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In the blink of an eye? Evidence for a reduced attentional blink for eyes

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Abstract

Eye contact serves as an important social signal and humans show a special sensitivity for detecting eyes. Here, we asked whether people's sensitivity to eyes would enable them to overcome temporal limitations in visual attention. We used an "attentional blink" (AB) paradigm, in which the second of two visual stimuli presented in quick succession typically cannot be detected. Participants performed a rapid serial visual presentation (RSVP) task and were asked to identify, within a stream of symbols, a *target* and to detect whether the target was succeeded by a *probe*. The probe was either an image of an eye (with direct gaze) or of a star. As expected, participants' detection rate for the star was poor, demonstrating the typical attentional blink. Crucially, detection rate for the eye was significantly better. This reduced attentional blink suggests that people's sensitivity to eyes is strong enough to circumvent fundamental limitations in visuotemporal attention.

Keywords: attentional blink; eye detection; social gaze; visual attention; attentional limitations; social cognition.

Introduction

The eyes of another person are one of the most attention-grabbing visual stimuli we know of. Already from birth, human infants are extraordinarily sensitive to eye contact and prefer to look at faces that gaze back at them (Farroni et al., 2002, 2004). This sensitivity may lay the foundation for the development of social cognition (for reviews, see Senju & Johnson, 2009; Striano & Reid, 2006). In human adults, direct (as opposed to averted) eye gaze captures attention (Baron-Cohen, 1995; Böckler et al., 2014; Senju & Hasegawa, 2005; von Grünau & Anston, 1995) and receives preferential processing (George et al., 2001; Macrae et al., 2002; Mason et al., 2004), even when direct gaze is made invisible by continuous flash suppression (Yokoyama et al., 2013). In fact, studies suggest that the detection of direct gaze may not require a focus of attention (Conty et al., 2007; Senju & Johnson, 2009; Yokoyama et al., 2014; but see Burton et al., 2009). Notably, Yokoyama et al. (2014) found that people were able to discriminate direct from averted gaze even when they performed a dual-task in which attention was drawn away from the gaze stimulus.

In the present study, we aimed to further investigate this human predisposition for the detection of eyes. In particular, we were interested in situations where people cannot pay full attention and yet detect others' eyes. Whereas Yokoyama et al. targeted *spatial* attention by testing whether gaze direction can be discriminated when shown in the periphery (while attention is focused on the center), we examined *temporal* attention by testing whether eyes can be detected when attention is temporarily suppressed. To this end, we used the established "attentional blink" paradigm (Raymond et al., 1992; for reviews, see Dux & Marois, 2009; Martens & Wyble, 2010) which demonstrates that attention is attenuated for the second of two visual stimuli (e.g., letters, digits, or pictures) occurring in close temporal proximity in a stream of distractors. If the second stimulus is presented within a critical window (200-500 msec) after the first, people typically have difficulties detecting the second stimulus (Dux & Marois, 2009). This effect, termed the attentional blink (AB), arises because of a general attentional capacity limitation which prevents attentional resources from being allocated to the second stimulus while the processing of the first one still requires attention. Thus, the AB demonstrates the temporal limits of selective visual attention (Dux & Marois, 2009; Raymond et al., 1992).

Previous research has shown that the AB can be modulated by stimuli with personally-relevant or emotional content, due to enhanced processing of affective information. Particularly, people do not experience an AB (or one significantly reduced in size) when the to-be-detected second stimulus consists of their own name (Shapiro et al., 1997) or of emotionally arousing verbs (Keil & Ihssen, 2004; Keil et al., 2006), nouns (Anderson & Phelps, 2001), objects (Trippe et al., 2007) or faces (Awh et al., 2004; de Jong et al., 2009; de Oca et al., 2012). The extent to which emotional contents modulate the AB is in turn affected by inter-individual differences (Fox et al., 2005; Kang et al., 2017; Kanske et al., 2013; Koster et al., 2009; van Dam et al., 2012).

Building on earlier work on gaze perception on the one hand and visual attention on the other hand, the present study investigated if people's special sensitivity to eyes would allow them to detect an eye within the critical window of the attentional blink, thereby overcoming fundamental limitations in visuotemporal attention.

Methods

Participants

Prior to data collection, we ran a power analysis (alpha = 0.05, power = 0.80, two-tailed paired t-test) using G*Power (Faul et al., 2009) and determined that a sample size of 50 would allow us to detect moderately sized effects (Cohen's *d* = 0.37; Cohen, 2013). Thus, fifty-two[1] participants (44 women, *M* (*SD*) = 22.1 (3.2) years) took part in our main experiment in exchange for course credits[2]; all gave informed written consent. Four participants were excluded from analysis due to below-chance performance[3]. The study was conducted in accordance with the ethical principles of the American Psychological Association.

Stimuli and procedure

We used a rapid serial visual presentation (RSVP) task in which participants saw a rapid stream of 12 symbols (10 Hz presentation rate) presented centrally on a white background. The stream consisted of distractors and targets. The first target (T1) was a pink shape (triangle or square); the second target (T2) was a black-and-white eye (in the experimental condition) or star (in the control condition), see Figure 1.

Distractors were 17 black-and-white symbols. Distractors and targets were matched for size and structural similarities. In particular, the star was chosen because it resembled the eye in that it consisted of a black disc on a white background, surrounded by a black outline[4].

T1 occurred in position 1, 2, 3, 4 or 5 of the RSVP stream; T2 occurred up to 7 positions after T1. The SOA (stimulus onset asynchrony) between symbols was 100 msec. Hence, T2 occurred with a lag of 100-700 msec after T1. Crucially, T2 was only present in 50 % of all trials. Depending on whether T2 was present or absent, 10 or 11 distractors were randomly selected in each trial and presented in random order.

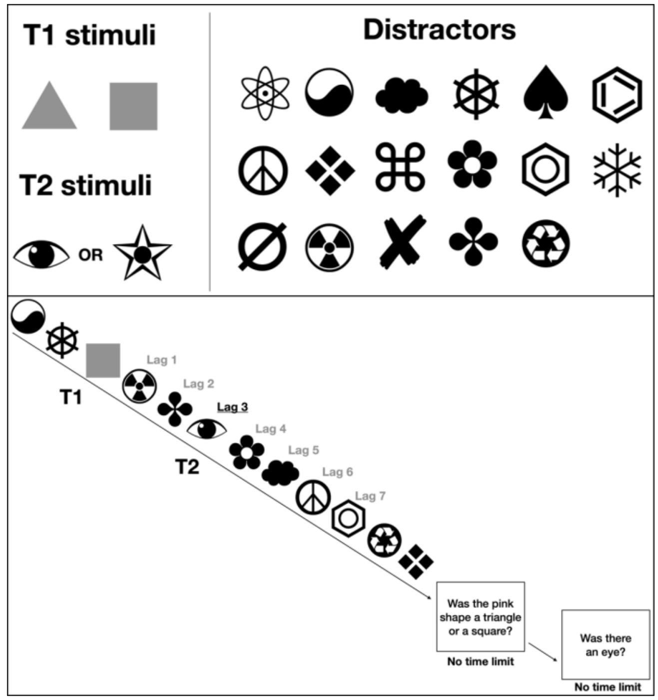

Figure 1: The upper panel shows all target and distractor stimuli used in the study. Note that the actual T1-stimuli were colored pink; all other stimuli were black-and-white. The lower panel shows an exemplary RSVP stream where T1 occurs in position 3 and T2 occurs at lag 3 (300 msec after T1), followed by two unspeeded response prompts.

Each trial started with the presentation of a fixation cross (400 msec); participants were asked to fixate this cross. Subsequently, the 12 symbols were presented; each for 33 msec, with a gap of 66 msec between symbols (resulting in an SOA of ~100 msec). Then, participants were asked to perform a two-choice discrimination task ("Was the pink shape a triangle or a square?") followed by a detection task ("Was there an eye / a star?"). Participants answered these two questions (always in that order) by pressing one of two buttons on the keyboard, respectively (K = square, L = triangle; J = yes, N = no). They were told that they could take their time to respond.

Design

Participants performed four blocks of trials. In blocks A and C, they were required to perform the *dual-task* as described above (illustrated in Figure 1, lower panel). In one of these blocks (control condition, A), T2 was a star; in the other block (experimental condition, C), T2 was an eye. There was no difference regarding T1 which was always either a triangle or a square. Blocks B (control condition) and D (experimental

[1] A total sample of 52 was chosen to allow for an equal number of participants (N = 13) for each of the four experimental orders.

[2] Since the course was held online, participants performed the task at home on their personal laptop/PC.

[3] Participants were excluded if they performed below chance in the single-task (T2 detection rate < 50% in one or both blocks).

[4] Star and eye were designed such that the image complexity was comparable in terms of black-to-white ratio, computed as the proportion of black pixels (eye: 21 %; star: 22 %).

condition) were structurally and perceptually identical to A and C (i.e., block B contained the star and block D the eye), yet participants performed the detection task only, i.e., they received only the second question about whether they had detected an eye / a star (*single-task*). Block order was counterbalanced such that participants performed the blocks in one of the following orders: ABCD, BADC, CDAB, or DCBA. This way, the two blocks in which T2 was a star would always follow each other and the same was true for the two blocks in which T2 was an eye.

Each block consisted of 140 trials, with 35 trials for each combination of T1 (triangle/square) and T2 (absent/present). That is, there each were 35 trials where T1 was a triangle and T2 was absent; where T1 was a triangle and T2 was present; where T1 was a square and T2 was absent; and where T1 was a square and T2 was present. This resulted in 10 trials per lag in which T2 was absent and 10 trials per lag in which T2 was present; or in other words, 10 observations per cell. Trials were randomly intermixed.

Taken together, our experiment followed a 2 (Condition: experimental, control) × 2 (Task: dual-task, single-task) × 7 (Lag: 1-7) within-subjects design. Note that the experimental condition contained an eye as T2-stimulus and the control condition contained a star as T2-stimulus; everything else was identical in the two conditions. Based on previous research, we expected participants to have difficulties in detecting T2 within the critical period (i.e., lags 2-5) in the dual-task (attentional blink; AB). No such difficulties should occur in the single-task. Our aim was to compare the size of the AB (i.e., the difference in T2-detection rate between single- and dual-task as a function of lag) between the experimental and the control condition (see MacLean & Arnell, 2012). If direct gaze can be detected even when attention is temporarily suppressed, participants should display no (or a reduced) AB in the experimental condition compared to the control condition.

Data analysis

For statistical inference, we used permutation-based ANOVAs and t-tests (Kherad-Pajouh & Renaud, 2015). As effect size measures, we report generalized eta squared (η_G^2; Bakeman, 2005) for the ANOVAs and Cohen's *d* for t-tests. Data was analyzed using R.

Results

Discrimination task (T1)

First, we tested whether participants performed the discrimination task for T1 with sufficient accuracy and whether performance in this task differed between experimental and control conditions. Accuracy was high in both conditions (control: M (SE) = 88.1 (1.2) %; experimental: M (SE) = 89.7 (1.2) %); it was significantly higher in the experimental condition, $t(47) = 2.22$, $p = .03$, Cohen's $d = 0.32$. In line with previous research (Raymond et al., 1992), we included only trials with correct T1-responses in our main analysis of T2-performance.

Detection task (T2)

To test whether participants experienced an AB and whether its size differed between conditions, we analyzed T2 detection rate by performing a within-subjects 2×2×7 ANOVA with the factors Condition (experimental, control), Task (dual-task, single-task) and Lag (1-7). For a descriptive overview of the data, see Figure 2. All main effects and all interactions were significant. First, there was a significant main effect of Condition ($F(1,47) = 59.16$, $p < .001$, $\eta_G^2 = .19$), indicating that detection rate was higher in the experimental condition compared to the control condition. Second, there was a significant main effect of Task ($F(1,47) = 34.74$, $p < .001$, $\eta_G^2 = .05$), indicating that detection rate was higher in the single-task compared to the dual-task. Consistent with previous research on the AB, this performance difference shows that performing the discrimination task on T1 impairs the detection of T2. Third, the significant main effect of Lag ($F(6,282) = 10.53$, $p < .001$, $\eta_G^2 = .02$) indicates that detection rate differed across lags.

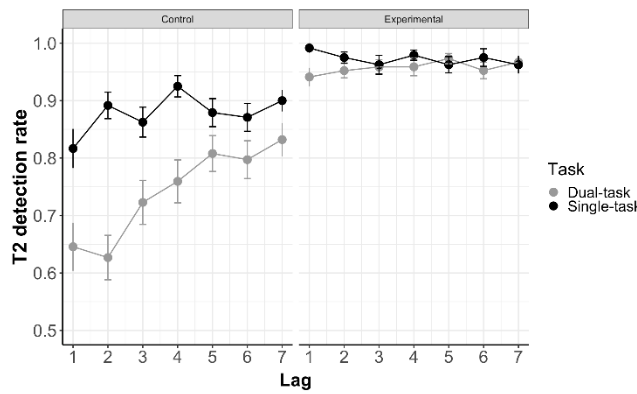

Figure 2: T2 detection rate is shown as a function of Lag for the control condition (left) and the experimental condition (right), separately for dual-task (grey) and single-task (black). Detection rate is defined as the number of detected T2-stimuli relative to the number of trials in which T2 was present and participants' T1-response was correct. Error bars show the standard error of the mean.

Moreover, there were significant two-way interactions for Condition × Task ($F(1,47) = 21.15$, $p < .001$, $\eta_G^2 = .03$), Condition × Lag ($F(6,282) = 7.25$, $p < .001$, $\eta_G^2 = .01$), and Task × Lag ($F(6,282) = 8.65$, $p < .001$, $\eta_G^2 = .02$).

Finally, and most importantly, we found a significant three-way interaction for Condition × Task × Lag ($F(6,282) = 4.24$, $p < .001$, $\eta_G^2 = .01$). This interaction indicates that the difference in T2 detection rate between single- and dual-task differed as a function of lag between the experimental and the control condition. Following the methodological framework for measuring and modulating the AB by MacLean & Arnell (2012), we interpret this interaction effect as reflecting a difference in the size of the AB between the experimental and the control condition. Thus, this result shows that participants experienced a significantly reduced AB for the eye compared to the star.

To determine whether an AB was present in each condition separately, we followed up with two separate 2×7 ANOVAs with the factors Task and Lag for the experimental and the control condition, respectively. For the control condition, results showed a significant main effect of Task ($F(1,47) = 29.16$, $p < .001$, $\eta_G^2 = .09$) and a significant main effect of Lag ($F(6,282) = 11.97$, $p < .001$, $\eta_G^2 = .05$). The significant interaction for Task × Lag ($F(6,282) = 6.59$, $p < .001$, $\eta_G^2 = .02$) indicates that participants experienced an AB in the control condition (where T2 was a star).

For the experimental condition, results showed a significant main effect of Task ($F(1,47) = 5.58$, $p = .02$, $\eta_G^2 = .01$). The main effect of Lag was not significant ($F(6,282) = 0.15$, $p = .99$, $\eta_G^2 = .001$). The significant interaction for Task × Lag ($F(6,282) = 2.33$, $p = .03$, $\eta_G^2 = .01$) indicates that participants also experienced an AB in the experimental condition (where T2 was an eye) – yet the size of this AB was significantly smaller than for the star (as shown by the significant three-way interaction reported earlier).

Detection task (T2) – matched task difficulty

It is noteworthy that absolute task difficulty seemed to differ between the control and the experimental condition (as reflected in the differences in detection rate for the single-task, see Figure 2). This is not surprising because the T2-stimulus in the experimental condition (the eye) may in itself be easier to detect than the T2-stimulus in the control condition (the star). Even though this absolute difference should not have affected our results on the AB (which were computed based on the differences between single- and dual-task, not based on absolute performances), we conducted a further analysis to exclude this possibility (Wahn & Sinnett, 2019). We thus created a subset of our data (N = 19) which included only those participants who performed equally well on the single-task in the control and the experimental condition (inclusion criterion: max. 5% difference in T2 detection rate averaged across lags; included participants' mean difference: 0.75 %).

Using this subset of data, we performed the same analyses as reported in the previous section for the full dataset. Results were very similar (see Figure 3). Again, all main effects and all interactions of the 2×2×7 ANOVA were significant. There were significant main effects of Condition ($F(1,18) = 26.13$, $p < .001$, $\eta_G^2 = .09$), Task ($F(1,18) = 42.28$, $p < .001$, $\eta_G^2 = .10$), and Lag ($F(6,108) = 5.83$, $p < .001$, $\eta_G^2 = .04$). Moreover, there were significant two-way interactions for Condition × Task ($F(1,18) = 24.45$, $p < .001$, $\eta_G^2 = .07$), Condition × Lag ($F(6,108) = 5.14$, $p < .001$, $\eta_G^2 = .05$), and Task × Lag ($F(6,108) = 8.09$, $p < .001$, $\eta_G^2 = .07$). Finally, and most importantly, there was also a significant three-way interaction for Condition × Task × Lag ($F(6,108) = 3.74$, $p = .002$, $\eta_G^2 = .03$). This interaction effect shows that our main finding also holds for the subset of data matched for task difficulty: Participants experienced a significantly reduced AB for the eye compared to the star.

To determine whether an AB was present in each condition separately, we again followed up with two separate 2×7 ANOVAs with the factors Task and Lag for the experimental and the control condition, respectively. For the control condition, results showed significant main effects of Task ($F(1,18) = 36.18$, $p <. 001$, $\eta_G^2 = .19$) and Lag ($F(6,108) = 6.59$, $p < .001$, $\eta_G^2 = .10$). Importantly, there was also a significant interaction for Task × Lag ($F(6,108) = 7.43$, $p < .001$, $\eta_G^2 = .11$), indicating that participants experienced an AB when T2 was a star.

Just as in our full dataset, results for the experimental condition did not show a significant main effect of Lag ($F(6,108) = 0.40$, $p = .88$, $\eta_G^2 = .01$). However, in contrast to the full dataset, in the subset we did not find a significant main effect of Task ($F(1,18) = 3.97$, $p = .07$, $\eta_G^2 = .01$), indicating that the AB was absent for the eye. There was no significant interaction for Task × Lag ($F(6,108) = 1.73$, $p = .12$, $\eta_G^2 = .04$) either. This lack of an interaction effect suggests that there was likely not enough power in the subset (N = 19) to detect the small effect that was present in the full dataset – yet a similar pattern is present on a descriptive level.

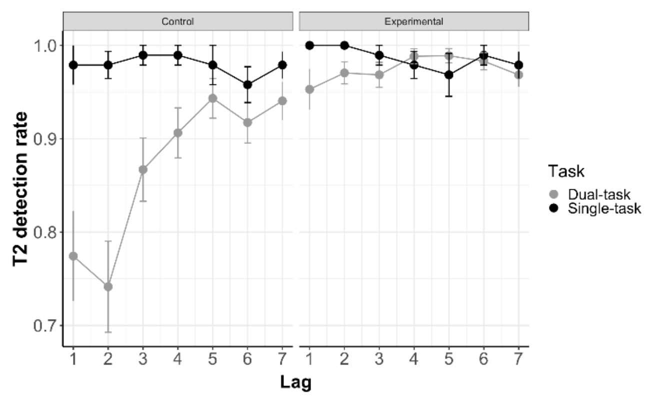

Figure 3: T2 detection rate is shown in the same way as in Figure 2. Here, however, only data from a subset of participants (N = 19) is included to match task difficulty between the two conditions (pls. refer to the text for details).

Control Experiments

We conducted two further experiments to (1) control for a specific perceptual difference between eye and star in our main experiment and (2) further examine which feature of the eye stimulus might have led to its enhanced detection rate. A sample of 36 participants[5] took part in each control experiment (Control 1: 34 women, M (SD) = 21.7 (2.7) years; Control 2: 29 women, M (SD) = 26.4 (5.3)). Design, procedure, and data analysis were the same as in the main experiment.

In control experiment 1, we aimed to rule out that the white reflection point in the black disc of the eye might have (partially) caused the higher detection rate for the eye

[5] In control experiment 1 (2), 4 (3) participants were excluded.

compared to the star. Thus, we removed the reflection point from the eye and left all other stimuli unchanged. If the reflection point had been a decisive factor in making the eye perceptually different from the star (resulting in the eye's higher detection rate), we should find a reduced (or no) difference between detection rates in this control experiment. If, however, the reflection point had *not* been the cause for the difference in detection rates in the main experiment, we should observe the same difference again.

In control experiment 2, we aimed to further examine which feature of the eye stimulus might have led to its increased detectability. In the main experiment, we had chosen the star as a control stimulus because it consisted of a black disc on a white background, surrounded by a black outline – just like the eye. What differed between eye and star was their shape; the eye had an oval shape whereas the star (and, actually, most of the distractors) had a roundish shape. Therefore, we chose to compare the eye to another oval stimulus, namely a fish[6] (see Figure 4). If the shape of the eye had been a decisive factor in making the eye perceptually different from the star (resulting in the eye's higher detection rate), we should find a reduced (or no) difference in detection rates between eye and fish in this control experiment. If the shape of the eye had *not* been the cause for the difference in detection rates in the main experiment, we should again observe a difference in detection rates, this time between eye and fish.

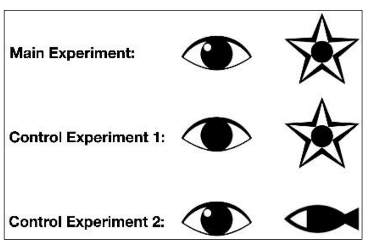

Figure 4: T2-stimuli used for each experiment.

Results: Control Experiment 1 (reflection point)

The results of our first control experiment perfectly mirrored the results of the main experiment.

Accuracy in the discrimination task (T1) was high in both conditions (control: *M* (*SE*) = 85.8 (2.23) %; experimental: *M* (*SE*) = 89.7 (1.69) %); it was significantly higher in the experimental condition, $t(31) = 2.74$, $p = .002$, Cohen's $d = 0.48$.

The within-subjects 2×2×7 ANOVA with the factors Condition (experimental, control), Task (dual-task, single-task) and Lag (1-7) carried out for T2 detection rate showed, just as in the main experiment, that all main effects and interactions were significant. There were significant main effects of Condition ($F(1,31) = 44.94$, $p < .001$, $\eta_G^2 = 0.18$), Task ($F(1,31) = 27.72$, $p < .001$, $\eta_G^2 = 0.07$), and Lag ($F(6,186) = 2.67$, $p = .002$, $\eta_G^2 = 0.01$), as well as significant two-way interactions for Condition × Task ($F(1,31) = 16.84$, $p < .001$, $\eta_G^2 = 0.03$), Condition × Lag ($F(6, 186) = 2.82$, $p = .01$, $\eta_G^2 = 0.01$), and Task × Lag ($F(6, 186) = 5.49$, $p < .001$, $\eta_G^2 = 0.02$). Finally, and most importantly, there was a significant three-way interaction for Condition × Task × Lag ($F(6, 186) = 4.87$, $p < .001$, $\eta_G^2 = 0.02$), indicating that participants experienced a significantly reduced AB for the eye (without reflection point) compared to the star. Separate follow-up ANOVAs for the experimental and the control condition indicated that participants experienced an AB in the control condition (where T2 was a star) but not in the experimental condition (where T2 was an eye).

Results: Control Experiment 2 (fish)

The results of our second control experiment showed that the oval shape played a crucial role for the increased detectability of the eye.

Accuracy in the discrimination task (T1) was high in both conditions (Fish: *M* (*SE*) = 89.9 (1.57) %; Eye: *M* (*SE*) = 88.2 (1.72) %); conditions did not differ significantly, $t(32) = 1.82$, $p = .07$, Cohen's $d = 0.32$.

Results of the 2×2×7 ANOVA showed a significant main effect of Task ($F(1,32) = 25.99$, $p < .001$, $\eta_G^2 = 0.01$), indicating, expectedly, that detection rate was higher in the single-task compared to the dual-task. There were no other significant effects (all $p > .2$). The absence of a significant two-way interaction for Task × Lag ($F(6, 192) = 1.34$, $p = .25$, $\eta_G^2 = 0.00$) indicates that participants, as a whole, did not experience an AB in this experiment. Moreover, the absence of a significant three-way interaction for Condition × Task × Lag ($F(6, 192) = 1.06$, $p = .38$, $\eta_G^2 = 0.00$) suggests that there were no differences with regard to the size of the AB between experimental conditions.

Discussion

In the present study, we investigated whether people's perceptual sensitivity to eyes would enable them to detect an image of an eye even when their visual attention is temporarily diverted due to a dual-task. Participants were asked to identify, within a stream of symbols, a *target* (triangle or square) and to detect whether or not the target was succeeded by a *probe*, which was either an image of an eye (with direct gaze) or of a star. When target and probe occurred in close succession, participants had difficulties detecting the star, thus showing the typical "attentional blink" (AB) effect. Crucially, these difficulties were largely reduced for the eye. This pattern of results also held when controlling for task difficulty.

A first control experiment convincingly ruled out one potential alternative explanation for this finding, namely that a specific perceptual difference between the images of eye and star (i.e., a reflection point in the eye) may have led to the observed difference in detection rates.

[6] The image complexity of eye and fish was comparable in terms of black-to-white ratio (eye: 21%; fish: 20 %).

A second control experiment further probed which feature of the eye stimulus might have led to its increased detectability. The results suggest that the oval shape of the eye played a crucial role in facilitating its detectability. Here, the image of an eye was compared to the image of a fish; the two stimuli had identical shapes. For both images, the attentional blink was largely absent. This finding indicates that – in the context of high attentional load – eyes and *eye-shaped* stimuli can be detected exceptionally well.

At this point, one should note that one limitation of the current set of experiments concerns the relational similarity between the eye-shaped target and the shapes of the distractors and the star-target. Even though the overall size of all stimuli was the same, most distractors and also the star had more of a round(ish) – rather than oval – shape. Thus, it is theoretically possible that the distractors masked the round star better than the oval eye-shape, facilitating the detectability of the eye-shape. Further thorough experiments are needed to rule out this possibility.

Consistent with previous research, the present finding suggests that people are able to detect eyes with direct gaze even when their attentional resources are allocated otherwise. Whereas Yokoyama et al. (2014) showed that people can discriminate direct from averted gaze without a focus of *spatial* attention, we show here that eyes with direct gaze can be detected without a focus of *temporal* attention.

Furthermore, our finding complements earlier research showing that the AB can be modulated by personally-relevant and emotional content, such as one's own name (Shapiro et al., 1997) and emotional facial expressions (e.g., de Jong et al., 2009; de Oca et al., 2012; Kang et al., 2017). What is common to one's own name, emotional expressions and eye contact is that all serve as social signals and capture people's attention. Due to their social relevance, these stimuli arguably possess a higher salience than, for example, unfamiliar names (Shapiro et al., 1997), neutral expressions (Keil et al., 2006), or closed eyes (Senju & Hasegawa, 2005). According to Shapiro et al. (1997), higher salience implies a lower processing threshold. A lower processing threshold, in turn, leads to less interference with other stimuli, which could explain why (socially) salient stimuli "pop out" of a stream of distractor stimuli whereas other, less salient stimuli do not (Shapiro & Raymond, 1994; Shapiro et al., 1997). Hence, stimuli such as one's own name, emotional faces and eyes can be preferentially detected among distractors, even under conditions of diverted attention.

Interestingly, it has been shown that certain elementary visual features (e.g., spatial orientation), which typically pop out of scenes and are thus considered 'pre-attentive', can only be poorly detected when attention is diverted in a dual-task like the AB paradigm (Joseph et al., 1997). Thus, even some so-called 'pre-attentive' stimuli do require attention to be detected. It would be worthwhile to follow up the study by Joseph et al. (1997) to directly compare, within the same setting, whether socially salient stimuli, such as eyes, might have an even lower detection threshold than elementary visual features such as spatial orientation.

Future research should compare the size of the AB for direct versus averted eye gaze. Based on previous research (e.g., Senju & Hasegawa, 2005; Yokoyama et al., 2014) one may predict a reduced attentional blink for direct compared to averted gaze (but see recent findings by Riechelmann et al., 2020, which would predict the opposite pattern). Furthermore, one could address whether pictures of real eyes would lead to the same, or an even larger, reduction of the AB as the images used in the present study.

In sum, the present study extends previous research on gaze perception and visual attention by demonstrating that the attentional blink is modulated by eyes. This result shows that the human predisposition for the detection of eyes is strong enough to circumvent fundamental limitations in visuo-temporal attention.

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