Multiple goal management starts with attention: goal prioritizing affects the allocation of spatial attention to goal-relevant events

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Running head: Spatial attention and goal prioritising

Multiple goal management starts with attention:

Goal prioritising affects the allocation of spatial attention to goal-relevant events

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Abstract

Prior studies have shown that attention is allocated to events relevant to the current goal of a person. Until now, research has focused on the implementation of a single goal leaving open the question of how attention is allocated when multiple goals are activated. We examined whether the allocation of spatial attention is affected by the prioritising of one goal over another. The results of two dot probe studies showed that attention is oriented to stimuli relevant to a goal with high value when simultaneously presented with stimuli relevant to a goal with low value (Experiment 1) and to stimuli relevant to a goal with high expectancy of success that were simultaneously presented with stimuli relevant to a goal with low expectancy of success (Experiment 2). These findings demonstrate that the allocation of spatial attention is dependent on the motivational strength of goal pursuit.

Key words: spatial attention, attentional bias, motivation, multiple goal pursuit

It is generally assumed that goals are a major determinant of attentional allocation (Allport, 1989; Desimone & Duncan, 1995). Supporting this assumption, it has been shown that attention is oriented to goal-relevant locations (Posner, 1980), that distractors resembling goal-relevant events cause attentional interference (Maruff, Danckert, Camplin, & Currie, 1999; Rothermund, 2003), and that the actual goal of a person determines which stimuli in the environment reach awareness (Simons & Chabris, 1999).

The existing research has primarily investigated whether a *single* goal directs the allocation of attention. In most real-life situations, however, individuals are pursuing more than one goal at one time. Often these situations require giving priority to one goal because resources are limited or goals are incompatible (Johnson, Chang, & Lord, 2006). Consequently, one goal will be pursued with more motivational strength. Recent research demonstrated that cognitive processes underlying goal pursuit reflect the strength of goal pursuit (Förster, Liberman, & Higgins, 2005; Kruglanski et al., 2002). For instance, Förster and colleagues (2005) found that the activation level of words related to a task goal is higher in participants who were promised a high monetary reward for achieving this goal compared to participants promised only a low monetary reward, even though all participants were pursuing the goal. Applied to multiple goal pursuit situations, Shah, Friedman, and Kruglanski (2002) demonstrated that the mental representation of a prioritised goal is more activated than representations referring to non-prioritised goals.

The aim of the present study was to examine whether the prioritising of a goal affects the allocation of spatial attention. Attention is supposed to play a crucial role in the management of multiple goals (Johnson et al., 2006), but it is not yet clear how spatial attention is allocated when multiple goals are activated and when stimuli relevant to these different goals are competing in the environment of an individual. Recent evidence by Engelmann and colleagues

(Engelmann & Pessoa, 2007; Engelmann, Damajaru, Padmala, & Pessoa, 2009) showed that the detection of target stimuli was improved with increases in the monetary reward that was linked to the detection of these targets. These results suggest that the motivational strength with which a single goal is pursued influences how well goal-relevant events are perceived. In the present study, we assumed that the allocation of spatial attention is also sensitive to the relative relevance of *multiple* activated goals and that attention is therefore allocated primarily to stimuli relevant to the most important goal in a situation. In order to test this assumption, the present study investigated whether spatial attention is allocated to stimuli relevant to a high priority goal when simultaneously presented with stimuli relevant to a low priority goal.

To examine this issue, we compared the effects of two goals with a different value (Experiment 1) or with different expectancy of success (Experiment 2). Classic theories of motivation (Tolman, 1955; Atkinson, 1964) state that the motivation to pursue a goal increases with the goal's value and with the expectancy to achieve it. Consequently, we assumed that a goal with high value will be prioritised over a goal with low value (Experiment 1) and that a goal with high expectancy of success will be preferred over a goal with low expectancy of success (Experiment 2).

We used a simple task to implement two goals. In each trial of this task, a single word appeared briefly on the screen. Participants were instructed to respond (by pressing the spacebar) when one of two words (e.g., "boat" or "field") was presented. Correct reactions were rewarded with points and participants were instructed to strive for the maximum score on this task. More importantly, correct reactions to the words were rewarded in a different manner. In Experiment 1, correct reactions to one word (e.g., "boat") were rewarded with 90 points (high value goal) whereas correct reactions to the other word (e.g., "field") were rewarded with 10 points (low value goal). In Experiment 2, correctly reacting to one word led to 90% chance of winning 100 points (high expectancy of success goal) whereas correct reactions to the other word carried 10% chance of winning 100 points (low expectancy of success goal).

We used a second, independent task, a dot probe paradigm (MacLeod, Mathews, & Tata, 1986), in order to examine the allocation of spatial attention. In this task, two words were simultaneously presented at two different spatial locations on the screen, immediately followed by a probe. If individuals selectively attend to a particular word category, responses are faster to probes at the location previously occupied by these words. The goal-relevant words were used as cues in this task and trials of the dot probe task alternated with trials of the goal task. This procedure allowed us measuring attentional processing of goal-relevant words while participants were simultaneously pursuing the goals. However, because no points could be won in the dot probe task, attending to the goal-relevant words in the dot probe task was neither required nor instrumental for the achievement of the goals. Crucially, to investigate our main hypotheses, we employed trials comparing the two goal-relevant words to each other. We also used trials comparing one of the goal-relevant words to goal-unrelated control words. Because participants should be pursuing both the high and low priority goal, we expected an attentional bias to both goal-relevant words in comparison to control words. Of critical importance, we expected a bias to the words relevant to the high priority goal in trials presenting the two goal-relevant words simultaneously.

Method

Participants

A sample of 45 students (12 men) and a different sample of 29 students (7 men) at Ghent University took part in Experiments 1 and 2, respectively. Participants received course credits or were paid 5 €.

Apparatus and Materials

Words.

We used four Dutch words as goal and control words: *Werk* (work), *boot* (boat), *lijn* (line), and *veld* (field). The control words were used in dot probe and goal task. They required no reaction in the goal task but were used also here in order to present goal-relevant and control words equally often in the whole experiment. Moreover, control words were as well explicitly mentioned in the instructions to control for effects of pre-exposure. The function of the words (goal or control) was counterbalanced between participants. The words were chosen in such a way that the initial letter of each word differed. All words were matched concerning frequency as indicated by the WordGen tool (Duyck, Desmet, Verbeke, & Brysbaert, 2004), word length and number of syllables. Two of these words ("werk" and "lijn") were affectively neutral according to the database provided by Hermans and De Houwer (1994). The other two words ("boot" and "veld") were not included in that database but can be considered to be neutral also.

Four supplementary filler words were used in the goal task only. These words were: *Computer* (computer), *tas* (bag), *kaas* (cheese), and *tafel* (table). Three of these words ("tas", "kaas", "tafel") were affectively neutral according to the database provided by Hermans and De Houwer (1994), the fourth word ("computer") was considered to be neutral by the first author. In the practice block, five additional words were used. These words were: *Fiets* (bike), *mango* (mango), *spinazie* (spinach), *aquarium* (aquarium), and *geweten* (known). Filler words and words used in the practice phase were words that were considered as semantically unrelated to the goal-relevant and control words by the first author.

All words were presented in Courier New font size 28. The experiment was programmed using Inquisit 2.0 (2005) software that was implemented on a Dell Dimension 5000 computer with an 85 Hz, 17-inch CRT monitor. All stimuli were presented against a black background.

Dot Probe and Goal Task

A trial in the *dot probe task* started with the presentation of a black fixation cross (5 mm high) in a white square in the middle of the screen. Along with the fixation cross, two white rectangles (5 cm high x 6 cm wide) were presented above and below the fixation cross (Figure 1). The middle of each of these peripheral rectangles was 4.6 cm from the fixation cross. Cues and probes were presented within the rectangles. The fixation screen was presented for 500 ms. Hereafter, two cue words appeared for 350 ms. Immediately after offset of the cue words, a probe consisting of a black square (0.5 cm x 0.5 cm) appeared. Responses required locating the probe by pressing one of two keys (“q”, “m”) with the left and right index finger on an AZERTY keyboard. Distribution of keys to probe locations was counterbalanced between participants. A trial ended after a response was registered or 1500 ms had elapsed since the onset of the probe. The fixation cross remained on the screen throughout a trial of the dot probe task.

(Figure 1 about here)

A trial of the *goal task* started with the appearance of a word in the middle of the screen for 150 ms, after which it was replaced by a red question mark (8 mm high). A trial ended with a response (pressing the spacebar, only required for the two goal-relevant words) or when 2000 ms had elapsed since the onset of the question mark (Figure 1). In Experiment 1, correct reactions to the goal-relevant words were followed by a feedback indicating the amount of points won. In Experiment 2, 90% of the trials of the low priority goal word and 10% of the trials of the high priority goal word were followed by a feedback indicating that no points were won. On the rest of the trials, the feedback indicated that points were won. Feedback was presented for 200 ms.

Procedure

Practice phase.

Participants were seated approximately 60 cm from a computer screen. Instructions were presented on the screen. For the dot probe task, participants were asked to maintain attention at the fixation cross and to respond as quickly and as accurately as possible to the probe location. They were informed that after responding to the probe, a single word would be presented in the middle of the screen. If the word in the middle of screen was one of the two goal-relevant words, they should press the spacebar with both thumbs when the question mark appeared. Instructions for the goal task further stated that speed is not important in this task.

Test phase.

Before the test phase, participants were shown the goal-relevant and control words and were told that these words would be used in the test phase. Participants were informed that they would win points for correctly indicating the presence of the goal-relevant words during the goal task. Participants were instructed to strive for the maximum score on this task. Furthermore, in Experiment 1 participants were told the amount of points per word (high value goal word: 90 points; low value goal word: 10 points) and in Experiment 2 the probability of success per word (high success expectancy goal word: 100 points with 90% chance; low success expectancy goal word: 100 points with 10% chance). To make sure that participants picked up this information they had to repeat it by typing it in. They received feedback whether they were correct. Additionally, participants reported after the experiment (a) how much they had focused on each of the goal-relevant words in the goal task and (b) the amount of points (Experiment 1) or the probability of success (Experiment 2) that was assigned to these words. In Experiment 2, participants were also told explicitly that the words appearing in a dot probe trial were not predictive of the word appearing later on in the goal task trial.

Dot probe and goal task consisted each of 160 trials (Experiment 1) or 192 trials

(Experiment 2). Each type of dot probe trial (goal vs. goal, high priority goal vs. control, low priority goal vs. control, control vs. control[1]) was presented 40 times (Experiment 1) or 48 times (Experiment 2). In both experiments, each cue word was presented on half of the trials in the upper cue location and on the other half in the lower cue location. Each cue word predicted the target location correctly on half of the trials. In Experiment 1, each goal and control word was presented 30 times in the goal trials. On the remaining 40 trials, a filler word was presented. In Experiment 2, each goal and control word was presented 40 times in the goal trials and filler words were presented on the remaining 32 trials. Hence, in both experiments, goal and control words were presented equally often. Trials of dot probe task and goal task alternated. The intertrial interval was 600 ms. The order of the trials of both tasks was determined randomly for each participant. The order of the dot probe task and goal task trials was determined independently. Hence, the cue words that were presented in a dot probe trial were not predictive of the word that would appear in the consequent trial of the goal task.

Results

Experiment 1

One participant reported to have focused more strongly on the low value goal in the goal task. We excluded her data because in order to test our hypotheses it was necessary that subjects prioritised the high value goal in the goal task. The data of three female participants were excluded because they indicated to have believed that the values of the goals were opposite to their actual values (i.e., belief that the word leading to 90 points led to 10 points).[2] Trials with errors in the dot probe trials were removed from the data (3.38%). For each participant, dot probe reaction times (RTs) shorter than 150 ms or larger than three standard deviations above the individual mean were discarded as outliers (1.88%). Means and standard deviations of the dot probe task responses can be found in Table 1. Performance in the goal task was accurate (2.13% errors).[3]

(Table 1 about here)

We performed four separate paired t-tests, one for each type of dot probe trial. The first analysis on trials comparing high value goal words to control words revealed that, as expected, RTs were significantly faster when the probe appeared on the former location of the high value goal word than when the probe appeared on the former location of a control word, M = 449 ms, SD = 67 ms, and, M = 465 ms, SD = 74 ms, respectively, $t(40) = -2.94$, $p < .006$. Second, as expected, in trials comparing the low value goal word to control words, probes were more rapidly detected when preceded by a low value goal word than when preceded by a control word, M = 447 ms, SD = 68 ms, and, M = 464 ms, SD = 75 ms, respectively, $t(40) = -4.09$, $p < .001$. Of critical importance were the trials comparing the two goal-relevant words. In line with our hypothesis, RTs were significantly faster when the probe appeared on the former location of the high value goal word than when the probe appeared on the former location of the low value goal word, M = 453 ms, SD = 68 ms, and, M = 463 ms, SD = 68 ms, respectively, $t(40) = -2.28$, $p < .03$. Fourth, RTs did not differ on trials comparing control words, $t(40) = 1.32$, *ns*.

Experiment 2

The same analyses were performed as for Experiment 1. The data of one participant were excluded because she believed that the success expectancies of the goals were opposite to the actual success expectancies.[4] Incorrect probe responses occurred on 1.87% of the trials. The data from these trials were excluded from the analyses. 1.76% of all probe responses were discarded as outliers. Means and standard deviations of the dot probe task responses can be found in Table

2. Participants made errors on 1.60% of the goal task trials.[5]

(Table 2 about here)

First, on trials comparing the high success expectancy goal word to control words, RTs were significantly faster when probes were preceded by a high success expectancy goal word than when probes were preceded by a control word, M = 456 ms, SD = 77 ms, and, M = 483 ms, SD = 83 ms, respectively, $t(27) = -3.85$, $p < .002$. Second, on trials comparing the low success expectancy goal word to control words, RTs were significantly faster to detect probes preceded by a low success expectancy goal word than to detect probes preceded by a control word, M = 462 ms, SD = 80 ms, and, M = 479 ms, SD = 84 ms, respectively, $t(27) = -3.52$, $p < .003$. Of crucial importance were again the trials comparing the two goal-relevant words. As expected, RTs were significantly faster when the probe appeared on the former location of the high success expectancy goal word than when the probe appeared on the former location of the low success expectancy goal word, M = 468 ms, SD = 80 ms, and, M = 485 ms, SD = 88 ms, respectively, $t(27) = -2.39$, $p < .03$. Fourth, RTs did not differ on trials comparing control words, $t(27) = -.687$, *ns.*

Discussion

The present study examined whether the prioritising of a goal affects the allocation of spatial attention to stimuli relevant to multiple goals. The results are in line with our hypotheses. Experiment 1 showed that attention was oriented to stimuli relevant to a goal with high value when presented simultaneously with stimuli relevant to a goal with low value. Demonstrating the stability of the effect, Experiment 2 replicated and extended this finding by showing that attention was allocated to stimuli relevant to a goal with high expectancy of success when presented simultaneously with stimuli relevant to a goal with low expectancy of success.

Moreover, as expected, we found that attention was allocated to both goal-relevant words when these words were presented simultaneously with control words.

Our results corroborate the growing evidence demonstrating that spatial attention is biased towards goal-relevant events (e.g., Folk, Remington, & Johnston, 1992; Moskowitz, 2002; Rothermund, 2003). First, our results demonstrate that the influence of goals on the allocation of spatial attention is not limited to situations in which only one goal is activated. Second, our results reveal that the allocation of spatial attention also reflects differences in the relative relevance of these goals. Recent research showed that a goal representation conveys more information than only what kind of stimuli or stimulus dimensions are goal relevant. In particular, the activation level of a goal representation reflects the motivational strength of goal pursuit and thus how important a goal is (Förster et al., 2005). The present results reveal that the allocation of spatial attention is very quickly affected by even fine-grained relevance differences between multiple goals that are simultaneously present. By this, our findings provide the first evidence that the allocation of spatial attention supports the management of multiple goals and especially the prioritising of one goal.

The Theory of Visual Attention (TVA) by Bundesen (1990) can account for these effects on a theoretical level. The influence of goals on attention is supposed to be mediated by the activation of goal representations in working and long-term memory that bias the attentional selection to prefer matching stimuli in the environment (Desimone & Duncan, 1995; Moskowitz, Li, & Kirk, 2004; Soto, Hodsoll, Rotshtein, & Humphreys, 2008). More importantly, TVA states that such representations have an attentional weight that reflects their relevance. A high weight raises the probability that matching stimuli get selected. Consequently, the representation of a high priority goal should have a higher attentional weight than the representation of a low priority goal. In a similar vein, Treisman (1960) proposed that the representation of an incoming stimulus needs to reach a certain activation level ("threshold") in order to be consciously recognized. Importantly, the current relevance of a stimulus can increase the resting level of its representation which makes it more likely to reach the threshold when the stimulus impinges the system.

It needs to be mentioned that the value and the expectancy of success associated with a goal are only two examples of factors that determine the motivational strength of goal pursuit. There are other characteristics of goals as well as individual preferences or situational demands that determine the relevance of a goal (Austin & Vancouver, 1996). Furthermore, expectancy and value of a goal can interact, making a goal with both high value and high expectancy of success most relevant (Atkinson, 1964; Förster et al., 2005).

Another issue concerns the relation between multiple goals that are present in a situation. First, the two implemented goals in our study served the same superordinate goal (achieving the maximum score in the goal task) and can therefore be described as subgoals or means to this goal (Kruglanski et al., 2002). Multiple goals that an individual holds often represent subgoals to a superordinate goal, for instance, when a student has to pass different exams in order to get a degree. Our results are relevant only for these types of situations. One should, for instance, be careful in generalizing the present findings to situations in which multiple goals are independent of each other (e.g., a student having the goal of passing an exam and the goal of being able to run a marathon). Second, in our study, participants were still pursuing the low priority goal. Consequently we found a bias to words relevant to this goal when we compared them to control stimuli. This result might change when multiple goals are conflicting and cannot be pursued in parallel. In this case, it seems likely that low priority goals have to be inhibited (Shah et al., 2002). Hence, when multiple goals are conflicting, attention might not at all be allocated to events relevant to low priority goals.

What are the implications of the present findings for multiple goal pursuit situations in everyday life? In the present study, the implemented goals required participants to detect goal-relevant words. In daily life, however, people do not always have such specific detection goals. One might thus wonder whether our findings extend to other goals that do not require being attentive to goal-relevant events in one's environment (i.e., non-detection goals). Concerning the pursuit of a single goal, Moskowitz (2002) demonstrated that attending to goal-relevant events occurs also for non-detection goals. In his study, the goal of being egalitarian was activated by letting participants remember instances in which they failed to act egalitarian towards members of minority groups. Experiencing failure in goal pursuit has been shown to strengthen the activation of a goal (e.g., Rothermund, 2003; Förster et al., 2005). The results of his study showed that words relevant to this goal (e.g., tolerant) attracted attention. Given that attention is directed to both words relevant for a detection goal and words relevant for non-detection goals, we believe that the effects of goal prioritising on attention for goal-relevant words will also be similar for both types of goals. For instance, a student being more motivated to succeed in a psychology exam than to succeed in a statistics exams might be more attentive to words related to the psychology exam than to words related to the statistics exam. However, everyday-life goals might often be more complex than the goals implemented in the present study. Because of this, conflicts between different goals are more likely to arise, meaning that often only one goal (i.e., the prioritised goal) can be pursued in a given situation. As already pointed out above, attending of stimuli relevant to *non-prioritized* goals might depend on whether those goals are in conflict with more important goals that are active in the same situation. For instance, when conflicting goals are present, stimuli that are relevant to non-prioritised goals might not be attended at all or might even evoke attentional avoidance.

An increasing number of studies demonstrated that attention is also *automatically* allocated to goal-relevant events (Folk et al., 1992; Ansorge & Neumann, 2005; Rothermund, 2003). Although there are not absolute criteria for defining a process as automatic (Moors & De Houwer, 2006), two arguments support the conclusion that our effects were due to the automatic allocation of attention. First, we observed the effect at a cue-target interval of 350 ms and with RTs of less than 500 ms. Hence, the time window in which strategic processes could have influenced responses was very short. Prior studies using two words as cues typically implemented a cue-target interval of 500 ms (see Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & van IJzendoorn, 2007). Second, attending to goal-relevant words in the dot probe task was not instrumental for the goal task. Additionally, attending to the cues in the dot probe task was also not instrumental for the dot probe task because none of the cue categories predicted the probe location above chance level. Hence, attending to goal words in this task might have been unintentional.

Several limitations of the present research can be addressed in future studies. First, it would be worthwhile to investigate the effects of multiple goals that are more independent of each other (e.g., using two different goal-inducing tasks) or even conflicting (e.g., implementing goal-inducing tasks that cannot be performed in parallel). As we argued above, the relation between the multiple goals that are present in a situation could have an important impact on the allocation of attention. Furthermore, it might be interesting to use goal tasks that provide more clear indices of participant's motivation to reach the goals. In the present study, the fact that responses after high priority goals in the goal task were faster than responses after low priority goals (see Footnotes 3 and 5) suggests that participants indeed strove more for the high than for the low priority goal. However, the speed of the responses during the goal task was not relevant for the task itself. It is therefore not clear whether the speed of responding during the goal task does provide an index of the strength of goal pursuit. There are different ways in which the motivational strength of goal pursuit might have influenced the speed of these responses. For instance, due to selective attention, words relevant to the high priority goal might have been detected more rapidly in the goal task which resulted in faster responses to these words. Nevertheless, future studies should for instance make response speed relevant in the goal task.

Future studies might not only use different goal tasks but could also optimize the dot probe task that is used to register attention. In our studies, participants could in principle fulfil the dot probe task by monitoring one of the two probe locations. For instance, if the probe is presented in the location that is monitored, the corresponding key can be pressed and in case that the probe does not appear in this location, the other key can be pressed. Nevertheless, the fact that we did observe the expected effects in the dot probe task shows that our task was sensitive enough. Also note that the procedure of the experiments discouraged a strategy of monitoring either the upper or lower location of the screen. In our experiments, dot probe trials alternated with goal trials which required participants to attend to the middle of the screen because in the goal task stimuli were presented at that location. This should have encouraged participants to follow the instructions of the dot probe task, namely to maintain attention at the fixation cross presented in middle of the screen during the dot probe trials. However, future research can solve this issue in a more definite manner by using probes that need to be categorized (e.g., two dots in horizontal vs. vertical arrangement).

In conclusion, the present study is the first one to show that the (automatic) allocation of spatial attention reflects the prioritising of a goal and thus the motivational strength of goal pursuit in multiple goal pursuit situations. Our study opens the way for future research in which the influence of goals on spatial attention can be examined in the context of multiple goal pursuit.

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Footnotes

[1]Trials comparing the two control words were implemented to present all four words equally often over the whole experiment.

[2]The data of these four participants showed a significant attentional bias for the low value goal word in the trials comparing the two goal-relevant words, $t(3) = 3.26$, $p < .05$. Concerning the other effects, they showed the same pattern as the other participants.

[3]We analysed the RTs from goal trials with goal-relevant words in order to see whether participants were faster to react after a high value goal word had been presented than after a low value goal word had been presented. The RT was defined as the time between the onset of the question mark and the registration of the spacebar response. The analyses indicated that RTs after high value goal words ($M = 430$ ms; $SD = 95$ ms) were faster than RTs after low value goal words ($M = 462$ ms; $SD = 108$ ms), $t(40) = -3.00$, $p < .01$. This suggests that participants prioritised the high value goal in the goal task.

[4]The same conclusions were reached when her data were included.

[5]As in Experiment 1, we analysed the RTs from goal trials presenting goal-relevant words. The analyses revealed that RTs after high success expectancy goal words ($M = 404$ ms; $SD = 99$ ms) were faster than RTs after low success expectancy goal words ($M = 441$ ms; $SD = 88$ ms), $t(27) = -4.29$, $p < .001$. This suggests that participants prioritised the high success expectancy goal.

Table 1

Mean Latencies and Standard Deviations (in ms) as a Function of Trial Type and Probe Location in Experiment 1

		Latency	
Trial Type	*Probe Location*[a]	*M*	*SD*
High value vs. control	High value goal word	449	67
	Control word	465	74
Low value vs. control	Low value goal word	447	68
	Control word	464	75
High value vs. low value	High value goal word	453	68
	Low value goal word	463	68
Control vs. control	Control word 1	457	73
	Control word 2	450	68

Note. [a]Probe location implies that the probe replaced the cue word category mentioned in a line of this column.

Table 2

Mean Latencies and Standard Deviations (in ms) as a Function of Trial Type and Probe Location in Experiment 2

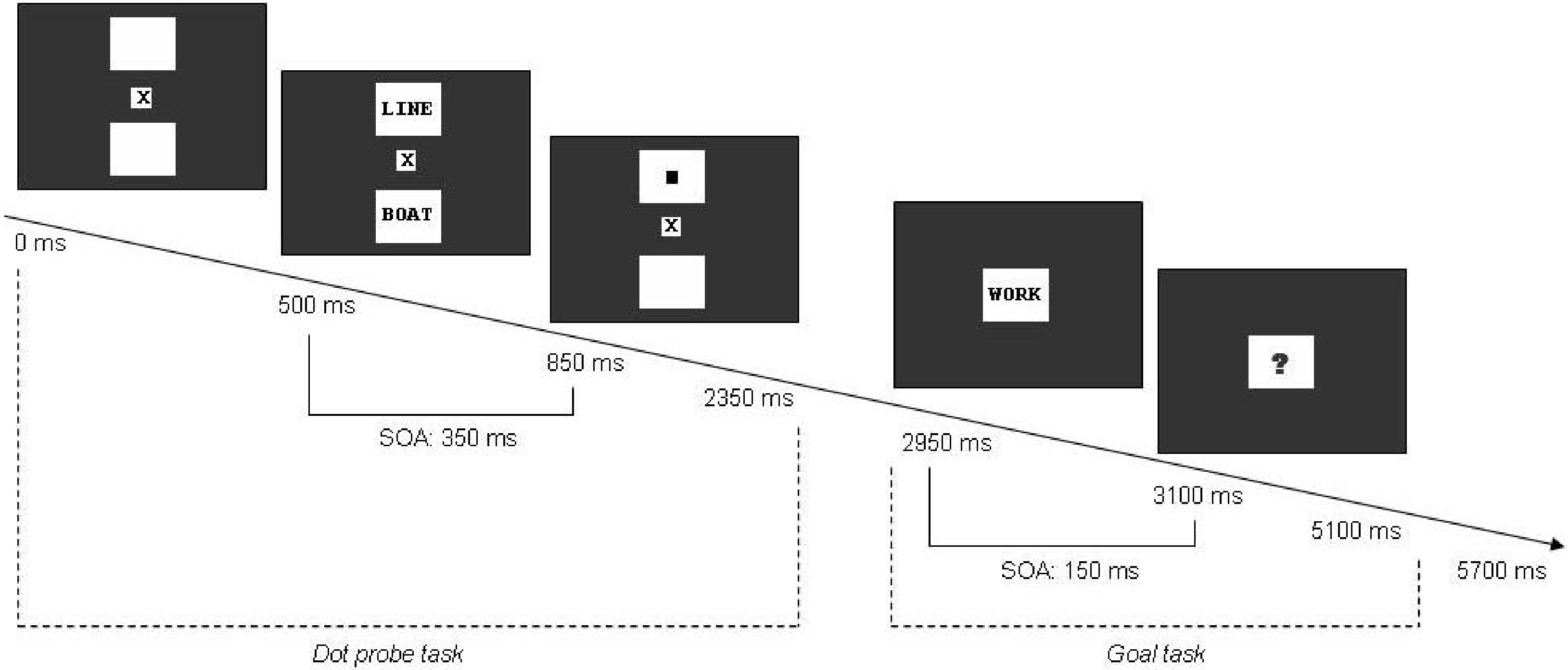
		Latency	
Trial Type	*Probe Location*[a]	*M*	*SD*
High expectancy vs. control	High expectancy goal word	456	77
	Control word	483	83
Low expectancy vs. control	Low expectancy goal word	462	80
	Control word	479	84
High expectancy vs. low expectancy	High expectancy goal word	468	80
	Low expectancy goal word	485	88
Control vs. control	Control word 1	468	84
	Control word 2	473	85

Note. [a]Probe location implies that the probe replaced the cue word category mentioned in a line of this column.

Figure captions

Figure 1. Schematic overview of an example trial of the combined dot probe and goal task in the experiments. The first three boxes depict the dot probe task in which the presentation of two cue words was followed by a target which had to be localized. The last two boxes display the goal task in which the presentation of a single word was followed by the appearance of a question mark. Participants had to react to the question mark by pressing the spacebar when the single word presented before had been one of the two goal-relevant words.

Figure 1.


X
LINE
X
BOAT
X
WORK
?
0 ms
500 ms
850 ms
2350 ms
SOA: 350 ms
2950 ms
3100 ms
5100 ms
5700 ms
SOA: 150 ms
Dot probe task
Goal task