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Beware of the gorilla: Effect of goal priming on inattentional blindness

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ABSTRACT

When people's attention is engaged in a visual task, they often are blind to unexpected events occurring in their environment. This phenomenon is known as inattentional blindness. In this study, we examine inattentional blindness with regard to goal priming, a technique allowing to unconsciously influence goal pursuit. After being primed with a detection goal, the name of the target to detect, or no prime, participants watched a short sequence in which they had to count passes made by basketball players. An unexpected event occurred during the video. Results indicated that when attentional demands of the monitoring task were moderate, goal priming improved the detection of the unexpected event. Implications for the understanding of non-conscious management of attention will be discussed.

1. Introduction

Many people have experienced a time when either themselves or someone else was engaged in an activity and appeared to be deaf or blind to what was happening around them. This phenomenon, when it affects the visual channel, is known as "inattentional blindness". Even if focusing attention on a single activity is generally an adaptive process, it can lead to problems if attention is required to process an unexpected event or to rapidly adapt to the ongoing situation. For instance, drivers involved in a car accident frequently claim that they "looked but failed" to see the other vehicle (White, 2006). This paper explores one potential method to improve the detection of an unexpected event in an inattentional blindness paradigm: goal priming.

1.1. Inattentional blindness

Inattentional blindness (Mack & Rock, 1998) refers to the fact that salient objects or events fail to reach awareness when attention is otherwise engaged in a task. In 1999, Simons and Chabris provided a striking example of this phenomenon: while watching a short video clip, almost half of the participants who had been instructed to count the number of passes performed by basketball players failed to notice a person wearing a gorilla suit, even if the gorilla was fully visible for an extended time.

Two factors are particularly important in the occurrence of inattentional blindness: the unexpected event's features and the demands of the primary task (Most, Scholl, Clifford, & Simons, 2005; Simons & Jensen, 2009). Observers are more likely to detect an unexpected event that shares visual features (e.g., color, shape) with the targeted events. For instance, in the gorilla example, detection rates were higher when observers had to monitor players wearing black shirts (i.e., sharing the same color as the gorilla).

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Inattentional blindness also depends on the difficulty of the monitoring task. The more difficult the task, such as requiring a high level of attention, the less often the observers detect the unexpected event. In other words, inattentional blindness depends on the unexpected target's characteristics and on the goal's demands.

1.2. Goal priming

If goal pursuit is usually considered as a voluntary and consciously controlled activity, it can also occur outside of awareness, intent, and control (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Troetschel, 2001; Bargh, Schwader, Hailey, Dyer, & Boothby, 2012). Indeed, if goals are generally set in a volitional way, they can also be activated and pursued nonconsciously, leading to outcomes comparable to conscious goal setting and pursuit (Bargh et al., 2001; Chartrand & Bargh, 1996). In terms of processes, Hassin, Bargh, Engell, and McCulluch (2009) suggested that once a goal is primed, it enters implicit working memory (IWM) and some capacity such as mental resources, or processing time, is allocated to this goal. Then, if the goal is allocated sufficient capacity, schemas, means and relevant knowledge are selected or created. Finally, nonconscious goal pursuit is triggered and influences behavior (e.g., Dijksterhuis, Chartrand, & Aarts, 2007) as well as information processing (e.g., Dijksterhuis & Aarts, 2010; Mitchell, Macrae, Schooler, Rowe, & Milne, 2002). Interestingly, it was demonstrated that nonconscious goal pursuit is flexible (Hassin, Aarts, Eitam, Custers, & Kleiman, 2009) and can run in parallel to a conscious activity. Thus, conscious and nonconscious goals can coexist, especially when both types of goals are compatible or share a high degree of similarity (e.g., Bargh et al., 2001; Hassin, Aarts et al., 2009; Hassin, Bargh et al., 2009; Légal & Meyer, 2009). In that case, nonconscious and conscious goal pursuits would make use of the same underlying motivational circuits and systems (Huang & Bargh, 2014) and lead to improved performance.

1.3. Current study

Inattentional blindness relies on the allocation of an observer's attentional resources and, as a consequence, is closely related to the processing of goals. During a task or an activity, a conscious goal defines what to observe and what is important. In other words, the goal linked to the primary task or activity sets up a prioritization of the scope of attention and determines the allocation of attentional resources, creating what is called an attentional set (Most et al., 2005). In line with research about implicit working memory (Hassin, Aarts et al., 2009; Hassin, Bargh et al., 2009), we propose that goal priming could be a way to nonconsciously allocate unused attentional resources to a task. Specifically, goal priming could be a way to allow the involvement of attentional resources with aspects other than those related to the primary task objectives.

In this article, we explore whether goal priming can improve rates of noticing an unexpected event in an inattentional blindness framework. To that end, we combined two classical paradigms. The first one, from the goal priming literature, allowed us to prime either a nonconscious detection goal, no goal, or the word "gorilla" (i.e., the upcoming unexpected event) in participants. The second paradigm refers to Simons and Chabris' (1999) "gorilla experiment" on inattentional blindness. In this paradigm, participants engage in a monitoring task involving basketball players and frequently miss the unexpected arrival of a gorilla on the playground.

Because of its motivational features, we assume that priming a detection goal, compared to the no goal and the gorilla-prime conditions, should improve the detection of the unexpected event in the subsequent monitoring task. In contrast, priming the name of the target to detect, as it is not linked to motivational processes, should not affect the allocation of attentional resources, and therefore should not influence detection rates (Kreitz, Schnuerch, Furley, Gibbons, & Memmert, 2014). We also assume that the goal priming effect should be more likely to occur when a part of the attentional resource remains available despite the task performance. In other words, the goal priming effect should occur more often for an easy monitoring task rather than a hard one, this latter consuming more resources. Finally, since our detection goal is compatible with and applicable to the monitoring task, it should also lead to a better performance on this task. Indeed, priming of goals applicable in a task should result in the investment of more resources and lead to better performance.

2. Material and method

2.1. Participants and design

One hundred and sixty-seven first-year psychology students participated in the study in exchange for course credits. Participants were randomly assigned to one of the conditions of a 3 (priming: detection-prime, gorilla-prime, no-prime) × 2 (monitoring task difficulty: normal vs. high) between-subjects design. Data from 14 participants were discarded either because they reported losing count of the passes (n = 6) or because the participant already knew about the video (n = 8).

2.2. Materials and procedure

Participants were told they would participate in two unrelated studies. The first study, presented as a decision task, was a cover for our subliminal priming manipulation. The second study, presented as a monitoring task, allowed us to assess inattentional blindness. After the completion of the two studies, participants were thanked and debriefed.

2.2.1. Decision task/priming manipulation

Upon arriving to the lab for the studies, participants were invited to start with a "decision task" in which they were instructed to