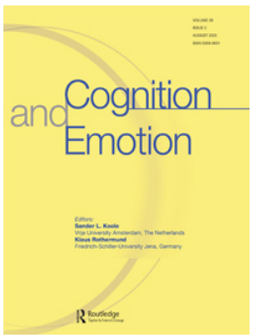
A new look at Good Samaritans: task relevance of emotion impacts attention allocation to other people in need of help



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A new look at Good Samaritans: task relevance of emotion impacts attention allocation to other people in need of help

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ABSTRACT

Paying attention to an emergency is a prerequisite for helping. However, previous evidence suggests that people often fail to notice emergencies. In contrast, the present study investigated whether inducing a background goal to notice the emotional state of others will enable attention allocation to others' distress. To examine this assumption, we tested whether hearing emotional sounds (i.e. screams for help) increases attention towards emergency scenes while also manipulating the task relevance of the emotional value of the sounds. Specifically, participants performed a dot probe task that measured attention allocation towards emergency and matched neutral scenes. Emotional (i.e. screams for help) or neutral sounds were presented before the scenes. Participants had to encode either the valence of the sounds or the sound quality (a control condition) for a secondary task. Participants displayed an attentional bias to emergency scenes when the auditory stimulus was emotional but only when they encoded the emotional value of the sound. These results suggest that attention to emergencies is not a default but requires that paying attention to others' suffering is relevant to the observer.

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People fail to help in emergency situations (Penner et al., 2005). For instance, in Darley and Batson's (1973) seminal "Good Samaritan" study, theology students failed to help a stranger in need of help though they had read an extract of the bible emphasising the importance of helping others including ostracised strangers (i.e. the parable of the Good Samaritan). Various biases in people's perception and judgements contribute to bystanders' apathy. Yet, little research has investigated the first step and thus a prerequisite of helping in Latané and Darley's model of bystander interventions (1969; see also Hortensius & de Gelder, 2018), that is, paying attention to others in need.

Failures to pay attention to others in need might contribute to failures to help. For instance, as suggested by Darley and Batson (1973), the theology students in the Good Samaritan study may not have been aware of the person in need of help. However, the study allows little insight in the underlying attentional processes because attention could only be inferred from behaviour (i.e. helping or not) but was not directly measured. Therefore, it is unclear whether the students did not pay attention to the emergency or failed to act. More research is also necessary because a reanalysis of Darley and Batson's data by Greenwald (1975) suggested that reading the parable prompted helping behaviour. Similarly, Hortensius and de Gelder (2018) emphasised the importance of examining attentional processes in helping behaviour that are suggested to operate automatically. In the present study, we will therefore investigate drivers of attentional processing of emergency scenes using established attention measures.

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Research investigating attention to emotional events supports the conclusion that attention to other people in help might not be the default. For instance, attention to negative emotional content appears to be limited to negative information that is potentially dangerous to the observer such as angry people or self-relevant in other ways but does not extend to negative content such as sad people that do not pose a threat to the observer (Givon-Benjio & Okon-Singer, 2022; Wentura et al., 2000). Indeed, non-depressed participants display attentional avoidance of sad faces (Joormann & Gotlib, 2007). Further, attention to emotion appears to depend on top-down settings (e.g. Forrest et al., 2022; Pessoa & Adolphs, 2010) though this is debated (e.g. Xue & Pourtois, 2025).

In the current study, we investigated whether attention to emergency situations can be evoked by making the emotional value of scenes relevant to the observer. For instance, prompting people to look out for emotional content induced attention to threat and diminished differences between anxious and non-anxious participants (Brown et al., 2020; Dodd et al., 2017). This effect has also been shown crossmodally: Participants displayed an attentional bias to happy (fearful) faces after hearing laughter (screams) but only when they were asked to encode the valence of the sounds (Van Dessel & Vogt, 2012). In the present study, we aimed to extend previous findings to the bystander context by testing whether encoding the emotional value of sounds such as screams for help induces an attentional bias to images of individuals in emergency situations (cf. Hortensius & de Gelder, 2018). This will allow us to understand whether the effects of task relevance generalise to emotional stimuli that are not directly self-relevant but signal that others may need assistance.

We used a dot probe task (MacLeod et al., 1986) to examine the orienting of attention. In this task, two pictures were simultaneously presented at two different locations on the screen, immediately followed by a target. If individuals selectively orient to a cue category, responses will be faster to targets at the location previously occupied by that picture (i.e. congruent trials) but slower when the target is in the opposite location (i.e. incongruent trials). We implemented trials comparing scenes representing emergencies to matched neutral scenes. We asked participants to encode the valence (task relevant) or the quality (task irrelevant) of a sound that was presented before the images. Sounds were either neutral or emotional (screams for help). Pilot testing suggested that only presenting the pictures (with or without sounds) is not enough to cause an attentional bias to emergencies. We theorised that asking participants to focus on the valence of the sounds would increase participants' attention towards emergency scenes after hearing help or pain sounds in contrast to participants that did not have to encode the valence of the sounds.

Method

Participants

Eighty students from the University of Reading (16 male, 63 female, 1 other; $M_{age} = 20.74$ years) took part in the experiment for a cash reward of £5. The study was approved to be in line with the guidelines of the University of Reading Research Ethics. Due to funding limitations, we had to limit the sample size to 80 participants. Post hoc analyses using the effect of the crucial within-between interaction between condition, sound valence, and congruency ($\eta_p^2 = .07$) in Van Dessel and Vogt (2012) suggested that this sample size is sufficient to find support for our directed hypothesis at an alpha of 0.05 (one tailed) and a power of 0.80. We pre-registered the study before finalising data collection and before conducting the analyses (https://osf.io/cyzme).

The study involved a 2 (Goal Condition: emotion relevant, control) × 2 (Emergency Congruency: probe presented in emergency cue location (congruent), probe presented in the opposite location (incongruent)) × 2 (Sound Valence: emotional, neutral), with the first factor manipulated between subjects, and the remaining factors as within-participant variables. Please note that each trial showed one emergency and one matched neutral scene. For this reason, neutral congruency is not a separate factor (e.g. an emergency congruent trial is a neutral incongruent trial).

Apparatus and materials

The experiment was programmed and presented using the INQUISIT Millisecond software package (Inquisit 5.0, 2016) on an Intel Core 2 computer with a 75 Hz, 17-inch LDT monitor.

Stimuli for the dot probe task

Pictorial cues: Ten emergency and ten neutral scenes were created for the project (see Appendix A, and OSF: https://osf.io/dqynm/). We set up purported "emergency" scenes for ethical reasons. None of the

stimuli included graphic content. The neutral scenes showed the same person in the same background but in a neutral pose to match the emergency scene as closely as possible. Five actors and five actresses from different age groups appeared in various situations.

Auditory cues: For each image a sound was created such as "Help" (see Appendix B) by a person matching the actor's age and gender. Each sound lasted 1000 ms.

Ratings of pictures and sounds: Participants rated all pictures and sounds regarding how likely they thought that there was a need of emergency help, on a scale of 1 (*Not at all likely*) to 7 (*Very likely*). Emergency pictures ($M = 5.75$; $SD = 0.71$) were rated as significantly more indicative of an emergency than neutral pictures ($M = 1.39$; $SD = 0.51$), $t(79) = 50.62$, $p < .001$. Emergency sounds ($M = 5.77$; $SD = 0.77$) were rated as significantly more indicative of an emergency than neutral sounds ($M = 1.19$; $SD = 0.34$), $t(79) = 51.77$, $p < .001$.

Dot probe task

All stimuli were presented against a black background. Each trial started with the presentation of a black fixation cross (0.5 cm high) on a white background in the middle of the screen along with two white rectangles (12.6 cm high × 9.4 cm wide) on the left and the right of the fixation cross (see Figure 1). The middle of each of these peripheral rectangles was 5.7 cm from the fixation cross. Cues and targets were presented within the rectangles. The fixation cross remained on the screen throughout the trial. After 500 ms, an auditory stimulus was played along with the message "Remember this sound!" at the bottom of the screen for 1000 ms. Hereafter, two picture cues (12.6 cm high × 8.6 cm wide) appeared for 500 ms. Immediately after

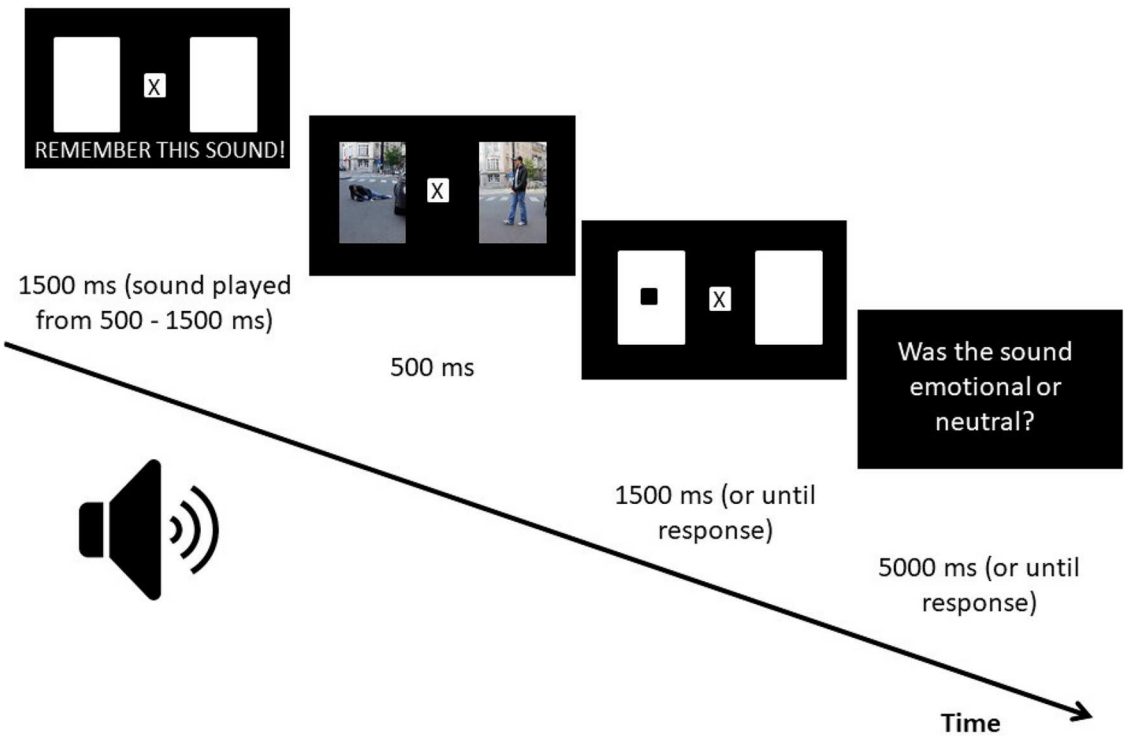

Figure 1. Schematic overview of an example trial of the combined encoding and dot probe task. A trial started with the presentation of a fixation screen for 500 ms, and this was followed by either an emotional sound or neutral sound for 1000 ms, and the instruction to remember the sound. At the offset of the sound, two cue pictures were shown for 500 ms. Hereafter, the target (black square) was presented. Participants had to indicate the location of the target. A trial ended after a response was registered or 1500 ms had elapsed since the onset of the target. After this, participants were asked about either the emotional valence or the quality of the sound that they had previously heard in the trial. The following trial started at a random ITI of either 500, 1000 or 1500 ms after a response was registered or the presentation of the target had ended. The left cue in this example consists of an emergency picture and the right cue consists of a neutral scene. Pictures cues were fully coloured in the experiment.

picture offset, a target consisting of a black square (0.7 cm × 0.7 cm) appeared in one of the two peripheral rectangles. Responses required locating the target by pressing one of two keys on the number pad with their right hand on a QWERTY keyboard. A trial ended after a response was registered or 1500 ms had elapsed since the onset of the target. Hereafter, participants in the emotion-relevant condition were asked "Was the sound emotional or neutral?" and could answer with "emotional sound" or "neutral sound" using the s and d keys with their left hand. In the control condition, participants were asked "How would you rate the sound quality?". Participants could respond "rather good" or "rather poor" with the s and d keys. The following trial started after a random interval of 500, 1000, or 1500 ms.

Procedure

Participants were seated approximately 60 cm from a computer screen. All instructions were presented on the screen. Participants first practiced the procedure of the tasks in 23 trials using different cues (i.e. words) and different sounds (i.e. neutral mumbling, laughter). We used different cues and sounds to prevent habituation. For the attention task, participants were instructed to indicate the location of the target as quickly and as accurately as possible. For the secondary task, participants were instructed to indicate whether the sound that they heard at the beginning of the trial was emotional or neutral (experimental condition) or of good or poor quality (control condition). Instructions were repeated between practice and test phase. Experimenters made sure that participants had understood them.

The main attentional bias task consisted of 160 trials with a short break after 80 trials. In half of the trials, the valence of the auditory stimulus was emotional (neutral). Each cue category was presented equally often in both locations and predicted the probe location correctly on 50% of the trials. The order of trials was determined randomly and separately for each participant.

Participants then rated the images. Hereafter, they completed the Prosocial Personality Battery (PSB), a measure of prosocial tendencies (Penner et al., 1995) using questions such as "I tend to lose control during emergencies" with responses being rated from 1 *(Strongly Disagree)* to 5 *(Strongly Agree)*. Two factors are calculated: Other-Oriented Empathy and Helpfulness. Participants finally wrote down their age, gender, and dominant hand.

Results

Control comparisons

We first compared the conditions regarding age, gender, and Other-Oriented Empathy and Helpfulness. As expected, we did not find any significant differences between conditions, all Fs < 2.66, ps > 0.11.

Data preparation

Trials with errors on the dot probe task were removed (emotion-relevant condition = 2.5%, control condition = 2.2%). Individual outliers (RTs shorter than 150 ms or larger than three standard deviations away from the participants' individual means) for participants were deleted (1.9%; Van Dessel & Vogt, 2012). The dataset can be found here: https://osf.io/5vwb6/.

Main analyses

We performed a 2 (sound valence: emotional, neutral) × 2 (congruency: emergency congruent, emergency incongruent) repeated measures analysis of variance (ANOVA) on the RTs of the dot probe task with experimental condition as a between-subjects factor. There was a significant effect of sound valence, $F(1,78) = 5.53$, $p = .021$, $\eta_p^2 = .066$. Responses were faster on trials with emotional sounds (M = 530.80 ms, SD = 97.68 ms) than on trials with neutral sounds (M = 537.96 ms, SD = 105.09 ms). The interaction between sound valence and condition approached significance, $F(1,78) = 3.31$, $p = .073$, $\eta_p^2 = .041$. Importantly, the main effect of the experimental condition was not significant, $F(1,78) < 1$, $\eta_p^2 = .001$, meaning that reaction times on average did not significantly differ from each other in the two conditions. Crucially, as expected, we found a significant interaction between congruency, sound valence, and experimental condition, $F(1,78) = 5.46$, $p = .022$, $\eta_p^2 = .065$. All other effects were not significant, Fs < 1.19, ps > .275.

We then conducted separate ANOVAs per condition to investigate the three-way interaction. In the emotion-relevant condition, we found a main effect of sound valence, $F(1,39) = 7.09$, $p = .011$, $\eta_p^2 = .154$, participants responded faster after emotional

Table 1. Mean RTs and Standard Deviations (in ms) as a function of sound valence and emergency congruence in the emotion-relevant and control condition.

	Congruent[a]		Incongruent[b]		Attentional bias indices[c]	
Trial type	*M*	*SD*	*M*	*SD*	*M*	*SD*
Emotion-Relevant Condition						
Emotional Sound	525	81	538	84	13	33
Neutral Sound	545	99	544	89	−1	34
Control Condition						
Emotional Sound	532	119	528	111	−4	37
Neutral Sound	530	120	533	116	3	30

[a]Congruent refers to trials in which the probe replaced the emergency picture.
[b]Incongruent refers to trials in which the probe replaced the neutral picture.
[c]Attentional bias indices were calculated by subtracting RTs on congruent trials from RTs on incongruent trials.

sounds ($M = 531.81$ ms, $SD = 80.78$ ms) than after neutral sounds ($M = 544.52$ ms, $SD = 92.49$ ms). The effect of congruency was not significant, $F(1,39) = 1.82$, $p = .186$, $\eta_p^2 = .044$. Most importantly, the expected interaction between congruency and valence was significant, $F(1,39) = 5.30$, $p = .027$, $\eta_p^2 = .120$. To further investigate the interaction, we calculated attentional bias scores per sound valence by subtracting reaction times on emergency congruent trials from emergency incongruent trials separately for emergency and neutral sounds. Positive scores indicate attention to emergencies whereas negative scores indicate attention away from emergencies. Scores around zero indicate inattention. Importantly, the score was significantly positive after emergency sounds in two-sided t-tests, $t(39) = 2.55$, $p = .015$, 95% CI [2.71, 23.53], indicating attention to emergencies, but not after neutral sounds, $t(39) = -0.34$, $p = .73$, 95% CI [−12.87, 9.12] (see Table 1 for means and standard deviations). There were no significant effects in the control condition (all Fs < 1.2, ps > .286).

Discussion

The present study examined when hearing screams for help will orient peoples' attention to emergencies and other people in need. When asked to encode the valence of such sounds, participants selectively attended to emergency scenes when the preceding sound was emotional. In contrast, when participants were asked to encode the quality of the sound, they did not allocate attention to emergencies even after hearing emotional sounds. The findings suggest that attention to emergencies depends on the task relevance of these sounds.

Our results support early theorising (e.g. Darley & Batson, 1973;but see Greenwald, 1975; Hortensius & de Gelder, 2018) suggesting that people often fail to pay attention to others in need. In Darley and Batson's famous Good Samaritan study, theology students walked past a person in need of help without stopping to help that person even though they had the parable of the Good Samaritan on their mind. The results of the present study suggest that people need to have a very specific goal to encode the emotional valence of their surroundings. This aligns with more recent evidence suggesting that people do not help unless it is relevant to themselves (e.g. Lockwood et al., 2017).

These findings are in keeping with evidence showing that goals need to be activated and prioritised in order to affect attention allocation (e.g. Moskowitz, 2002; Vogt et al., 2017, 2022). Information relevant to a prioritised goal is activated in long-term and working memory and serves as a filter for attentional selection (Soto et al., 2008). Consequently, attention is allocated to stimuli relevant to currently active goals but not to goals that are not or insufficiently activated (Moskowitz, 2002; Vogt et al., 2017). In line with these considerations, attention was only allocated to others in need after hearing screams for help when the secondary task made the prosocial content task relevant. It is important to acknowledge that, arguably, activating a prosocial goal should have increased attention to emergency scenes even without preceding emergency sounds. This implies that cross-modal integration, beyond task relevance, may be necessary. For example, we cannot fully rule out that subtle differences between the two categorisation tasks influenced the results such as categorising sound valence prompting deeper semantic processing and integration of sounds and images.

Our results lend support to work on attention to emotional information. First, our study represents a conceptual replication of Van Dessel and Vogt (2012) who found that participants selectively attended to happy (fearful) faces when they were asked to encode the valence of a preceding laughter (scream), but not when they were asked to only remember the sound. Similarly, while it was previously believed that factors such as negativity, threat value, or high arousal inherently drive attention (see Abado et al., 2020, for a review), more recent research suggests that attentional bias toward threatening emotional stimuli occurs primarily when these stimuli align with an observer's current goals

or expectations (Brown et al., 2020; Victeur et al., 2020; Vogt et al., 2017; but see Xue & Pourtois, 2025). The present study extended this effect to stimuli that, while not self-relevant, depict others in need, therefore addressing an untested component of helping behaviour models that suggest automatic attentional capture by emergencies (e.g. Hortensius & de Gelder, 2018; Latané & Darley, 1969). Future work could shorten the presentation time of the images in the attention to tap into even earlier attentional processes.

Future research also needs to address which manipulations of prosocial motivation are most successful in guiding attention allocation. Previous research has differentiated between more altruistically motivated manipulations such as evoking empathy and motivations that might be more selfish like gaining reputation and approval in return for helping (see Penner et al., 2005). The present data suggest that paying attention to others' emotional state which might resemble empathy could induce attention to others' suffering. Importantly, prosocial goals will have to be on the forefront of people's mind to guide attention to others in need. This suggests, for instance, that prosocial goals or state empathy need to be activated close in time to encountering others in need. Future research will also need to associate attentional patterns with actual helping behaviour, for instance, by measuring helping intentions towards actors displayed or by measuring attention in more realistic settings.

In conclusion, the present findings suggest that people do not automatically attend to emergency scenes even when those scenes are cued by screams for help unless the valence of these sounds is task relevant in the current situation. We hope that other researchers will replicate this study and will also extend these findings, for instance, by varying materials and methods (e.g. to induce task relevance) to ensure robustness and generalizability. Ultimately, we hope that this work might help to develop interventions that prevent such attentional apathy to others' suffering.

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Appendices

Appendix 1. Overview of the content of the pictures used as cues for the dot probe task

A1.1. Emergency scenes (all scenes purported for ethical reasons)

(1) A young man in agony who has just fallen off a skateboard in the middle of a street; (2) A young man who has fallen under a wooden panel in an outdoor space; (3) A young man laying on a street who appears to been hit by a car; (4) A young, pregnant woman in pain leaning towards a wall on a street; (5) An older woman sprinting on an alleyway with a scared look on her face; (6) An older woman who has cut her finger with a knife; (7) An elderly woman who has fallen over and dropped her shopping on the pavement; (8) An elderly woman in pain, holding a walking stick and leaning on a lamp post; (9) An older man who has fallen off a ladder – he is splayed out on the ground with a ladder on top of him; (10) A young man in distress – he is holding his chest and leaning against a wall on the street.

A1.2. Neutral pictures

(1) A young man with a skateboard; (2) A young man next to many wooden panels; (3) A man crossing the road; (4) A young, pregnant woman walking down the road; (5) An older woman walking on an ally way; (6) An older woman whisking whilst cooking; (7) An elderly woman with shopping on the street; (8) An elderly woman with a walking stick; (9) An older man next to a ladder; (10) A young man looking at a wall.

Appendix 2. Overview of the content of the sounds

A2.1. Emergency sounds (all sounds purported for ethical reasons)

(1) A sharp "OW" (male); (2) A longer "OW" (male); (3) A long "AARGH" (male); (4) A high pitched "HELP" (female); (5) A long "HELP" (female); (6) A long "OW" (female); (7) A long "HELP" (female); (8) Crying (female); (9) A long "OW" (male); (10) "Help – Please" (male).

A2.2. Neutral sounds

(1) "I'm going" (male); (2) "I'm going to" (male); (3) "I'll see you there" (male); (4) "I'm going" (female); (5) "Oh well then" (female); (6) "I'm going" (female); (7) "Only went there today" (female); (8) "I'm going to" (female); (9) "I only went there today" (male); (10) "Ok then" (male).