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ABSTRACT

People daydream, plan, and anticipate. They think frequently about their own actual or potential behaviors, and create behavioral scenarios (or scripts) in which they are the main character. To investigate the relationship between thinking about a behavior and one's expectancies or intentions to perform that behavior, subjects (N=93) in Experiment 1 were induced to imagine six different behavioral scenarios, and to sketch out the scenario in cartoon form. The instructors asked 30 subjects to imagine and sketch themselves as the main character, 33 subjects to imagine and sketch their best friend, and 30 subjects to imagine and sketch a person they knew and disliked. If intentions are based on the relative availability of appropriate behavioral scripts, then it was hypothesized that intentions should change in the direction of imagined and drawn cartoon scripts, but only for subjects who drew themselves as the main character. Results suggest that thinking about a course of action--creating a self-referent behavioral scenario or script--can produce intention changes in the direction that is being imagined. Subjects, in essence, created salient behavioral scripts. In Experiment 2, subjects (N=21), repeated Experiment 1 to verify results, and then behavioral intentions were assessed 3 days after the cartoon task to see if initial changes persisted across time. Results of Experiment 2 replicated results of Experiment 1, and the magnitude of the induced changes appeared undiminished after a 3-day period. (PAS)

The Effects of Creating Behavioral Scripts on Personal Intentions

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Imagination and Expectation: The Effect of Imagining Behavioral Scripts on Personal Intentions

A great portion of our lives is focussed on private, internal events. We ruminate about past events ("I really enjoyed the concert last night"), engage in causal analysis ("Why did I like the concert so much?"), and make attributions ("The band was very good"). Additionally, we imagine possible alternative courses of action for situations that have occurred ("I should have said ..."), are occurring ("What would happen if I say ...") or might occur ("If this happens, I might try saying ..."). We daydream, plan, anticipate. In short, we frequently think about our own actual or potential behaviors -- i.e., we create behavioral scenarios (or scripts) in which we are the main character.

What are the effects of thinking about such behavioral scenarios? We know that thinking about sad scenes makes us sad, and that thinking about happy scenes makes us happy (e.g., Thompson, Cowan, & Rosenhan, 1980; Rosenhan, Salovey, & Hargis, 1981). We know that remembering past scenes or imagining novel ones can induce feelings of embarrassment, guilt, joy or any of a large number of affects that in turn influence our behavior in a wide range of social situations. But these examples concern affective reactions to different kinds of thoughts, and subsequent behavioral effects.

Questions concerning the cognitive effects of creating behavioral scenarios with oneself as the main character have yet to be explored. For instance, does the process of thinking about a behavior change the person's expectancy or intention to perform that behavior? While there is no evidence that bears directly on this question, a number of empirical studies and theoretical formulations do provide some suggestive hints.

One relevant set of findings concerns the phenomenon of belief perseverance -- the finding that people tend to cling to their initial beliefs or

impressions to a normatively inappropriate degree (cf. Anderson, Lepper, & Ross, 1980; Ross, Lepper, & Hubbard, 1975). Researchers in this area have suggested that judgments and beliefs about ourselves (Ross, Lepper, & Hubbard, 1975), about other people (Carroll, 1978; Ross, Lepper, Strack, & Steinmetz, 1977), and about social theories (Anderson, 1982 a & b; Anderson et al., 1980) are based on the relative availability (Tversky & Kahneman, 1973) of causal scenarios or scripts. That is, the occurrence of an event is judged to be likely to the extent that the person can easily imagine a plausible scenario in which it occurs. A person's judgment of the probability that a "risky" firefighter will be more successful than a "conservative" one (as in Anderson et al., 1980) depends upon the availability of risky/success and conservative/failure scenarios, relative to risky/failure and conservative/success scenarios. Similarly, people's expectancies about their own behavior in a given setting, that is their intentions, may be judgments based in part on the ease or difficulty of imagining themselves performing the various behavioral options. We expect to donate blood to the extent that it is easy to imagine a plausible scenario in which we are the main character who does in fact donate blood.

Clearly, a large number of variables other than scenario availability play a large role in a judgment of this type. The expected consequences of a given act will influence both the person's intention to act and the likelihood that he or she will act, as has been discussed by cognitive behavior theorists (e.g., Mahoney, 1974), social learning theorists (e.g., Bandura, 1977), and expectancy-value theorists (e.g., Atkinson, 1964). Similarly, the plausibility of an imagined scenario also will influence behavioral expectancy judgments. For example, I may generate a "nuclear war" scenario in which I participate as a blood donor. The fact that such a scenario is readily available or easy to generate does not guarantee that I expect to

donate blood in the near future. To the extent that I judge such a scenario to be implausible, my self-expectancies concerning blood donation may be quite low. Thus, while numerous factors influence intentions, the general proposition to be examined in this paper is that when other factors are held constant, a person's self-expectancy or intention to perform a given act is a function of the availability of scenarios that include that act.

A second relevant approach to this question is the script theory of Abelson and colleagues (Abelson, 1981; Schank & Abelson, 1977). This approach points out that we participate in many behavioral events that occur frequently and with little variation. For such situations, we develop a schematic conception or a cognitive script that guides our understanding of the situation and our behavior in it by preparing us for the next scenes. That is, we come to expect certain events to occur, often in a specified order. Thus, in our restaurant script, we expect to be seated, examine a menu, order a meal, receive the meal, eat it, pay for it, and leave the restaurant.

Once a script has been formed (on the basis of repeated occurrences) and activated (by the instantiation of the relevant situational participation criteria), it presumably influences our expectations and intentions, our interpretations of immediate events, and our behavior in that situation. While there is some empirical evidence that once formed such scripts do influence one's behaviors, interpretations, and memory processes (see Abelson, 1981, for a review), there is no research on the formation of individual scripts or on how such scripts influence intentions.

This brings us back to the earlier question about the relationship between thinking about a behavior and one's expectancies or intentions to perform that behavior. Briefly, both the perseverance literature and the script notions discussed above suggest that any manipulation that increases the availability of a given behavioral scenario (or script) should (all else

being equal) increase one's expectancy to perform that behavior. One factor that typically increases the availability of particular events in memory is frequency of presentation. Thus, thinking about a behavioral scenario should increase one's intention to perform the target behavior. Furthermore, the change in intention brought about by imagining a type of scenario should be a monotonic function of the frequency that similar scenarios are imagined. The present experiments were designed to test these predictions.

EXPERIMENT 1

In an experiment on "Creativity in Imagination Processes," subjects were induced to imagine a particular behavioral scenario, and to sketch out the scenario in cartoon form. The cartoon task was selected because subjects get very involved in it, and because we can examine the drawn cartoons to insure that the proper scenarios were imagined. Each subject did this for six different scenarios. For each subject, three of the scenarios had the main character deciding to do the target behavior (positive scenario); the other three scenarios had the main character deciding to not do the target behavior (negative scenario). Within each of these two sets, one scenario was presented (and imagined and drawn) three times, one was presented twice, one was presented once. Approximately one third of the subjects were instructed that the main character in each scenario was to be themselves; another third were to use a close friend and the remaining third were to use a disliked acquaintance as the main character. The latter two conditions were included to test several competing explanations of the effects proposed for the self-as-main-character condition. For each subject, intentions (self-expectancies) concerning each of the six target behaviors were assessed both before and after the cartoon task. The main prediction was that for subjects drawing cartoons with themselves as the main character, expectancy to engage in a behavior would change in a direction congruent with the scenarios for that behavior, and

would show greater change the more often the scenario had been presented. It was further predicted that there would be no systematic change in intentions among subjects whose cartoons had a friend or a disliked acquaintance as the main character.

Method

Subjects

Ninety-three college students at Stephen F. Austin State University participated for course credit. Subjects were run in groups ranging in size from 11 to 36. Within each session, subjects were randomly assigned to the various experimental conditions.

Procedure

Upon arrival, subjects were told that they would be participating in a study on "creativity in imagination processes." Their task was explained as follows: "Your main task will be to sketch out, in cartoon panel form, a number of different action sequences or scripts. For each script you will be given the script title and a brief general description of the action sequence you are to create." It was further explained that the experimenter was not interested in drawing skills, but in the creativity of ideas displayed in the cartoons. Subjects were then given booklets that contained further instructions. Specifically, subjects were told that: a) a given script may be presented more than once; b) a different version of the script should be drawn each time it is presented; c) since creativity may be influenced by the relevance of the script to the subject, several rating scales were to be completed at several points in the experiment. Finally, the booklet instructions stated who was to be the main character in the scripts. For 30 of the subjects, the instructions read, "In each script you are to imagine (and sketch)

yourself as the main character." For 33 subjects, "your best friend" was the main character; for 30 other subjects "a person you know and dislike" was the main character.

Six target behaviors were selected for the cartoon task. These were blood donation, tutoring, taking a new part-time job, running for student government office, changing academic major, and taking a trip over spring break. Two scripts were prepared for each of these target behaviors. In the positive script the main character was to perform the target behavior; in the negative script the main character was not to perform the behavior. The positive blood donation script follows.

> This action sequence should begin with a scene in which the possibility of donating blood comes to the attention of the main character. The action sequence should end with the main character donating blood. If you have sketched this script previously, be sure to create a different version this time.

The negative blood donation script was identical, except that the sequence was to end with the main character "not donating" blood. In a similar fashion, positive and negative scripts were created for all six target behaviors.

Each subject imagined and sketched a script for each of the six target behaviors. Three of the scripts were positive; three were negative. One positive and one negative script were presented three times; one of each was presented twice; one of each was presented once. Thus, each subject imagined and sketched 12 cartoons under 2 script directions (positive vs. negative) and 3 frequencies (3 vs. 2 vs. 1).

Each of the 12 cartoons was presented on a separate page of the booklet. Each page contained the script title (the target behavior), a description of the script to be imagined and drawn, and 5 blank cartoon panels. The presentation order of target behaviors, script direction, and frequency was counterbalanced across subjects. Since order did not have any effects, it will not be discussed further.

Dependent Measures

Before and after the cartoon task, subjects' intentions concerning each of the target behaviors were assessed on 10-point scales. Subjects indicated their intentions by placing "Xs" on segmented lines anchored at "will definitely (donate blood, take a trip, etc.)" (coded as a 9) and "will definitely not (donate blood, take a trip, etc.)" (coded as a 0). The main dependent variables were the changes in intentions (post minus pre cartoon) to perform the target behaviors. Thus, a positive change score indicated an increased intention to engage in the target behavior, while a negative change score indicated a decreased intention. The last page in each booklet assessed subjects' evaluations of the overall consequences of each of the six target behaviors on 9-point scales anchored at "consequences are all positive" (9), "are equally positive and negative" (5), and "consequences are all negative" (1). This measure allowed a test of whether the perceived value of an action was changed by the cartoon task.

A final set of dependent measures were derived from the cartoons that subjects drew. One cartoon was randomly sampled from each subject's booklet. These cartoons were examined by a rater blind to the purposes and hypotheses of the experiment. The rater assessed each cartoon, using 9-point rating scales, on how detailed the cartoon was, its vividness, humor, creativeness, realism, overall quality, and how likeable the main character seemed. These

measures were designed to examine possible differences between the main character manipulations.

At the completion of the experiment, each subject was thoroughly debriefed about the purposes, hypotheses, and potential impact of the study.

Results and Discussion

Intention Changes

Six intention change scores, one for each of the six experimental conditions (and the six target behaviors), were obtained for each subject. If intentions are based on the relative availability of appropriate behavioral scripts or scenarios, as suggested earlier, then intentions should change in the direction of imagined and drawn cartoon scripts, but only for subjects who drew themselves as the main character. For these subjects, intentions to perform a behavior should increase for positive scripts and decrease for the negative ones. Furthermore, the amount of change should depend upon the frequency that a given script was drawn. To test this prediction across target behaviors, a slope and intercept was calculated for each subject using the intention change scores as the Y variate and the frequency and script direction conditions (-3, -2, -1,+1, +2, +3) as the X variate (see Anderson & Jennings, 1980, for a similar analysis). To the extent that the intention changes occurred as predicted, the average slope should be significantly greater than zero. Similarly, the average intercept reveals the extent to which positive and negative script induced changes are symmetric about zero. That is, a positive intercept would indicate that the positive scripts had a larger impact, while a negative intercept ould indicate that the negative scripts had a larger impact. Figure 1 presents the results of this analysis in the form of regression lines based on the average slope and intercept for each of the three main character conditions. It can be seen in Figure 1 that intention changes

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Insert Figure 1 About Here

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were produced as predicted for subjects in the self-as-main-character conditions; the average slope was significantly larger than zero, $t(29) = 2.95$, $p < .01$.[1] Figure 1 also shows that these effects were of about the same size for the positive and negative scripts; the average intercept did not differ from zero, $t < 1$.

Also as expected, the cartoon task did not produce corresponding intention changes for subjects who drew a friend or a disliked person as the main character, t s < 1. This lends support to the view that the intention changes were due to the increased availability of relevant self-referent scripts, not to changes in general conceptions of the target behaviors. A more stringent test of the difference between the slope of the self condition and the averaged slopes of the friend and disliked person conditions supported this, although weakly, t (90) = 1.74, p =.09.

While the above analyses confirm the overall predictions, examination of intention changes brought about by the different frequency manipulations are also of interest. Thus, the amount of intention change congruent with script direction was examined separately for cartoons drawn once, twice, and three times. This was accomplished by assigning a contrast weight of +1 to intention changes for positive scripts and -1 for intention changes for negative scripts, for each of the three levels of frequency separately. A series of t - tests (essentially, simple effects tests) were performed to assess the effects of the cartoon task.

Imagining and drawing a behavioral script once had no reliable effect on intentions, all ts < 1. Presentation frequencies of two and three, however,

produced reliable changes in intentions when the subjects drew themselves as the main character ($ts(29) = 1.92$ and 2.03, $ps = .07$ and $.05$ respectively), but not when a friend or disliked person was the main character ($ts < 1$). Since the effects of these multiple repetitions did not differ ($ts < 1$) they were combined for each subject and analyzed together. As expected, when a given script was presented multiple times (2 or 3), imagining and drawing the script led to significant changes in behavioral intentions for the self condition, $t\ (29) = 3.05$, $p < .005$, but not for the friend and disliked other conditions, $ts < 1$. Additional analysis on this multiple presentation measure revealed that the changes in behavioral intentions were significantly greater for the self than for the friend and disliked person conditions, $t\ (90) = 2.05$, $p < .05$.

One final set of comparisons concerns the relative size of effects produced by the different presentation frequencies. As pointed out earlier, the two multiple presentation levels did not reliably differ from each other, but both produced significant intention changes for the self condition. Were these changes significantly greater than those produced by the single presentation? A contrast assessing this comparison was calculated for each subject. As expected, for subjects in the self condition the multiple presentations produced significantly more intention change than did the single presentation, $t\ (29) = 2.01$, $p = .06$. Also as expected, there were no differences in the friend and disliked person conditions, $ts < 1$. Finally, the difference between multiple and single presentation effects was significantly larger in the self condition than in the remaining conditions, $t\ (90) = 2.05$, $p < .05$.

Overall, the results of the intention change measures suggest that thinking about a course of action, that is, creating a self-referent behavioral scenario or script, can produce intention changes in the direction that is

being imagined. The subject has, in essence, created a salient behavioral script. The person's intention seems to derive from an answer to the self-question, "How easy is it to imagine myself doing (or not doing) X?"

Alternative Explanations

There appear to be four sets of alternative explanations for the results in the self-as-main-character condition. Each will be examined in detail.

Experimenter Demand and Evaluation Apprehension. Since subjects' intentions were assessed both before and after the cartoon task, subjects may have guessed the experimenter's interest in intention change, and may have complied with the experimenter's implicit demands to show the appropriate changes (Orne, 1962). Alternatively, subjects' evaluation concerns (Rosenberg, 1969) might have led to the observed intention changes, from attempts to "look good" to the experimenter. There are several compelling reasons to believe that neither experimenter demand nor evaluation apprehension produced the observed intention changes.

Let's first consider the experimenter demand hypothesis. A fairly extensive literature on the general notion of experimenter demand shows that subjects do not, in general, try to support experimenters' hypotheses (Berkowitz & Donnerstein, 1982; Kruglanski, 1975; Silverman, 1977; Weber & Cook, 1972). Indeed, subjects often attempt to avoid confirming them.

Empirical data gathered to assess the demand characteristics of the present paradigm also contradict the demand hypothesis.[2] Two additional groups of subjects were presented with the stimulus materials from either the self or the friend main character conditions. Their task was to examine the materials in order to figure out the experimenter's hypothesis. Subjects were then asked to predict the pattern of intention changes that the experimenter wanted, on 7-point rating scales. These predictions were analyzed using the same

type of analyses presented earlier. The "demand" hypothesis makes four predictions; disconfirmation of any of the four rules out the demand interpretation. First, subjects examining the "self" stimulus materials should "predict" positive slopes for intention change. Second, "friend" subjects should predict slopes that are not different from zero, and that are significantly less than those predicted by self condition subjects. Third, "self" subjects should predict more change for multiple presentation frequencies than for single presentations. Fourth, "friend" subjects should predict no differential intention changes as a function of presentation frequency, and should be significantly lower on this index than "self" subjects. Again, if any of these predictions do not hold, then the demand hypothesis is disconfirmed. Three of these four predictions were disconfirmed. "Self" condition subjects did predict positive slopes on the intention change, t (12) = 4.14, $p < .01$, but "friend" subjects also predicted such intention changes, t (13) = 3.71, $p < .01$. Furthermore, the Self and Friend predictions did not differ, t (25) = 0.11 (compare to the intention changes presented in Figure 1). Finally, neither self or friend condition subjects predicted the presentation frequency effect (ps >.16 and .14, respectively), and there was no mean difference between the predictions of these groups, $t(25) = -.54$.

In sum, since the predictions of these subjects (who explicitly tried to figure out the experimental hypothesis) do not parallel the actual results, the obtained intention changes could not have resulted from experimenter demand.

To address the evaluation apprehension hypothesis, these additional subjects were also asked to predict the pattern of intention changes given by subjects who wanted to look good or intelligent to the experimenter. The same four predictions outlined above for the demand hypothesis apply to the

evaluation apprehension hypothesis. To quickly summarize these results, all four predictions were disconfirmed (all ts < 1). Subjects who examined the "self" condition or the "friend" condition materials predicted that the way to look good to the experimenter was to show no intention change. Since it appears that subjects frequently try to look good (i.e., intelligent, healthy, normal), even when to do so conflicts with supposed experimenter demands (cf. Carlsmith, Ellsworth, & Aronson, 1976; Weber & Cook, 1972), this finding suggests that the present paradigm underestimates the true amount of intention change induced in the self-as-main-character condition.

Learning Scripts vs Alternative Behaviors. Subjects may not have learned (or self taught) behavioral scripts but rather may have learned about possible alternative modes of responding in a given situation. For example, in drawing a cartoon in which the main character refuses to donate blood, the subject may learn ways of refusing to donate blood, rather than a sequence of events that leads to a refusal. However, this alternative explanation also predicts that intention change should occur equally in all three main character conditions. As we saw earlier, though, change occurred only (and more significantly) in the self-as-main-character condition. It thus appears that intention change was based on script availability, and that scripts with other people as main characters were not used to assess one's own intentions.

Differences in Cartoon Quality. Intention change may have been limited to the self condition because the imagined scenarios and cartoons were in some sense better in that condition. Subjects might be more motivated and involved when drawing themselves as the main character, which could lead to creation of cartoons that are more memorable and therefore more influential on one's intentions. To test this possibility, one cartoon was randomly

selected from each of 86 subjects.[3] A rater blind to the purposes of the experiment, the predictions, and the main character condition of the various cartoons, rated each of these 86 cartoons on 7 dimensions that might differentiate the cartoons. The quality-of-cartoons explanation predicts that cartoons drawn by subjects in the self condition should be more detailed, more vivid, more humorous, more creative, more realistic, better overall, and the main character should be more likeable than in cartoons from the other main character conditions. Each rating was made on a 9 point scale where 9 indicated high levels on each of the above dimensions. Table 1 presents the means of these ratings and the t - tests of the contrast comparing the

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self condition to the average of the other two conditions. Contrary to the quality or memorability alternative explanation, the differences that existed showed the self cartoons to be worse, not better. The self cartoons were less detailed, less vivid, less creative, and worse overall than the friend and disliked person cartoons, $ts(83) \geq 2.00$, $ps < .05$. The cartoons did not differ in their humor, realism, or likeability of the main character, $ts(83) < 1.25$.

Change in Consequences. Intention change may have occurred because imagining and drawing behavioral scripts may have led to changes in subjects' assessments of the value or overall consequences of the target behaviors. A number of researchers have theorized and empirically demonstrated that motivation to perform a behavior is strongly influenced by the perceived value of the behavior (cf., Atkinson, 1964; Ajzen & Fishbein, 1980; Bandura, 1977). Considering a positive script may make salient the positive features of that target behavior, while considering a negative script may make negative

features salient (cf. Tesser, 1978). Thus, the cartoon task may have changed intentions by changing the perceived consequences of the target behaviors.

There are several problems with this alternative explanation. First, why should such changes in perceived consequences occur only in the self main character condition? Since intention changes occurred only in that condition, perceived consequence changes must match this pattern to remain a plausible explanation.

Furthermore, recall that upon completion of the experiment each subject rated the perceived consequences of the various target behaviors. We can estimate the effect of the cartoon task on perceived consequences by subtracting the perceived consequences for negative scripts from the perceived consequences for positive scripts, for each subject. If the cartoon task did change the perceived consequences as suggested above, the average of the difference scores should be greater than zero, but only for the self-as-main-character condition. The results did not support this alternative explanation. The difference in the perceived consequences of positive and negative script behaviors was not significant for any of the three main character conditions, all ts < 1.29. Furthermore, there was no difference between the self and the other two conditions on this measure, $t < 1$.

One could maintain that the lack of changes in perceived consequences here may have been due to use of a poor (unreliable) measure of perceived consequences. If the measure was a good one, we would expect behavioral intentions to be significantly correlated with perceived consequences. Correlations were calculated between subjects' intentions (both pre and post cartoon) and their ratings of perceived consequences for each of the six target behaviors. All twelve of these correlations were positive and significant at the .01 level; the lowest was .28, the highest .47. Thus, the measures of perceived consequences were strongly related to

intentions, but were unchanged by the cartoon task, ruling out this final alternative interpretation.

EXPERIMENT 2

The second experiment served two main purposes. First, it was designed to provide a replication of the main results from the self-as-main-character condition in Experiment 1. Second, behavioral intentions were also assessed three days after the cartoon task to see if the initial changes persisted across time.

Method

Subjects

Subjects were 21 Rice University undergraduates in a social psychology class. Their participation was part of a series of in-class demonstrations of methodological and conceptual approaches to knowledge.

Procedure

Session 1. Instructions, materials and procedures during this session were identical to those in Experiment 1 with the following exceptions: 1) All subjects drew themselves as the main character in their cartoons. 2) Only two target behaviors were examined, blood donation and joining a political action group. 3) Each subject drew 3 positive sketches of one target behavior and 3 negative sketches of the other. The order and direction of these scripts were counter-balanced and randomly assigned, as in Experiment 1. 4) At the completion of the perceived consequences ratings, subjects were asked to print their names and phone numbers on the back of their booklets, supposedly so they could be contacted by a graduate student doing survey research on attitudes.

Session 2. Three days later, all members of the class, including both those students who had and those who had not participated in Session 1,

were asked to complete the behavioral intention measures on blood donation and joining a political action group. This was explained as being necessary to understanding the class discussion that was to follow. All were then asked to print their names on the scales and to return them to the instructor. This allowed the experimenter to match responses from the two sessions. In the course of later class discussions, all subjects were thoroughly debriefed about the purposes and results of the experiment.

Results

Mean changes in behavioral intentions from initial (pre-cartoon) intentions are presented in Table 2, for both sessions. Table 2 also presents

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the t - tests resulting from within subjects analyses of the intention changes. These results replicated the findings of Experiment 1. Imagining and sketching self-referent behavioral scripts led to significant intention changes congruent with the script, t (20) = 3.28, $p < .01$. More impressive, perhaps, was the finding that such intention changes were still evident three days after the cartoon task, t (18) = 3.03, $p < .01$.[4]

As in Experiment 1, the ratings of perceived consequences of the target behaviors were examined for possible effects of the cartoon task. Also as in Experiment 1, the cartoon task had no effect on perceived consequences, $t < 1$.

Finally, for both target behaviors the perceived consequences ratings were correlated with each of the three measures of behavioral intentions (pre-cartoon, session 1 post-cartoon, and session 2). All of these six correlations were positive and at least marginally significant ($p < .10$), ranging from .39 to .63.

Thus, Experiment 2 successfully replicated the basic findings of Experiment 1. Inducing subjects to imagine and sketch themselves performing a behavior (including refusing to do something) led to significant changes in behavioral intentions. Furthermore, the magnitude of the induced changes appeared undiminished after a three day period.

General Discussion

The results of the present studies are related to a number of phenomena. Before discussing these though, it must be emphasized that the present studies showed changes in behavioral intentions, not in the target behaviors. However, it is important to note that specific behavioral intentions do tend to correlate quite highly with actual behavior (cf., Ajzen & Fishbein, 1980). In the present studies, behavioral intentions were assessed in as specific a way as seemed reasonable for each of the target behaviors. For example, the scale assessing subjects' intentions concerning taking a new part-time job asked, "How likely are you to take a new part-time job within the next 6 months?" Thus, the intention was assessed for a specific and relatively short period of time.

In sum, though no attempt was made in these initial studies to assess the impact of the cartoon task on the target behaviors, a vast array of theoretical and empirical work suggests that the intention changes should lead to corresponding behavioral changes (see Ajzen & Fishbein, 1980, and Fishbein & Ajzen, 1975, for reviews of much of this work). Additional research on this issue is currently in progress.

Memory for Self-images and Other-images

Recent work in memory suggests that in addition to the traditional verbal-propositional system, people often store information in images (Bower, 1972; Kosslyn & Pomerantz, 1977; Pavio, 1971). Lord (1980), for instance,

demonstrated that images were more effective memory aids for information about other people than for information about the self. Lord also showed that self-imaged behavior was less salient than other-imaged behavior. Experiment 1 replicated and extended this latter finding of qualitative differences in images that were self versus other-referent. Recall that self-referent cartoons were rated as less detailed, less vivid, less creative, and of lower overall quality than friend and disliked other-referent cartoons. Lord's work and the present differences in cartoon quality suggest that the scripts produced with a friend or a disliked other should also be more memorable than self-referent scripts. Yet changes in behavioral intentions occurred only for subjects in the self-as-main-character condition, an effect attributed to changes in script availability. While this may seem paradoxical, the apparent contradiction is easily understood when we consider the subject's judgmental task. Each subject was asked about his or her own intentions. Only self-referent scripts would be seen as relevant to this judgment. Had subjects estimated the likelihood that other people (i.e., friend and disliked person) would engage in the various target behaviors, the superiority of imagery as a memory aid for other-referent behavior would likely be shown by relatively large expectancy-changes. In the present case, however, availability of scripts in which other people engaged (or did not engage) in the target behaviors was probably seen as irrelevant to self-intentions. The extent to which script availability influences expectations about other people is a question warranting further investigation.

Self-erasing Prediction Errors

Sherman (1980) has shown that people tend to overpredict the degree to which they would perform the socially desirable behavior in a choice situation, but that such predictions tend to be self-fulfilling prophecies. In

Sherman's first experiment, for example, only 29% of subjects that were asked to predict their compliance or non-compliance to a counter-attitudinal request said that they would comply. A group that was given the counter-attitudinal request (but not the prediction task) demonstrated a 67% actual compliance rate. Since subjects were randomly assigned to conditions, the discrepancy between the predicted rate and actual compliance rate can be seen as a "misprediction". Most interesting, though, was the actual compliance rate of subjects asked to predict their response before being given the request. Only 33% of these subjects complied, confirming their initial prediction (29%), and "erasing" the misprediction. Sherman theorizes that the predictions influenced later behavior by changing the subjects' cognitive representations of that particular behavior sequence. That is, in order to make a prediction the subject must create a cognitive representation of the situation and, in essence, imagine his or her behavioral response. This hypothesized imagination task should lead to the formation of a behavioral script, much as the cartoon task of the present investigations, and should lead to changes in behavioral intentions. While Sherman did not measure such intentions, the present studies can be seen as providing converging evidence for the script formation--behavior intention--behavior performance sequence.

Relation to Therapeutic Phenomena

Several therapeutic procedures may be further understood by noting how they relate to these findings that intentions and subsequent behaviors can be modified by simply imagining self-referent behavioral scenarios. Covert modeling, covert desensitization, and role playing procedures frequently have the client imagine (and sometimes "play out" behavioral

scenarios in which the main character performs some desired behavior or does not perform some undesired behavior (see Mahoney, 1974; Meichenbaum, 1977). While such treatments are multidimensional in nature, the present studies suggest that at least part of their effectiveness lies in the formation of new behavioral scripts for the client. The present results further suggest that these procedures will be more effective in producing intention and behavior change when the main character in the imagined scene is the client rather than some other role model. Interestingly, there appears to be only one published covert modeling study explicitly designed to test this notion (Kazdin, 1974). In that study, no difference was found between imagining oneself versus a similar other in the treatment of snake avoidance behaviors. Further research is needed to test this prediction, and to see if other factors such as increased anxiety or decreased scenario plausibility might mitigate the effectiveness of self-scenarios in therapy.

Thought in Natural Settings

In everyday, natural settings, we all engage in imagination processes such as reflecting, planning, and ruminating. Decisions about what we or other people are likely to do are often made on the basis of "how easy" it is to imagine a sequence of actions occurring. When we create such scenarios for all (or at least the major) possible actions in a given situation, the script availability heuristic will have relatively little impact on our final course of action; all scripts will simply become slightly more available. In this case, the behavior chosen probably will depend more upon such considerations as the perceived consequences of the various acts and the perceived likelehood that the act can be performed (see Bandura's distinction between outcome expectations and efficacy expectations, 1977). But when only one (or a few related) scenarios are imagined and re-imagined,

that thought process itself may lead to intention and behavioral changes independent of perceived consequences. There are a number of reasons why a person may think about only one course of action. First, a plausible intuitive theory of how to decide whether or not to do a particular action is to simply think about it. The importance of thinking about alternatives may not be apparent (cf. Nisbett & Ross, 1980). Second, one may be encouraged by one's peers to think only of one course of action, to preserve the harmonious nature of the group, as has been documented by Janis(1972) in his work on the groupthink phenomenon. Thus, a juvenile gang may force its members to think only of protecting its territory, or a high level policy group may allow its members to think only of how the favored action may succeed. Third, an individual's mood state may restrict the types of actions a person imagines. Understanding how these variables affect imagination processes, and how imagination processes affect intentions and actions, seems essential to understanding social behavior.

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Footnotes

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1. All p levels are two-tailed.
2. Details concerning the procedures and results of this experiment may be obtained by writing to the author.
3. Cartoons were not available from the other 7 subjects. Note, however, that removing these subjects from all other analyses does not appreciably alter any of the results.
4. Two subjects did not return for the second session, producing the smaller sample size. Removing their data from the session 1 analyses does not appreciably change the results. Also note that further analyses revealed no difference between intention changes at session 1 and session 2, $F(1,18)<1$.

Table 1. Quality of Cartoon Ratings, and t - tests of Differences between Self-referent and Friend and Disliked Person-referent Cartoons, Experiment 1.

	Rated Dimensions [a]						
Main Character	Detail	Vividness	Humor	Creativeness	Main Character Likeability	Realistic	Overall Quality
Self	4.1	4.5	2.1	4.3	4.3	4.6	4.4
Friend	5.1	5.4	2.9	5.4	4.9	4.6	5.1
Disliked Person	5.0	5.4	2.4	5.6	4.7	4.2	5.1
t (83)[b]	2.17*	2.18*	<1	2.53*	1.24	<1	2.00*

* $p < .05$

[a] Ratings were made on 9-point scales where "9" indicated high levels and "1" indicated low levels on the dimension.

[b] Contrast t - tests of the difference between the Self and the average of Friend and Disliked Person conditions. Note that where the contrast is not significant, there were also no overall significant differences between conditions, Fs (2, 83) < 1.

Table 2. Mean Change in Behavioral Intentions as a Function of Script Direction Assessed by *t* - tests, Experiment 2. [a]

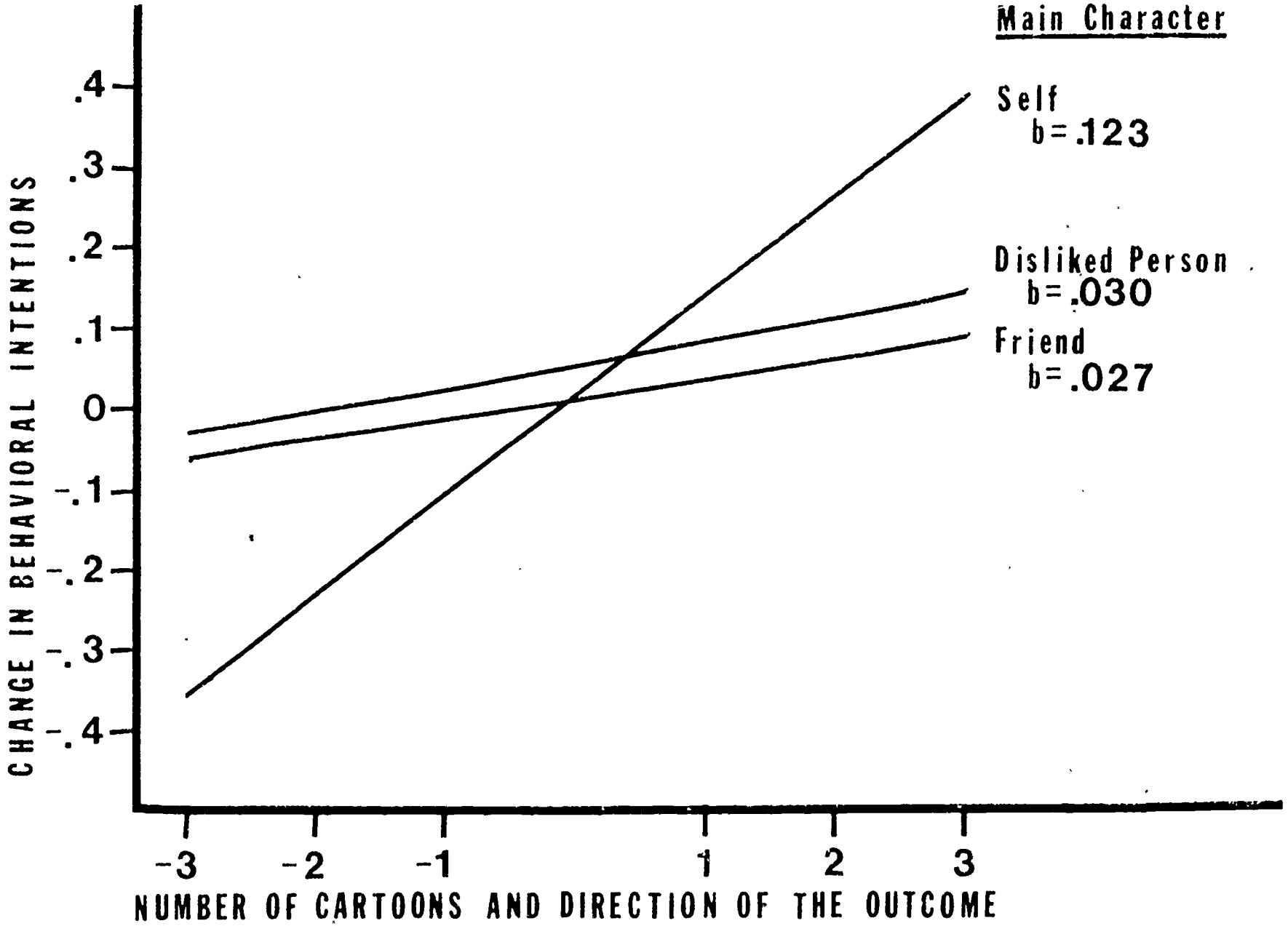
	Script Direction			
	Positive	Negative	n	t (DIFF)
Session 1 (immediate)	.43	-.19	21	3.28*
Session 2 (3 day delay)	.53	-.37	19	3.03*

* $p < .01$

[a] In all scripts, the subject was the main character. Each script was presented 3 times. Positive scores indicate intention changes in the direction of being more likely to engage in the target behavior; negative scores indicate changes in the direction of being less likely to engage in the target behavior.

Figure Caption

Figure 1. Change in Behavioral Intentions as a Function of Direction of Cartoon Script and Frequency of Script Presentation, Experiment 1.


Main Character
Self
b=.123
Disliked Person
b=.030
Friend
b=.027
CHANGE IN BEHAVIORAL INTENTIONS
.4
.3
.2
.1
0
-.1
-.2
-.3
-.4
-3
-2
-1
1
2
3
NUMBER OF CARTOONS AND DIRECTION OF THE OUTCOME