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The role of planning for intention-behavior consistency

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Two studies investigated how planning affects intention-behavior consistency. In Study 1 an experimental group and control group which each consisted of 14 undergraduates were requested in computerized interviews to indicate which activities they intended to perform on the following day. Subjects in the experimental group were also requested in a second phase of the interviews to specify when and where they intended to perform the activities. The results showed that activities for which time and place had been specified were more likely to be performed. In Study 2 another 75 undergraduates volunteered to participate in an experiment in which they were requested to perform an activity (reporting mood effects of reading a prose excerpt) by themselves on one of three following days. One group of subjects only agreed to perform the activity, another group agreed to perform the activity as well as indicated when and where they would do it, and a third group in addition to this indicated which other activities they would perform on the same day. In support of the hypothesis that planning an activity increases the likelihood that it will be performed, the results showed that subjects who indicated other activities more frequently performed the target activity. More efficient time management resulting from planning may account for the findings, although further research is needed to show this conclusively.

Key words: intention, behavior, planning, time management.

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How intentions to act are implemented is an issue of increasing interest (Gollwitzer, 1993; Heckhausen & Beckmann, 1990; Kuhl, 1987, 1992; Kvavilashvili, 1992). In cognitive psychology research on prospective memory has gained momentum in recent years (see, e.g., Kvavilashvili & Ellis, 1996). This research addresses the role of memory in determining whether or not intentions are implemented. Possibly important differences have been demonstrated between retrospective and prospective memory (Kvavilashvili, 1987) concerning, for example, storage properties (Goschke & Kuhl, 1993) and age-related deficits (Einstein *et al.*, 1992). In addition, factors enhancing prospective memory performance have been identified (e.g., Maylor, 1993). Motivational factors also bearing on the issue have more explicitly been addressed in social-psychological research (Brandstätter & Gollwitzer, 1994).

In social psychology the study of how intentions are implemented represents a continuation of research on attitude-behavior consistency (Dawes & Smith, 1985) which focuses on how closely attitudes are related to behavior. As noted by Zanna and Fazio (1982), the first generation of this research sought to determine if such a relation exists. Since no straightforward relationship was found, the focus then changed to the investigation of possible moderating factors (see, e.g., Ajzen & Fishbein, 1973; Borgida & Campbell, 1982; Davidson & Jaccard, 1979; Wicker, 1969). A third generation of research should, as proposed in Zanna and Fazio (1982), look more deeply into how attitudes guide behavior. Fazio (1986, 1990) may be mentioned as one example of a research program which does this.

One of the most influential theories of the attitude-behavior relationship is the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975; see also Ajzen & Fishbein, 1977, 1980). In this theory it is assumed that an intention to perform an activity is related to the attitude towards performing the activity and the subjective norm for performing it. Attitude and subjective norm are similarly defined as beliefs about the consequences of performing the activity, in the former case beliefs about how positively the outcomes are judged and in the latter case about the degree of approval from important others. The single most important implication of the theory is that intention will predict behavior better than will attitude. In particular this would be true if intention is measured so that it corresponds to the behavioral criterion with regard to action, target, context, and time (see, e.g., Eagly & Chaiken, 1993). However, habitual behavior is not predicted from intention (Bentler & Speckart, 1979, 1981; Gärling, 1992*b*), most likely because performing the behavior is not preceded by the formation of an intention (Ronis *et al.*, 1989).

Furthermore, TRA is assumed to only apply to behaviors which are under volitional control. Such behaviors should be distinguished from outcomes or goals where the degree of volitional control is less. In a metaanalysis of the results of 87 studies, Sheppard *et al.* (1988) obtained strong evidence for that intention predicts behavior. However, the relationship was modified by several factors. One was whether the behavior was an outcome or a goal. Unless intention was measured as an expectation (rated likelihood that the behavior/goal would be attained) the relationship to behavior was weaker. In the theory of planned behavior

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(TPB) more recently proposed by Ajzen (1985, 1988, 1991), intention is assumed to be influenced by perceived behavioral control in addition to attitude and subjective norm (e.g., Ajzen & Madden, 1986; Gärling, 1992*a*; Netemeyer & Burton, 1990). The theory is in this way extended to include the prediction of a broader class of behaviors, not only behaviors which are under volitional control.

Gollwitzer (1993) recently made a distinction between a goal intention and an implementation intention. The formation of a goal intention is characterized by deliberating desires which may be in conflict with each other. This type of intention specifies a desired end state or goal to which a person commit himself or herself. Hence, possible obstacles to implementation are not taken into account. The amount of commitment associated with the goal intention is furthermore assumed to be related to how important the goal is.

An implementation intention is formed when the conflict has been resolved between different means of achieving the desired goal specified by the goal intention. This may entail both the course of the subsequent goal pursuit as well as when, where, and how the goal-directed actions are to be enacted.

Planning is an important component of the formation of an implementation intention (Gollwitzer, 1996). Under different definitions planning has been the focus of research in many subfields of psychology, such as cognitive psychology (e.g., Hayes-Roth & Hayes-Roth, 1979; Miller *et al.*, 1960), social psychology (e.g. Schank & Abelson, 1977), and environmental psychology (e.g., Gärling *et al.*, 1984). It is difficult to provide a general definition of planning. Scholnick and Friedman (1987) suggest a number of sources of confusion. One is that planning is defined to simultaneously engage three different levels, namely to solve a problem, to act in accordance with a schema, and to mediate between a schema and a behavior. Depending on which of these levels is emphasized, different definitions of planning follow. Other sources of confusion discussed by Scholnick and Friedman are, for example, that planning can be treated either as a general cognitive skill or as a context-specific mental activity, or that planning involves many different activities, each one aiming at different goals. An acceptable general definition of planning may be "the predetermination of a course of action aimed at achieving some goal" (Hayes-Roth & Hayes-Roth, 1979, p. 275–276). A more specific definition should specify the psychological factors controlling the decisions about the course of action such as memory retrieval, problem solving, and commitment or motivation.

Notwithstanding these difficulties, research has demonstrated that planning (the formation of an implementation intention) improves memory for a goal intention (Gollwitzer, 1993). Such findings prompted Mäntylä (1996) to argue that research on prospective memory has neglected the "trace-dependent" components affected by an increased level of activation resulting from planning. Instead, much research has focused on the cue-dependent components (e.g., the effect of salient cues in the environment on prospective memory performance) and capacity-dependent components (e.g., a person's capacity of self-initiated mental operations during the retention and retrieval interval). Based on empirical findings, Mäntylä (1993) assumed that level of activation (planning) at the time an intention is formed will enhance the likelihood of recalling the (goal and/or implementation) intention.

A distinction has been made between event-based and time-based prospective memory tasks (Einstein & McDaniel, 1996). In event-based tasks external cues remind subjects of their intention. Thus, the situation prompts action. On the other hand, in time-based tasks external cues are absent and thus subjects are dependent on self-initiated retrieval processes. Planning may have the effect of changing time-based to event-based tasks by associating a goal intention with specific situational contexts.

There may also be other effects of planning than mere enhancing of memory. Commitment is one aspect of goal-directed behavior which seems to be related to performance, especially when the goal is challenging (Klein & Wright, 1994). According to Kuhl (1987; Heckhausen & Kuhl, 1985), intention is often defined as a commitment to perform an activity as opposed to mere wishing to perform it. Although people may feel committed to perform activities requested of them by others, they may furthermore need to identify the commitment as something part of the self to be motivated to implement an intention. A possibility is that planning through elaboration of an intention increases the salience of self-related components. For this reason the intention may be strengthened.

Still another effect of planning may be the recognition of spatio-temporal constraints. Accordingly, planning increases efficient time management. For instance, when people plan several intended activities they will probably acquire a more realistic view of their ability to enact all their intentions. This effect of planning is broader than that discussed by Gollwitzer (1993). While Gollwitzer focused on the implementation or planning of single goal intentions, time management also include the coordination of several intentions in the same plan.

To summarize, if an intended activity is planned there are three reasons why it is more likely to be performed (see Fig. 1). One reason is that the strength of the (goal) intention increases. A second reason is that the memory for the (goal and/or implementation) intention is improved. A third reason is that planning may facilitate recognition and management of spatiotemporal constraints leading to a more realistic plan (implementation intention) which better coordinates co-existent goal intentions. The present research aims at demonstrating that planning increases intention-behavior consistency through improving the coordination of goal intentions. A similar study by Goll-

witzer (1993) entailing only one target activity did not allow the inference that coordinating several intentions or time management was the important factor enhancing intention-behavior consistency. Therefore, in the present Studies 1 and 2 subjects participating in experimental groups were requested to plan several activities, whereas subjects participating in control groups did not plan or planned a single activity. Like in the Gollwitzer study, planning was induced by means of instructions. All subjects who participated intended to perform the activities. A difference in the rate with which the activities were performed would thus indicate an increase of intention-behavior consistency.

STUDY 1

The primary aim of Study 1 was to investigate whether the intention-behavior relationship is increased if subjects are required to plan so that they manage time more efficiently. A demonstration of an effect of planning would be most convincing in a real-life context in which subjects are not aware of the experimental manipulation. In such a context subjects have already formed goal intentions and in most cases also know how to act to achieve these goals. Still, the everyday lives of a majority of people are not as well-organized as to not entail conflicts between competing intentions which they must coordinate. Thus, planning may fulfill the important function of accomplishing this.

In Study 1 undergraduates were asked to indicate for a set of everyday activities which ones they intended to perform on the following day. Subjects assigned to an experimental group were also asked to specify time and place of the activities. This was expected to increase the likelihood that they perform the activities as compared to a control group in which subjects were supposed to spontaneously engage less in such planning.

Since everyday activities were selected, a methodological liability is that many single such activities or sequences of activities have become habitual and are therefore performed automatically without deliberate intention (Ronis *et al.*, 1989). It is only for nonroutine activities deliberation or planning may increase the likelihood that intended activities are performed. A way of identifying activities which are nonroutine is to require that subjects indicate if they intend to perform the activities. In the analysis of the results, it will then be possible to uncover if planning increases the likelihood of performing intended rather than nonintended activities.

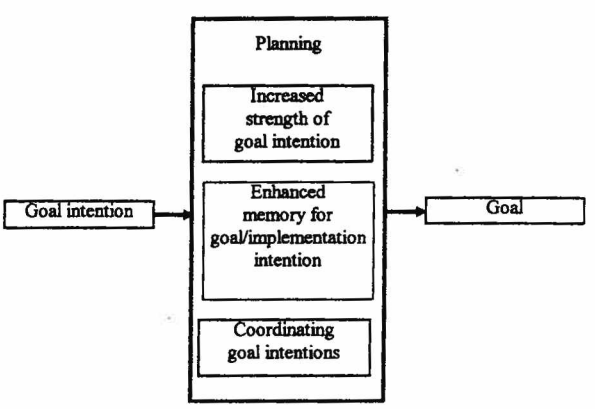

Fig. 1. Suggested reasons why planning increases intention-behavior consistency.

Method

Subjects. Twenty eight undergraduates at Göteborg University participated in return for payment. An equal number of subjects, equally many men as women, was randomly assigned to an experimental and control group.

Procedure. Subjects participated individually in the study on two occasions separated by one day. On the first occasion subjects first filled out a shortened 38-item version of a mood adjective checklist (Sjöberg *et al.*, 1979), then they answered computerized interview questions (Ettema *et al.*, 1993) aiming at measuring their intentions to perform a designated set of activities on the following day. In the experimental group the interview procedure also entailed specifying when and where these activities would be performed. The procedure was repeated on the second occasion except that the purpose of the computerized interview this time was to obtain information about which of the activities subjects performed the day before. On the average the first session lasted for about 75 minutes (from 55 to 95 minutes), whereas the second session lasted for about 15 minutes (from 12 to 22 minutes).

Subjects were told that the purpose of the study was to investigate how stress is related to time pressure. They were informed that the mood adjective checklist was administered to measure stress and that the questions about activities were used as a means of assessing time pressure. After having completed the mood adjective checklist and the interview procedure on the second occasion, in a debriefing interview subjects were informed about the actual purpose of the study. None of the subjects reported that they had suspected it.

In the first part of the computerized interview procedure, both experimental and control group subjects were asked questions about 28 mundane activities (Table 2) which they were likely to perform. Each activity was presented individually on the computer screen in a randomized order. For each activity subjects indicated the following: How many times per month they performed it*; how many days ago they last performed it; the maximum and minimum amount of time (in hours and minutes) on average they spent each time on the activity; the names and addresses of a maximum of three locations where they usually performed the activity; if they intended to perform the activity the following day; and, on a 9-point scale ranging from 1 (very low priority) to 9 (very high priority), their priority for performing the activity the following day. Subsequent to the questions about the activities, subjects judged travel times between pairs of locations consisting of a subset of locations where they usually performed the activities. The pairs were presented individually on the screen in random order. Travel times were judged in minutes for one or more travel modes

* The following questions were only answered if subjects performed the activity at least once per month. If not, subjects were asked to proceed to the next activity.

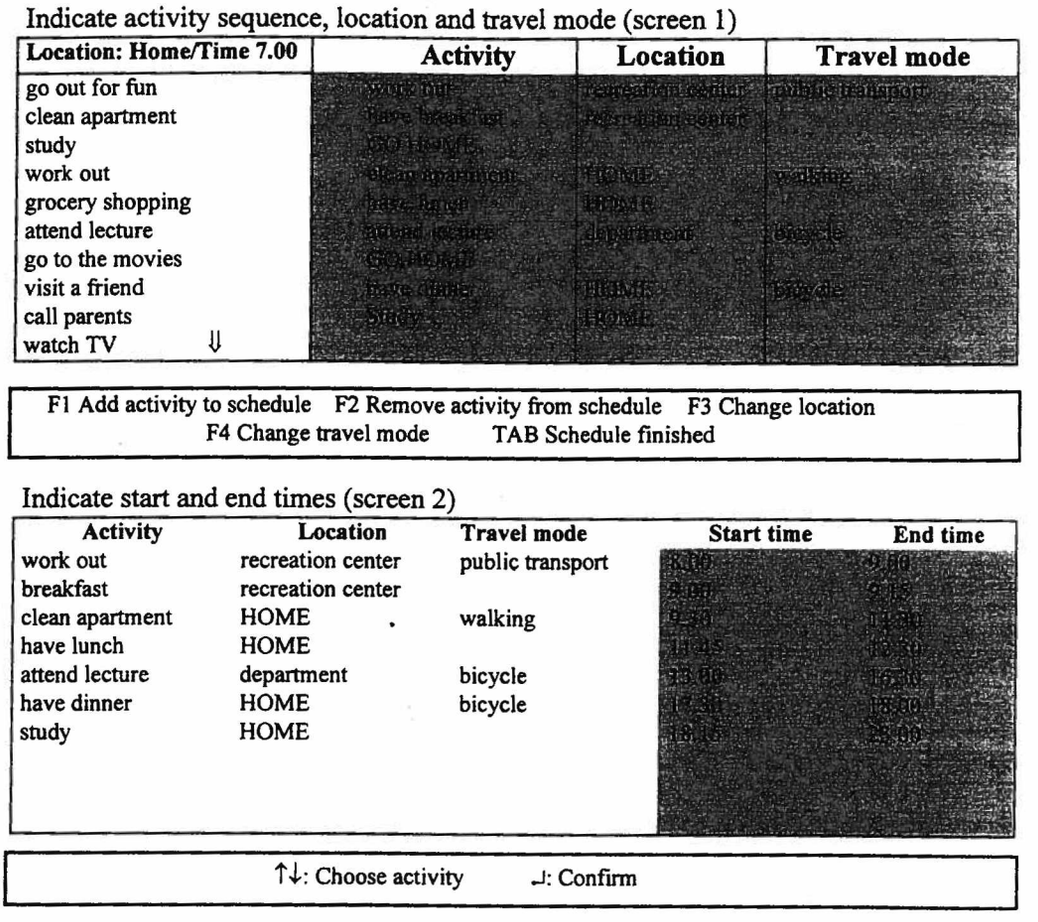

Fig. 2. Views of the computer screen during the planning phase of the computerized interview procedure used in Study 1. (In the shaded areas subjects inserted activities, locations, travel modes, and start/end times).

subjects preferred (walking, biking, driving a motor vehicle, or public transport).

In the second part of the procedure in which only the experimental group participated, the same 28 activities were presented in a scrollable list (Fig. 2). Subjects were instructed to form a detailed plan for when and where to perform the activities by doing the following tasks in any order they preferred: Selecting the activities they intended to perform the following day; ordering the activities from the first to the last to be performed; indicating for each activity where to perform it (by selecting one of the locations provided earlier or a new one); selecting one of the preferred travel modes for the trip to the location; and choosing when to perform the activity and for how long.

On returning the day after the target day, subjects first once again filled out the mood adjective check list. Thereafter, they reported which ones of the 28 activities they had performed the preceding day. They also indicated where, when, and for how long they had performed them, and how they had traveled to the locations. The second part of the computerized interview procedure was used to this end. All information was this time provided by subjects. The activities were presented in random orders.

When performing the required tasks subjects were seated in a cubicle located in the laboratory. The experimenter was seated outside monitoring subjects through a screen connected to the subjects' computer. In this way the experimenter could direct subjects when necessary. Subjects obtained general information about the response procedure before the start of the interview. Specific instructions about what keys to press were given on line in the program. When questions arose, subjects were told to read through the available instructions once again. If they still were facing problems, the experimenter provided additional information orally. This information did not differ importantly from that given in the program.

Results and discussion

Inspection of the results indicated that subjects provided complete information in both the planning phase and the phase where they reported which of the activities they had performed the day before. For each activity, a location, a travel mode, and a start and end time were always given. In addition, Table 1 shows the extent to which the plans formed by the subjects in the experimental group corresponded to their activity patterns. There were no significant differences between means whereas the correlations and the percent agreements were all significant. The least correspondence was observed for number of activities. However, planned activities which were performed were largely executed according to the plan.

Table 2 shows for each activity how frequently in the experimental and control groups it was intended, how

Table 1. *Correspondence between plan (P) and activity pattern (AP) in the experimental group (Study 1).*

Measure	M_P	M_{AP}	$r_{P,AP}$	Agreement (%)
Number of activities	7.4	6.6	0.524*	
Start time (duration from 7 am in minutes)	360	355	0.825***	
Duration of activity (minutes)	117	111	0.903***	
Place				92***
Travel mode				87**

Note: Means of start time and duration are computed for those 76 activities which were both intended and performed.
* $p<0.05$
** $p<0.01$
*** $p<0.001$

frequently in the experimental group it was planned, and how frequently in the experimental and control groups it was performed. Subjects in both groups indicated that they intended to perform approximately the same number of activities (on the average 8.5 in the experimental group and 8.2 in the control group). Of the intended activities the percentages performed were almost the same in the experimental and control groups (54.6% and 58.3%, respectively). Of those activities not intended to be performed ($M = 11.9$ in the experimental group and $M = 12.6$ in the control group), the percentages performed were 15.0% in the experimental group and 6.8% in the control group. A 2 (experimental vs. control group) by 2 (intended vs. not intended activity) analysis of variance (ANOVA) performed on these percentages revealed a significant main effect of whether the activity was intended or not, $F(1, 26) = 121.51$, $p < 0.001$.

Despite the lack of increased intention-behavior consistency in the experimental group, planning might have played a role. As Table 2 shows, subjects in the experimental group refrained from planning (selected to the list of activities in the second part of the interview) as many as 21.8% of the intended activities whereas they planned 7.2% of the nonintended activities. Of the 104 planned activities, 73.1% were performed. In contrast, 7.7% of the 181 nonplanned activities were performed. An additional ANOVA in which planned activities replaced intended activities in the experimental group yielded a reliable main effect of group, $F(1, 26) = 6.60$, $p < 0.05$, and of whether the activity was intended/planned or not, $F(1, 26) = 173.03$, $p < 0.001$. The interaction between these factors did not quite reach significance, $F(1, 26) = 2.81$, $p < 0.15$.

A main finding was that subjects in the experimental group chose to plan partly other activities than those which they indicated they would perform. They might have done that because spatio-temporal constraints were identified. This may then also explain why planning increased the likelihood that an activity was performed. Another possibility is that subjects changed their priorities. Since priority was rated by subjects in the experimental group before they planned, it is not possible to determine if such was the case. Still another possibility is that the activities which subjects in the experimental group planned differed from those intended by subjects in the control group. Routine activities which are more likely to be performed may, for instance, have been selected. However, it is difficult to draw any firm conclusions. Those activities that in the experimental group were stated as intended but not planned by at least two subjects was visit a cafe, taking a walk, and watching TV. These activities were also less frequently planned in the experimental group than they were intended in the control group, but when collapsed over intended activities (i.e., regardless of whether they were planned or not) they were intended by virtually the same number of subjects in the two groups (Table 2).

STUDY 2

Study 2 addressed problems which were raised by the attempts to interpret the results of Study 1. Subjects in the experimental group in Study 1 selected other activities to be planned than those they previously had stated as intended. The observed performance differences may therefore depend on the fact that the activities differed. In Study 2 all subjects were required to perform a single activity consisting of a contrived experimental task (reporting mood effects of reading prose). Subjects were randomly assigned to different groups entailing experimental conditions in which varying amounts of planning were induced.

Whether planning increased the strength of the (goal) intention or not, rather than the opportunity of performing the activity, could not be determined in Study 1 since the ratings of intention strength (priority) were obtained before subjects planned. In Study 2 subjects were instead required to rate the strength of their intentions to perform the task subsequent to the experimental manipulations.

Gollwitzer (1993) reported a study in which students were requested to write an essay during their upcoming holidays. Subjects in the experimental group indicated where and when they would do the writing, whereas subjects in the control group only indicated that they would perform the activity. In support of the hypothesis that implementation intentions increase the likelihood of performance, more subjects in the experimental group complied

Table 2. *Frequency of intended, planned and performed activities[1] in experimental and control groups (Study 1).*

	Experimental											
	Nonintended				Intended				Control group			
	Nonplanned		Planned		Nonplanned		Planned		Nonintended		Intended	
	Non-performed	Performed	Non-performed	Performed	Non-performed	Performed	Non-performed	Performed	Non-performed	Performed	Non-performed	Performed
Invite people	7	0	0	0	1	1	3	0	13	0	0	0
Grocery shopping	9	1	0	0	1	0	3	0	2	0	8	3
Buying clothes	7	0	0	0	1	0	2	0	7	0	0	0
Visit cafe	8	1	0	0	2	0	0	1	8	0	2	2
Read novel	7	1	0	0	1	0	3	2	5	0	4	3
Clean apartment	11	0	0	0	1	0	1	1	9	2	2	0
Attend movies	4	0	0	0	1	0	2	0	12	0	0	0
Attend concert	5	0	0	0	0	0	0	0	5	0	0	0
Jog	5	0	0	0	0	0	0	0	5	0	0	1
Work out	5	0	0	0	0	0	0	0	2	0	2	0
Walk	4	0	0	0	4	0	2	1	7	1	4	1
Bike trip	2	0	0	0	1	0	0	0	6	0	2	0
Go out for fun	10	2	0	0	1	0	0	0	8	0	3	0
Window-shopping	6	2	0	0	1	0	2	0	9	1	0	0
Visit friend	6	0	0	3	2	0	0	3	4	2	0	8
Watch TV	5	3	0	0	3	0	1	1	5	0	2	5
Have a bath	4	0	0	0	0	0	1	3	5	0	0	0
Call parents	7	3	0	0	2	0	0	1	8	0	2	3
Work extra	2	0	0	0	0	0	0	4	3	2	0	2
Study	1	0	0	0	1	0	I	11	5	0	3	6
Write letter	5	0	0	0	2	0	0	0	7	0	1	0
Attend lecture	3	0	0	4	0	0	1	6	2	4	2	6
Play musical instrument	3	0	0	1	0	0	2	0	3	0	0	2
Do laundry	13	0	0	0	1	0	0	0	13	0	0	0
Have breakfast	1	0	0	1	0	0	1	11	2	0	2	10
Have lunch	1	0	0	1	0	0	1	11	0	0	6	6
Have dinner	0	0	0	2	0	0	2	9	0	0	3	9
Total	141	13	0	12	26	1	28	64	155	12	48	67

[1] Team sports is excluded since it was never selected.

Table 3. *Mean ratings of importance, priority, and likelihood of performing the target task by subjects assigned to different groups (Study 2).*

	Goal-intention	Implementation-intention	Coordinating-intention
Importance	6.1	6.1	6.4
Priority	5.1	5.8	5.6
Likelihood	7.6	8.1	7.6

with the request. However, from these results it may not be concluded that the coordination of intentions is an essential component associated with the effect of planning. Accordingly, in Study 2 subjects in one group (implementation-intention group) were asked to indicate where and when they intended to perform the target activity, whereas subjects in another group (goal-intention group) were only asked to perform it. If coordinating the target activity with other activities is also an important factor, asking subjects to explicitly do this may lead to a further increase in the likelihood of performing the target activity. Therefore, a third group of subjects (coordinating-intention group) was asked to indicate all activities they planned to perform in addition to the target activity. It was expected that these subjects would be more likely to perform the target activity than subjects in the implementation-intention group. Subjects in the latter group were in turn expected to be more likely to perform the target activity than were subjects in the goal-intention group.

Method

Subjects. Another 75 undergraduates at Göteborg University, 16 men and 59 women, participated in the study. They were randomly assigned to one of three groups with an approximately balanced number of men and women.

Procedure. Subjects were recruited in psychology classes on one of the first two days of the week. In three different classes the experimenter informed students about an ongoing study with the purpose of investigating if reading prose reduces stress. Their task was said to be to fill out a short mood adjective check list immediately subsequent to having read an excerpt of a novel. They were required to do the reading in some quiet place during one of the following three days. It was said to take approximately 45 minutes. No financial or other compensation was promised. Subjects were guaranteed anonymity. After this information had been given, subjects were asked to participate in the study. An average of 75% of the students accepted to do this. They wrote their names on a separate page which the experimenter collected at the same time as he distributed a short questionnaire which subjects answered in class. Subjects also received a sealed envelope containing the other material to take away.

On the front page of the two-page questionnaire answered in class, the information given orally about the study was first repeated. It was stressed that the task would take about 45 minutes and that it had to be performed without interruptions in a quiet place. Subjects were asked to not open the sealed envelope until they were sure they could perform the task as required. Subjects in the implementation-intention group were asked to indicate on which day, when on that day, and where they would perform the task. In the coordinating-intention group subjects were asked to do the same for both the task and other activities which they had planned to perform on that day. Ten blank lines forming the rows of a table were provided for them to write down the activities. In the implementation-intention and coordinating-intention groups subjects were told that the additional information requested was needed to determine what other factors influenced their mood. In the goal-intention group, subjects were not required to indicate on which day, when on that day, and where they would perform the task.

On the second page of the questionnaire, all subjects rated on numerical scales what priority they assigned to the task, how important they perceived it to be, and how likely they were to perform it. Numerical nine-point scales were used with the endpoints also verbally defined as low priority and high priority, completely unimportant and very important, and very unlikely and very likely, respectively.

Enclosed in the envelopes which subjects brought with them was a new set of instructions, together with another short questionnaire, the 38-item mood adjective check list (Sjöberg *et al.*, 1979), and the reading material consisting of an excerpt from Paul Thoroux's novel "The Ozone." In the questionnaire subjects were first asked whether they found themselves in a location where they could do the task for 45 minutes without being interrupted†. If not, they were urged to wait until this was the case. If they decided to continue, a following question requested subjects to indicate date, time, and their location before starting to read. The same questions were answered after subjects had read the prose excerpt and filled out the mood adjective check list. Subjects were also required to indicate age and sex. If interrupted for some reason, they were asked to make a note of it. Subjects were finally asked to mail the questionnaire and the mood adjective check list using an enclosed free-of-charge envelope.

In between 7 and 14 days after subjects were recruited, they were called by the experimenter for a postexperimental interview. They were informed about the actual purpose of the study and thanked for their participation.

Results and Discussion

The number of subjects who mailed in the response forms was 14 (56%) in the group who did not receive any additional instructions (goal-intention group), 15 (60%) in the group who were asked to indicate time and location (implementation-intention group), and 19 (76%) in the group who also indicated time and location of other activities (coordinating-intention group). Significance tests showed that the difference between the coordinating-intention and goal-intention groups was close to significant, $\chi^2_1 = 3.31$, $p < 0.07$, whereas the implementation-intention group did not differ reliably from the goal-intention group ($p < 0.25$).

† Pilot tests showed that answering the questionnaire, reading the prose excerpt, and filling out the mood adjective check list took about 45 minutes.

Table 3 shows that there were some group differences with respect to the mean ratings of importance, priority, and likelihood. However, analyses of variance (ANOVA) failed to show that these differences were significant ($Fs < 1$). Thus, the results did not show that intention strength increased due to planning.

Correlational analyses affirmed that the ratings of priority and likelihood were somewhat more closely related to each other ($r = 0.55$) than the ratings of importance were to the ratings of priority ($r = 0.47$) or likelihood ($r = 0.21$), respectively. A sum of the former two was therefore used as a measure of intention. Suggesting that intention strength increased the likelihood of performing the activity, in a multiple linear regression analysis performance was reliably related to the intention index ($\beta = 0.52$, $t_{71} = 5.18$, $p < 0.001$)‡. An independent effect of planning to further increase the likelihood of performance was indicated by the fact that the difference between the coordinating-intention and goal-intention groups was close to significant ($\beta = 0.21$, $t_{71} = 1.81$, $p < 0.10$). However, consistent with the observation that planning did not increase the strength of intention, efficient time management may be the most important component in planning since the difference between the implementation-intention and coordinating intention groups did not reach significance ($\beta = -0.15$, $t_{71} = -1.33$, $p < 0.20$). In the reported analysis $R^2_{adj} = 0.268$, $F(3, 71) = 10.04$, $p < 0.001$.

A closer examination of the results for the coordinating-intention group showed that 6 subjects did not list any other activities than the target activity. When these subjects were excluded, the percentage of subjects who mailed in the response forms increased from 76% to 90% (17 out of 19) leading to a significant difference between the coordinating-intention and goal-intention groups, $\chi^2_1 = 6.25$, $p < 0.05$. In an additional multiple linear regression analysis on all subjects except those in the coordinating-intention group who did not list more activities than the target activity, a significant effect was observed both of group ($\beta = 0.22$, $t_{66} = 2.09$, $p < 0.05$) and of intention index ($\beta = 0.45$, $t_{66} = 4.31$, $p < 0.001$), $R^2_{adj} = 0.277$, $F(2, 66) = 12.66$, $p < 0.001$.

An internal analysis of the results thus confirmed the observed tendency that subjects who planned were more likely to comply. Suggesting that time management is an important component of planning, the effect of planning was most clear when subjects coordinated several activities. Intention strength did not increase in the experimental groups but predicted performance of the activity across both experimental and control groups.

GENERAL DISCUSSION

The aim of the present research was to investigate the role planning may play in the implementation of intentions. This role presumably emanates from several sources, such as enhanced memory for intentions (Gollwitzer, 1993; Mäntylä, 1993), increased commitment to performing an activity (Kuhl, 1987), as well as from more efficient time management as was suggested here. In the latter case, if spatiotemporal constraints due to other activities are recognized and taken into account, a more realistic plan is perhaps formed. An intended activity is therefore more likely to be performed due to an increase of perceived and actual control over its performance (Ajzen, 1985, 1988, 1991).

In both Studies 1 and 2 it was shown that planning had the hypothesized effect of increasing the intention-behavior consistency. In Study 1 this was demonstrated for everyday activities which were planned by the subjects in the experimental group. Although the activities were also likely to have been planned in the control group, additional planning appeared to result in the selection of other activities than those first intended. The identification of spatiotemporal constraints was possibly the reason why some (prioritized) activities were replaced. Another possibility is that subjects changed their priorities. However, the results of Study 2 did not suggest that planning affected the strength of the intention to perform a designated activity. An important difference may still be that in Study 1 the activities were self-selected. As noted by Kuhl (1987), intentions which are identified as part of the self may differ from intentions due to requests by others. Possibly, the priority of self-generated intentions are more easily changed. Another possibility is that subjects included activities which they perform routinely without forming an intention. Perhaps the planning procedure reminded subjects in the experimental group about some activities they usually perform which they then decided to include in the plan. However, this interpretation of the results is again not consistent with the results of Study 2 in which an effect of planning a nonroutine activity was revealed. In Study 2 subjects could not exclude the target activity but were free to exclude other activities which might have interfered with performing it.

Although routine perhaps played a role in Study 1, the results of Study 2 showed that planning increased the intention-behavior consistency for a nonroutine activity. Furthermore, as already noted, the strength of the intention did not increase as a result of planning. However, the results differed from those reported in Gollwitzer (1993) in that committing oneself to a time and place was not sufficient. It is possible that those subjects who agreed to participate were more motivated than in the Gollwitzer study. A contributing factor may be that a prose-reading task is likely to be perceived as less demanding than essay writing. For that reason, perhaps subjects spontaneously did not plan or use other self-control techniques (Kuhl, 1987). Nevertheless, an additional advantage was observed when subjects coordinated the target activity with other activities.

‡ Logistic regression analysis yielded essentially the same results.

Taken together, the results suggested that planning increases the intention-behavior consistency. In addition, as was shown in Study 2, knowing if subjects plan improves the possibility of predicting performance of the activity compared to if information is available only about intention strength. According to Ajzen (1985, 1988, 1991), perceived control over a behavior increases the likelihood that an intention is formed. However, in the present study planning appeared to increase actual control without increasing intention strength. Since the latter did not increase, it may be inferred that perceived control did not increase either. However, it seems unlikely that engaging in planning should not increase perceived control. Further research is therefore needed to both theoretically end empirically clarify the relationships between planning, intention strength, and perceived control. Similarly, it would be of interest to learn what the limits are on actual control. In an unpredictable environment, increasing control through planning would not be possible. Yet, human environments are in general to some degree both predictable and controllable. The ability to form realistic plans is then important. A further understanding of the reasons of intention-behavior inconsistency should therefore benefit from studies of planning (Hayes-Roth & Hayes-Roth, 1979; Scholnick & Friedman, 1987).

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