EFFECTS OF DIRECTED THINKING ON PERCEIVED DESIRABILITY AND FEASIBILITY OF EXERCISE

by

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INTRODUCTION

Many physiological and psychological benefits are associated with exercising (Blair, Kohl, Paffenbarger, Clark, Cooper, & Gibbons, 1989; Powell & Blair, 1994). Evidence also shows that positive mental well being is associated with physical activity (Biddle 1995; Biddle, Fox & Boutcher, 2000; Biddle & Mutrie, 2001; Brown, Mishra, Lee & Bauman, 2000) and lowered reactivity to cognitive stress (Norris, Carroll & Cochrane, 1990; Stein & Boutcher, 1992). There are a number of physiological models connecting exercise and positive affect, such as the endorphin hypothesis (Dunn & Dishman, 1991; Farrell et al., 1987), the amine hypothesis (Dunn & Dishman, 1991; Kety, 1966; Morgan & O'Connor, 1988), and the thermogenic hypothesis (Koltyn, 1997; Petruzzello, Landers, Hatfield, Kubitz & Salazar, 1991). Clearly research on physical activity and exercise has revealed important psychological and physiological advantages of exercising, and yet too many Americans today choose a sedentary lifestyle. One important research question, then, involves the factors that would make Americans "Choose to Move" (American Heart Association Public Campaign, 2006).

Previous research suggests an answer to this question: that people's intentions to engage in self-beneficial behaviors might be increased merely through thinking that reorganizes cognitive structures, even without providing new information in the form of persuasive messages or public service announcements. The present research draws on theories of attitudes, directed thinking, action identification, and temporal construal to investigate the effects of directed thinking on perceived desirability and feasibility of exercise.

Cognitive Systems

McGuire and McGuire (1991) asked college students to list the ideas that came to mind when they thought about various future events. Some of the events were relatively impersonal, such as drug abuse being eliminated. Other events were relatively personal, such as improving one's social life. Regardless of whether the events were personal or impersonal, two-thirds of the ideas that students listed could be classified as either antecedents that led up to the event or consequences that followed from the event.

McGuire and McGuire (1991) further classified the antecedents and consequences as either desirable or undesirable, and as either facilitating or inhibiting the event. Table 1 shows examples of the eight different types of ideas that students might have listed for an event like "Me exercising more." According to McGuire and McGuire (1991), it is not surprising that two-thirds of spontaneous associations to future events would involve either antecedents or consequences. It is clearly adaptive to think about the antecedents that might lead to future events, so as to plan ahead. Similarly, it is adaptive to anticipate possible outcomes or consequences, so as to be prepared should they occur.

Table 1

The 8 Content-Analysis Categories McGuire and McGuire (1991)Used for Classifying the Thoughts Evoked by Mention of Core Events (CE). The examples Provided for the 8 Categories Involve Thoughts that Might be Evoked by the Core Event of "Me exercising more."

Symbol	*Description of Contents*	*Example*
DMS	Desirable antecedents promoting CE	Joining a health club will get me to exercise
UMA	Undesirable antecedents promoting CE	Gaining a lot of weight will get me to exercise
DLA	Desirable antecedents preventing CE	Going to parties might keep me from exercising
ULA	Undesirable antecedents preventing CE	Cramming for exams might keep me from exercising
DMC	Desirable consequence promoted by CE	Exercising will help me lose weight
UMC	Undesirable consequences promoted by CE	Exercising might bring on an injury
DLC	Desirable consequences prevented by CE	Exercising will keep me from having an active social life
ULC	Undesirable consequences prevented by CE	Exercising will keep me from gaining weight

The significance of this research for McGuire and McGuire (1991) was that evaluations of a target depend importantly on which associations to that target are temporarily accessible. The same individual can evaluate the same target very differently at two different times if positive associations come to mind on one occasion and negative associations come to mind on the other occasion (Lord & Lepper, 1999; Schwarz & Bohner, 2001; Wilson & Hodges, 1992). Given their reasoning, McGuire and McGuire (1991) suspected that it might be possible to elicit different evaluations of a target from participants without giving them any new information, but instead by directing them to think about pieces of information that they already knew, thus making those particular pieces of information temporarily more accessible.

Directed Thinking

To illustrate the power of directed thinking, McGuire and McGuire (1996) investigated college students' evaluations of themselves. These researchers asked some students to list positive characteristics they possessed and negative characteristics they did not possess, whereas they asked other students to list negative characteristics they possessed and positive characteristics they did not possess. The former scored higher than the latter on a subsequent self-esteem scale.

Characteristics are not necessarily the same as events, but Ratcliff, Czuchry, Scarberry, Dansereau, and Lord (1999), inspired by McGuire and McGuire's (1991) theories and McGuire and McGuire's (1996) self-esteem results, decided to test whether it might be possible to alter students' evaluations of an event such as "studying" by directing them to think about either antecedent actions a person might take to facilitate studying or positive consequences that might come from studying (i.e., reasons to study). In short, they chose from McGuire and McGuire's

(1991) eight types of spontaneous associations (see Table 1) the type of antecedent and the type of consequence that seemed most likely to increase students' intentions to study.

Students in Ratcliff et al.'s (1999) study reported increasing their intentions to study more after listing actions that would lead to studying than after listing reasons for studying. In subsequent follow-up research, some of the same researchers found that directed thinking about actions that would lead to studying is especially effective compared to reasons when participants mentally simulate the actions (Ten Eyck, Labansat, Gresky, Dansereau, & Lord 2006), and when participants perceive that they are already making some progress in the direction of increased studying (Labansat, Ten Eyck, Gresky, Dansereau, & Lord, in press). More recently, Ten Eyck, Gresky, and Lord (2006) found that directing students to think about actions that would increase exercising was more effective than directing students to think about reasons for exercising. These investigators also found that thinking about actions increased exercise time and improved cardiovascular fitness. Neither Ratcliff et al's (1999) study nor the follow-up studies, however, have investigated the mechanisms by which directed thinking about actions and reasons might alter behavioral intentions.

Mechanisms of Directed Thinking

For clues about possible mechanisms, recall McGuire and McGuire's (1991) initial reasoning about the adaptive functions served by associating antecedents and consequences with future events. McGuire and McGuire (1991) believed that thinking about antecedent actions that might lead to an event is useful for planning. These types of associations are essential for actively taking charge of the environment rather than passively waiting for events to occur. By generating and sometimes mentally simulating the actions that would lead to a future event, people can increase the likelihood that the event will actually occur. In the process of doing so,

research shows, they come to perceive that the event is more probable and more feasible (Ross, Lepper, Strack, & Steinmetz, 1977). Students who think of actions they can take to increase their exercising, for instance, might convince themselves that exercising is easier to accomplish and more likely to happen than they had previously thought, because effective strategies have become cognitively accessible.

McGuire and McGuire (1991) believed that thinking about consequences that might stem from an event is useful not for planning, but instead for anticipating and preparing to cope with positive or negative outcomes. By generating the consequences that might follow from an event, people can motivate themselves to enjoy benefits and minimize costs (Bandura, 1986). The emphasis in thinking about consequences is not so much on what is feasible, but rather on what is desirable versus undesirable, or positive versus negative (Janis & Mann, 1977). Students who think about the positive consequences of exercising, for instance, might convince themselves that it is worthwhile to exercise, because the benefits of engaging in exercise are so desirable. They might also be more likely to intend to exercise, because desirable consequences have come to seem both more desirable and more cognitively accessible.

The Present Study

In this way, McGuire and McGuire's (1991) theory of cognitive systems suggested the central hypothesis of the proposed research: that directed thinking about antecedent actions increases behavioral intentions through its effect on perceived feasibility of doing the behavior, whereas directed thinking about positive consequences increases behavioral intentions through its effect on perceived desirability.

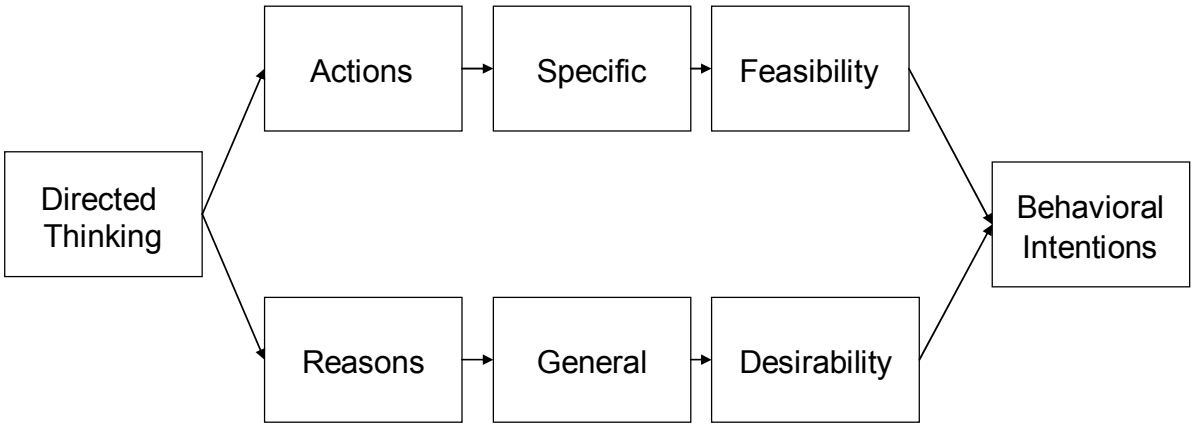
This central hypothesis, however, suggested a subsidiary hypothesis regarding the mechanisms of directed thinking. First, consider the contention that directed thinking about

antecedent actions increases the perceived feasibility or probability of enacting the target behavior. Research by Gollwitzer (1996, 1999) and others has shown that actual feasibility and probability of enacting a goal-directed behavior is increased by thinking about antecedent actions in specific rather than general ways, and including specific implementation intentions. These findings suggested that directed thinking about antecedent actions would prove most effective when participants were encouraged to include specific details of the actions that they generated.

Second, consider the contention that directed thinking about positive consequences increases perceived desirability of engaging in the target behavior. It seems at least possible that broader, more inclusive positive outcomes might be more motivating than narrower, more specific outcomes. Thinking that studying harder will help your overall GPA this semester, for instance, might be more motivating than thinking that studying harder will help your grade in only one course. Thus it seemed possible that including specifics in a list of positive consequences might be less likely to increase behavioral intentions than including specifics in a list of facilitating actions, or even that thinking about specific positive outcomes might result in lower behavioral intentions than thinking about more general positive outcomes.

The central hypothesis about feasibility versus desirability and the subsidiary hypothesis about specificity are shown graphically in Figure 1. The present experiments tested the central and subsidiary hypotheses.

Figure 1. *Postulated mechanisms by which directed thinking alters behavioral intentions (Experiment 1)*



Experiment 1

Experiment 1 tested the effects of self-generated specific and general actions and reasons on perceptions of exercise desirability and feasibility, as well as on intentions to exercise.

Method

Participants

One hundred thirty-five students participated for partial course credit. One student was eliminated from analyses because he did not follow instructions, leaving a final sample of 134 (33 men and 101 women). Gender did not interact with any of the significant results to be reported.

Procedure

Participants were given a paragraph to read describing the experiment as a way to brainstorm about ideas to exercise. They were randomly assigned to one of four conditions: 1) specific actions, 2) specific reasons, 3) general actions, or 4) general reasons. All participants were instructed to read different scenarios in which people have problems thinking and communicating their ideas. Participants were given examples of buying a car from one of the four conditions (Appendix B).

In the *specific actions* condition, 34 participants read that most people are too general in how they communicate their ideas, and could improve by being more specific. Instead of saying that they could buy a car if they saved more money, for instance, they should be more specific and say they could buy a car if they increased the amount of earnings that they deposited in their savings account by $40 per week. These participants were then asked to list five specific actions "that you could take that would get you to exercise more."

In the *specific reasons* condition, 33 participants also read that most people are too general in how they communicate, but these participants were given different examples. Instead of saying that a desirable consequence of buying a car would be to impress peers, for instance, they should say that buying a car would give them a better chance of getting a specific person to go out with them.

In the *general actions* condition, 32 participants were told that most people go into too much tedious detail and could communicate more effectively if they gave the big picture. Instead of saying that they could buy a car if they increased the amount of their earnings that they deposited to $40 each week, for instance, they should say they could save more money.

Finally, in the *general reasons* condition, 32 participants also read that most people are too specific in how they communicate, but they were given different examples. Instead of saying that a desirable consequence of buying a car would be that a specific person would go out with them, for instance, they should say that buying a car would allow them to impress their peers.

All participants were given 15 minutes to generate and list their five ideas. Then all participants completed the behavioral intention measures. On scales from -8 = much less than in the first half of the semester to +8 = much more than in the first half of the semester, with the scale midpoint of 0 labeled "no change," participants were asked how much exercise they intended to do, how much time they planned to dedicate to exercise, how important exercising would be to them, how much emphasis they would give to exercising, how much more time they would spend exercising, and how much more effort they would put into exercising.

After they had completed this questionnaire, all participants were asked to copy the five actions or five reasons they gave earlier toward exercise onto a new questionnaire and then to rate each of their own ideas on desirability and feasibility scales from 0-10 (Appendix E). The

last questionnaire the participants completed involved visualization. They were again asked to copy their ideas in order and to rank how much they mentally visualized each idea as they were coming up with it, on a scale from 0 to 10. Finally, participants were debriefed and thanked for participating.

Results and Discussion

The main analyses involved behavioral intentions, desirability and feasibility ratings, and their correlations.

Table 2 shows the results from a principal components analysis (PCA) of the six behavioral intention questions. Because they all loaded at least .858 on one factor that explained 82.49% of the variance, the six questions were averaged to create a single measure of intentions to exercise. A 2 (Type of Directed Thinking: Reasons, Actions) X 2 (Focus: Specific, General) analysis of variance (ANOVA) of these behavioral intention scores yielded no significant effects or interactions (all Fs < 1). Table 3 shows mean behavioral intentions as a function of type of idea and specificity. Contrary to previous research (Ratcliff et al., 1999; Ten Eyck et al., 2006), participants who generated actions did not report greater subsequent intentions to engage in the target activity than did participants who generated reasons. Similarly, instructions to generate specific ideas did not create greater behavioral intentions that instructions to generate general ideas, and specific actions had no greater effect than the other three conditions.

Table 2

Factor Loading of 6 Behavioral Intention Questions (Experiment 1)

Question	Factor Loading
How much exercise do you intend to do?	.832
How much time do you plan to dedicate to exercise?	.896
How much more important do you think exercising Will be to you?	.737
How much more of an emphasis would you be willing to give to exercising?	.828
How much more time do you think that you will spend exercising?	.825
How much more effort do you intend to put into exercising?	.831

Table 3

Mean Intentions To Exercise More In Second Half of Semester, By Students Who Had Previously Listed Actions or Reasons With A Specific or General Focus (Scale: -8 = much less than the first half of the semester, 0 = No Change, +8 = much more than the first half of the semester) (Experiment 1).

	Type of Idea	
	Actions	Reasons
Specific	3.24	3.36
	(2.14)	(1.99)
	$n = 34$	$n = 34$
General	2.95	3.41
	(2.11)	(2.17)
	$n = 33$	$n = 33$

Note: Standard deviations are in parentheses.

Although the manipulations had no effect on overall intentions to exercise, they might still have had an effect on perception of the desirability and/or feasibility of exercise. Table 4 shows factor loadings of the three perceived desirability questions. In a PCA, all three questions loaded at least .778 on one factor that explained 72.44% of the variance, so they were averaged to form one measure of perceived desirability. Table 5 shows factor loading of the three perceived feasibility questions. Again, these questions loaded at least .873 on one factor that explained 80.00% of the variance, so they were averaged to form one measure of perceived feasibility.

Table 4

Factor Loadings of 3 Perceived Desirability Questions (Experiment 1)

Question	Factor Loading
How much more desirable does exercise seem to you now than before you participated in this experiment?	.731
How much more does it seem that you would get out of exercising than you used to think it would?	.606
How much more positive does the concept of exercising feel to you now than before?	.836

Table 5

Factor Loading of 3 Perceived Feasibility Questions (Experiment 1)

Question	Factor Loading
How much easier does it seem that it would be for you to exercise now than you thought it would be before participating in the experiment?	.779
How much more likely is it that you would actually be able to exercise more starting now than you used to be able to do?	.762
How much more feasible or possible does it seem that you can exercise now than you used to think it was?	.859

Ratings on these two dimensions—the perceived desirability and feasibility of exercise after generating five ideas—were used as the repeated measures factor in a 2 (dimension: desirability, feasibility) X 2 (type of idea: actions reasons) X 2 (specificity: specific, general) ANOVA. The ANOVA yielded a main effect of rating dimension, $F(1, 130) = 9.19$, $p < .01$, in which desirability ratings ($M = 1.34$, $SD = 1.25$) were higher than feasibility ratings ($M = 1.08$, $SD = 1.25$). The ANOVA also yielded a significant dimension X type of ideas interaction, $F(1, 130) = 6.05$, $p < .05$.

Although the three-way interaction was not significant, $F < 1$, Table 6 shows the means for all eight cells of the experimental design. By simple, simple effects tests using the overall MS error, actions and reasons did not differ in their effect on rated desirability of exercise either for participants who were told to be specific, $F(1, 130) = .46$, *ns*, or for participants who were told to be general, $F(1, 130) = 1.46$, *ns*. Actions and reasons also did not differ in their effect on rated feasibility of exercise for participants who were told to be general, $F(1, 130) = .08$, however, generating actions produced significantly higher ratings of exercise feasibility for participants who were told to generate specific actions ($M = 1.35$) than for participants who were told to generate specific reasons ($M = .88$). This finding supported McGuire and McGuire's (1991) observation that antecedent actions come to mind spontaneously for future events because they afford specific plans and strategies that can facilitate some events and inhibit others.

Table 6

Mean feasibility and desirability ratings for exercise when directed to think about actions or reasons with either a specific or general focus (Experiment 1).

	Actions	Reasons
Desirability		
Specific	1.25[a]	1.37[a]
	(.982)	(1.37)
	$n = 34$	$n = 33$
General	1.26[b]	1.47[b]
	(1.29)	(1.36)
	$n = 32$	$n = 32$
Feasibility		
Specific	1.35[c]	.88[d]
	(1.19)	(1.06)
	$n = 34$	$n = 33$
General	1.06[e]	1.01[e]
	(1.33)	(1.40)
	$n = 32$	$n = 32$

Note: Standard deviations are in parentheses. Row means with different superscripts differed significantly ($p < .05$).

Regression analyses were used to test the relationship between intentions to exercise and these ratings of perceived desirability and feasibility. The top part of Table 7 shows the results for predicting behavioral intentions from desirability and feasibility ratings among participants who generated **actions**. The overall model was significant, $F(2, 64) = 9.36$, $p < .001$. For these participants, perceived desirability of exercise was not a significant predictor of behavioral intentions, $F(1, 64) = .33$, *ns*, but perceived feasibility of exercise was a significant predictor, $F(1, 64) = 8.12$, $p < .01$, just as had been predicted. The bottom part of Table 7 shows the results for predicting behavioral intentions from desirability and feasibility ratings among participants who generated **reasons**. The overall model was significant, $F(2, 64) = 13.56$, $p < .001$. For these participants, perceived desirability of exercise was a significant predictor of behavioral intentions, $F(1, 64) = 3.98$, $p = .05$, and so was perceived feasibility of exercise, $F(1, 64) = 4.27$, $p < .05$.

Table 8 shows correlations among behavioral intentions, perceived desirability of exercise, perceived feasibility of exercise, and the extent to which participants reported having visualized the ideas that they generated. Behavioral intentions were significantly correlated with perceived desirability, perceived feasibility, and visualization. Perceived desirability was significantly correlated with perceived feasibility. Visualization was significantly correlated with both behavioral intentions and perceived feasibility. Although the visualization results were intriguing, they would not be replicated in Experiment 2, and visualization did not interact with any of the significant results reported in either experiment.

Finally, the ten most frequently listed actions and reasons in Experiment 1 are shown in Table 9. The table shows not only the frequency with which each idea was listed, but also the mean desirability and feasibility of each listed idea, averaged across all participants who listed it.

Contrary to predictions, the most frequently generated actions were not necessarily the most consensually feasible, nor were the most frequently generated reasons the most consensually desirable.

Table 7

Regression Analyses Predicting Behavioral Intentions from Rated Desirability and Feasibility of Exercise (Experiment 1)

	B	Std. Error	Beta	t	Sig.
Actions					
Constant	2.061	.353		5.842	.000
Desirability	.156	.272	.084	.574	.568
Feasibility	.697	.245	.416	2.849	.006
Reasons					
Constant	2.280	.312		7.313	.000
Desirability	.442	.221	.291	1.996	.050
Feasibility	.504	.244	.301	2.066	.043

Table 8

Correlations among behavioral intentions (Beh Int), perceived desirability (Perc Des), perceived feasibility (Perc Feas), and visualization (Visualiz) in Experiment 1

	Beh Int	Perc Des	Perc Feas
Perc Des	.435*		
Perc Feas	.476*	.663*	
Visualiz	.225*	.137	.246*

Table 9

The Ten Most Frequently Listed Actions and Reasons (Experiment 1)

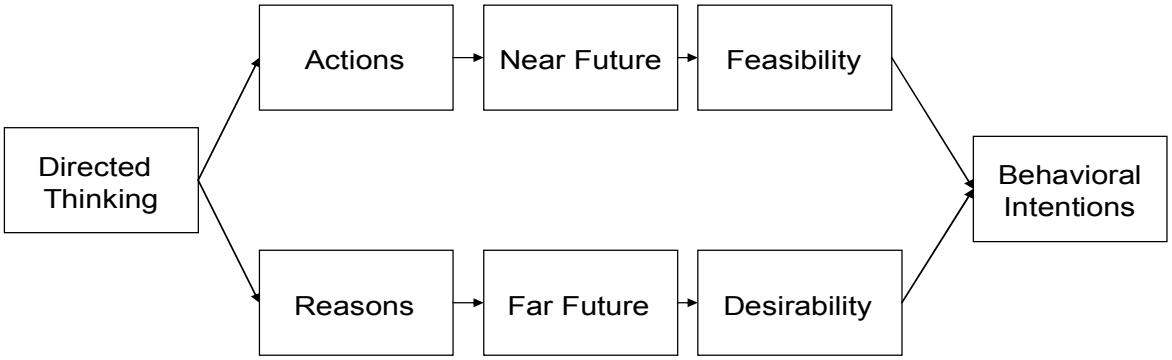
Ideas	Frequency	Desirability	Feasibility
Actions			
Manage Time	73	7.42	6.99
Exercise with Others	45	5.29	6.29
Change Diet	31	7.45	6.87
Motivate Myself	25	7.72	6.72
Make Equipment Available	21	7.90	7.76
Wake Up Earlier	14	5.79	5.14
Substitute Activities	14	6.78	7.50
Set Goals	13	8.30	8.00
Join Exercise Group	12	7.33	5.50
Reward Self	12	7.00	7.16
Reasons			
Health Benefits	69	8.43	8.05
More Attractive Body	50	8.30	7.22
Increased Self-Esteem	30	7.43	6.86
Strength & Endurance	30	8.27	7.70
Positive Mood	29	8.62	8.14
Lowers Stress	24	7.91	7.54
Lose Weight	22	8.81	7.31

Ideas	Frequency	Desirability	Feasibility
Reasons			
More Energy	20	7.95	7.70
Keep in Shape	16	8.31	7.25
Live Longer	9	9.11	8.44

Experiment 2

Experiment 1 found different effects of actions and reasons on perceived desirability and feasibility, but it found no effects of instructing participants to list specific vs. general ideas. One possible explanation might be that the instructions to be specific or general were too explicit. Participants might have discounted any effects of idea specificity because the level of specificity was so blatantly forced on them by the experimenter. Experiment 2, therefore was designed to create specific vs. general ideas in a far more subtle way. Temporal construal theory (Liberman & Trope, 1998; Trope & Liberman, 2003) suggested that near versus far future time perspectives might be a more subtle variation on the specific versus general instructions of Experiment 1. Numerous studies have shown that mental simulations include more specific details when they involve temporally near rather than distant events (Abelson, 1981; Liberman, Sagristano, & Trope, 2002; Liberman & Trope, 1998). Merely telling participants to generate actions or reasons for the near or far future, therefore, might be more effective than explicit instructions to make the ideas specific or general, because the experiment's purpose might be better disguised. Figure 2 shows the predicted sequence for Experiment 2, in which directed thinking about actions lends itself better to strategies for the near than far future, which in turn increases perceived feasibility of exercise. Directed thinking about reasons, in contrast, lends itself better to being motivated by long-term rewards in the far than near future, which in turn increases perceived desirability of exercise.

Figure 2. *Postulated mechanisms by which directed thinking alters behavioral intentions (Experiment 2)*



Method

Participants

One hundred thirty-two students participated for partial course credit. Two participants were eliminated from analyses because they did not follow directions, leaving a final sample of 130 (32 men and 98 women). Gender did not interact with any of the significant results to be reported.

Procedure

As in Experiment 1, participants were asked to list either positive consequences (reasons) or facilitating antecedents (actions) that would get them to exercise more. In Experiment 2, however, within each group, approximately half of the participants were asked to list ideas that would occur in the near future (the next week), and the other half were asked to list ideas that would occur in the far future (the following year). There were 33 participants in the near actions condition, 31 in the far actions condition, 33 in the near reasons condition, and 30 in the far reasons condition.

After they had listed their ideas, all participants completed the same behavioral intention questions and the same ratings of the desirability and feasibility of exercise, wrote their ideas and rated the desirability and feasibility of each, and then rated how much they visualized each of their ideas as in Experiment 1. Finally participants were debriefed and thanked for their participation in the experiment.

Results

As in Experiment 1, the main analyses involved behavioral intentions, feasibility and desirability ratings, and their correlations.

Table 10 shows factor loadings of the six behavioral intention questions. As shown, they all loaded at least .83 on one factor in a PCA that explained 76.69% of the variance, so they were averaged to form one measure of behavioral intentions.

Table 11 shows the mean behavioral intentions as a function of type of idea (action or reason) and the specificity (near or far). A 2 (Type of Directed Thinking: Reasons, Actions) X 2 (Time: Near Future, Distant Future) ANOVA of these behavioral intention scores yielded no significant effects, all Fs < 2.00 and *ns*. As in Experiment 1, actions and reasons did not differ in their effects on behavioral intentions, even when a near future temporal perspective would have seemed theoretically optimal for maximizing the effect of generating actions (Trope & Liberman, 2003).

Table 12 shows factor loadings of the three perceived desirability questions. All three questions loaded at least .862 on one factor in a PCA that explained 76.08% of the variance, so they were averaged to form one measure of perceived desirability.

Table 13 displays the factor loadings of the three feasibility questions. All three questions loaded at least .30 on one factor in a PCA that explained 72.60% of the variance, so they were averaged to form one measure of perceived feasibility ratings on these two dimensions—the perceived desirability and feasibility of exercise after generating five ideas—were used as the repeated measures factor in a 2 (dimension: desirability, feasibility) X 2 (type of idea: actions reasons) X 2 (specificity: specific, general) ANOVA. The ANOVA yielded only a marginally significant dimension X type of ideas interaction, $F(1, 126) = 3.52$, $p = .063$.

Table 10

Factor Loading of 6 Behavioral Intention Questions (Experiment 2)

Question	Factor loading
How much exercise do you intend to do in the second half of the semester compared to the first half?	.754
How much time do you plan to dedicate to exercise in the second half of the semester compared to the first half?	.787
How much more important do you think exercising will be to you in the second half of the semester compared to the first half?	.689
How much more of an emphasis would you be willing to give to exercising in the second half of the semester compared to the first half?	.786
How much more time do you think that you will spend exercising in the second half of the semester compared to the first half?	.808
How much more effort do you intend to put into exercising in the second half of the semester compared to the first half?	.777

Table 11

Mean Behavioral Intentions as Function of Type of Idea and Specificity (Experiment 2)

	Type of Idea	
	Actions	Reasons
Near	2.82	3.47
	(2.06)	(1.71)
	$n = 33$	$n = 34$
Far	3.30	3.61
	(1.96)	(2.05)
	$n = 32$	$n = 31$

Note: Standard deviations are in parentheses.

Table 12

Factor Loadings of 3 Perceived Desirability Questions (Experiment 2)

Question	Factor Loading
How much more desirable does exercise seem to you now than before you participated in this experiment?	.771
How much more does it seem that you would get out of exercising than you used to think it would?	.768
How much more positive does the concept of exercising feel to you now than before?	.743

Table 13

Factor Loading of 3 Perceived Feasibility Questions (Experiment 2)

Question	Factor Loading
How much easier does it seem that it would be for you to exercise now than you thought it would be before participating in the experiment?	.754
How much more likely is it that you would actually be able to exercise more starting now than you used to be able to do?	.689
How much more feasible or possible does it seem that you can exercise now than you used to think?	.736

Although the three-way interaction was not significant, $F < 1$, Table 14 shows the means for all eight cells of the experimental design. By simple, simple effects tests using the overall MS error, participants who generated ideas that would occur in the near future perceived exercise as more desirable when they generated reasons ($M = 1.70$) than actions ($M = 1.14$), $F(1, 126) = 12.01$, but this effect of type of ideas on perceived desirability did not occur for participants who generated ideas that would occur in the far future, $F(1, 126) = .06$, *ns*. Participants who generated ideas for the near future perceived exercise as more feasible if they generated reasons ($M = 1.51$) than actions ($M = 1.15$), $F(1, 126) = 5.01$, $p < .05$. Participants who generated ideas for the far future, in contrast, perceived exercise as more feasible if they generated actions ($M = 1.45$) than reasons ($M = 1.08$), $F(1, 126) = 5.10$, $p < .05$.

These results were surprising in several respects. First, it was predicted that reasons would be more effective than actions for increasing perceived desirability when the reasons entailed temporally distant positive consequences, and yet it was in the near and not the far time frame that reasons proved more effective than actions. Second, it was predicted that actions would be more effective than reasons for increasing perceived feasibility when the actions entailed temporally near facilitating strategies, and yet it was in the far and not the near time frame that actions proved more effective than reasons. In fact, reasons proved more effective than actions in increasing perceived feasibility in the near time frame, a result exactly opposite to predictions. These unanticipated results will be discussed further in the General Discussion section.

Table 14

Mean desirability and feasibility ratings for exercise when directed to think about actions or reasons in a near or future temporal orientation (Experiment 2)

	Actions	Reasons
Desirability		
Near	1.14[a]	1.70[b]
	(1.44)	(1.41)
	n = 33	*n* = 34
Far	1.25[c]	1.29[c]
	(1.28)	(1.47)
	n = 32	*n* = 31
Feasibility		
Near	1.15[d]	1.51[e]
	(1.17)	(1.33)
	n = 33	*n* = 34
Far	1.45[f]	1.08[g]
	(1.31)	(1.38)
	n = 32	*n* = 31

Note: Standard deviations are in parentheses. Row means with different superscripts differed significantly ($p < .05$).

Regression analyses were used to test the relationship between intentions to exercise and these ratings of perceived desirability and feasibility. The top part of Table 15 shows the results for predicting behavioral intentions from desirability and feasibility ratings among participants who generated actions. The overall model was significant, $F(2, 62) = 22.12$, $p < .001$. For these participants, perceived desirability of exercise was not a significant predictor of behavioral intentions, $F(1, 62) = 1.31$, *ns*, but perceived feasibility of exercise was a significant predictor, $F(1, 62) = 16.09$, $p < .001$—a result consistent with predictions.

The bottom part of Table 15 shows the results for predicting behavioral intentions from desirability and feasibility ratings among participants who generated reasons. The overall model was significant, $F(2, 62) = 12.41$, $p < .001$. For these participants, perceived desirability of exercise was not a significant predictor of behavioral intentions, $F(1, 62) = 1.30$, *ns*, and neither was perceived feasibility of exercise, $F(1, 62) = 2.68$, *ns*.

Table 16 shows correlations among behavioral intentions, perceived desirability of exercise, perceived feasibility of exercise, and the extent to which participants reported having visualized the ideas that they generated. As in Experiment 1, behavioral intentions were significantly correlated with perceived desirability, perceived feasibility. Perceived desirability was significantly correlated with perceived feasibility. Visualization was not significantly correlated with any other variable.

Finally, the ten most frequently listed actions and reasons in Experiment 2 are shown in Table 17. The table shows not only the frequency with which each idea was listed, but also the mean desirability and feasibility of each listed idea, averaged across all participants who listed it. As in Experiment 1, there was no systematic relationship between how frequently an idea was listed and its consensual feasibility or desirability.

Table 15

Regression Analyses Predicting Behavioral Intentions from Rated Desirability and Feasibility of Exercise (Experiment 2)

	B	Std. Error	Beta	t	Sig.
Actions					
Constant	1.665	.285		5.837	.000
Desirability	.226	.197	.152	1.144	.257
Feasibility	.865	.216	.532	4.011	.000
Reasons					
Constant	2.503	.290		8.632	.000
Desirability	.296	.259	.228	1.140	.259
Feasibility	.450	.275	.328	1.639	.106

Table 16

Correlations among behavioral intentions (Beh Int), perceived desirability (Perc Des), perceived feasibility (Perc Feas), and visualization (Visualiz) in Experiment 2

	Beh Int	Perc Des	Perc Feas
Perc Des	.515*		
Perc Feas	.571*	.765*	
Visualiz	.157	.084	.134

Table 17

The Ten Most Frequently Listed Actions and Reasons (Experiment 2)

Ideas	Frequency	Desirability	Feasibility
Actions			
Manage Time	96	7.27	6.95
Exercise with Others	46	8.21	7.13
Join Exercise Groups	32	7.06	6.41
Set Goals	20	7.25	6.90
Substitute Activities	15	7.73	8.13
Change Diet	14	7.79	7.64
Make Equipment Available	14	6.57	6.71
Reward Self	13	7.46	7.85
Motivate Myself	12	6.58	7.92
Get a Personal Trainer	10	7.40	5.60
Reasons			
Health Benefits	65	8.42	7.97
Lowers Stress	29	7.69	7.45
More Energy	29	8.24	7.93
Lose Weight	28	8.50	7.46
More Attractive Body	27	8.52	8.52
Increased Self-Esteem	22	8.55	7.68
Keep in Shape	17	8.65	7.47
Strength & Endurance	17	8.41	7.47

Ideas	Frequency	Desirability	Feasibility
Reasons			
New Social Opportunity	10	6.70	7.30
Live Longer	8	9.75	8.50

General Discussion

The present data can be interpreted as congruent with McGuire and McGuire's (1991) "persuasion from within" techniques in directed thinking. Persuasion from within involves directing people to call upon the information they already know in very self-aware, specific, and concrete ways, while persuasion from without involves providing individuals with new information about a topic of interest from an outside source. A previous study suggests that people can be directed to think about information that they already know and change their views on a topic, because directed thinking alters the accessibility of some items of already-known information relative to others (McGuire & McGuire, 1996).

Study 1's results do not suggest that directed thinking about specific actions one would take to exercise significantly increases participant's intentions of doing so. Directed thinking about general reasons also did not significantly increase participant's behavioral intentions to exercise. Through a different mechanism, the distinction becomes apparent when we examine the feasibility and desirability of the actions and reasons. Overall, desirability ratings were higher than feasibility ratings. However, when participants generated actions they could take to facilitate exercising, the feasibility of doing so was significantly higher than when participants thought about reasons. Also, when looking at a regression analysis, feasibility was found to be a predictor of behavioral intentions when participants listed actions and both desirability and feasibility predicted behavioral intentions when reasons were generated. The safest conclusion from these results might be that directed thinking about actions might have a greater effect on perceived feasibility than on perceived desirability, but this effect is unaffected by idea specificity and does not translate directly into changes in behavioral intentions. Even the most

feasible ideas about increasing a self-beneficial activity do not necessarily translate into greater motivation.

Study 2 yielded further interesting findings. Although there were no differences in behavior intentions, other mechanisms were explored. Directed thinking about actions made exercise seem more feasible and directed thinking about reasons made exercise seem more desirable, replicating the results of Experiment 1. In addition, the type of directed thinking seemed to have different effects on perceived desirability and perceived feasibility depending on the time frame in question. Participants who generated ideas for the far future perceived exercise as more feasible if they generated actions than reasons. In contrast, participants who generated reasons for the near future perceived exercise as more feasible than those who generated actions.

The findings are not consistent with those of Ratcliff et al., (1999), whose directed thinking research has shown that participants who generate actions to increase study behavior subsequently report greater intentions to study than participants who generate reasons for studying. In an extension of that study, directed thinking about actions (but not reasons) proved less effective for students when they focused on idea generation and more effective for students when they focused on mental simulation (Ten Eyck et al., 2006), presumably because mental simulation increases the perceived probability that the event will actually happen (Anderson, 1983; Ross et al., 1977). A related study that directed participants to think about positive actions increased actual subsequent behavior. This study had some participants receive information about cable television (CATV), and some participants were directed to actually imagine themselves experiencing the benefits of having CATV. Their finding was that participants who imagined themselves experiencing the benefits of having CATV were more likely to actually subscribe to the cable television than those who just received information about CATV (Gregory,

Cialdini, & Carpenter, 1982). It is not clear, then, why participants who generated actions in the present Experiment 2 would not have constructed more detailed mental images of themselves taking action in the near than far future, and thus increased both perceived feasibility and behavioral intentions. One possibility is that the "near" time frame in the present Experiment 2 was not near enough. College students who are used to marking time by the next class period might not regard "next week" as "near," but rather as part of an intermediate time between near and far.

The present studies also explored cognitive processes that are related to implementation intentions. Considerable research has explored the cognitive processes that increase the relationship between intentions and behavior (Gollwitzer 1996, 1999; Gollwitzer & Brandstaetter, 1997; Gollwitzer & Schaal, 1998). According to these studies, the initiation of goal-directed responses becomes somewhat automatic following implementation formation. In an empirical investigation (Gollwitzer & Brandstaetter, 1997) implementation intentions were found to facilitate the immediate initiation of goal-directed action when the intended opportunity was encountered, and intentions to attain difficult goals were more likely to be carried out when participants had formed implementation intentions. These findings are similar to those reported by Ten Eyck, Gresky, and Lord (2006). They found that directing students to think about actions that would increase exercising was more effective than directing students to think about reasons for exercising, or than no directed thinking, in increasing exercise time and cardiovascular fitness. Similarly, participants asked to formulate plans in the form of implementation intentions were found to be better able to carry out their intentions to go on a healthier diet (Verplanken & Faes, 1999) and to take a vitamin C pill each day (Sheeran & Orbell, 1999). Several lines of research converge on the principle that intentions play an essential role in guiding human action,

but the complexities concerned in translating intentions into genuine performance need to be better understood. It would be instructive in future research on directed thinking, then, to have participants in the actions condition try to anticipate possible barriers and temptations, and generate specific actions aimed at overcoming those obstacles rather than merely facilitating strategies.

Other theories that describe the prediction of behavior from attitudinal variables have explored planned behavior (Ajzen, 1991) and reasoned action (Ajzen & Fishbein, 1980), both of which seem consistent with our interpretation of the results. The theory of planned behavior postulates that people act in agreement with their intentions and perceptions of control over the behavior. Subjective norms (perceived probability that important others will approve), attitudes toward the behavior (perceived probability that the behavior will bring positive results), and perceptions of behavioral control (perceived ability to perform the behavior) all influence an individual's behavioral intentions. Our participant's subjective norms may be perceived as reasons to exercise. The more participants perceive that general exercise is something important and that others will approve, the more they will be motivated to exercise. When individuals perceive that specific actions to exercise will bring positive results, the more they may feel behavioral control over engaging in exercise.

Many studies continue to demonstrate the applicability of the theory of planned behavior in various content domains, including smoking (e.g. Norman, Conner, & Bell, 1999; Morrison, Gillmore, Simpson, & Wells, 1996), eating low-fat food (e.g. Armitage & Conner, 1999; Paisley & Sparks, 1998), engaging in physical activity (e.g. Courneya, Bobick, & Schinke, 1999; Trafimow & Trafimow, 1998), using illegal substances (e.g. Conner & McMillan, 1999), condom use (e.g. Albarracin, Fishbein, & Middlestadt, 1998; Reinecke, Schmidt, & Ajzen, 1996)

and other safe-sex behaviors (e.g. Boldero, Sanitioso, & Brain, 1999). Overall, these studies have found support for the theory. When looking at exercise as a beneficial activity, people may not have the perceived behavior control, even when attitudes and subjective norms are favorable. When evaluating the results, it seems likely that directed thinking about specific action will increase perceived behavioral control over exercising. It would be useful in future research, therefore, to measure not only perceived feasibility of exercising, but also perceived control over when, where, and how the exercise is to be performed.

Another plausible explanation for the findings stems from Attitude Representation Theory, or ART (Lord & Lepper, 1999). According to ART, evaluations of a target depend importantly on which associations to that target are temporarily accessible. The same individual can evaluate the same target in a different way at two different times if positive associations come to mind at one time and negative associations come to mind the next time (Lord & Lepper, 1999; Schwarz & Bohner, 2001; Wilson & Hodges, 1992). To examine directed thinking, we asked participants to list either actions or reasons to exercise, but we gave them no new information. According to ART, a mental representation is activated when an individual attempts to evaluate an attitude object. The attitude object in our present research is exercise.

Directed thinking toward an attitude-relevant action, especially specific antecedents rather than general or abstract consequences, might not activate concepts relevant to facilitating exercise and other beneficial activities because they seem more probable or feasible. Also, an individual's current perception of the attitude object combined with listing actions and reasons, which should all be positive, should activate more positive exemplars. It should not be surprising then that this new mental representation might allow people to alter their reported attitudes or behavioral intentions in a positive direction (Sia, Lord, Blessum, Ratcliff, & Lepper, 1997).

ART states that when exemplars are activated (positive or negative) prior to an attitude assessment, people will alter their attitude assessment in the direction that corresponds to that exemplar. A subsequent encounter with that particular attitude object may authenticate an attitude modification that has been integrated into their altered representations (Lord & Lepper, 1999). The resulting evaluative judgment may emerge through the individual's beliefs, feelings based on emotions, and behavioral intentions about the attitude object (Lord & Lepper, 1999), which might be different for each individual. Individual participants in our studies might have had some type of negative evaluative experience prior to the experiment, which unintentionally elicited not only antecedent actions, but also previous failures to enact well-intentioned plans, which in turn might have created less positive behavioral intentions that would have occurred had only facilitating antecedent actions been activated. Thus future studies might examine the recent experience with the exemplar and see what impact directed thinking may have using actual behaviors and health consequences.

The results of Experiment 2 were somewhat consistent with Construal Level Theory (CLT; Liberman & Trope, 1998; Trope & Liberman, 2003), but not completely consistent. CLT proposes that temporal distance changes people's responses to future events by changing the mental representation of those events. For example, increasing the temporal distance of an event leads individuals to make decisions more on the basis of ends (why they might engage in an action) rather than means (how they would perform an action). People also prefer activities that accord with their goals and values to a greater extent when those activities are associated with distant future rather than near future events. We manipulated and assessed participants' near and distant future intentions to exercise. The results were congruent with CLT, in that participants who thought about actions they could take in the far future found exercise more feasible and

possible. We did not anticipate, however, that participants who thought about reasons to exercise in the distant future would find exercise significantly more feasible. We have much to learn in future research about interactions between temporal perspective and the types of directed thinking.

Exploring the implications of temporal construal for information processing, Liberman, Sagristano, and Trope (2002) established that compared with near-future desires, distant-future desires are structured around simple constructs. They further discovered that objects are categorized into more widespread or inclusive categories when they relate to distant-future situations than when they relate to near-future situations. Beside similar constructs, Forster, Friedman, and Liberman (2004) established that temporal vastness also affects processing styles. They found that thoughts in relation to the distant future evoke a processing transfer toward a more abstract mental representation, facilitating the generation of creative, imaginative abstract solutions, as well as improving performance on insight tasks. These findings suggest that differences in temporal distance guide systematic differences in the way information is processed, thus creating more abstract thinking about the distant future than about the near future. Research on temporal construal theory, however, has not directly addressed the specific cognitive processes that occur when people try to generate plans for increasing a self-beneficial activity such as exercise.

Of possible relevance is a study conducted on gambling which suggested that people tend to overemphasize abstract, high-level goals and ignore the concrete, low-level steps needed to reach them (Sagristano, Trope & Liberman, 2002). As a result, their future obligations can turn out to be far riskier, more difficult and more time-consuming than they had imagined. The study in question used a gambling task to investigate the importance of risks and rewards for decisions

about the near and far future. It found that individuals who expect to gamble in the near future prefer safe bets with small payoffs, but those who expect to gamble after a delay of several months prefer much riskier bets with high payoffs. "In the distant future, we think about how much the outcome is attractive to us. In the near future, we think, 'Is it feasible?" (Sagristano, et al., 2002). If this principle applies also to future exercise intentions, then people who take a far-future perspective with the abstract goal of exercising more next year might tend to focus on the feasibility of an outcome while ignoring the desirability of achieving it. Conversely, people who take a near future perspective with a specific goal of exercising more next week might tend to focus on the desirability of an outcome while ignoring the feasibility. Similarly, strategies and positive versus negative consequences might be affected by spontaneous generation of "best case" and "worst case" scenarios, in which people tend to overestimate the negative impact on self-satisfaction of not meeting their exercise goals (Newby-Clark, 2005).

Finally, a greater understanding and explanation for our present findings might come from action identification theory (Vallacher & Wegner, 1985). This theory begins by asking the fundamental question, "What are you doing?" Answers to this seemingly trivial question differ according to how the action is identified. The major theoretical concern is the connection between actions and their identities. Any action can be defined at many different levels ranging from concrete to abstract. People identify their own actions in relatively specific or abstract ways. In the present research, we attempted to understand whether actions or reasons that are generated at a specific or general level are more effective in increasing intentions to exercise, but we did not measure levels of action identification. We might have intended that participants in the key conditions identify their self-generated actions as representing specific rather than general strategies aimed at making exercise more feasible, but we did not provide a comparison

level by which to judge what constitutes either “specific” or “feasible.” Both of these concepts might mean different things to different people, which might necessitate tailoring instructions to each individual if we want to promote exercise and better public health.

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Appendix A

STATEMENT OF CONSENT – Fall 2006

I, the undersigned, do hereby give my informed consent to my participation in the Pumpkin Spice Latte Study. I have been informed about each of the following:

- The purpose of the study is to test new items for the healthy heart campaign.
- The procedures of the study include answering a few questions about exercise.
- The benefits of the study include the opportunity to be involved in psychological experiments like the ones I've learned about in class.
- The risks of the study are negligible. After the completion of the study, the experimenter will answer any questions that I may have about the procedures.
- I understand that I will receive credit for this experiment at its completion and I cannot receive credit for participation in the current experiment more than once.

I understand that I may withdraw at any time before or during the experiment at my option.

Recognizing the importance of avoiding bias in the results of this experiment, I agree not to discuss any of the details of the procedure with other participants. I understand that all of the research and evaluation materials will be confidentially maintained. The means used to maintain confidentiality are:

1. My data will be given a code number for research identification, and my name will be kept anonymous.
2. Data, along with consent forms, will be kept in a locked file cabinet.
3. Only the investigators will have access to my identification data.

I understand that if I have questions concerning the research, I can call the following persons:

Shanna Mittie, Principal Investigator Department of Psychology 257-7414	Dr. Charles Lord Department of Psychology Faculty Advisor 257-7410
Dr Christie Scollon Chair, Dept of Psychology Human Subjects Committee 257-7410	Dr Timothy Hubbard TCU Committee on Safeguards of Human Subjects—Psychology 257-7410

_____ _____

Participant's Name (PLEASE PRINT) Date

_____ _____

Participant's Signature Phone Number

_____ _____ _____

Participant's TCU Student ID# Professor Course#

Appendix B (Specific Actions Condition)

Be Specific

One serious problem that most people have in thinking and communicating is that they are not specific enough in their ideas. Ask them how they are going to do something, for instance, and they will tell you that they are going to "do what it takes," or whatever. That's sloppy, imprecise thinking. It's always better for communication to be specific. Here's an example of what one high school student wrote on the topic of buying a car, and how the student's ideas might have been improved by being more specific.

How are you going to buy a car? What will you do to get it?

What the student wrote	**Improvement**
Work harder	Take a second after-school job at the pizza place where I can put in weekend hours
Save more money	Increase amount of my earnings that I deposit in my savings account by $40 per week
Economize on spending	Buy fewer CDs and rent books I want to read from the library instead of buying them

Notice that the ideas on the left are very vague, whereas the improved ideas on the right are much more specific. Specific ideas always carry more weight, because they get right down to the details that are important.

Now it's your turn to show that you understand about being specific. On the lines below, we want you to list actions you could take that would get you to exercise more. How would you accomplish that? What would you do that would make it happen? Please list 5 really good ideas, and remember to have each idea **be specific**.

1. _____

_____

2. _____

_____

3. _____

_____

4. _____

_____

5. _____

(Specific Reasons Condition)

Be Specific

One serious problem that most people have in thinking and communicating is that they are not specific enough in their ideas. Ask them why they are doing something, for instance, and they will tell you that they are doing it to "achieve my goals," or whatever. That's sloppy, imprecise thinking. It's always better for communication to be specific. Here's an example of what one high school student wrote on the topic of buying a car, and how the student's ideas might have been improved by being more specific.

Why are you going to buy a car? What do you hope to get out of it?

What the student wrote	**Improvement**
Be less dependent	Will not have to rely on parents to drive me to tennis and guitar lessons
Impress peers	Have a better chance of getting Melissa to go out with me
Achieve freedom	Be able to go out with friends Joe and Matt when and where I like

Notice that the ideas on the left are very vague, whereas the improved ideas on the right are much more specific. Specific ideas always carry more weight, because they get right down to the details that are important.

Now it's your turn to show that you understand about being specific. On the lines below, we want you to list reasons why you should exercise more. What would you get out of it? What good things would happen if you exercised more? Please list 5 really good ideas, and remember to have each idea **be specific**.

1. _____

_____

2. _____

_____

3. _____

_____

4. _____

_____

5. _____

Give the Big Picture (Abstract Actions Condition)

One serious problem that most people have in thinking and communicating is that they are too specific in their ideas. Ask them how they are going to do something, for instance, and they will tell you that they are going to "do X, Y, and Z," or whatever. That's tedious, overly detailed thinking. It's always better for communication to identify the larger concepts and give the big picture. Here's an example of what one high school student wrote on the topic of buying a car, and how the student's ideas might have been improved by realizing that what he wrote is just one instance of a much larger and more important theme.

How are you going to buy a car? What will you do to get it?

What the student wrote	**Improvement**
Take a second after-school job at the pizza place where I can put in weekend hours	Work harder
Increase amount of my earnings that I deposit In my savings account by $40 per week	Save more money
Buy fewer CDs and rent books I want to read from the library instead of buying them	Economize on spending

Notice that the ideas on the left are too detailed and confined to just one instance, whereas the improved ideas on the right are much more general and revealing of the overall strategies. More general and inclusive ideas always carry more weight, because they more effectively communicate the larger concepts.

Now it's your turn to show that you understand about giving the big picture. On the lines below, we want you to list actions you could take that would get you to exercise more. How would you accomplish that? What would you do that would make it happen? Please list 5 really good ideas, and remember to have each idea **give the big picture**.

1. _____

2. _____

3. _____

4. _____

5. _____

Give the Big Picture (Abstract Reasons Condition)

One serious problem that most people have in thinking and communicating is that they are too specific in their ideas. Ask them why they are doing something, for instance, and they will tell you that they are doing it to "get X, Y, and Z," or whatever. That's tedious, overly detailed thinking. It's always better for communication to identify the larger concepts and give the big picture. Here's an example of what one high school student wrote on the topic of buying a car, and how the student's ideas might have been improved by realizing that what he wrote is just one instance of a much larger and more important theme.

Why are you going to buy a car? What do you hope to get out of it?

What the student wrote	**Improvement**
Will not have to rely on my parents to drive me to tennis and guitar lessons	Be less dependent
Have a better chance of getting Melissa to go out with me	Impress peers
Be able to go out with friends Joe and Matt when and where I like	Achieve freedom

Notice that the ideas on the left are too detailed and confined to just one instance, whereas the improved ideas on the right are much more general and revealing of the overall goals. More general and inclusive ideas always carry more weight, because they more effectively communicate the larger concepts.

Now it's your turn to show that you understand about giving the big picture. On the lines below, we want you to list reasons why you should exercise more. What would you get out of it? What good things would happen if you exercised more? Please list 5 really good ideas, and remember to have each idea **give the big picture**.

1. _____

2. _____

3. _____

4. _____

5._____

Appendix C

(Reasons Conditions)

Next, we would like you to examine your five really good ideas. Please write your ideas again and tell us why you think each of them will be a really good motivator for doing more exercise. How will it have its effect? Do your best to spell out the connection for us.

1._____

2._____

3._____

4._____

5._____

(Actions Conditions)

Next, we would like you to examine your five really good ideas. Please write your ideas again and tell us why you think each of them will be a really good strategy for doing more exercise. How will it have its effect? Do your best to spell out the connection for us.

1._____

2._____

3._____

4._____

5._____

Appendix D (Dependent Measures)

Please circle the appropriate number on each scale to show your intentions to engage in exercise in the **second half** of the semester compared to the first half.

1. How much exercise do you intend to do?

-8 -7 -6 -5 -4 -3 -2 -1 00 +1 +2 +3 +4 +5 +6 +7 +8
Much No Much
Less than Change More Than
1st half 1st half

2. How much time do you plan to dedicate to exercise?

-8 -7 -6 -5 -4 -3 -2 -1 00 +1 +2 +3 +4 +5 +6 +7 +8
Much No Much
Less than Change More Than
1st half 1st half

3. How much more important do you think exercising will be to you?

-8 -7 -6 -5 -4 -3 -2 -1 00 +1 +2 +3 +4 +5 +6 +7 +8
Much No Much
Less than Change More Than
1st half 1st half

4. How much more of an emphasis would you be willing to give to exercising?

-8 -7 -6 -5 -4 -3 -2 -1 00 +1 +2 +3 +4 +5 +6 +7 +8
Much No Much
Less than Change More Than
1st half 1st half

5. How much more time do you think that you will spend exercising?

-8 -7 -6 -5 -4 -3 -2 -1 00 +1 +2 +3 +4 +5 +6 +7 +8
Much No Much
Less than Change More Than
1st half 1st half

6. How much more effort do you intend to put into exercising?

-8 -7 -6 -5 -4 -3 -2 -1 00 +1 +2 +3 +4 +5 +6 +7 +8
Much No Much
Less than Change More Than
1st half 1st half

Appendix E

Please circle the appropriate number on the scale to show how you feel now about exercising.

1. How much more desirable does exercise seem to you now than before you participated in this experiment?

-5	-4	-3	-2	-1	00	+1	+2	+3	+4	+5
Much Less Desirable					No Change					Much More Desirable

2. How much more does it seem that you would get out of exercising than you used to think you would?

-5	-4	-3	-2	-1	00	+1	+2	+3	+4	+5
Much Less					No Change					Much More

3. How much more positive does the concept of exercising feel to you now than before?

-5	-4	-3	-2	-1	00	+1	+2	+3	+4	+5
Much Less Positive					No Change					Much More Positive

4. How much easier does it seem that it would be for you to exercise now than you thought it would be before participating in the experiment?

-5	-4	-3	-2	-1	00	+1	+2	+3	+4	+5
Much More Difficult					No Change					Much Easier

5. How much more likely is it that you would actually be able to exercise more starting now than you used to be able to do?

-5	-4	-3	-2	-1	00	+1	+2	+3	+4	+5
Much Less Likely					No Change					Much More Likely

6. How much more feasible or possible does it seem that you can exercise now than you used to think it was?

-5	-4	-3	-2	-1	00	+1	+2	+3	+4	+5
Much Less Feasible					No Change					Much More Feasible

Appendix F

Please copy your 5 actions from page 1 here in the same order. Then, for each action please rate on a scale from 0 (Not Desirable) to 10 (Very Desirable) how desirable or positive taking that action would be for you. Write that number in the blank provided under the **"How Desirable"** column. Next, please rate on a scale from 0 (Not Feasible) to 10 (Very Feasible) how feasible or possible it would be for you to actually take that action. Write that number in the blank provided under the **"How Feasible"** column.

Five Actions:	**How Desirable (0 – 10)**	**How Feasible (0 – 10)**
1.		
2.		
3.		
4.		
5.		

Please copy your 5 Reasons from Page 1 here in the same order. Then, for each reason, please rate on a scale from 0 (Not Desirable) to 10 (Very Desirable) how desirable or positive that outcome would be for you. Write that number in the blank provided under the **"How Desirable"** column. Next, please rate on a scale from 0 (Not Feasible) to 10 (Very Feasible) how feasible or possible it seems that the outcome would actually happen if you exercise more. Write that number in the blank provided under the **"How Feasible"** column.

Five Reasons:	**How Desirable (0 – 10)**	**How Feasible (0 – 10)**
1.		
2.		
3.		
4.		
5.		

Appendix G

Please write down your five really good ideas and rate to what extent you imagined the idea, got a mental picture and actually visualized it happening in your mind's eye when you were thinking about the idea itself.

1._____

0 1 2 3 4 5 6 7 8 9 10
did not visualize visualized it
it happening at all very vividly

2._____

0 1 2 3 4 5 6 7 8 9 10
did not visualize visualized it
it happening at all very vividly

3._____

0 1 2 3 4 5 6 7 8 9 10
did not visualize visualized it
it happening at all very vividly

4._____

0 1 2 3 4 5 6 7 8 9 10
did not visualize visualized it
it happening at all very vividly

5._____

0 1 2 3 4 5 6 7 8 9 10
did not visualize visualized it
it happening at all very vividly

Appendix H

Please describe what exercise means to you. We would like you to fill the complete page and use the back if necessary to give us a complete description of what exercise entails for you in particular, not just for the average person.

Appendix I

STATEMENT OF CONSENT – Fall 2006

I, the undersigned, do hereby give my informed consent to my participation in the Pumpkin Spice Latte Study. I have been informed about each of the following:

- The purpose of the study is to test new items for the healthy heart campaign.
- The procedures of the study include answering a few questions about exercise.
- The benefits of the study include the opportunity to be involved in psychological experiments like the ones I've learned about in class.
- The risks of the study are negligible. After the completion of the study, the experimenter will answer any questions that I may have about the procedures.
- I understand that I will receive credit for this experiment at its completion and I cannot receive credit for participation in the current experiment more than once.

I understand that I may withdraw at any time before or during the experiment at my option.

Recognizing the importance of avoiding bias in the results of this experiment, I agree not to discuss any of the details of the procedure with other participants. I understand that all of the research and evaluation materials will be confidentially maintained. The means used to maintain confidentiality are:

4. My data will be given a code number for research identification, and my name will be kept anonymous.
5. Data, along with consent forms, will be kept in a locked file cabinet.
6. Only the investigators will have access to my identification data.

I understand that if I have questions concerning the research, I can call the following persons:

Shanna Mittie, Principal Investigator Department of Psychology 257-7414	Dr. Charles Lord Department of Psychology Faculty Advisor 257-7410
Dr Christie Scollon Chair, Dept of Psychology Human Subjects Committee 257-7410	Dr Timothy Hubbard TCU Committee on Safeguards of Human Subjects—Psychology 257-7410

_____ _____

Participant's Name (PLEASE PRINT) Date

_____ _____

Participant's Signature Phone Number

_____ _____ _____

Participant's TCU Student ID# Professor Course#

Appendix J
(Near Future Reasons Condition)

On the lines below we want you to list reasons why you should exercise more starting next week than you are now. What would you get out of it? What good things would happen if you exercised more next week? Please list 5 really good ideas.

1. _____

_____

_____

2. _____

_____

3. _____

_____

_____

4. _____

_____

_____

5._____

_____

_____

(Far Future Reasons)

On the lines below we want you to list reasons why you should exercise more starting in 2007 than you are now. What would you get out of it? What good things would happen if you exercised more next year? Please list 5 really good ideas.

1. _____

_____

_____

2. _____

_____

3. _____

_____

_____

4. _____

_____

_____

5._____

_____

_____

(Near Future Actions)

On the lines below, we want you to list actions you could take that would get you to exercise more next week than you are now. How would you accomplish that? What would you do that would make it happen next week? Please list 5 really good ideas.

1. _____

_____

_____

2. _____

_____

3. _____

_____

_____

4. _____

_____

_____

5._____

_____

_____

(Far Future Actions Condition)

On the lines below, we want you to list actions you could take that would get you to exercise more starting in 2007 than you are now. How would you accomplish that? What would you do that would make it happen next year? Please list 5 really good ideas.

1. _____

_____

_____

2. _____

_____

3. _____

_____

_____

4. _____

_____

_____

5._____

_____

_____

Appendix K

(Reasons Conditions)

Next, we would like you to examine your five really good ideas. Please write your ideas again and tell us why you think each of them will be a really good motivator for doing more exercise. How will it have its effect? Do your best to spell out the connection for us.

1._____

2._____

3._____

4._____

5._____

(Action Conditions)

Next, we would like you to examine your five really good ideas. Please write your ideas again and tell us why you think each of them will be a really good strategy for doing more exercise. How will it have its effect? Do your best to spell out the connection for us.

1._____

2._____

3._____

4._____

5._____

Shanna K. Mittie

Curriculum Vitae
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Education

Master of Science, Psychology
Texas Christian University, Fort Worth, TX, 2006

Master of Liberal Arts
Texas Christian University, Fort Worth, TX, 2003

Bachelor of Science, Criminal Justice
Missouri Western State College, St. Joseph, MO, 1993

Experience

Texas Christian University, Fort Worth
Teaching Assistant, 2005-2007

Publications

Stewart, W., Eason, S., Sayers, C., Lord, C. G., **Mittie, S. K.**, & Taylor, C. A. (2006). An appraisal of commonly used volunteer blood donor incentives. *Journal of Transfusion, 46,* (9S), 203A-204. (abstract).

Posters and Presentations

Stewart, W., Eason, S., Sayers, C., Lord, C. G., **Mittie, S. K.,** & Taylor, C. A. (2006). An appraisal of commonly used volunteer blood donor incentives. Poster presented at the American Association of Blood Banks, Miami, FL.

Flukinger, E. P., Dalton, B. P., Taylor, C. A., & **Mittie, S. K.** (2006). Thumbs Up, Thumbs Down: The Effects of Positive and Negative Gestures on Perceived Attitude Change. Poster presented at the Student Research Symposium (SRS),Texas Christian University, Fort Worth, TX.

Taylor, C. A., **Mittie, S. K.,** Seitz, S. J., & Lord, C. G. (2007). Effects of the activation dimension of emotions on attitude-behavior consistency. Poster presented at the Southwest Psychological Association (SWPA), Fort Worth, TX. April 2007.

Professional Affiliations

American Psychological Association
Southwestern Psychological Association
Psi Chi

Commuity Service

Fall 2006: Organized Major/Minor Fair as well as decorated and worked psychology booth at fair. Psychology booth won "Spirit of the Fair" Award.

ABSTRACT

EFFECTS OF DIRECTED THINKING ABOUT SPECIFIC AND GENERAL ACTIONS OR REASONS ON INTENTIONS TO EXERCISE

by Shanna Kaye Mittie, M.S., 2007
Department of Psychology
Texas Christian University

Thesis Advisor: Charles G. Lord, Professor of Psychology

Two-thirds of spontaneous associations to future events involve antecedent actions that facilitate or inhibit the event and positive or negative consequences that might follow from the event. According to McGuire and McGuire (1991), these spontaneous associations are evolutionarily adaptive, because thoughts about antecedent actions help people shape their environments, and thoughts about possible consequences help people prepare to cope. By this reasoning, thoughts about facilitating antecedent actions affect perceptions of an event's feasibility, whereas thoughts about positive consequences affect perceptions of the event's desirability. Participants in the present two experiments were directed to generate either antecedent actions that would increase their level of exercise or positive consequences that would motivate them to exercise more. In both studies, participants who generated antecedent actions subsequently rated exercise as more feasible, but less desirable, than did participants who generated positive consequences. The results are viewed as consistent with theories of directed thinking and attitude processes.