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Effects of mental control deprivation, cognitive busyness and anxiety on person perception.

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EFFECTS OF MENTAL CONTROL DEPRIVATION, COGNITIVE BUSYNESS AND ANXIETY ON PERSON PERCEPTION

A Thesis Presented

by

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CHAPTER 1

INTRODUCTION

In a social situation, anxious people may experience a range of unpleasant symptoms. They might feel their hearts beat faster and hear their voices shake. They may be distracted by self-focused thoughts about how the interaction is going or how well they are doing. Thoughts may intrude that remind them how poorly they are performing and how badly the interaction will turn out. Prospects of failure may tempt them to bolt from the situation, or withdraw in other ways. What would happen if we asked anxious people to form an impression of an interaction partner?

The processes and effects of anxiety have been variously documented, and the evidence suggests that anxious people do not do well in complex situations, which might then hold for person perception. For example, anxiety is likely to cause arousal, which can limit the range of cues the anxious person notices (Easterbrook, 1959). Self-focused thoughts may distract the anxious person from another task, hurting performance (Bates, Campbell, & Burgess, 1990; Sarason, 1980; Sarason & Sarason, 1990; Wine, 1980). Expectations of failure at a task may cause an anxious person to withdraw physically or mentally from the task, again hurting performance (Carver & Scheier, 1988). Anxious people are bothered by worries that significantly interrupt their attention to other tasks (Borkovec, Robinson, Pruzinsky, & DePree, 1983; Clark & de Silva, 1985; Deffenbacher, 1980). These anxiety-related ruminations, like most unwanted thoughts, are extremely difficult to suppress, so anxious people

may feel unable to control the interrupting thoughts (Clark & de Silva, 1985; Wegner, 1989; Wegner, Shortt, Blake, & Page, 1990). Although they may expend more effort to make up for their distraction, this increased effort may still not be enough to succeed at complex cognitive tasks (Eysenck & Calvo, 1992). Any of these effects of anxiety might similarly interfere with complex person perception.

Fiske and Emery (1993) describe a theory of how anxiety and mental control deprivation might lead to attempts at social control. The capacity and control theory of anxiety contains predictions about how anxiety might cause people to simplify (i.e., categorize or fail to differentiate) other people. They illustrate their theory with a psychoanalytic case study of a man remanded into therapy by the legal system. His "thinking was scattered and impulse driven" and his "stance toward other people was aggressively controlling....His conscience took an 'immoral' stance toward others as things to be manipulated for his own good and supposedly theirs" (p. 183). The client's scattered thinking left him feeling out of mental control, and he turned to controlling others as a substitute. He viewed others in stereotyped, categorical terms. Fiske and Emery's theory deals with how people like the man in the case study react to being out of mental control. They cite anxiety as an important example of the phenomenon. They propose that anxious people's uncontrollable, intrusive thoughts have two effects: they take up cognitive capacity, and they cause anxious people to feel out of mental control. While the control decrement motivates anxious people to want to regain control, the capacity decrement takes away resources with which to do so. As a result, anxious people may

resort to controlling others. Stereotyped thinking and categorization are easier to do with the anxious person's depleted cognitive resources. Categories also make others seem simpler and, to the anxious person, may make them seem easier to control. In this paper I develop and explain the details of the evolving theory below; Table 1 presents the steps of the current theory and each step's specific hypotheses in tabular form.

Capacity Decrements

People's capacity to process information is said to be fixed--it cannot be increased (Kahneman, 1973). Different attentional tasks require different amounts of capacity, and when a task exceeds a person's capacity, the task fails. When two tasks compete for limited capacity, one or both might fail. To some extent, people can control how they use their capacity by choosing to expend more effort on a task they deem important.

The intrusive ruminations that anxious people experience take up cognitive capacity. Both the test anxiety literature (Deffenbacher, 1980; Sarason & Sarason, 1990) and research on general anxiety (Bates, Campbell, & Burgess, 1990; Borkovec, Robinson, Pruzinsky, & DePree, 1983; Clark & de Silva, 1985) confirm that anxiety has a "worry" component consisting of intrusive thoughts, mostly focusing on the future, the self, or performance. The worry component is specified in anxiety research as a significant distractor from other tasks (Clark & de Silva, 1985; Wine, 1980).

In general, when people are distracted, they form simpler impressions of others. For example, "busy" subjects fail to include situational constraints on that person's behavior in their attributions (Gilbert, Krull, & Pelham, 1988).

Table 1.

Steps in the Fiske and Emery (1993) theory of mental control and exaggerated social control.

Postulate/Step	Related IV	Related DV
1. Anxious people experience intrusive thoughts	manipulate or measure anxiety	ask for thought content
2. The intrusive thoughts reduce cognitive capacity	manipulate thought suppression efforts	test cognitive performance
3. The intrusive thoughts are uncontrollable	manipulate thought suppression efforts	ask how controllable thoughts are
4. Losing control over their thoughts makes anxious people feel control-deprived	manipulate perceived mental control	ask about feelings of control
5. Mental control deprivation leads to control motivation	manipulate perceived mental control	test information search or other attempts at control
6. Anxious people who want to make their environments seem controllable cannot use normal means, because they lack cognitive space	add control deprivation and capacity deprivation	test for complexity of impressions, social control attempts, use of information
7. The self is aversive, so anxious people's control attempts are directed outward	manipulate or measure anxiety	measure aversiveness of self-focus
8. Other people appear simpler and also easier to control	manipulate or measure anxiety	measure perceptions of or control of others

continued on next page

Table 1., continued

Postulate/Step	Related IV	Related DV
9. To an anxious person, others seem a good target for control attempts	manipulate or measure anxiety	measure attempted control of others

And people have less memory for what another person said right before their own turn to speak, presumably because they are anxiously or at least busily rehearsing what they plan to say (Bond, Pitre, & Van Leeuwen, 1991).

In relation to the present research, anxiety has been studied as a distractor in person perception. For example, solos (people who believe they are the only one of their gender or race in a group) are more preoccupied and anxious about others' attention to them, and they remember less information about others (Saenz & Lord, 1989). Threats to self-esteem (a major cause of anxiety) cause people to differentiate the members of an outgroup less (Wilder & Shapiro, 1989).

These experiments and the test anxiety literature (Sarason & Sarason, 1990) do indicate that anxious people are distracted by intrusive thoughts, and that they show deficits in memory, differentiation, and cognitive performance. Thus, the literature supports the idea that anxiety takes up mental capacity. But capacity decrements are not the whole story. The capacity-control theory predicts that control motivation, in addition to decreased capacity, contributes to a desire for social control (and simpler impressions) in anxious people. I turn to this topic next.

Control Decrements

The intrusive thoughts that anxious people experience are difficult to control, especially as the thoughts become more emotional (Clark & de Silva, 1985; Salkovskis & Harrison, 1984). Even non-anxious people have great difficulty purposely suppressing thoughts (Wegner, 1989), particularly when they are exciting (Wegner, Shortt, Blake, & Page, 1990). But anxious people

report special difficulty in thought control (Borkovec, Robinson, Pruzinsky, & DePree, 1983).

We hypothesize that anxious people's unsuccessful attempts at controlling their thoughts and feelings will make them feel control-deprived. No research to date has measured how out of control people feel when they try unsuccessfully to suppress thoughts. However, Pittman and Heller (1987) suggest that experiencing negative, unexpected events or feeling a lack of contingency between one's efforts and one's outcomes threatens people's feelings of outcome control (prediction and influence over events). If these events make people feel out of control, anxious people's unsuccessful attempts at thought suppression probably have the same effect. One study that supports our claim is by Kent and Gibbons (1987), who found that perceived lack of thought control is strongly related to distress in anxious people, more so than the frequency of their intrusive thoughts. The reported distress in this study is perhaps a symptom of lost mental control.

Much research suggests that people who feel out of control usually seek information to regain a sense of predictability and control (for a review, see Pittman & Heller, 1987). For example, one study found that people who are control-deprived in one situation use more information when they form impressions of others in a second situation (Pittman & Pittman, 1980). In addition, when people are dependent on each other for an important reward, they lose sole control over their outcomes. As a result, they usually try to be more accurate about their partners (Dépret & Fiske, 1993; Erber & Fiske, 1984; Neuberg & Fiske, 1987; Ruscher & Fiske, 1990).

So far, the reasoning suggests that anxious people's uncontrollable, intrusive thoughts leave them feeling out of control. Control deprivation in nonanxious people usually leads to control motivation, reflected in active information searching. Will the control deprivation of anxious people also lead to control motivation? The answer does appear straightforward, and we do believe that anxiety will lead to control motivation. But we must address a potential problem in the reasoning first.

The problem lies in this distinction: All of the control deprivation paradigms mentioned in Pittman and Heller (1987) concern outcome control (control over one's rewards and punishments, not necessarily from another person). But the control deprivation in anxiety concerns mental control (control over one's thoughts and feelings). We believe that mental control deprivation will result in control motivation similar to that in outcome control deprivation, but the claim is speculative. Perhaps the best evidence comes from Pittman and Pittman's (1980) study. There, outcome-control deprivation in one situation (non-contingent feedback on a concept formation task) transferred to an unrelated situation (an impression-formation task). This study suggests that control motivation is general, indicating it could result from lost mental control as well. Because efforts at thought suppression often backfire, making people focus on the very thought they are trying to suppress, attempts at thought suppression mimic non-contingent feedback situations: in both, people's efforts are unrelated to their success. If so, feeling deprived of mental control might also motivate effortful impression formation. However, a direct test of this hypothesis is clearly necessary.

How Capacity Decrements and Control Decrements Might Work Together in Anxious People

The last two sections established that anxious people are likely to experience a capacity decrement and a control decrement. These two characteristics make competing predictions for impression formation. People who are short on capacity are likely to form more simple impressions of others because they lack the capacity to be complex. People who are control-deprived are likely to form more complex, or at least more effortful, impressions of others, because they are concerned about regaining prediction and control. Anxious people are caught in between: they want to regain control, but they lack the resources to do so. A person with this combination of tendencies is likely to want information about others, but not attend to it or use it in meaningful ways. The studies reported here cross mental control deprivation with cognitive busyness in nonanxious people to test this hypothesis.

Our research is designed to indicate whether or not simple control deprivation and cognitive busyness are sufficient to simulate an anxious person's impression formation processes. Will nonanxious people who are both control-deprived and distracted act similar to anxious people? We predict that both anxious people and simulated-anxious people will say they want more information about others, but will not use it in complex ways. They will form simple impressions of others rather than complex, integrated ones. They may be more likely to categorize people instead of individuating them.

An additional prediction the capacity-control theory makes is that anxious people respond to their lack of mental control and mental capacity by

simplifying others in an attempt at social control. Anxious people substitute the control of others, whom they perceive to be more simple, distant, and controllable, for controlling the self, which they perceive to be more complex, aversive, and uncontrollable. The two experiments in this report addresses this part of the theory as well, as will be explained below. But first, I review the reasons that anxious people may want to control others.

There are several social cognitive reasons why anxious people, short on capacity and in need of control, might prefer others as their objects of control. First, in anxiety, the self is the source of negative states, and anxious people may find attention toward the self particularly aversive (Baumeister, 1990; Higgins, 1987). Anxious people should find it more pleasant to direct their attention outward than to focus it on themselves.

Second, other people seem easier to control than the self because feedback from attempts at social control is more delayed, indirect, and ambiguous, whereas the anxious person's efforts at mental control give immediate (and often unsuccessful) feedback. Thus, unsuccessful attempts at mental control are immediately noticed, whereas unsuccessful attempts at social control can be reinterpreted or ignored.

Third, people have less complex concepts of others compared to themselves (Fiske & Taylor, 1991, Chapters 4 & 6), so other people seem simpler at the outset. The capacity decrements of anxiety accentuate a simple view of others: Categories are likely to be the tools of a distracted mind (Gilbert, 1989; Wilder & Shapiro, 1989). If anxious people are motivated to control their environment, another person who appears simple may seem a easy target.

Wilder & Shapiro, 1989). If anxious people are motivated to control their environment, another person who appears simple may seem a easy target.

We predict that anxious people and simulated-anxious people will report a desire to control their partners. They may report wanting their partners to follow their advice or act in expected ways. In these two studies, partner control is measured with a self-report scale, not behavioral measures. Although such behavioral measures are important, the focus of these two studies was on the categorical impressions that mediate the path from anxiety to social control.

The capacity-control theory is complemented by Baumeister's theory of escape from negative self awareness, which he uses to explain masochistic sexual behavior (Baumeister, 1989), suicide (Baumeister, 1990), and binge eating (Heatherton & Baumeister, 1991). One step in Baumeister's theory states that in order to escape negative affect (including anxiety), people narrow their cognitive views and "deconstruct" rational thinking. Cognitive narrowing results in concrete thinking and cognitive rigidity, including categorical thinking. Baumeister's theory complements ours because it implies that anxious people may find categories easier to handle (step 8 in Table 1).

Overview of Studies

To date, no parts of the capacity-control theory have been empirically tested. The purpose of the present studies is to begin doing so. These studies focus on the combined effects of control motivation and cognitive load (step 6 in Table 1). It only indirectly tests two mediating hypotheses, namely, that loss of mental control leads to control deprivation and control motivation (steps 4 and 5 in Table 1). The studies use a brief self-report measure to confirm steps

that are already well-established in other research, namely, that anxious people experience uncontrollable, intrusive thoughts that take up cognitive capacity (steps 1, 2, & 3 in Table 1). The studies also do not directly test the social cognitive reasons why anxious people might find others to be appealing targets for control (steps 7, 8, & 9 in Table 1). Subsequent research may address neglected steps.

In the two studies presented here, pairs of subjects expected to work together on various activities. They read information about each other that contained both consistent and inconsistent statements. Then they wrote brief essays about their partners and rated them on various traits. They answered questions about how much control they felt over their thoughts and feelings, how distracted they were by their thoughts and feelings, and how much control they felt over their outcomes in the experiment. They also answered questions about how much control they wanted over their partners' behavior, and about how much information they wanted about their partners.

Both studies involved five groups of subjects. One group of subjects, selected for high trait anxiety, served as an external comparison group, the fifth cell of a 2 x 2 + 1 design. Of the remaining subjects, half were mentally control-deprived and half were cognitively busy, forming a 2 (control-deprived or not) x 2 (cognitively busy or not) design.

As measures of person perception, we measured subjects' attention to information from their partners (reading times), the complexity or simplicity of their essays, how much of the information from their partners they actually used in their descriptive essays, and the extremity of their ratings of their

partners. We assumed that more polarized ratings (on bipolar scales) indicated that subjects did not modify their judgments with inconsistent information, suggesting simplicity.

Subjects in Study 1 were interdependent: They were told they could win a prize if they worked well with their partners. In previous research, outcome dependency has been shown to motivate subjects to pay more attention to their partners (Erber & Fiske, 1984), presumably because subjects no longer have sole control over their own outcomes. Interdependence, therefore, can also be seen as a control deprivation operationalization. Subjects in Study 2 were not interdependent, to investigate the pure effects of mental control deprivation (without outcome dependency).

Hypotheses

We expected the nonanxious subjects who are both mentally control-deprived and cognitively busy to resemble our anxious comparison group. Compared to subjects who are neither control-deprived nor busy, these two groups will make simpler impressions of their partners and indicate that they are interested in controlling them. They will pay less attention to inconsistent information about their partners, will write simpler essays using less of the information, and will polarize their ratings of their partners. They will report that they would like a lot of information about their partners, but they will not use the information they have in meaningful ways.

Two orthogonal contrasts are the most direct and theoretically interesting test in the study. Our first prediction is that the both control-deprived and cognitively busy cell (-2) will be similar to the anxious cell (-2) and different

from the other cells. Of those, the only busy cell (-1) will show a decrease in impression accuracy and complexity but not as much. The control-deprived cell (+3) will show an increase in these variables compared to the baseline cell (+2). These contrast weights take into account the predicted effects of busyness and control deprivation by themselves, as well as the combined effect we predict when people are both busy and control-deprived. Our second prediction is that the both control-deprived and cognitively busy cell and the anxious comparison cell will be the same, resulting in respective contrast weights of -1, +1, 0, 0, 0.

CHAPTER 2

STUDY 1

Method

Overview

Pairs of female subjects participated in an experiment about "working apart and together on activities" and thought they could win a prize for working well with their partners. Subjects first answered 8 interview questions about themselves, as an introduction for their partner (their answers were never actually shown to their partners). Subjects then spent 4 minutes trying to not think about a white bear, receiving feedback that their performance was normal or that they were having trouble doing the task. Subjects read answers to the 8 interview questions, presumably from their partners, but actually false answers. Then they wrote a short essay about their impressions of their partners based on the interview answers, rated her on several traits, and answered questions about their strategies for working together, their level of mental distraction, and the amount of information they wanted from their partners. Subjects then performed two tasks working together. Busy subjects counted beeps from an audio tape throughout most of the experiment. Materials from primary experimental tasks are contained in Appendix A.

Design

The design was a 2 (mental control-deprived or not) X 2 (cognitively busy or not) + 1 (anxious), 5-cell design. Anxious subjects, the comparison group, were not crossed with control deprivation or cognitive busyness because

they are expected to experience both of these naturally, so theoretically anxiety and the two manipulations would be redundant.

Subjects

One hundred two female introductory psychology students at the University of Massachusetts were run in 51 pairs. None of the pairs were acquainted before the study. Of these, five subjects in the anxious condition were omitted from all analyses because manipulation checks (self-ratings on "anxious" and "calm") indicated that they were not anxious during the experiment. In addition, four subjects were omitted because they volunteered suspicion at the control deprivation manipulation. One subject was omitted because she volunteered suspicion of the false partner information. Five subjects who were originally assigned to the control-deprived/busy condition were transferred to the only busy condition because they did not report any thought intrusions on the control deprivation exercise (to be described shortly), and thus it would have been unclear how the failure feedback would have affected them. These five subjects were not significantly different from the other busy subjects on any of the measures.

After omissions and transfers, 22 subjects were in the baseline condition, 25 were in the only busy condition, 16 in the only control-deprived condition, 15 in the busy and control-deprived condition, and 15 in the anxious condition.

Selection of Anxious Subjects

Anxious subjects were selected by their scores on the "state" scale of the Spielberger State-Trait Anxiety Inventory (STAI; Spielberger, Gorusch, & Lushene, 1970), included as part of the general psychology prescreening pool

administered at the beginning of the semester. Anxious subjects scored 2.70 or higher on a 4-point scale; this represented the topmost 20% of the 120 women who took the form of the prescreen that contained the scale. To be included, anxious subjects also had to indicate agreement (3 or more on a 4-point scale) with a majority of the items on a 6-item subscale, also on the prescreen. The subscale included items such as: "How anxious would it make you feel to work on a test with someone you've never met before, while someone evaluates how you work together?" Subscale scores helped ensure that the women who reported high trait anxiety would also be anxious in this particular lab situation. Non-anxious subjects did not meet the high-anxiety criteria.

Room Arrangement

The partners sat at desks facing each other. A 1 foot plywood barrier enabled subjects to see each others' faces but not anything their partners were writing.

The female experimenter sat in a chair facing the partners. Two clip-on microphones were taped to each side of her chair seat; each microphone was plugged into a tape recorder.

Experimental Conditions

Each member of a given pair received identical treatment conditions. That is, within a pair, both members were busy, control-deprived, both control-deprived and busy, or neither control-deprived nor busy (the baseline group). Similarly, both members received the same impression expectancy (either hardworking or lazy). One exception to this rule involved the pairing of anxious subjects with each other. Having an anxious partner might influence

subjects' reactions. For example, anxious subjects may display unusual nonverbal behaviors. To avoid any confounding effects of having an anxious partner with being an anxious subject, half of the anxious subjects worked with other anxious subjects and half worked with non-anxious controls. This also meant that half of the baseline subjects worked with each other and half with anxious subjects.

Busyness Manipulation. For the busy condition, the experimenter told half of the non-anxious subjects the following:

> You probably know that in the real world, people hardly ever devote all their attention to one thing at a time. You're almost always distracted by one thing or another--your neighbor's music, or your stomach growling--so you usually have to do two or more things at once. We like to make our experiments more like the real world by having people do more than one thing in here. That way, we can better generalize our results to people in the real world.

The experimenter then told them about the counting task. A tape recorder played a tape of beeps at random intervals an average of 12 s apart. The subjects counted each beep as they heard it. Subjects counted beeps during every task in the experiment (starting after the white bear task; see procedure below) except when oral instructions were given. At the end of each task in the experiment, the experimenter paused the tape and subjects wrote down the number of beeps they counted in that task. The tape began again after the instructions for the next task.

Control Deprivation Manipulation. Half of the nonanxious subjects were randomly assigned to the control deprivation condition, adapted from Wegner, et al. (1990). Near the beginning of the study, subjects were told:

> For the next two minutes I'd like you each to write down your thoughts; just whatever happens to be going through your head right now. But at the same time I'd like you to try really hard to not think about a white bear. Now, even though you're trying not to think of one, you might happen to. So if you do happen to think of a white bear--like the word, or the image, or something reminds you of it--just put a checkmark in the margin. I'm going to have you do this for two minutes.

After subjects did the task for two minutes, the experimenter told them to stop, leaned forward to look at their pages, and muttered, "I just have to take a look...." At this point, non-control-deprived subjects were told,

> Okay, you guys are both doing fine. This is impossible to do, and most people put a lot of checkmarks down. I need to get a total of four minutes from everybody, so if you could just draw a line under where you stopped, and start writing again below that line. I'll have you do it again for two more minutes.

In contrast, in the control-deprived condition, the experimenter expressed some disappointment, and looking from one subject's paper to the other, said,

> Well, I don't want either of you to comment on this or say anything, but since one of you is having some trouble, I think I'm going to have you both just practice it again. Why don't you draw a line on your page and you can do it again below the line. We just read somewhere that most

college students can go for four minutes without putting any checkmarks, so try really hard NOT to think of a white bear.

After the second two minutes, the experimenter collected the subjects' pages.

Procedure

Subjects were told that they were participating in a study on how people work together versus how they work apart. First they would do some activities on their own, then they would get to know each other, and finally, they would do a few activities together, as a pair. To make subjects interdependent, the experimenter offered three prizes of $40 to three pairs. One $40 prize was for the pair that did the best at the activities overall, and the two other prizes were randomly drawn from the pairs who performed better than half the other pairs. (In actuality, all prizes were awarded by lottery at the completion of the study.)

After introducing the experiment, the experimenter asked subjects' permission to tape-record the session. She explained that the microphones were attached to the chair because "we used to put them right on your desks in front of you, but we found that it made some people uncomfortable. So we moved them." All subjects agreed to be taped.

As their first task, subjects were asked to introduce themselves to their partners by answering eight questions about themselves and university life. The questions were printed on half-sheets of paper, paperclipped together. The experimenter wrote a large "R" and "L" in the top corner of the first pages, explaining that they stood for "right" and "left," respectively. When subjects finished, the experimenter collected the questionnaires and placed them in her lap.

Next, the experimenter explained that the subjects would be doing all of the individual tasks first and working together later. The first such task was the mental control, or white bear task, which contained the control deprivation manipulation.

After the mental control task, subjects completed Epstein's Feelings Checklist (Epstein, 1979). The checklist contains groups of emotions to which subjects respond on 7-point bipolar scales. Before they received the feelings checklist, busy subjects were introduced to the beep counting task, and told that the checklist was a way to practice counting the beeps before the more important "getting acquainted" part. Non-busy subjects, of course, did not receive such instruction.

While subjects completed the checklist, the experimenter secretly exchanged the actual answers the subjects gave to the eight interview questions with two previously prepared, standard sets of interview answers.

Next, the experimenter introduced the "getting acquainted" part. As she handed subjects their partners' answers to the introductory questions (which were actually the standard answers), she explained, "because the two of you will be working together for a prize later, you should use this information to get to know your partner a little bit." The experimenter casually watched the subjects read the interviews, and as each subject turned a page, she unobtrusively tapped the microphone (taped to her chair) that corresponded to that subject. Later, a timer, blind to experimental condition, timed the seconds between the taps on the tape to obtain a measure of attention for each page of the interview.

Interview Content. The first two pages of the interview set up an expectancy about the partner as either hard-working and smart or lazy and dull. (For example, the hard-working partner reported studying 20 hours a week, whereas the lazy partner studied 3 hours a week.) The remaining six answers contained three statements that were pretested to be consistent with the hard-working expectancy but inconsistent with the lazy expectancy (e.g., "I don't usually have time to go to movies during school because of homework") and three statements that were that are inconsistent with the hard-working expectancy but consistent with the lazy expectancy (e.g., "the best part about UMass is the big classes--nobody ever calls on you and they don't care if you skip"). Within each cell, half of the subjects (randomly assigned) received the hard-working expectancy and half received the lazy expectancy. Exact wording of the interview is contained in Appendix B.

After reading the partner information, subjects completed a packet of questions about their impressions of their partners. The experimenter told them that their answers to the questions would not be shown to their partners and, to emphasize this, gave each an envelope in which to seal her completed packet. On the first page of the packet, each subject wrote an essay paragraph about her impressions about her partner. Subjects took as much or as little time as they wanted to complete the essay paragraph. On the next page of the packet, subjects rated their partners on 11 traits (e.g., smart, loyal, lazy, crabby) on 7-point scales anchored from "not at all" to "extremely." Then they answered nine questions concerning their confidence about doing well at the activities and about how much they wanted to control their partners (e.g., "It would be

better if my partner takes my advice when we work together"). The next five questions asked how much control they presently felt over their own thoughts and feelings and how much they were presently distracted by irrelevant thoughts. Finally, two questions asked subjects to indicate how much information they considered necessary to form a good impression of their partners (see the appendix for the specific questions).

After completing the packets, subjects were introduced to the activities working together. For the first task, alternative uses, subjects were given 2 min to help each other think of uses for an automobile tire that were different from the objects' common use. This activity has been used as a measure of divergent thinking in previous work (Jackson & Messick, 1967), and was intended to address the degree to which subjects think in rigid versus flexible ways. While pairs worked together, the experimenter unobtrusively recorded how many uses each subject suggested. The second task was a verbal one in which subjects worked together to come up with shorter words that could be spelled with the letters in the word "Washington" (Estroff & Nowicki, 1992). Again, the experimenter recorded the contribution of each subject.

Finally, subjects were given a brief questionnaire asking what they considered to be important in the experiment. They first answered two free-response questions ("what part did you try hardest to do well on?" and "what part did you try least hard to do well on?") and then rated the importance of each individual experiment task (e.g., making an accurate impression of the partner, writing a good essay about the partner, doing well at the activities, etc.).

At the end of the study, each pair of subjects was carefully debriefed and probed for suspicion. Anxious subjects were never told why they had been selected to participate.

Essay Coding

Subjects' essays were coded for three main elements. All coders were blind to the experimental conditions of the subjects whose essays they were coding. First, coders counted the number of words and the number of sentences in each essay as an index of verbal productivity (e.g., Strauman & Higgins, 1987). Second, a coder recorded how much of the information from the hard-working or lazy interview answers subjects used in their essays. If a part of the interview was mentioned, the coder classified it into one of three categories: a.) mentioned the piece of information in accurate detail (e.g., "she said she likes the big classes because you can skip"); b.) mentioned only the gist of the information (e.g., "she likes to skip classes"); or c.) mentioned the information but incorrectly (e.g., "she likes big classes because she likes meeting other students").

Third, all essays were coded for complexity by the author and one other coder using a coding scheme developed by Woike and Aronoff (1992) (see also Woike, 1989). Sentences and sentence fragments could be coded with one or more of 9 categories. Category scores were later summed into two subscores as well as a total complexity score. The differentiation subscore comprised the number of new ideas mentioned in the essay and statements that restrict the meaning of an aspect, point out a contrast between aspects, or indicate a relative comparison between aspects. The integration subscore comprised

statements that extend the meaning of an aspect, make an inference, or provide evidence for a conclusion and statements that point out similarities, show causal relationships between aspects, or make general integrative statements about the person or essay as a whole. The total complexity score was the sum of the differentiation and integration subscores.

Before coding the essays in this study, the two coders trained to 85% agreement on essays from a pilot study. Then each coder scored 61 of this study's 102 essays so that 20 essays were scored by both; inter-rater agreement on these 20 essays was 80%.

Results

Manipulation Checks

Anxiety. Anxious subjects' mean responses to the Epstein feelings checklist were compared to the combined mean of the other four groups. This test incorporates the same weights as a planned contrast (weighting the anxious group +4 and the other four groups -1) but tests against a more conservative error term. As expected, anxious subjects were more anxious (M's = 3.60 vs. 2.51; $t(91) = 2.45$, $p < .025$) and less calm (M's = 3.47 vs. 4.69; $t(91) = -2.76$, $p < .01$). Anxious subjects also reported being less happy (M's = 3.73 vs. 4.85; $t(91) = 2.77$, $p < .01$) and less alert (M's = 2.87 vs. 4.36; $t(91) = 3.37$, $p < .01$). Anxious subjects were not more frightened (M's = 2.07 vs. 2.10, n.s.).

Busyness. Self-reports of distraction were tested using a 2 (busy or not) x 2 (control-deprived or not) between subjects ANOVA. As expected, busy subjects reported feeling more distracted (M's = 4.08 vs. 2.61; $F(1,74) = 13.10$, $p < .01$). Unexpectedly, they also reported being happier (M's = 5.18 vs. 4.50;

$F(1,74) = 4.29$, $p < .05$) and more alert (M's = 4.78 vs. 4.08; $F(1,74) = 3.30$, $p = .07$).

The number of beeps that busy subjects reported counting was compared to the actual number of beeps played. Busy subjects' error rate was 6%, suggesting that the task was challenging enough to influence capacity yet not so difficult to cause subjects to give up. The acceptable error rate in other distraction experiments has been 15% (see Gilbert et al., 1988).

Mental Control Deprivation. No direct manipulation checks were included for mental control deprivation. However, one way to test whether the feedback was effective is to test if control-deprived (CD) subjects put fewer checkmarks the second 2 mins (after the feedback to try harder). They did (M's first two mins: CD = 3.32, non-CD = 2.72; second two min: CD = .871, non-CD = 2.51; interaction F (1,76) = 18.17, $p < .001$). This interaction qualifies a main effect for trial ($F(1,76) = 25.74$, $p < .01$). As another ad hoc check, control-deprived subjects reported being marginally more distracted (M's = 3.74 vs 3.11; $F(1,74) = 2.80$, $p < .10$). However, this effect accompanies the busyness main effect and probably reflects only the responses of the control-deprived/busy group; only-control-deprived subjects were not significantly more distracted than the baseline group (M's = 2.94 vs. 2.36). No other differences emerged on the feelings checklist.

Hardworking Versus Lazy Expectancy. Subjects' ratings of their partners on the traits "hardworking" and "smart" were summed and ratings on "lazy" and "irresponsible" were summed to serve as manipulation checks for the hardworking and lazy expectancies. Subjects receiving the hardworking

expectancy rated their partners as more hardworking than did subjects receiving the lazy expectancy (M's = 6.26 and 4.21, respectively; F(1,70) = 8.01, p < .01), and subjects receiving the lazy expectancy rated their partners as more lazy than did subjects receiving the hardworking expectancy (M's = 3.42 and 1.86, respectively; F(1,70) = 28.69, p < .01).

Impression Formation Strategies

The main hypotheses in this study were that anxious subjects and control-deprived/busy (CD/B) subjects would a) want more information about their partners but b) would not use the information about their partners in complex ways, and c) would express a desire to control their partners. The dependent variables measuring impression formation included subjects' attention to information, their self-reports of the amount of information they wanted, the complexity and length of their essays, the extent to which they mentioned information from the partner interview in their essays, their ratings of their partners on several traits, and their self-reports of wanting to control their partners. Analyses on these impression formation variables were first done as 2 (busy or not) x 2 (control-deprived or not) x 2 (hardworking expectancy or lazy expectancy) between subjects ANOVAs, excluding anxious subjects. Planned contrasts included the anxious subjects, using the error term from a 5 (condition) x 2 (expectancy) ANOVA.

In this section, I will present results that clearly support the specific hypotheses or that give null effects on dependent variables relevant to the hypotheses. Several effects obtained that were not predicted and do not

specifically support the hypotheses but that are interesting nonetheless. I will present these in a following section.

Information Seeking. Being mentally control-deprived or anxious should have led subjects to seek more information about their partners. Anxious subjects tended to report wanting more information on the self-report measure (M's: anxious = 10.07, baseline = 9.52, only-B = 8.54, only-CD = 9.20, CD/B = 8.29; $F(4,79) = 2.28$, $p = .07$). However, this tendency did not hold for control-deprived subjects, who did not report wanting more information than non-control-deprived subjects (M's CD = 8.76, non-CD = 9.00, n.s.).

Information seeking can also be measured by the amount of attention subjects paid to the information from their partners while they were reading it: More attention (hence, longer reading times) may reflect a desire to get more information about the partner. Unfortunately, over 1/3 of the attention data were lost due to a tape recorder malfunction, and no effects on the attention variables were significant due to very low power. Means for the total time spent reading the essay suggest that, counter to the predictions and the self-report results, anxious subjects spent less time reading the information than the other groups (M's: anxious = 68.59, baseline = 74.47, only-B = 75.13, only-CD = 75.45, CD/B = 74.03; n.s.). Of course, this result is equivocal because of incomplete data.

Impression Complexity. Three types of complexity subscores were compared: differentiation, integration, and total complexity (which is the sum of differentiation and integration). All complexity subscores are very highly correlated with the number of words subjects wrote (r's = .57 to .86).

Therefore, to separate the effect of verbal productivity from actual differences in complexity, subjects' complexity scores were divided by the number of words in their essays. Scores were then multiplied by a constant to make them greater than 1. Because of these transformations, the complexity scores themselves are uninterpretable but differences between the groups on complexity are meaningful.

Findings from the total complexity subscore perfectly support the hypotheses. A busy by control-deprived interaction was significant ($F(1,70) = 4.44$, $p < .05$; M's baseline = 16.05, only-B = 15.98, only-CD = 17.46, CD/B = 14.96. Anxious group M = 15.01.). The planned contrast weights on each of the means (weights +2, -2, +3, -1, -2, respectively) was significant ($F(1,87) = 8.15$, $p < .01$) and the contrast comparing the anxious group to the CD/B group was, as predicted, nonsignificant ($F(1,87) < 1.0$). The residual from the contrasts was nonsignificant ($F(2,87) < 1.0$), as predicted. These results suggest that mental control deprivation alone increased complexity, but when control deprivation was combined with cognitive busyness, it dramatically decreased complexity--more than just busyness alone. And as predicted, anxious subjects resembled the control-deprived/busy subjects. These two groups were the least complex of the five. (This busy x control-deprived interaction qualified a main effect for busyness, $F(1,70) = 4.68$, $p < .05$; M's busy = 15.6, not busy = 16.6.)[1]

Analyses on the integration subscore showed no differences (all F's n.s.). And results for the differentiation subscore are largely redundant with the results for the total complexity score. The same busy x control-deprived interaction was significant ($F(1,70) = 5.14$, $p < .05$; M's: baseline = 11.4, only-B

= 12.2, only-CD = 13.3, CD/B = 11.0. Anxious group M = 11.1.). The pattern here is very similar to the results for total complexity with the exception that the only busy group mean is now higher than baseline; however, the only control-deprived group used the most differentiation and the anxious and the control-deprived plus busy groups used the least. Because of the higher mean in the busy group, the planned contrast involving all five groups failed to reach significance ($F(1,83) = 1.52$, n.s.). But the anxious group and the control-deprived/busy groups are not significantly different, as the theory predicts ($F(1,83) < 1$). The residual was not significant ($F(2,83) = 1.94$, $p < .25$). As in the total complexity results, a control deprivation by expectancy interaction obtained ($F(1,70) = 10.41$, $p < .01$), with the same pattern of means. Because the total complexity score is comprised of the subscores for differentiation and integration, this set of findings suggests that the total complexity results are mainly reflecting the amount of differentiation, not the amount of integration, subjects used.

Use of the Interview Information. Results on how often subjects mentioned the information from the interview in their essays did not follow the hypothesized pattern. All subjects were more likely to mention the information accurately than to mention only its details or to mention it inaccurately ($F(2,166) = 14.78$, $p < .01$). And there was an uninterpretable interaction involving the anxious group ($F(1,83) = 2.77$, $p < .05$), such that anxious subjects mentioned inconsistent information more in the hardworking expectancy. This effect qualified a main effect for condition and a condition x expectancy interaction

(F's (4,83) = 3.28 & 4.21, p's < .025). One other result from this dependent measure is presented in a following section.

Desire to Control Partner. We predicted that the anxious and control-deprived/busy subjects would want to control their partners more than the other groups. Five self-report items combined into an index (alpha = .78) addressed this hypothesis. No significant effects obtained.

Other Impression Findings

Some patterns of findings that emerged in Study 1 were not specifically predicted by the capacity-control theory; still, they are not inconsistent with the theory and are interpretable in terms of previous research. I will present those findings here.

Busyness Made Ratings of Positive Traits More Extreme. When they rated their partners on the positive traits "hardworking" and "smart," busy subjects made more extreme ratings than non-busy subjects. (M's: Busy subjects: hardworking expectancy = 6.67, lazy expectancy = 3.98; Not-busy subjects: hardworking = 5.93, lazy = 4.53; F(1,70) = 13.56, p < .01). Given that subjects read information that was both consistent and inconsistent with their expectancies, this result suggests that non-busy subjects probably modify their trait ratings accordingly. A capacity decrement, as seen in busy subjects, seems to interfere with this process, causing polarization, a result consistent with Gilbert et al. (1988). Anxious subjects' scores (M's hardworking = 5.83, lazy = 3.78) were midway between the busy and not-busy groups, not clearly matching either group.

Mental Control Deprivation Made Ratings of Negative Traits Less Extreme. On ratings of "lazy" and "irresponsible," subjects in the control-deprived groups made more moderate ratings than non-control-deprived groups. Scores show less polarization in the CD group (M's CD: hardworking expectancy = 2.03, lazy expectancy = 2.94; Non-CD hardworking = 1.76, lazy = 3.77; $F(1,70) = 4.99$, $p < .05$). Thus it appears that mental control deprivation caused subjects to incorporate inconsistent information more in their ratings on "lazy." This result is consistent with previous work showing more effortful attributions in control-deprived groups (e.g., Pittman & Pittman, 1980), and also fits in with control-deprived subjects' special attention to negative information in this study, which is discussed shortly. Anxious subjects' scores (M's: hardworking = 2.50, lazy = 3.61) are closest to the control-deprived group, perhaps reflecting the control deprivation component in anxiety.

Control-deprived Subjects Rated Filler Traits in Line With the Inconsistent Information. The four traits, "hardworking," "smart," "lazy," and "irresponsible," were embedded in a list that included 7 filler traits. I did not expect to find any differences on the filler traits because they were unrelated to the information that subjects read about their partners. However, some differences did emerge. Filler traits with a positive valence ("likable," "outgoing," "loyal," "friendly," and "honest") were summed and analyzed separately from filler traits with a negative valence ("crabby" and "nervous") but parallel effects emerged.

The effects involve differences between the control-deprived and the non-control-deprived subjects. Non-control-deprived subjects show a "halo"

effect on the filler traits, rating them more in line with the consistent information, whereas control-deprived subjects showed the opposite effect, rating the filler traits more in line with the inconsistent information (M's for negative fillers: non-CD: hardworking expectancy = 2.16, lazy expectancy = 2.89; CD: hardworking expectancy = 2.63, lazy expectancy = 1.91; F of interaction (1,70) = 7.82, $p < .01$; M's for positive fillers: non-CD: hardworking expectancy = 5.51, lazy expectancy = 4.95; CD: hardworking expectancy = 5.21, lazy expectancy = 5.49; F of interaction (1,70) = 8.22, $p < .01$). Therefore, control-deprived subjects seem to be using the filler traits to reflect the inconsistent information they read. Interpreted this way, the result is compatible with previous findings of more effortful processing in control-deprived subjects (Pittman & Heller, 1987). Of course, here the control deprivation is mental, not outcome, control, as in previous work.

Anxious subjects appeared to show the "halo" effect pattern of non-CD subjects, but only on the positive fillers (M's hardworking expectancy = 5.17, lazy expectancy = 4.47). On negative fillers their ratings did not differ (M's hardworking = 2.83, lazy = 3.00) and thus they do not resemble either of the two groups.

Subjects Focused on Negative Information, Especially When They Were Control-deprived. Negative information about one's partner can be threatening when one is dependent on the person for a prize. In fact, all subjects in this study tended to mention the lazy information more in their essays, regardless of expectancy ($F(1,70) = 3.05$, $p < .09$; M's: mentions of lazy info = .86, mentions of hardworking info = .45). But subjects who were control-deprived seem to

have expended special effort processing negative information. As previously reported, CD subjects used more complexity when they wrote about partners they thought were lazy, compared to when they wrote about partners they thought were hardworking. Also mentioned previously, CD subjects were more moderate in their judgments of the negative traits, "lazy" and "irresponsible." These two findings are complemented by a pattern of effects revealing that the only-CD group wrote a much higher number of words in the negative expectancy compared to the other groups. (These effects included a main effect for busyness, a main effect for expectancy, a busy x expectancy interaction, and a CD x expectancy interaction (F's(1,70) between 5.75 and 9.40, all ps < .01). All four of these effects seem to be addressing the deviant cell in the CD-only, lazy expectancy cell: M = 102.2; all other cells range from 53.4 to 86.7). Therefore, in general, subjects seem to mention negative information more in their essays. And when subjects are control-deprived and receive a negative expectancy, they may think in complex ways, write more about their partners (if they are not distracted), and make more moderate judgments of their partners on laziness. (Anxious subjects, like control-deprived subjects, wrote longer essays about lazy partners: M's = 98.0 vs. 80.1.)

Anxious Subjects Write the Most Words But Use the Least Complexity. Anxious subjects wrote the longest essays of any of the five groups (M = 91.2, other groups ranged from 58.3 to 81.3; $F(4,83) = 4.14$, $p < .01$). But when their essays are controlled for words, they are the least complex (see results for total complexity above). The high number of words in the anxious group fits with Strauman and Higgins (1987) who found that anxious people talked much more

than non-anxious people. Our findings add that although anxious people are using a lot of words, the content of what they write is not very complex. The specific test of this effect, a homogeneity of slopes test (regressing complexity on number of words for each group), failed to reach significance, however.

Intrusive Thoughts in Anxious Subjects

The five self-report items measuring degree of thought control (alpha = .83) revealed a main effect for condition ($F(4,83) = 3.25$, $p < .025$). Anxious subjects ($M = 3.76$) and the 2 busy groups (M's: only-B = 3.87, CD/B = 3.53) indicated more trouble with thought control than non busy groups (baseline = 2.55, only-CD = 3.10). In a post-hoc analysis, the scale was divided into two subscales, with three items measuring thought distraction (e.g., "In the past few moments, have you been distracted by thoughts or images about something other than this experiment?") and two items measuring control of distracting thoughts (e.g., "Presently, are you concerned about not being able to control bothersome thoughts or worries?"). This division showed a main effect for question type, such that subjects reported more thought distraction than trouble controlling thoughts ($F(1,88) = 21.46$, $p < .001$). Of greater interest, a condition x subscale interaction ($F(4,88) = 2.91$, $p < .05$) suggested that busy groups felt distracted by thoughts (M's: baseline = 2.59, only-B = 4.44, only-CD = 3.43, CD/B = 3.87) but could control them (M's: baseline = 2.50, only-B = 3.02, only-CD = 2.59, CD/B = 3.03). Anxious subjects were also distracted ($M = 3.89$) but were most likely of all the groups to report having trouble controlling their thoughts ($M = 3.57$). This result is consistent both with the theory and also with previous research finding that anxious subjects' distress is related mainly

to the uncontrollability of their thoughts (not to their content or frequency; Borkovec et al., 1983).

Other Measures

Confidence. Anxious subjects tended to be less confident about doing well at the activities and winning the prize ($F(4,83) = 3.41$, $p < .025$; M's: anxious = 4.5, baseline = 5.7, only-B = 5.4, only-CD = 6.1, CD/B = 5.5).

Performance on the Activities. No effects emerged for subjects' performance on the word-find activity. The only effect on the alternative uses task showed that busy subjects tended to think of fewer uses than non-busy subjects (M's: busy = 3.43, not-busy = 4.24; $F(1,70) = 3.03$, $p = .09$).

Importance of Impression Formation to Busy Subjects. The brief questionnaire in which subjects rated the importance of each activity was intended to test whether the effects of busyness on impressions were caused not by distraction, but by busy subjects finding the beep counting task to be more important than the impression task. Paired t-tests involving only subjects in the busy groups compared the importance of counting the beeps (M rating = 4.50) to the various impression activities. Reading the partner's answers (M = 6.0) and working cooperatively with the partner (M = 6.43) were judged more important than counting beeps (t's(41) = 4.12 and 5.29, respectively, p's < .01). Writing a complex, accurate description of the partner (M = 3.88) was judged equally important ($t(41) = -1.35$, n.s.). Thus the effects that the busyness manipulation had on impression formation cannot be attributed to a demand effect of subjects finding the busyness task more important; these effects are more likely to be due to distraction.

Effects of Having an Anxious Partner. Did having an anxious partner have any special effect on subjects' feelings or impressions? To test this, 2 (subject: anxious or not) x 2 (pair type: matched or mixed) ANOVAs were computed using only anxious and baseline subjects. An interaction, with higher means in the matched/anxious and unmatched/baseline cells, would show an effect of having an anxious partner. All main dependent variables and the feelings scales were tested. The only effect that showed an interaction for the relevant diagonal was subjects' ratings of their partners on the combined trait score for "lazy" and "irresponsible" ($F(1,33) = 3.38$, $p = .075$). Subjects with anxious partners tended to rate them as more lazy (M's: anxious partner: baseline subjects = 3.25, anxious subjects = 3.62; non-anxious partner: baseline subjects = 2.62, anxious subjects = 2.64). Having an anxious partner, then, does not seem to cause subjects to feel differently or behave differently on most of the dependent variables. But subjects with anxious partners may have detected some nonverbal cues that caused them to rate their partners somewhat more negatively. Interestingly, subjects with anxious partners did not rate them as being more "nervous."

Discussion

Support for the Theory

The capacity-control theory received mixed support in Study 1. Many of the patterns, though complex, are encouraging for future research. Complexity results clearly support the theory, with all five groups performing as predicted. Control deprivation appears to increase complexity over baseline, whereas control deprivation plus busyness decreases complexity--more than just

busyness alone. The two components, control deprivation and cognitive load, combined in a way that could not be predicted from the effects of either one of these components alone: This is exactly the interaction pattern predicted. Furthermore, anxious subjects used as little complexity as the control-deprived/busy subjects, suggesting that the theory may have identified two main components in anxiety.

Results from the self-report measure of thought control support steps 1 and 3 of the theory. Anxious subjects reported being distracted by intrusive thoughts, supporting step 1. And they were more likely to say their thoughts were uncontrollable, supporting step 3. This pattern nicely reflects two components that operate in anxiety, according to the capacity-control theory.

Other dependent variables support some of the theory's predictions but not others. The theory predicts that anxious people want to control other people. This hypothesis was not supported, perhaps because of measurement problems: Some of the items had low item variance and none were negatively worded. Study 2 revises these self-report questions. Nevertheless, behavior may be a better measure than self-report of controlling other people. The present research intended primarily to find support for the impression part of the theory; future research will need to identify and measure actual social control behaviors in order to more clearly support that part of the theory.

Although anxious subjects reported wanting more information, as predicted, this was not true of control-deprived subjects in general or of control-deprived/busy subjects in particular. The unfortunate loss of much of the

attention data, however, means that this result is based solely on two self-report questions.

Mental Control Deprivation

This study is one of the first to demonstrate that mental control deprivation can motivate people to form more complex impressions. Research already shows that outcome control deprivation causes increased attention and more effortful attributions (see Pittman & Pittman, 1980; Fiske & Neuberg, 1990), but no research to date has linked mental control deprivation to this general phenomenon. Mentally control-deprived subjects' trait ratings reflected the inconsistent information they obtained from their partners, and they used more complexity if they were not busy. Mentally control-deprived subjects seemed especially likely to put forth effort when they had lazy partners, suggesting that they are perhaps more sensitive to negative information. Perhaps most compelling about this set of results is that the subjects were also outcome control-deprived because they were interdependent: Effects of mental control deprivation occurred in addition to an already motivated baseline. Thus Study 1 demonstrated that mental control deprivation can be manipulated, and that loss of mental control, like loss of outcome control, can lead to complex person perception.

In sum, Study 1 holds promise for the capacity-control theory, but still has its difficulties. The results, though encouraging, are not always consistent, and some of the manipulations might have been cleaner. For example, the control deprivation feedback did not work for some subjects because the white bear task was too easy for them. The anxious sample in Study 1 (the top 20%

of a small group of prescreened subjects) may not have been extreme enough to capture hypothesized differences in processing. And the fact that all subjects were motivated by interdependence may have obscured or complicated true effects of the independent variables. Study 2 was designed with these and other improvements in mind.

CHAPTER 3

STUDY 2

Introduction

The second experiment was intended to amplify, supplement, or replicate several results from Study 1. First, changes in the operationalizations of the main independent variables attempted to amplify the main results of Study 1. For instance, the manipulation for mental control deprivation was improved. In the first study, several subjects who had been assigned to the control deprivation condition did not record any checkmarks during the white bear task; these subjects had to be switched to the busy-only condition. To improve this, the second study used a thought-control task that had a more uniformly high baseline. In particular, subjects were asked to sit quietly and try not to think of anything at all; if they did have a thought, they were to put down a checkmark. Virtually all subjects put at least one checkmark on this task, meaning that the control deprivation feedback was relevant for every subject in that condition. A direct manipulation check was also included to test the effect of the feedback on subjects' judgments of their success at the task.

The busyness manipulation differed as well. The new operationalization required subjects to monitor random numbers for sets of three consecutive odd numbers (N. MacCrae, personal communication, Sept. 1993). This task required more vigilant attention than the beep-counting task; therefore, busy subjects in Study 2 were probably more distracted. This might then cause larger differences between the busy and the not-busy groups. Even if the new

busyness task does not differ in distractedness, an alternative operationalization of the distraction variable would support the generalizability of the busyness findings.

Another significant change was that anxious subjects were selected from a much larger group of prescreened subjects. The sample could select the top 5% on anxiety of over 1,000 women (compared to the top 20% of 120 women). Therefore, anxious subjects in Study 2 may represent a significantly more anxious population. Effects due to anxiety may therefore be much stronger.

Another difference meant to strengthen results in the second study was the absence of interdependence instructions. All subjects in Study 1 were interdependent; theoretically, they were all control-deprived. Any motivational effects of the mental control deprivation, busyness, or anxiety had to act on top of this already control-deprived baseline. Making subjects non-interdependent might provide more room for the independent variables to show effects. Additionally, a non-interdependent baseline could better show the pure effects of mental control deprivation on impression judgments.

In addition to changes in the independent variables, Study 2 also contained some new dependent variables. Several new performance measures were added to capture some hypothesized processing differences in anxious people. The study included a timed proofreading task, reasoning that anxious people may be distracted from noticing small errors. (Performance on the proofreading task could also show effects of the busyness and control deprivation conditions.) The alternative uses and word-find tasks of Study 1 were replaced with a more complex task where subjects described abstract

shapes (tangrams) to each other. Anxious subjects may show decrements on more complex tasks, even when they show no differences in simpler tasks. A surprise memory test was included in Study 2 to test the hypothesis that anxious people show less incidental learning (learning material that is not related to the task) compared to non-anxious people. Anxious people were expected to recognize fewer previously encountered stimuli than non-anxious people. Finally, Study 2 included an oral spelling test, reasoning that anxious people might be distracted from keeping several letters in their working memories.

Some significant but unpredicted results from Study 1 were tested a priori in Study 2. First, more filler traits were included to try to replicate the effect of mental control deprivation on ratings of these traits. Specifically, more negative fillers were added to equate the number of positive and negative fillers. Second, we attempted to replicate the finding that anxious people were as distracted by intrusive thoughts as busy people, but were more bothered by the uncontrollability of their thoughts. Items were constructed more specifically and deliberately to measure these two components of intrusive thoughts.

Finally, the STAI was administered in the course of the experiment. This test-retest method was intended as an additional manipulation check for anxiety.

Of course, Study 2 also hoped to replicate the results for complexity that obtained in Study 1. In general then, Study 2 was designed to strengthen many of the manipulations in an attempt to find clearer support for the capacity-control theory.

Method

Subjects

Subjects were 106 female undergraduates who participated for extra credit in their psychology classes. They were scheduled and run in 53 pairs. All were unacquainted before the study. Women who scored 3.05 or higher on the STAI (on a 4-point scale), administered as part of an introductory psychology prescreening questionnaire, were recruited as anxious subjects. They represented the upper 5% of the 1076 women who took the prescreen. To be included, anxious subjects also had to score above 2.25 on the subscale items about whether they would be anxious in this particular laboratory situation.

Of the subjects, 9 were omitted from all analyses because they volunteered suspicion about the control deprivation manipulation. Two were omitted because they volunteered suspicion about the partner information. Five subjects in the anxious condition were omitted from all analyses because their scores on the second administration of the STAI (given at the end of the experimental session) were lower than 2.75 and they reported being not anxious (a value of 1) and being very calm (a value of 7) on the feelings checklist.

After omissions, 20 subjects remained in the baseline condition, 20 in the only busy condition, 17 in the only control-deprived condition, 18 in the busy and control-deprived condition, and 15 in the anxious condition.

Most procedures in Study 2 were similar to those in the first study but there were several exceptions.

Conditions

As in Study 1, pairs of subjects received the same experimental conditions and the same expectancies. Again, half of the anxious subjects were paired with one another and half were paired with non-anxious controls. However, the mental control deprivation and cognitive busyness manipulations were slightly changed.

Busyness Manipulation. Subjects in the busy condition listened to a tape that played random numbers read (by a female research assistant) at regular 3 s intervals. Whenever subjects heard three consecutive odd numbers they wrote the numbers down on a separate page. As in Study 1, busy subjects did not have to listen to the tape when the experimenter gave instructions.

Pretesting indicated that answering Likert-type scales labeled with numerals was quite difficult for busy subjects. Therefore, all rating scales on the experimental materials were replaced with 7 evenly spaced response boxes.

Control Deprivation Manipulation. Near the beginning of the experiment, the experimenter explained,

> We're interested in how people relax; how they clear their minds. So what I'd like you to do is for the next couple of minutes, try hard not to think about anything at all. Just try to empty your mind completely. Now, no one can do this perfectly unless they're trained in meditation. So I'm going to give you this sheet of paper, and if you do happen to think of something--whether it's a thought, an image, you're wondering about something, you can't block something out, or anything like that--

just put a checkmark on the page. But try really hard not to think of anything. I'm going to have you do this for two minutes.

After subjects tried this task for two minutes, the experimenter leaned over to look at their pages as in Study 1, and told the non-control-deprived subjects that their performance was normal and that they would be doing another two minutes in order to obtain a total of four minutes. She told the control-deprived subjects, as in Study 1, that one of them was having some trouble so they would have to practice it again. She added, "I think I'll have you draw a line below your checkmarks, if any, and put any new checkmarks below that line." After control-deprived subjects finished the second two minutes, the experimenter looked at their pages and then at her watch, saying "well, we're still not quite there yet, but we really have to keep moving. We should get on to the next part."

At the bottom of the page on which subjects made their checkmarks were two questions designed as a manipulation check for this false feedback. The two questions read, "How successful do you feel you were at this task?" and "How successful do you feel most UMass students would be at this task?" (both rated on a 7-point scale from "not at all" to "extremely"). All subjects answered both questions after the four minutes of "meditation."

Procedure

Subjects arrived in pairs to participate in an experiment on working together with a partner. The laboratory was set up identical to Study 1. The experimenter told them that they would be doing a few activities working on their own first, then they would get to know each other a little bit, and then

they would be working together on a couple of activities. No prizes were offered in this study. All subjects agreed to be taped.

As in Study 1, subjects first answered the eight interview questions about themselves. Then they did the "meditation" task, which served as the mental control deprivation manipulation. Then all subjects spent one minute proofreading a brief passage on pasta recipes. The passage was too long for subjects to finish proofreading in the time allowed, so when time was called, they drew a line indicating how far into the passage they had read. Then subjects did a second proofreading passage on the same topic for one minute. Between the two passages, however, busy subjects were instructed in the busyness task, and were told that the second proofreading passage was an opportunity to become comfortable with the task. After the proofreading passage, subjects completed Epstein's feelings checklist.

Then subjects read their partner's answers to the interview questions, which were actually the standard interviews (with a hardworking or a lazy expectancy) used in the first study (see Appendix B). After reading, they wrote an essay paragraph about their impressions and completed trait ratings of 14 traits (3 more than in Study 1). They answered questions about their strategies for working together that were based on questions used in Study 1; however, some were worded negatively (unlike in Study 1) and two questions were reworded to try to obtain more item variance. Next subjects answered six questions about their feelings of mental control, again based on questions in Study 1; however, they were designed a priori to test the two components, distraction and controllability, separately. The last two questions in the packet,

as in Study 1, asked about how much information subjects wanted from their partners.

After completing the packet, subjects worked together on two activities. In the first, each pair member received a page with eight abstract figures (tangrams) of intermediate difficulty (used in Hupet, Seron, & Chantraine, 1991). The partners had the same tangrams but in different orders. One partner described the tangrams to her partner so she could correctly order them on her page. The pairs worked on the tangram task for 90 s (not all pairs finished describing all eight), and then switched roles with a new set of tangrams. In the second activity, subjects read spelling words to each other. Each tried to spell out loud a set of five words as quickly and accurately as possible. The experimenter recorded each subject's spelling errors and total time for spelling the five words.

After the spelling task, subjects received a page containing 16 tangram figures. Eight were old tangrams (they were on one of the two sets subjects previously worked from) and eight were foils. Working independently, subjects circled the tangrams they remembered seeing before.

Finally, subjects completed the STAI. Busy subjects did not monitor the numbers while they filled out the scale. Subjects were then carefully probed for suspicion, debriefed, and dismissed.

Essays were coded for verbal productivity, information use, and complexity using the same procedures as in Study 1. The two complexity coders trained to 87% agreement; their agreement on the essays coded from this study was 82%.

Results

Manipulation Checks

Anxiety. As in Study 1, t-tests compared the anxious group to the mean of the other four groups. As expected, anxious subjects were more anxious (M's = 3.33 vs. 2.57; t(88) = 1.64, p = .10)[2]. Anxious subjects were also less calm, as predicted (M's = 3.73 vs. 4.47; t(88) = -1.69, p = .09), and were more frightened (M's = 3.13 vs. 2.01; t(88) = 3.05, p < .01). On the second administration of the STAI, anxious subjects scored higher, as expected (M's = 3.09 vs. 2.04; t(88) = 9.10, p < .01).

Busyness. As expected, busy subjects reported feeling more distracted (M's = 4.63 vs. 2.89; F(1,70) = 17.69, p < .01. Unexpectedly, they also reported being more energetic (M's = 3.63 vs. 3.00; F(1,70) = 2.95, p = .09) and more anxious (M's = 3.05 vs. 2.11; F(1,71) = 7.09, p < .025). These three findings all reflect the increased vigilance necessary for this extraordinarily demanding task.

Busyness Accuracy. Busy subjects monitored numbers on nine parts of the experiment. Their average accuracy rate over the nine parts was 65% (SD=16.2%). However, the last five parts were when they worked together, and many subjects gave up monitoring the numbers on these parts. When only the first four parts are used (these included proofreading, the feelings checklist, reading about the partner, and writing the essay and doing the questions in the packet), the average accuracy rate was 82% (SD=16.7). This is still outside the acceptable accuracy range (85%) for distracted subjects, according to previous research (Gilbert et al., 1988).

Mental Control Deprivation. Control-deprived subjects made fewer checkmarks in the second two minutes of the meditation task (M's: First two mins: CD = 5.96, non-CD = 5.73; Second two mins: CD = 1.63, non-CD = 5.90; F of interaction (1,73) = 74.10, p < .001), suggesting that they tried harder (or censored more) after the feedback. When subjects rated their success at the meditation task and the average UMass student's success at the task, non-control-deprived subjects showed a positivity bias (M's: my success = 3.95, other's success = 3.35) but control-deprived subjects reversed this bias (M's: my success = 3.67, other's success = 3.74; F of interaction (1,73) = 3.94, p = .05). This helps to confirm that control-deprived subjects thought they had done slightly less well on the meditation task.

Proofreading Results. Subjects' performance on the proofreading activities revealed a few effects of the manipulations. Recall that subjects did two trials of proofreading, right after the control deprivation manipulation, and the busyness manipulation came between proofreading trials 1 and 2. Therefore, effects of control deprivation can be seen in both trials and effects of busyness can be seen in the difference between trials 1 and 2. Proofreading performance was measured in rate (number of words read) and accuracy (percentage of errors corrected).

All subjects tended to read faster in the second trial (F(1,67) = 7.26, p < .01), but being distracted in Trial 2 interfered with this improvement, as might be expected. (Busy x Trial interaction F(1,67) = 2.95, p = .09; M's: Busy: trial 1 = 59.2, trial 2 = 62.0; Non-busy: trial 1 = 69.1, trial 2 = 81.1). The interaction

qualifies a main effect for busyness, where busy subjects read slower than non-busy subjects ($F(1,67) = 7.55$, $p < .01$).

Control-deprived subjects started out at a higher proofreading rate in Trial 1, suggesting they were more motivated initially, but did not improve much across trials (CD x Trial interaction $F(1,67) = 3.05$, $p < .09$; M's: CD: trial 1 = 68.4, trial 2 = 70.8; non-CD: trial 1 = 60.9, trial 2 = 72.4), perhaps because of ceiling effects on rate. Anxious subjects' rate improved from 64.0 to 73.4, comparable to the baseline group.

Control-deprived subjects increased their accuracy between trials 1 and 2, but only if they were not distracted. (Busy x Control-deprived x Trial interaction $F(1,67) = 4.87$, $p < .05$); M accuracy scores from trial 1 to trial 2: baseline = .86 to .81, only-B = .86 to .83, only-CD = .82 to .89, CD/B= .82 to .73). The pattern showed that only-control-deprived subjects tend to increase their accuracy between trials 1 and 2, but control-deprived/busy subjects decrease in accuracy dramatically. This result suggests that combining busyness and control deprivation has an effect that is not the additive effect of busyness and control deprivation separately. Anxious subjects, like the only-CD subjects, increased accuracy between the two trials, although not as much (M's = .84 to .89), a result that is not consistent with the CD/B group, but may reflect the hypothesized control deprivation component in anxiety. Anxious subjects did not show the lower accuracy on this task that was expected.

Hardworking Versus Lazy Expectancy. As intended, subjects receiving the hardworking expectancy rated their partners as more hardworking than did subjects receiving the lazy expectancy (M's = 5.80 and 4.09, respectively; $F(1,80)$

= 52.07, $p < .001$), and subjects receiving the lazy expectancy rated their partners as more lazy than did subjects receiving the hardworking expectancy (M's = 3.23 and 2.03, respectively; $F(1,80) = 17.15$, $p < .001$).

Impression Formation Strategies

Study 2 had two general goals. One was to test again the hypotheses from the capacity-control theory, but with what were intended as stronger manipulations than in Study 1. Again, anxious and control-deprived/busy subjects were expected to seek more information about their partners, use the information less often and in less complex ways, and express a desire to control their partners. The second goal of Study 2 was to replicate some results of the first study, such as the significant contrast on total complexity, the effects of busyness and control deprivation on trait ratings, and subjects' self-reports of thought distraction and thought control.

Neither of these two goals was clearly achieved. Self-reports of information seeking did not support the theory: Control-deprived and anxious subjects did not want more information. Attention data did not show the expected effect for greater attention in the CD and anxious groups, and CD groups actually wrote less about their partners than non-CD subjects, suggesting less effort rather than more ($F(1,67) = 3.42$, $p = .07$; M's = 57.6 words vs. 68.4 words). One predicted result was that anxious subjects did report the most desire to control their partners ($M = 4.3$); however, the control-deprived/busy group did not match them; in fact, they had the least desire to control their partners (Busy x Control-deprived interaction: $F(1,67) = 12.10$. $p < .01$; M's: baseline = 4.1, only-B = 3.7, only-CD = 3.7, CD/B = 2.4)[3]. Most

disappointing was the predicted contrast on complexity, which did not replicate from Study 1.

The trait rating results from Study 1 did not replicate; most analyses on traits gave null results, and one of the effects, the polarization shown by busy subjects on ratings for "hardworking" in Study 1, was reversed (this effect is discussed later). Anxious subjects did not show the same high verbal productivity as in Study 1. Finally, results for the two new thought distraction and thought control scales (alphas = .68 and .64, respectively) revealed no significant effects.

In sum, Study 2 did not meet its desired goals. Instead, it revealed some impression formation results that were not predicted from the capacity-control theory or found in Study 1. One pattern of effects in Study 2 involves expectancy, with subjects paying more attention and using more complexity in the hardworking expectancy but mentioning lazy information more, especially in the lazy expectancy. In addition, subjects in the busy condition, surprisingly, evidenced more effortful processing. Here, I will present and briefly discuss these two patterns.

Subjects May Process Positive Information On-line, And Negative Information From Memory. The hardworking information in Study 2 seemed to capture subjects' attention. Subjects in the hardworking expectancy spent longer reading the partner information (M's: 87.1 vs. 79.3; $F(1,62) = 4.77$, $p < .05$), and all subjects, regardless of expectancy, looked longer at information that contained hardworking statements (the expectancy x consistency interaction was significant; $F(1,67) = 3.80$, $p = .06$; M's: hardworking expectancy: consistent

information = 9.92, inconsistent information = 9.52. Lazy expectancy: inconsistent = 9.50, consistent = 8.62). (Anxious subjects matched this pattern.) Subjects in the hardworking expectancy also used more complexity--in total complexity, differentiation, and integration--than subjects in the lazy expectancy (F's(1,67) = 4.14 to 10.42, p's <.05). This pattern is unusual; in most research, people pay more attention to negative than to positive information (see Pittman & Heller, 1987).

Although subjects in the hardworking expectancy looked longer at the information and were more complex, those in the lazy expectancy actually wrote more about their partners (M's = 71.65 words vs. 57.5 words; $F(1,67)$ = 4.81, $p < .05$). Subjects in the lazy condition also mentioned more information from the interview in their essays (M's = .68 vs. .36; $F(1,67) = 4.81$, $p < .05$). In fact, all subjects mentioned the lazy information more in their essays, but this was especially true when it was consistent (expectancy by consistency interaction $F(1,67) = 7.88$, $p < .01$; M's: Lazy expectancy: consistent = 1.0, inconsistent = .32. Hardworking expectancy: inconsistent = .41, consistent = .32)[4].

To summarize, subjects looked longer at hardworking information and were more complex in that expectancy. Subjects in the lazy expectancy mentioned the information more and write longer essays, but their essays were less complex. One speculative description of these results is that as subjects paid more attention to the hardworking information, they were forming impressions on-line, so that when they were asked to write an essay, they had ready conclusions in mind. They could therefore be concise yet complex. In

contrast, subjects in the lazy expectancy may not have thought about the information on-line, so they had to form their impressions from memory, mentioning the information more and writing longer essays. This memory-based strategy may have cost them in complexity. It is unclear, however, why hardworking partners would have motivated the more effortful pattern, especially in light of most other impression research.

Busy Subjects Showed More Effortful Processing. Surprisingly, busy subjects used more integrative complexity in their essays than non-busy subjects (*M*'s = 4.79 vs. 3.36; $F(1,67) = 4.14$, $p < .05$). Further analyses revealed that this effect was due primarily to a higher number of similarity statements. Therefore, busy subjects may see their partners as more similar to themselves or to other people they know. It is hard to explain why busy subjects, who presumably had fewer cognitive resources available, showed this effortful pattern, unless it is somehow cognitively easier to make similarity statements.

Contrary to previous research and the findings in Study 1, busy subjects polarized less when they rated their partners on "hardworking" ($F(1,67) = 4.41$, $p < .05$; *M*'s: Busy subjects: hardworking expectancy: = 5.60, lazy expectancy = 4.32; Not busy subjects: hardworking = 6.04, lazy = 3.82) However, inspection of all four cells suggested that this interaction had probably obtained not because the busy groups polarized less, but because of non-significantly high polarization in the only-CD group (which was included in the not-busy group; *M*'s (only-CD): hardworking = 6.41, lazy = 3.67). Relative to the true baseline group (*M*'s (baseline) hardworking = 5.70, lazy = 3.93) the busy groups were not less extreme.

Busy subjects also spent longer reading the essays ($F(1,62) = 28.15$, $p < .001$; M's = 94.4 s vs. 73.1 s). This 20 s difference probably obtained in part because they needed to write down numbers an average of two times, and in part because the constant monitoring caused them to read more slowly.

Other Measures

Confidence. Busy subjects tended to report feeling less confident than non-busy subjects about doing well at the activities (M's = 4.87 vs. 5.41; $F(1,67) = 3.11$, $p = .08$). Anxious subjects, who were the least confident in Study 1, were not significantly less confident in Study 2.

Tangrams. The measures on the tangram activity were the number of tangrams completed in the time limit (speed) and the number of tangrams correctly identified (accuracy). Each subject had a turn describing tangrams and a turn identifying tangrams. The analysis included only data from the subjects' turn at identifying the tangrams. For subjects in the busy, control-deprived, or control-deprived/busy groups, both members of the pair were under the same manipulation, so identifications were likely based on descriptions of equal quality. However, subjects in the baseline and the anxious conditions sometimes had anxious partners and sometimes had baseline partners. Therefore, I needed to test the assumption that the descriptions by anxious subjects and baseline subjects were of equal quality. In fact, they were not. 2 (subject: anxious or baseline) x 2 (pair type: matched or mixed) ANOVAs indicated that people with anxious partners were less accurate (M's = anxious partner: anxious s = 5.9, non-anxious s = 6.0; non-anxious partner: anxious s = 7.1, non-anxious s = 7.4; $F(1,31) = 5.74$, $p < .025$) and completed fewer

tangrams in the time limit (anxious partner: anxious s = 6.0, non-anxious s = 6.6; non-anxious partner: anxious s = 7.1, non-anxious s = 7.8; $F(1,31) = 6.30$ $p < .025$). These results suggest that anxious subjects are not as good at describing tangrams as non-anxious subjects. Therefore, in the analyses of the tangram results, subjects with anxious partners were excluded. This reduced the cell n's in the baseline and anxious groups by half.

There were two main effects for busyness such that busy subjects were slower and less accurate at tangrams than non-busy subjects (F's (1,60) = 10.51 and 5.71, respectively, p's <.025). A busy x control-deprived interaction (supported by a condition main effect in the 1 x 5 analysis) suggests that either busyness, control deprivation, or anxiety decreased speed compared to the baseline group (2 x 2: $F(1,60) = 4.48$, $p < .05$; 1 x 5: $F(4,66) = 3.61$, $p < .025$; M's: baseline (w/baseline partners) = 7.80, only-B = 5.68, only-CD = 7.00, CD/B = 6.56, anxious (w/anxious partners) = 6.00).

Spelling. The prediction that anxious subjects would make more errors in spelling was not supported.

Memory. Recognition memory for the tangrams was correlated with the number of tangrams completed ($r = .62$); therefore, the number completed was entered as a covariate. In the analysis of memory errors (combined false alarms and misses) a busyness main effect emerged ($F(1,70) = 2.83$, $p < .10$) but this was qualified by a busyness x control deprivation interaction (F (1,70) = 3.48, $p = .07$). Only-busy subjects made more memory errors (adjusted $M = 2.77$) than the other groups (adjusted M's: baseline = 1.61, only-CD = 1.86, CD/B = 1.84. Anxious group adjusted $M = 1.49$). Interestingly, being control-deprived

seemed to cancel out the impact of busyness on incidental memory. However, the hypothesis that anxious subjects would have the worst memory was not supported.

Pair Effects. As in Study 1, anxious and baseline pairs were tested for effects of having an anxious partner. The feelings items and all major dependent variables were tested; none showed the necessary interaction with the exception of the tangram descriptions mentioned above.

Discussion

The results of Study 2 are not supportive of the capacity-control theory. Manipulation checks suggested that the independent variables performed as intended, yet few of the relevant dependent variables support the hypotheses, and none replicated findings in Study 1. The only supportive result was on the revised partner control scale, where anxious subjects scored highest, as expected. Unfortunately, however, the control-deprived/busy group scored the lowest. Information seeking and complexity did not show the predicted effects.

A number of factors might explain some of the failures of Study 2. First, the busyness task was probably too difficult. Compared to the beep-counting task of Study 1, in which beeps sounded at irregular and infrequent intervals, monitoring the numbers was a relentless and extremely difficult task. Busy subjects in Study 2 made three times more errors at the busyness task than in Study 1. They also reported feeling more anxious and energetic, perhaps indicating extra effort on their part. They spent much longer reading their partners' essays (and took longer to complete the experiment as a whole), suggesting that monitoring the numbers interfered dramatically with their

efforts. Busy subjects were less confident in the experiment than their non-busy counterparts, suggesting that they were aware that their performance was suffering. These confidence ratings were prophetic: Their tangram performance and incidental memory was, in fact, worse than that of baseline subjects. And their performance on these tasks was worse even though their accuracy rate suggested that they had given up trying to monitor the numbers on this task.

A busyness manipulation that was too strong may have overpowered the control deprivation manipulation, explaining why the control-deprived/busy group never resembled the anxious group in this study. And to the extent that busy subjects gave up trying to monitor the numbers, they could devote more effort to impression tasks, accounting for why they did not differ from baseline. Indeed, some busy subjects missed as many as 50% of the probes; perhaps they largely ignored the numbers and chose to apply all of their attention to forming impressions. Some busy subjects were observed to do one task or the other, either pause to listen to the numbers or concentrate on the experiment. Such a strategy would allow a busy subject to monitor at least some of the numbers while performing adequately on the impression questions (but doing worse, as was shown, on the timed tangram task).

Beyond the busyness manipulation, different situational goals may help account for the differences in attention to hardworking and lazy information between Studies 1 and 2. People tend to pay more attention to goal-threatening information (Pittman & Heller, 1987), and information that threatens interdependence goals may not threaten the goals of non-interdependent

subjects. Specifically, interdependent situations are performance-oriented, so subjects are especially threatened when their partners are incompetent. This was reflected in Study 1 by subjects' increased use of lazy information and the special effort control-deprived subjects used to describe their lazy partners.

In contrast, non-interdependent situations like Study 2 may be socially-oriented by default, so subjects may be especially interested in how fun their partners are. A social goal would account for their attention to and complexity for the hardworking partner, whose academic single-mindedness might have threatened a relaxed interaction. Consistent with this reasoning, subjects with hardworking partners rated them as marginally more "boring" ($F(1,67) = 3.41$, $p < .07$).

Alternatively, the hardworking partner may not have been threatening, but may simply have been more surprising, thus attracting attention. Because she studies 20 hours a week, the hardworking partner may have seemed more extreme on the hardworking-lazy dimension than the lazy partner, who may have been closer to subjects' conceptions of the average student (studying 3 hours a week). Extremity on this dimension, of course, may seem particularly unexpected in a social context, and could account for subjects' complex impressions in this expectancy (Hastie, 1984). This reasoning suggests that new studies should equate the extremity of the two expectancies for more experimental control.

More broadly, perhaps the differences between the two studies occurred because interdependence, with its accompanying outcome control deprivation, is necessary for the hypothesized independent variables to affect impressions.

Thus, although Study 2 was based on the assumption that interdependence creates a ceiling effect, the results suggest instead that non-interdependence creates a floor effect. The predicted effects of busyness, mental control deprivation, and anxiety may obtain primarily when the outcome of the situation matters and the partner shares control of that outcome. New theoretical work could develop this hypothesis and its mediators.

Eysenck and Calvo's (1992) Processing Efficiency Theory complements this reasoning with respect to anxious people. Consistent with our reasoning, they claim that anxiety has both a distracting (worry) component and an arousal component. Although worry interferes with performance, the arousal component enables anxious people to make up for the deficit with greater effort. Anxious people may then perform as well as non-anxious people, but because it takes greater effort they are less efficient. Eysenck and Calvo predict that motivational factors (here, interdependence), benefit non-anxious people more than anxious people, mainly because anxious people are already expending as much effort as they can under low motivation situations (p. 421). This theory may explain why anxious subjects, compared to non-anxious subjects, were low in complexity in Study 1 but higher in complexity in Study 2. Because arousal differs from control motivation, it is difficult to map this theory onto our control deprivation hypotheses. However, it converges to some extent with the results for the anxious subjects.

Study 2 did not find significantly more effortful performance by the control-deprived groups. The control-deprived subjects in Study 1 showed increased effort on impression variables, especially when they received negative

information. But control-deprived subjects in Study 2, though they behaved as expected on manipulation checks, showed no impression effects. As stated above, it may be that mental control deprivation is not a general motivator, but instead only spurs impression processing under the more threatening situation of outcome-control deprivation. It also seems possible that the "scolding" nature of our failure feedback manipulated temporary self-esteem as well as control deprivation. Thus when control-deprived subjects attended to negative information in Study 1, they may have been favorably comparing themselves to repair their self-images in this performance-oriented situation. However, control-deprived subjects did not report any depressive emotions. Nevertheless, new research could focus more on how generally motivating mental control deprivation is, and future mental control manipulations should consider possible self-esteem effects.

Furthermore, in neither study did mentally control-deprived subjects show the superior cognitive performance that has been shown with outcome control deprivation (Pittman & Pittman, 1980). Perhaps our control-deprivation manipulation was not strong enough to affect these measures. To argue successfully that mental control deprivation is simliar to outcome control deprivation, future research should make the manipulation strong enough to affect cognitive performance, perhaps by giving subjects more failure trials.

Across both studies, Study 2's tangram exercise was the only non-impression performance measure on which anxious subjects showed a clear deficit. The difference may be one of difficulty: Describing the tangrams successfully requires abstract thought (Hupet et al., 1991), whereas spelling,

proofreading, finding words, and even thinking up alternative uses are easier tasks to do. This pattern matches much of the test-anxiety literature, in which anxious subjects perform worse on difficult tasks and about equally (if not better) on simple tasks (see Eysenck, 1982, for a review).

CHAPTER 4

GENERAL DISCUSSION

These two studies offer a complex set of findings. The independent variables often worked in predicted ways, but rarely did so in the patterns predicted by the theory, and never worked the same way in both studies. Anxious subjects wanted more information in Study 1 and wanted to control their partners more in Study 2. They matched the control-deprived/busy group on complexity in Study 1, where they were the least complex group. They tended to write a lot without saying much in Study 1, and they also reported being both distracted by their intrusive thoughts and bothered that their thoughts were uncontrollable. Finally, anxiety did not interfere with simple cognitive tasks in either study but did impair performance on the abstract tangram exercise of Study 2. Thus, many effects of anxiety were as expected, but replication of these effects was a problem.

The results for control deprivation were consistent with expectations in Study 1 but not replicated in Study 2. Mentally control-deprived subjects showed more effortful impressions in Study 1, where they were the most complex (if they were not distracted), moderated their ratings of "lazy," and rated their partners in line with the inconsistent information they had read. Control-deprived subjects used special effort to process lazy information, writing longer, more complex essays in this expectancy, but only in Study 1.

Cognitively busy subjects polarized on positive ratings in Study 1. They used more similarity statements in their essays for Study 2. Busyness also

interfered with some general cognitive tasks, such as the alternative uses activity of Study 1 and the proofreading, tangram, and incidental memory tasks of Study 2. Study 2's busyness manipulation, however, may have been too distracting and these subjects could have adopted unintended performance strategies on some of the measures.

When the mental control deprivation and busyness variables acted together, they sometimes performed like two, additive distractors, sometimes like a distractor simply added to a motivator (canceling each other out), sometimes like one distractor acting alone, and sometimes, as hypothesized, in a non-additive combination. Of course, the clearest support for the original hypotheses comes when the only-busy group is lower than baseline, the only-control-deprived group is higher than baseline, and the control-deprived/busy group is lower than all three cells. This exact pattern happened only once, in the total complexity result for Study 1. Therefore, specific support for the hypotheses for this cell is scant in these two studies.

Future Directions

These were ambitious studies. As an initial test of the theory, it made sense to cross busyness and mental control deprivation, but it was perhaps premature to do so before the manipulations had been studied separately. Although the effects of busyness on impressions are well-studied, specific busyness tasks have rarely been calibrated for their distractingness or their interaction with interdependence. Furthermore, our mental control deprivation manipulation is the first of its kind. No standard existed to inform our choices about manipulating this factor or adjusting it to the desired motivational

strength. This pair of studies may have suffered because we dared to test these two variables together before their separate effects were clearly understood.

A logical next step, therefore, would be to narrow our scope. And because it is the least studied of the variables in the theory, it makes sense to focus on the development of a robust manipulation for mental control deprivation. A contribution on this front would not only help test the capacity-control theory, but is also interesting in its own right. Everyday life is full of attempts to control ones' thoughts and moods, for social (Pennebaker, 1993; Wegner & Erber, 1993), hedonic (Parrott, 1993), and coping purposes (Cioffi & Holloway, 1993), to name a few (see Wegner & Pennebaker, 1993). The current surge of research in this area could certainly benefit from theory connecting mental control failure to general control motivation and its attributional consequences. On the other side of the coin, social-cognitive work would also benefit if mental control deprivation proved to be an impression motivator. Finally, such work would add a new dimension to what we know about people's need for control in general (e.g., Strickland, 1989; White, 1959).

Given the results of these two studies, a line of research on mental control deprivation should focus on two primary goals. First, of course, a reliable manipulation for mental control deprivation should be developed. We still do not know how much experience with mental control failure is required for control deprivation. It is also unclear how mental control deprivation would affect mood or temporary self-esteem. Another difficulty is that mental control is relatively unobservable, and the checkmark methods we used in these studies can be censored by subjects, perhaps confusing the effects of failure feedback

about their performance. New methods might test other ways of measuring (or pretending to measure, for manipulation purposes) mental control.

This line of research might also consider how additional outcome control deprivation might moderate mental control deprivation. The present studies suggest that interdependence may be necessary for mental control deprivation to affect impressions. Although it would be a simple matter to cross this well-established paradigm with mental control deprivation, so far there are no theoretical reasons for an interaction effect. Therefore, perhaps our next efforts should focus primarily on a reliable experimental manipulation and its effects on attention, complexity, and final impressions. When mental control deprivation is better understood, we can resume testing its hypothesized interaction with busyness under the capacity-control theory.

APPENDIX A
PRIMARY EXPERIMENTAL MATERIALS

White Bear Exercise (Mental Control Deprivation Manipulation)

Please write down whatever thoughts happen to be coming into your head right now. At the same time try NOT to think of a WHITE BEAR. If you happen to think of one, please make a check-mark in the margin.

Feelings Checklist

Please indicate how you feel right now by circling a level of each of the following groups of emotions:

happy, cheerful, or joyous
not at all 1 2 3 4 5 6 7 very much

angry, irritated, or annoyed
not at all 1 2 3 4 5 6 7 very much

unhappy, sad, or gloomy
not at all 1 2 3 4 5 6 7 very much

frightened, worried, or threatened
not at all 1 2 3 4 5 6 7 very much

energetic, aroused, or keyed-up
not at all 1 2 3 4 5 6 7 very much

tired, weary, or unreactive
not at all 1 2 3 4 5 6 7 very much

jittered, anxious, or nervous
not at all 1 2 3 4 5 6 7 very much

calm, relaxed, or at-ease
not at all 1 2 3 4 5 6 7 very much

distracted, preoccupied, or busy
not at all 1 2 3 4 5 6 7 very much

enthusiastic, alive, or alert
not at all 1 2 3 4 5 6 7 very much

Impression Essay

Impressions--Essay Paragraph

We are interested in what impressions you have of your partner right now. Please use this page to describe what kind of person you think your partner is, how she acts, what her personality traits might be. Of course, you may not feel that you have enough information from your partner. Please do your best anyway, and tell us your impressions from what you know so far. You can take up to 5 minutes to write. Your answers will never be shown to your partner, so please try to answer honestly.

Please write your essay paragraph here:

Trait Ratings

We'd like you to use the scales below to rate your partner on a number of dispositions and traits. Again, do your best, using the information you have so far from your partner. Your answers will never be shown to your partner, so please try to answer honestly.

My partner seems:

OUTGOING

not at all 1 2 3 4 5 6 7 extremely

HONEST

not at all 1 2 3 4 5 6 7 extremely

FRIENDLY

not at all 1 2 3 4 5 6 7 extremely

SMART

not at all 1 2 3 4 5 6 7 extremely

LAZY

not at all 1 2 3 4 5 6 7 extremely

LOYAL

not at all 1 2 3 4 5 6 7 extremely

IRRESPONSIBLE

not at all 1 2 3 4 5 6 7 extremely

CRABBY

not at all 1 2 3 4 5 6 7 extremely

NERVOUS

not at all 1 2 3 4 5 6 7 extremely

HARD-WORKING

not at all 1 2 3 4 5 6 7 extremely

LIKABLE

not at all 1 2 3 4 5 6 7 extremely

Confidence and Partner Control Questions

Please circle the number that indicates your answers or agreement with the following questions and statements.

I feel confident about doing well at the activities and winning the prize.

disagree 1 2 3 4 5 6 7 agree

I'd like to be the one to decide how we split up the work on our team activities.

disagree 1 2 3 4 5 6 7 agree

I think it will be better if my partner listens to me when we work together.

disagree 1 2 3 4 5 6 7 agree

I think we can do better if my partner takes my advice.

disagree 1 2 3 4 5 6 7 agree

I almost wish my partner could read my mind when we work together.

disagree 1 2 3 4 5 6 7 agree

I hope my partner follows my suggestions.

disagree 1 2 3 4 5 6 7 agree

I sometimes get upset because people don't anticipate my needs.

I never feel this way 1 2 3 4 5 6 7 I often feel this way

How much control do you think each of you will have over your pair's doing well at the activities and winning the prize?

1	2	3	4	5	6	7
I think she will have total control			We'll probably have equal control			I think I will have total control

How much control do you want to have over your pair's winning the prize?

1	2	3	4	5	6	7
I want her to have total control		I want us to have equal control				I want to have total control

Thought Control Questions

In the past few moments, have you been distracted by thoughts or images about something other than this experiment?

no, not distracted at all	1	2	3	4	5	6	7 yes, very much distracted

In the past few moments, have you had trouble focusing your thoughts?

no, no trouble at all	1	2	3	4	5	6	7 yes, very much trouble

In the past few moments, have you been worried about anything?

no, not worried at all	1	2	3	4	5	6	7 yes, very much worried

At the moment, how much control do you feel over your thoughts and feelings--over what's coming into your head?

no control at all over my thoughts	1	2	3	4	5	6	7 very much control over my thoughts

Presently, are you concerned about not being able to control bothersome thoughts or worries?

not at all concerned	1	2	3	4	5	6	7 very much concerned

Information Seeking Questions

Please help us plan future research by answering these questions:

Ideally, in this situation, I would like:

1	2	3	4	5	6	7
less information from my partner			the same amount of information			more information from my partner

Ideally, I would like to have my partner's answers to:

____ 14-16 interview questions
____ 10-12 interview questions
____ 7-9 interview questions
____ 4-6 interview questions
____ 1-3 interview questions

APPENDIX B
INTERVIEW CONTENT

Hardworking Expectancy:

Describe how you like your classes this semester.

I really enjoy my classes. I take 5 classes. I really like biology & anthro & math. They're not too hard (I guess I'm good at science--I get good grades anyway.) Psych is fun too--the material is easy but interesting.

Describe what you do in your free time, after classes.

After class I usually study, maybe 20 hours a week. I also work for a prof and if I'm not working I might do some activity like frisbee or soccer.

Lazy Expectancy:

Describe how you like your classes this semester.

I'm not too crazy about them. I take 4 classes. I don't really like my science classes--biology, & math (I'm not too good at science--grade-wise anyway.) Psych is pretty fun-- I don't need to study as much in there.

Describe what you do in your free time, after classes.

After class I sometimes hang out w/ friends or just watch TV and do nothing. I study maybe 3 hours a week. Sometimes I do some activity like frisbee or soccer.

Other answers (received by both expectancies):

What's the worst thing about UMass?

A lot of times when I try to study the dorm is too loud, but I usually go somewhere else.

What's the best thing about UMass?

The best aspect about UMass is the big classes! Nobody ever calls on you, and they don't care if you skip.

What would you like to do after you graduate?

Assuming that I do graduate, I'll probably get a job, maybe in sales.

Describe (briefly) your favorite professor.

My favorite prof taught history. He made us write two 20-page papers and do a lot of discussion, but it was fun and really worth it!

What was the last book you read for fun? How did you like it?

I mainly read books for fun to blow off homework. But usually I'd rather just hang out and do nothing.

What is one of your favorite movies? Why?

I loved "Chaplin." I thought it was great. I usually don't have time to see movies during school because of homework.

NOTES

[1]Total complexity obtained a significant interaction also between control deprivation and expectancy ($F(1,70) = 9.40$, $p < .01$). The pattern appears to be that control-deprived subjects used more total complexity in the lazy expectancy (M's hardworking expectancy = 15.6, lazy expectancy = 16.9) whereas non-control-deprived subjects used more in the hardworking expectancy (M's hardworking expectancy = 17.1, lazy expectancy = 14.8).

[2]This test fails to reach .05 probably because in this study, busy subjects tended to be anxious too (a main effect for busyness is reported later in the text). Compared to all nonbusy subjects, anxious subjects were significantly more anxious (M's = 3.33 vs. 2.11; $t(50) = 2.74$, $p < .01$.

[3]The 2 x 5 analysis involving the anxious group was also significant ($F(4,80) = 4.68$, $p < .01$).

[4]There was also a main effect that subjects mentioned consistent information more ($F(1,67) = 4.99$, $p < .05$); and a within-subjects main effect as in Study 1, where subjects were more likely to mention information correctly than to mention only the gist of it or to mention it incorrectly ($F(2,134) = 11.48$, $p < .01$).

[5]An uninterpretable interaction with busyness also obtained on the self-report measure for information seeking; busy subjects wanted more information in the lazy expectancy (M's = 9.44 vs. 8.24), whereas non-busy subjects (and anxious subjects) wanted more information in the hardworking expectancy (M's = 9.70 vs. 7.85; $F(1,65) = 9.84$, $p < .01$).

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