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

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The effects of imagining behavioral scripts on personal intentions were investigated in two experiments. Subjects imagined either themselves, a friend, or a disliked acquaintance performing or not performing a series of target behaviors. Subjects also sketched these behavioral scenarios in cartoon-panel form. Intention changes were assessed in a pre–post design. Experiment 1 demonstrated that (a) imagining oneself performing (or not performing) a target behavior produces corresponding changes in intentions towards that behavior; (b) the more frequently one imagines oneself in a behavioral script, the more intention change is produced; (c) such changes in personal intentions do not occur when the main character of the script is not oneself. Experiment 2 replicated the basic effect and demonstrated that the intention changes persist over at least a 3-day period. These effects are discussed in terms of judgmental heuristics used to assess intentions and in terms of Abelson's script theory. Alternative explanations are considered and rejected on the basis of supplementary data. The relations between the present findings and research on memory for self and other images, on self-erasing prediction errors, and on several therapeutic phenomena are also discussed.

A great portion of our lives is focused 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, and anticipate. In short, we frequently think about our own actual or potential behaviors; that is, 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., Rosenhan, Salovey, & Hargis, 1981; Thompson, Cowan, & Rosenhan, 1980). 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. However, 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? Although 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 oneself (Ross et al., 1975), about other people

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(Carroll, 1978; Ross, Lepper, Strack, & Steinmetz, 1977), and about social theories (Anderson, 1982, 1983; 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" fire fighter will be more successful than a "conservative" one (as in Anderson et al., 1980) depends on 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 difficultly 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, although numerous factors influence intentions, the general proposition to be examined in this article 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 his 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. Recent work by Gregory, Cialdini, and Carpenter (1982) and by Wilson and Capitman (1982) support this analysis, but not unambiguously. That is, these studies (and others that purportedly require a script interpretation) can be explained by other nonscript-like constructs.

The three main problems of the script studies to date have been (a) problems of perceived experimenter demands, (b) manipulations that may simply make the target behavior more salient for the "script" subjects than for control subjects, and (c) manipulations that differentially influence the target-behavior evaluations (or attitudes) of script and control subjects. The first problem is fairly obvious: Are script subjects influenced by script processess or by manipulations suggesting what the experimenter wants? The second problem is more subtle, being based on what is meant by a script. Although definitions do vary, a common feature is that scripts are composed of organized sequences of scenes or events. Some script manipulations, though, vary whether or not the target behavior is presented. Such manipulations may produce changes in intentions or behavior because of changes in the relative salience or availability of the target behavior and not because the target behaviors occurred as part of an organized sequence of events.

The third problem is also a difficult one. The script theory implies that intention and behavior change should be possible with a

purely cognitive manipulation. Some script manipulations, though, change attitudes or evaluations of target behaviors as well. In one of the more impressive experiments in this area, Gregory et al. (1982, Experiment 4) demonstrated significant script effects on intentions (Likelihood, Question 5) and behavior concerning subscribing to a new cable TV service. This study handled both the demand and the salience of target-behavior problems quite well. However, the experimental script manipulation, which had subjects imagining positive consequences of getting cable TV, also produced more positive attitudes towards cable TV compared to the control condition. Were the subsequent intention and behavior effects due to an induced attitude change, to cognitive scripts, or to both? Although one cannot be certain in this experiment, removing the effects of attitudes (by calculating the semipartial correlations from the data in Table 3, p. 98) from the dependent variables leaves only weak evidence for the cognitive script prediction. The point-biserial correlation between treatments (experimental vs. control) and intentions drops from a significant value of .24 to a nonsignificant value of .076. The corresponding correlation for the behavioral measure drops from .30 to a marginally significant value of .216.

In sum, there is empirical evidence that once formed, scripts do influence one's behaviors, interpretations, and memory processes (see Abelson, 1981, for a review). However, there is no unambiguous research on the formation of individual scripts or on how such scripts influence intentions.

This brings us back to the earlier question about the relation 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 of performing 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, while addressing several alternative explanations that have plagued this area.

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 I could examine the drawn cartoons to ensure 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 not to 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, and one was presented once. For each subject, intentions (self-expectancies) concerning each of the six target behaviors were assessed both before and after the cartoon task. 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. First, the perceived experimenter demands should be the same for all three conditions. If subjects are reporting intention changes solely in response to perceived demands, such changes should occur equally in all three conditions. Second, if intentions change because new target behaviors are made more salient by the manipulations, all three groups of subjects should show equivalent intention change. Third, any changes in intentions due to positive versus negative affect toward the main character should show up in different amounts of change between the friend and disliked-acquaintance conditions.

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 was 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

On 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, and (c) because 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 two script directions (positive vs. negative) and three frequencies (three vs. two vs. one).

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 five blank cartoon panels. The particular order and target-behavior assignments to the six within-subjects conditions (the Script Direction × Frequency variables) were based on a Latin square. In the six orders created, each target behavior occurred once in each of the six script-frequency/direction conditions and once in each of the six sequential positions. Because 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 an X 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 0). The main dependent variables were the changes in intentions (post- minus precartoon) to perform the target behaviors. Thus, a positive change score indicated an increased intention to engage in the target behavior, whereas 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 was 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.

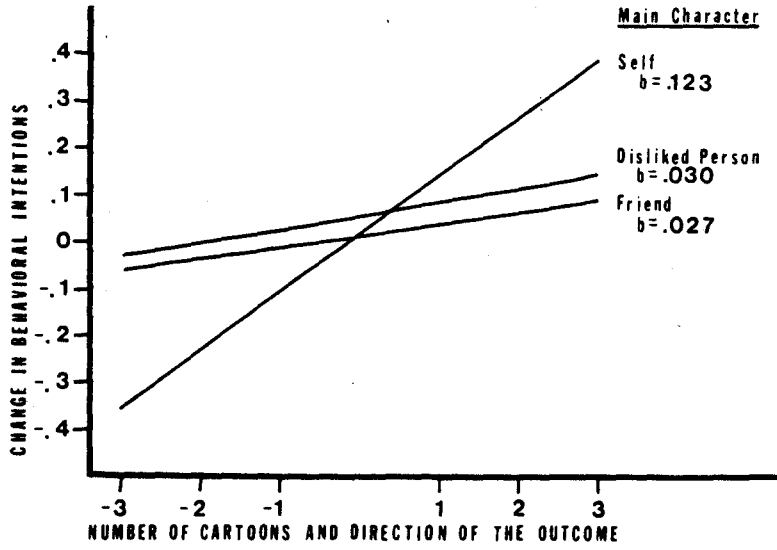

Figure 1. Change in behavioral intentions as a function of direction of cartoon script and frequency of script presentation: Experiment 1.

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 on the frequency that a given script was drawn. To test this prediction across target behaviors, a slope and intercept were 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, whereas a negative intercept would 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 were produced as predicted for subjects in the self-as-main-character conditions; the average slope was significantly larger than zero ($M = .123$), $t(29) = 2.95$, $p < .01$.[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 ($M = .017$; $t < 1$).

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 ($ts < 1$). 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

[1] All p levels are two-tailed.

averaged slopes of the friend and disliked-person conditions supported this, although weakly, $t(90) = 1.74$, $p = .09$.[2]

Although 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) was 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, $t(29) = 1.92$ and 2.03, ps = .07 and .05, respectively, but not when a friend or disliked person was the main character (ts < 1). Because 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 (two or three), 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, $t(29) = 2.01$, $p = .06$.

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[2] The reader should note that the analyses presented in the main text ignore the various possible main and interaction effects of the different target behaviors. The variance due to such effects is, of course, contained in the error-variance estimates for the reported analyses, thus treating target behaviors much like a random factor. A more traditional type of data analysis—treating target behavior as a random factor—was also performed. A linear Treatment (script direction and frequency) × Main Character (self, friend, disliked person) × Order analysis of variance (ANOVA) was performed, with linear treatment as a within-subjects variable, main character and order as between-subjects variables, and order as a random effect. The six different orders composed a Latin square in which each target behavior was in each treatment condition once (script direction and frequency) and each sequence position once (first, second, third, etc.). Thus, differences between target behaviors in the linear effects of treatments are reflected in the mean square linear Treatment × Order interaction, making it an appropriate error term when target behavior is treated as a random effect. (This same mean square term also, unfortunately, includes variance components from the linear Treatment × Sequence interaction, the Target Behavior × Sequence interaction, and the linear Treatment × Sequence × Target Behavior interaction.) Testing the three main-character conditions for the predicted linear treatment effects against the linear Treatment × Order mean square yielded the same results as the slope analysis reported above. A significant linear effect was found for the self-as-main-character condition, $F(1, 5) = 17.39$, $p < .01$, whereas the friend and disliked-person conditions did not yield a linear effect (Fs = .97 and 1.01, respectively).

One can similarly test the difference between the linear effect in the self, the friend, and the disliked-person conditions. For this F test, the most appropriate mean square for the denominator is the linear Treatment × Order × Main Character interaction. As in the slope analysis reported above, the self condition yielded a significantly stronger linear treatment effect than did the friend and disliked-person conditions, $F(1, 10) = 10.14$, $p < .02$.

The issue that prompted this analysis was the generalizability of these treatment effects across target behaviors. These random-effects analyses suggest that the effects are general. However, it seems clear that the effects of such simple imagination processes must differ for different target behaviors. For instance, it is unlikely that imagining oneself swimming from New York to London would change one's intentions concerning that behavior. Thus, the domain of target behaviors to which one can generalize is unclear. It appears that the effects would occur most strongly for target behaviors for which the subject has no firm or extreme prior intentions. Because the present research does not directly address this issue, the focus of the remainder of this article is on the general intention-change phenomenon, not on particular target-behavior differences. (See Winer, 1971, for a discussion of fixed and random effects.)

Also as expected, there were no differences in the friend and disliked-person conditions ($ts < 1$). Not surprisingly, the difference between multiple- and single-presentation effects was significantly larger in the self condition than in the remaining conditions, $t(90) = 2.05$, $p < .05$. One might additionally wonder, however, if the frequency effect (single vs. multiple) occurred more strongly for one script direction than the other (positive vs. negative). A specific contrast assessing this interaction revealed no such asymmetry in the frequency effects ($ts < 1.26$, $ps > .20$, in all three main-character conditions).

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 is examined in detail.

Experimenter demand and evaluation apprehension. Because 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.

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.[3] 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 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, $t(25) = .11$ (compare to the intention changes presented in Figure 1). Finally, neither self- nor friend-condition subjects predicted the presentation-frequency effect ($ps > .16$ and $.14$, respectively), and there was no reliable difference between the predictions of these groups, $t(25) = -.54$. In sum, because the predictions of these subjects (who explicitly tried to figure out the experimental hypothesis) do not parallel the actual results,

[3] Details concerning the procedures and results of this experiment may be obtained by writing to the author.

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 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. Because 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 versus making alternative behaviors salient. Subjects may not have learned (or taught themselves) behavioral scripts but rather may have learned about possible alternative modes of responding in a given situation or may have had alternative behaviors made relatively salient. 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. As discussed earlier, though, this alternative explanation also predicts that intention change should occur equally in all three main-character conditions. However, 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.[4] 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 seven 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, and better overall and that 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 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 (i.e., their attitudes). 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. Ajzen & Fishbein, 1980; Atkinson, 1964; Bandura, 1977). Considering a positive script may make salient the positive features of that target behavior, whereas 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.

[4] Cartoons were not available from the other seven subjects. Note, however, that removing these subjects from all other analyses does not appreciably alter any of the results.

Table 1
Quality of Cartoon Ratings, and t tests of Differences Between Self-, 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*

[a] Ratings were made on 9-point scales, where 9 indicates high levels and 1 indicates 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, $Fs(2, 83) < 1$.
* $p < .05$.

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

Furthermore, recall that on completion of the experiment, each subject rated the perceived consequences of the various target behaviors. One 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 postcartoon) and their ratings of perceived consequences for each of the six target behaviors. All 12 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 3 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: (a) All subjects drew themselves as the main character in their cartoons; (b) only two target behaviors were examined—blood don-

ation and joining a political action group; (c) each subject drew three positive sketches of one target behavior and three negative sketches of the other (the order and direction of these scripts were counterbalanced and randomly assigned, as in Experiment 1); (d) 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 for 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 (precartoon) intentions are presented in Table 2, for both sessions. Table 2 also presents 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, $t(20) = 3.28$, $p < .01$. In addition, both target behaviors individually yielded reliable intention changes congruent with script direction: blood donation, $t(20) = 2.61$, $p < .05$; political action, $t(20) = 2.02$, $p < .06$. More impressive, perhaps, was the finding that such intention changes were still evident 3 days after the cartoon task, $t(18) = 3.03$, $p < .01$.[5] Finally, examination of the relative amounts of intention change produced by positive versus negative scripts revealed no reliable differences at either the initial session, $t(20) = 1.31$, $p < .20$, or the follow-up session, $t(18) < 1$.

Table 2
Mean Change in Behavioral Intentions as a Function of Script Direction Assessed by t Tests: Experiment 2

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

Note. In all scripts, the subject was the main character. Each script was presented three 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.
* $p < .01$.

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 ($t < 1$).

For both target behaviors, the perceived-consequences ratings were correlated with each of the three measures of behavioral intentions (precartoon, Session 1 postcartoon, 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 3-day period.

General Discussion

Overall, these two studies provide unambiguous evidence that a simple cognitive manipulation of script availability influences self-expectations or behavioral intentions. Before discussing the relevance of these results to other phenomena, it must be emphasized that the present studies showed changes in the 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

[5] 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, $F(1, 18) < 1$.

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-referent 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. However, changes in behavioral intentions occurred only for subjects in the self-as-main-character condition, an effect attributed to changes in script availability. Although this may seem paradoxical, the apparent contradiction is easily understood when one considers 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) showed 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 who were asked to predict their compliance or noncompliance to a counterattitudinal request said that they would comply. A group that was given the counterattitudinal request (but not the prediction task) demonstrated a 67% actual compliance rate. Because subjects were randomly assigned to conditions, the discrepancy between the predicted rate and the 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, 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. Although 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 require that 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). Although 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 are 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, everyone engages 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 has relatively little impact on our final course of action; all scripts simply become slightly more available. In this case, the behavior chosen probably depends more on such considerations as the perceived consequences of the various acts and the perceived likelihood that the act can be performed (see Bandura's distinction between outcome expectations and efficacy expectations, 1977). However, when only one (or a few related) scenario is imagined and reimagined, 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 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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