or almost never true	usually true	rarely true	occasionally true	often true	usually true	always or almost always

Please read the following passage and rate the individual on the listed characteristics.

William is an undergraduate student at Dalhousie who wishes to go on to further education after he completes his degree. He attends class regularly and always gets things passed in on time. He volunteers and works a part-time job. William is also involved in extracurricular activities at school and in the community. He lives at home and manages to take care of his dog and cat as well as help out with chores. No matter how busy he gets, William always makes time for family and friends.

### **Aggressive**

1	2	3	4	5	6	7
never or or almost never true	usually true	rarely true	occasionally true	often true	usually true	always or almost always true

### **Gentle**

1	2	3	4	5	6	7
never or or almost never true	usually true	rarely true	occasionally true	often true	usually true	always or almost always

### **Affectionate**

1	2	3	4	5	6	7
never or or almost never true	usually true	rarely true	occasionally true	often true	usually true	always or almost always

### **Dominant**

1	2	3	4	5	6	7
never or or almost never true	usually true	rarely true	occasionally true	often true	usually true	always or almost always

### **Tender**

1	2	3	4	5	6	7
never or or almost never true	usually true	rarely true	occasionally true	often true	usually true	always or almost always

**Competitive**

1	2	3	4	5	6	7
never or or almost never true	usually true	rarely true	occasionally true	often true	usually true	always or almost always

**Compassionate**

1	2	3	4	5	6	7
never or or almost never true	usually true	rarely true	occasionally true	often true	usually true	always or almost always

**Ambitious**

1	2	3	4	5	6	7
never or or almost never true	usually true	rarely true	occasionally true	often true	usually true	always or almost always

## Appendix E

### Rating Scales for Task Related Variables in Study 3

1. For what percentage of the photos do you think that you were able to accurately guess the height of the person within 2 inches?

\_\_\_\_\_ %

2. How confident or certain are you about your own opinions, judgments and decisions in general?

0-----	1-----	2-----	3-----	4-----	5-----	6-----	7
Not at all confident							Extremely confident

3. To what extent do you have a feeling of personal control or power over the events in your own life?

0-----	1-----	2-----	3-----	4-----	5-----	6-----	7
I have no power or control							I have a great deal of power or control

4. How difficult was the height estimation task?

0-----	1-----	2-----	3-----	4-----	5-----	6-----	7
Not at all Difficult							Extremely Difficult

5. How important was this task?

0-----	1-----	2-----	3-----	4-----	5-----	6-----	7
Not at all Important							Extremely Important

6. How hard did you try to accurately complete the height estimation task?

0-----	1-----	2-----	3-----	4-----	5-----	6-----	7
Not at all							Extremely Hard



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