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Review

# Willful inattention: Integrating visual attention mechanisms and willful ignorance

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Willful ignorance refers to the intentional avoidance of relevant information, even when access is cost-free. We integrate this concept with the idea that visual attention operates along a continuum and define *willful inattention* as below-baseline attention to relevant information, driven by avoidance motivation. Willful inattention allows individuals to reduce awareness of visually apparent information and plays a significant role in several domains including dishonesty and harmful consumption. We show how interventions aimed at reducing willful inattention may harm information seeking behavior and vice versa. Policies targeting heterogenous populations must therefore tradeoff capturing the attention of information seekers and avoiders.

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Willful ignorance is the intentional avoidance of relevant information, even when acquiring such information comes at no additional cost [1–3]. Willful ignorance plays an important role in dishonesty and consumption, such when consumers avert their gaze from calorie counts, climate labels, or warnings about unethical production to maintain comfort or justify preferred choices. Integrating this concept with visual attention, we propose the term *willful inattention*, referring to the deliberate use of visual attention to produce willful ignorance. While willful ignorance is typically framed as a binary distinction between knowing and remaining ignorant, this dichotomy is overly simplistic and does not map well onto visual attention. Visual attention is often measured as gaze time - a continuous metric ranging from zero to theoretically infinite values [4]. Even when gaze time is zero, perception is not entirely absent, as stimuli are often detected through peripheral vision [5,6]. Figure 1a illustrates that, within this continuum, there is a baseline - or chance-level zone - representing the attention a stimulus receives due to random fixations or noise [7,8]. The exact bounds of this zone depend on how the baseline is operationalized, but it generally forms a lower threshold for meaningful attention. Figure 1a maps stimulus relevance onto the underlying attentional mechanisms that determine whether attention falls below or above baseline. Attention to relevant information above baseline is generally driven by top-down facilitation, which refers to internal factors such as goals, preferences, and task instructions. In vision science, stimuli that are relevant and deliberately attended to are typically referred to as targets. In contrast, attention that rises above baseline levels for irrelevant information is typically the result of bottom-up facilitation - that is, stimulus-driven features like visual salience, spatial location, or surface size. Such stimuli are referred to as distractors [9].

Recent research also shows that individuals can learn the typical locations or features of distractors through observation and use this information to actively suppress attention to them [10–13]. This suppression results in below baseline levels of attention to those distractors, thereby improving visual search efficiency and decision speed (Figure 1b-1c). Furthermore, recent evidence links suppression to willful inattention. In study 1 by Børsting et al. [14], participants in the "baseline" condition were instructed to report the location a target object (T1) while ignoring the distractor object (T2). In the "avoid" condition, participants were instructed to report the location of either T1 or T2 depending on which they first notice but were only incentivized for reporting T1. Compared to the baseline condition, participants suppressed gazes to locations where there was a high probability of encountering T2 thereby maximizing

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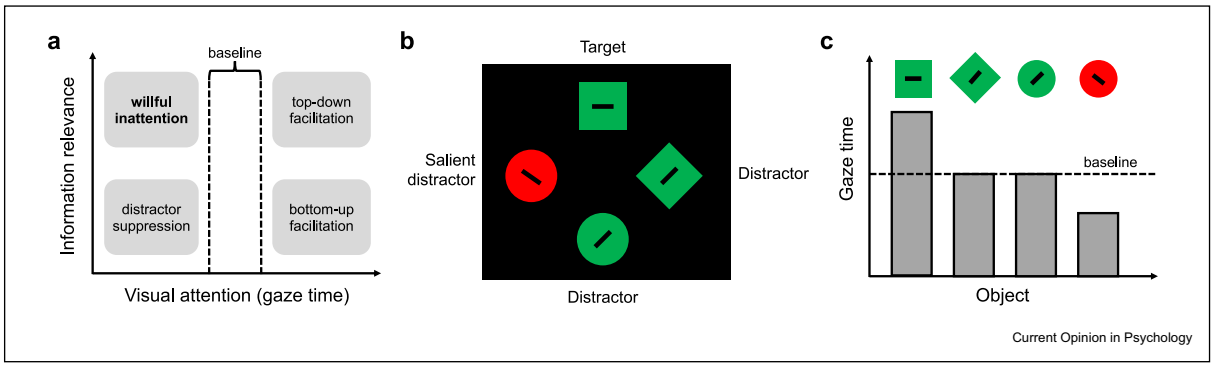
**Figure 1**




**(a)** We define *willful inattention* as below baseline levels of attention to a relevant stimulus driven by the motivation to avoid it. **(b)** In the singleton search task, participants are instructed to find a target object. Typically, the target attracts gaze through top-down facilitation and salient distractors attract gaze through bottom-up facilitation. (c) The figure illustrates how individuals suppress gaze to salient distractors below baseline levels thereby enhancing search efficiency [15].

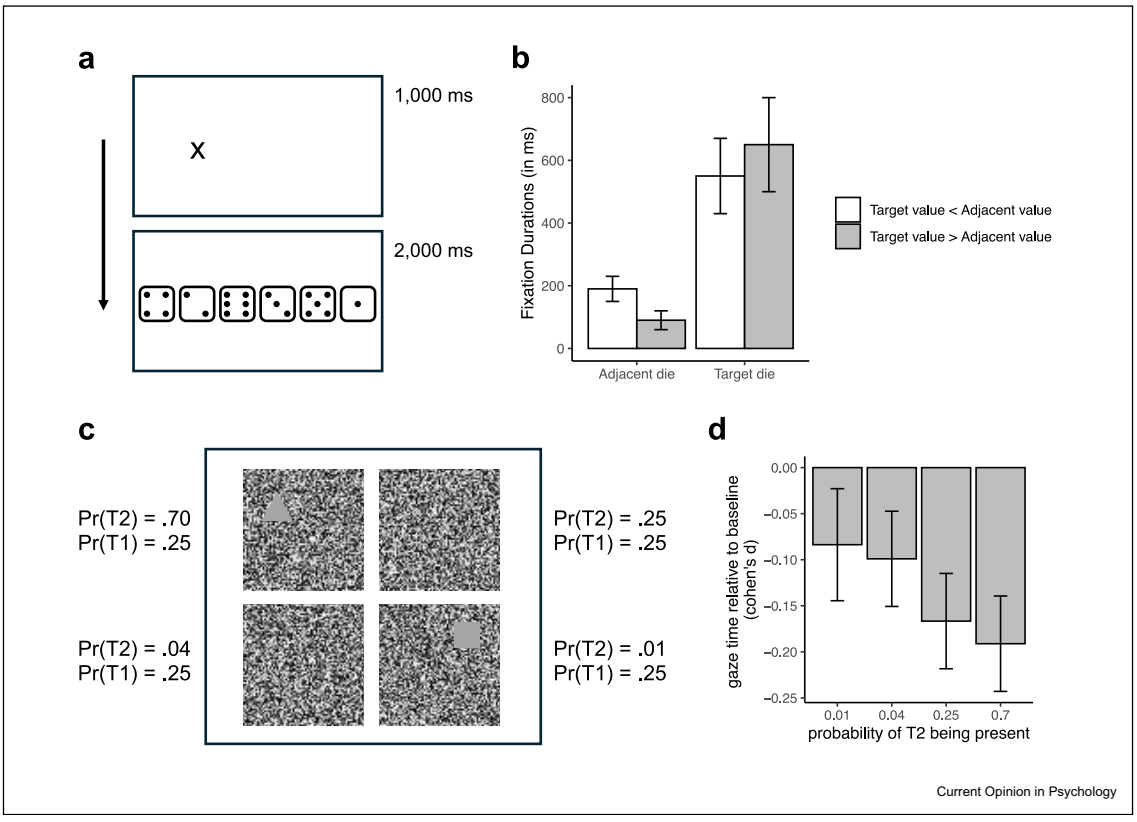
their financial incentives (Figure 2c-2d). The findings suggest that individuals can suppress attention to both irrelevant distractors and to relevant target stimuli to remain willfully inattentive. Based on these findings, we define willful inattention as below baseline levels of attention to relevant information. Importantly, willful inattention does not imply a complete absence of attention. Rather, it indicates that the level of attention to a relevant stimulus is disproportionately low compared to the attention typically given to other relevant stimuli.

## Mechanisms of willful inattention

We suggest that willful inattention can result from two different mechanisms: one is suppression, which involves actively avoiding certain stimuli; the other is facilitation, which involves selectively focusing limited attention on other stimuli instead. In study 1 in Pittarello et al. [16], participants were asked to report which of six dice appeared closest to a fixation cross (Figure 2a). When accuracy was incentivized, participants made fewer mistakes and focused their attention on the correct die. When the dot count was incentivized - meaning participants earned money based on the number of dots they reported (e.g., reporting 6 dots earned them $6) - participants made more self-serving mistakes and spent more time gazing at the higher value (but incorrect) die and less at the correct one. In this study, willful inattention to the correct die resulted from participants facilitating attention to the alternative higher value die. Similar patterns have been observed using comparable paradigms (e.g. Refs. [17–20]). An important question is whether participants intentionally facilitated attention to the alternative high-value die to reduce gazes to the correct but low-value die or whether their attention was unintentionally captured by the high-value die — a mechanism known as value-driven attentional capture [21]. Speaking against value-driven attentional capture are the findings from study 3 in Børsting et al. [14] in which participants were asked to report the location of either of two letters. In the accuracy condition, finding either letter was rewarded but in the report condition only one of them was. In the report condition, dishonest participants with many self-serving errors facilitated attention to locations with a low probability of containing the unrewarding target letter. Importantly, the low probability locations were not associated with a higher value suggesting that individuals can intentionally facilitate attention to an alternative and unrewarding stimulus to remain wilfully inattentive.

Another mechanism that may lead to below baseline levels of attention to relevant stimuli is the presence of salient distractors. Visually prominent but irrelevant stimuli can capture attention, reducing the attention available for relevant, potentially less salient information. This attentional competition is frequently exploited in consumer contexts [22,23]. For example, companies may design advertisements or product interfaces to emphasize appealing visuals while obscuring unfavorable information, such as hidden fees or liability waivers. Even when consumers would prefer to know such information, their attention is diverted, resulting in reduced awareness [24]. It is therefore essential to distinguish between willful inattention and attentional outcomes shaped by choice architecture - the deliberate structuring of environments to influence decision-making [25]. In light of this, we refine our definition of willful inattention to emphasize intention: Willful inattention is below baseline levels of attention to relevant information, motivated by a desire to avoid that information.

**Figure 2**




**(a)** In study 1 in Pittarello et al. [16], participants are instructed to report which die is closest to the fixation cross. (b) In the pay-for-report condition, participants spend more time gazing at the higher value die. **(c)** In study 1 in Børsting et al. [14], participants are instructed to report the location of target T1 in the baseline condition. In the avoid condition they must report either T1's or T2's location but only T1 is rewarded. (d) Participants suppress gazes more to locations where the probability of T2 being present is higher.

## Implications of and remedies for willful inattention

Prior research has established a strong link between willful inattention and dishonest behavior, with higher levels of inattention associated with greater tendencies toward self-serving or dishonest conduct [16—20,26]. Notably, interventions using salience or gaze-contingent exposure have been successfully use for reducing willful inattention and at least to some extent also decrease dishonesty [20,26], suggesting a causal role of attention in ethical behavior. These findings are consistent with evidence that attention has a linear effect on behavior, as opposed to a threshold or tipping-point model, where even a small increase in attention can lead to a proportionally small change in behavior [27]. Because willful inattention is best understood as a continuum rather than a discrete state, even modest reductions in inattention may be meaningful for influencing behavior. Similar patterns have been observed in consumer behavior. Many consumers actively avoid information that could benefit themselves, such as calorie counts, health labels, or nutritional facts [28—31]. Others avoid information that could benefit others, including data on $CO_2$ emissions, animal welfare, or unethical production practices [31—33]. However, studies show that reducing inattention can significantly increase the use of health- and sustainability-related information [34,35]. Given the potential of these interventions, a key question is what methods are most effective at reducing willful inattention.

Valuable insights can be drawn from the advertising industry, which has long grappled with the challenge of consumer inattention [36]. In traditional mass media, such as print, radio, and television, advertisers have relied heavily on salience to attract attention, using bright colors, bold headlines, and iconic imagery [37]. However, these predictable formats are easily recognized and increasingly ignored by consumers, resulting in low attention levels. With the emergence of digital media, new formats like banner ads and video pre-rolls were introduced. Initially effective, these formats quickly lost impact as consumers learned to identify and dismiss them [38]. In response, the advertising industry has evolved and diversified its tactics. A key strategy has been to embed promotional content within editorial or

entertainment material, making it more difficult for consumers to identify and avoid. Techniques such as native advertising [39], branded entertainment [40], product placement [41], and influencer marketing [42] have become central tools. These approaches blur the boundaries between content, creator, and promotion, making the advertising message less consciously identifiable and thus harder to avoid. The underlying psychological mechanism appears to be a disruption of attentional suppression - consumers are less able to suppress attention when the location or appearance of the message is unpredictable. This mechanism has also been demonstrated in research. Orquin et al. [34] found that placing nutrition labels in unpredictable locations increased attention among consumers who would otherwise ignore them. However, this strategy presents a trade-off: while unpredictability can reduce willful inattention, it can also hinder deliberate search. In the same study, consumers actively looking for labels performed worse when labels were unpredictably placed, suggesting that strategies to counter inattention may come at the cost of usability for engaged consumers. Another approach is to enhance salience. Pittarello et al. [20] found that making information more visually prominent reduced willful inattention. However, other research (e.g. Ref. [43]) indicates that salience can backfire if consumers associate it with advertising, leading them to ignore the message altogether. Pop-up windows offer another method of forcing exposure to information. While they may reduce inattention by interrupting the user's flow, they are often perceived as intrusive or annoying, limiting their long-term effectiveness and acceptability. Conversely, concealing important information with visual clutter, a tactic often used to hide harmful ingredients, hidden fees, or legal disclaimers, may facilitate willful inattention and obstruct search. This deliberate obfuscation significantly reduces the likelihood that such information will be noticed [44]. Table 1 summarizes the trade-offs between methods aimed at counteracting willful inattention and those supporting effective search. It also highlights the need for further research into strategies that can balance both objectives without undermining either.

## Operationalizing and measuring willful inattention

A central question for future research is how to reliably measure willful inattention. Our definition introduces several key conditions that must be met for a behavior to be classified as such. While eye tracking is a useful tool for capturing overt attention, it does not provide a complete picture of willful inattention on its own. Researchers must first establish that the stimulus in question is relevant to the task or decision at hand. This cannot be inferred from eye-tracking data alone; it requires either experimental manipulation (e.g., assigning relevance through instructions or incentives) or supplemental data such as participant self-reports or behavioral measures. Second, the stimulus must receive below baseline levels of attention. In vision science, the baseline is typically operationalized by measuring average attention to non-salient distractors [13,15], but its equivalent in applied settings remains uncertain. Defining a reliable and context-sensitive baseline for attention is a necessary step for advancing empirical work in this area. Third, researchers must rule out alternative explanations, such as limited attention being captured by competing salient or reward-associated stimuli. Without controlling for the attentional demands of the environment, low attention to relevant stimuli cannot conclusively be interpreted as willful inattention. Finally, it is also important to consider the possibility of covert attention [6]. Individuals may process and respond to stimuli without directly fixating on them. For example, recent findings by Pekovic et al. [5] suggest that people can covertly identify decision-relevant stimuli and make faster, more accurate choices based on that information. In such cases, a lack of overt attention does not necessarily indicate inattention, let alone willful inattention. Together, these challenges highlight the complexity of operationalizing willful inattention and the need for multi-method approaches that combine eye tracking with behavioral, contextual, and self-report data. Future work should aim to refine measurement strategies and better delineate the cognitive and motivational processes that underlie the deliberate avoidance of relevant information.

**Table 1**

**The relation between remedies that support search and remedies that counteract willful inattention.**

| | Supports willful inattention | Counteracts willful inattention |
|---|---|---|
| Supports search | Predictable locations or features, such as nutrition tables always being placed on the back of products, makes search easier but also makes it easier to avoid the information. | Forced exposure, such as pop-up windows on websites, make it impossible to avoid information and can support search. More research is needed to establish if and when salience can play a similar role. |
| Counteracts search | Concealing information, for instance by drowning it in clutter, makes it easy to avoid information and difficult to search. | Unpredictable locations or features, such as nutrition labels can make it difficult to avoid information but also makes search more difficult. |

## Author's contribution

Jacob L Orquin: Conceptualization, Funding acquisition, Writing – original draft, Writing – review & editing; Andrea Pittarello: Conceptualization, Writing – review & editing; Joy Geng: Writing – review & editing; Valdimar Sigurdsson: Funding acquisition, Writing – review & editing.

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## Declaration of competing interest

The authors declare no conflict of interest.

## Data availability

No data was used for the research described in the article.

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•• of outstanding interest

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## Further information on references of particular interest

13. •• This discussion paper provides an overview of important concepts in vision science such as distraction, suppression, attention capture etc.

14. •• In this article, the authors show how participants direct visual attention away from locations despite direct instructions to search for target objects suggesting willful ignorance. The authors propose that participants simultaneously use facilitation and suppression to distribute their visual attention in a self-serving manner.

19. •• Using an eye-tracking dice task, researchers found that participants were more likely to report incorrect but profitable outcomes when a nearby die showed a higher value, indicating that attention shifts toward temptation drive dishonest behavior.

20. •• In this article, the authors show how visual salience can be used to draw attention to stimuli and thereby reduce willful inattention.

34. •• In a series of experiments, the authors show that predictable stimulus locations increase attention for participants who seek information but reduce attention for participants who ignore or avoid that information and vice versa for unpredictable stimulus locations.