

Prevalence Effect is Determined by Past Experience, not Future Prospect

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摘要

Wolfe, Horowitz, and Kenner (2005) 以實驗方法測試「低出現率效應」。他們在實驗中模擬機場行李檢查的程序，指出若目標物件(危險工具)出現之機率非常低，缺失率將不合比例地升高。是項研究根據 Wolfe et al. (2005) 之結果，進一步探討「低出現率效應」之成因：究竟該效應為自上而下、自主控制的結果，抑或由下而上、由經驗及刺激物引起？實驗一及二的結果顯示，參加者並不會被實驗的指示影響搜尋效能，反之他們的表現受制於目標物件出現的機率；在實驗三及四，被搜的行李中，有一半被標示為高危，另一半被標示為安全。被標示為高危的行李當中，其中一半藏有目標物件，被標示為安全的行李當中，只有百分之十藏有目標物件。實驗中，參加者需要在三種不同的情景進行搜尋任務，包括整批高危，整批安全，以及高危和安全行李相混在一起。在高危和安全行李混雜的情景下，目標物件整體出現的機率為百分之三十，但參加者得悉目標物件於個別行李出現的機率分別為百分之五十及百分之十。我們發現參加者對於高危和相對安全的行李的搜尋表現沒有顯著的差別，表現同樣優勝。結果證明「低出現率效應」由經驗及刺激物引起，難以透過改變參加者的自主控制提升搜尋的表現。是項研究對機場行李檢查的程序有重要的啓示。

Abstract

In a laboratory task similar to an X-ray baggage search at an airport, Wolfe, Horowitz, and Kenner (2005) reported a “prevalence effect” (i.e., a very high miss rate) when the presence of a target is very infrequent. The present study tested whether this prevalence effect is the result of a voluntary top-down control (i.e. instruction driven) effect for future prospect or an implicit stimuli-driven priming process from past experience. Experiments 1 and 2 showed that, regardless of instructions given on the likelihood of target presence, the magnitude of prevalence (i.e., the miss rate) is determined only by the actual prevalence of the target. In Experiments 3 and 4, target prevalence was indicated by background color on a trial-by-trial basis. Some blocks (i.e., constant blocks) were either comprised of all high-prevalence trials or all low-prevalence trials, whereas in other blocks (i.e., mixed blocks) high-prevalence and low-prevalence trials were randomly mixed. Target prevalence significantly affected the miss rate in the constant blocks, but had no effect in the mixed blocks. Overall, the prevalence effect is essentially the result of past experience and is not affected by future prospect.

Keywords: Visual search; Stimuli-driven; Prevalence effect