Young children show the bystander effect in helping situations

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Abstract

Much research in social psychology has shown that otherwise helpful people often fail to help when bystanders are present. Research in developmental psychology has shown that even very young children help, and that others' presence can actually increase helping in some cases. In the current study, in contrast, 5-year-old children helped an experimenter at very high levels when they were alone, but significantly less in the presence of bystanders who were potentially available to help. In another condition designed to elucidate the mechanism underlying the effect, children's helping was not reduced when bystanders were present but confined behind a barrier and thus unable to help (a condition that has not been run in previous studies with adults). Young children thus show the bystander effect, and it is not due to social referencing or shyness to act in front of others, but rather to a sense of a diffusion of responsibility.

Keywords: bystander effect, helping, children, diffusion of responsibility, prosociality, developmental psychology

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Humans are inordinately helpful. Not only do we help our kin and friends, we sometimes even help complete strangers. There are good reasons for this. First, helping others increases the chances that the recipient ('direct reciprocity'; Fehr, Gächter, & Kirchsteiger, 1997) and others ('indirect reciprocity'; Seinen & Schram, 2006) will help us later. Thus helping can enhance our reputations (Milinski, Semmann, & Krambeck, 2002). Second, helping social partners we are dependent on benefits us in the long run as it means that they are more likely to be available as cooperative partners in the future ('mutualism'; Tomasello, Melis, Tennie, Wyman, & Herrmann, 2012).

However, there is a striking finding from social psychology demonstrating that sometimes we fail to help, particularly in the presence of others. Darley and Latané (1968, 1970; Latané & Darley, 1968) were the first to assess the so-called bystander effect experimentally. They found that the presence of other potential helpers decreases participants' likelihood to help. From a game-theoretical perspective, the bystander situation has been described as a 'volunteer's dilemma': Since helping is costly, the individual likelihood to help approaches zero the more other potential helpers there are (Diekmann, 1985). As a psychological explanation for the bystander effect, Darley and Latané (1970) suggested a five-step model of intervention in an emergency: An actor has to (1) notice the event, (2) interpret it as an emergency, (3) take responsibility, and (4) know how to help before he can (5) provide help. They proposed that the presence of bystanders interferes with the successful completion of these steps by three processes we will refer to as social referencing, diffusion of responsibility, and shyness to act in front

of others. Social referencing, or noting the bystanders' passivity, interferes with step 2, diffusion of responsibility interferes with step 3, and a shyness is most likely to interfere with step 5 (Darley & Latané, 1970; Fischer et al., 2011; Latané & Nida, 1981). Meta-analyses show that helping becomes less likely the more bystanders there are, the more ambiguous the need for help is, when bystanders remain passive and act unaffected by the situation, and when bystanders are strangers (Fischer et al., 2011; Latané & Nida, 1981).

Human prosocial tendencies are deeply rooted in ontogeny. Developmental research on helping in children has focused mainly on how helpful young children are (Warneken & Tomasello, 2009) rather than on testing the limits to their helpfulness. Children start helping others around one year of age (Warneken & Tomasello, 2007), and do so in a variety of contexts including instrumental need (Rheingold, 1982; Svetlova, Nichols, & Brownell, 2010; Warneken & Tomasello, 2006), sharing (Hay, Castle, Davies, Demetriou, & Stimson, 1999), comforting (Svetlova et al., 2010; Zahn-Waxler, Radke-Yarrow, Wagner, & Chapman, 1992), and providing useful information (Liszkowski, Carpenter, Striano, & Tomasello, 2006). Crucially, young children help with no regard for direct rewards or praise (Warneken & Tomasello, 2008) and, sometimes, even at a cost to themselves (Warneken, Hare, Melis, Hanus, & Tomasello, 2007).

What little research has been done on how the presence of others can affect children's helping behavior has focused mainly on how others' presence can *increase* helping: Five-year-olds are more likely to behave prosocially when someone is watching them (Engelmann, Herrmann, & Tomasello, 2012; Leimgruber, Shaw, Santos, & Olson,

2012). Thus even young children apparently recognize the reputational advantage of helping in some contexts.

Only one previous study has looked for the bystander effect in children. Staub (1970) had participants who were either alone or in pairs overhear a child in another room fall from a chair. Staub did not find a bystander effect until children reached the age of 9. In fact, children from 5 years showed the opposite pattern of results: They helped *more* when in pairs than when alone. However there is other evidence from naturalistic observations and interviews in daycare and school settings suggesting that young children may show the bystander effect in some contexts. These studies find that children seldom help or feel responsible for helping when witnessing a peer in distress (Caplan & Hay, 1989; Thornberg, 2007) or during bullying incidents (e.g., Craig & Pepler, 1997; Salmivalli, Lappalainen, & Lagerspetz, 1998). Although in these naturalistic settings there were usually bystanders present, none of the studies manipulated the presence of bystanders systematically. We thus do not know whether children's reluctance to help in these studies was due to bystander presence. The important question of whether young children take responsibility into account when deciding whether to help has also not yet been experimentally investigated.

In this study, we therefore investigated whether young children's tendency to help can be reduced by the presence of bystanders. Five-year-olds witnessed an experimenter who needed help when they were either alone (Alone condition) or in the presence of two peer (confederate) bystanders who did not help (Bystander condition), and we measured whether they helped the experimenter. An additional aim was to investigate the main processes underlying the bystander effect, assuming we observed it (i.e., shyness to act in

front of others, social referencing, or diffusion of responsibility). We thus included a third condition (that is new to the bystander literature in general) in which the bystanders were positioned behind a low barrier, visible for the participant and watching the situation, but unable to help (Bystander-unavailable condition). This condition matched the Bystander condition in that bystanders were present and could observe the situation, thus controlling for shyness to act. Furthermore, participants had the opportunity to socially reference the bystanders' passivity in both conditions. The only difference between the Bystander and the Bystander-unavailable condition was whether the bystanders were available, and therefore potentially responsible, to help. Thus this condition tested whether any bystander effect we found was driven by diffusion of responsibility.

We tested 5-year-olds because whereas previous studies found that the presence of others increased, rather than decreased, helping in 5-year-olds, there are methodological factors that might explain this (see below). If instead we found decreased helping in the presence of bystanders, this would provide an important contrast to those studies, and a much richer picture of the complexity of young children's helping behavior.

Method

Participants

Participants were sixty 5-year-olds (mean age: 5 years, 7 months; age range: 5 years, 0 months – 5 years, 11 months). The sample size was specified prior to data collection, based on typical sample sizes in this field. Half of the participants in each condition were female. Children were recruited from a database of parents who had agreed to participate in studies on child development. Children were randomly assigned to one of the three conditions. A total of 12 peer confederates (mean age: 5 years, 10

months; age range: 4 years, 11 months – 6 years, 11 months) were assigned to mixed-sex dyads on the basis of availability to participate in testing and their reliability as confederates. These children were bystanders in the Bystander and the Bystander-unavailable conditions and were always strangers to the participant.

Four additional children were invited but not tested because they refused to participate. An additional 14 participants were tested but excluded from analyses for video camera error (1), experimenter error (3), or confederate error (10). Confederate error was coded if confederates deviated from their instructions in significant ways: if they gave hints to the participants that they knew what was going to happen next (3/10), if they revealed that they had participated before (4/10), if the participants noticed them looking towards them on more than two occasions during the test phase (1/10), or if they talked excessively (2/10). Inter-rater reliability on the decision to exclude participants due to confederate error was assessed on a random selection of 12 cases (including 6 out of the 10 confederate drop outs) by a coder who was naïve to the hypotheses of the study ($\kappa = 0.83$). The few disagreements were resolved by discussion.

Set-up and materials

Testing was conducted in a room containing four child-size tables and chairs, one for E and three for the participant and two bystanders. Children's tables stood next to each other (at a distance of 130 cm) in the back of the room facing the experimenter's table, and were separated by 135 x 80 cm barriers (which were opaque up to a height of 70 cm, i.e., approximately shoulder height of the children while seated). From the participant's sitting position, both bystanders were equally visible in the Bystander and the Bystander-unavailable condition (see Figure 1). There was a pile of paper towels on

the floor between children's tables and the experimenter's table (175 cm equidistant from each of the children's tables). Other materials were a set of 10 different pictures for coloring, color pencils, a 300 x 80 cm cardboard wall, a cup of green paint, and a cup containing colored water and paintbrushes.

Fig. 1.

Re-enactment of the set-up in (a) the Alone condition, (b) the Bystander condition, and (c) the Bystander-unavailable condition. The participant is seated on the left in each picture.

Procedure

Introduction. Participants were told that they were going to color a picture. In the Alone condition, participants were led to the testing room, where they were asked to choose a picture to color. In the Bystander and Bystander-unavailable condition, participants met the two confederates in front of the testing room. They were introduced by name and said to be participating as well. All children and the experimenter then entered the testing room and chose a picture. Participants always were asked (seemingly randomly) to choose first and then the confederates always each chose different pictures.

Introductory phase. In all conditions, the experimenter then noticed a puddle of water in the middle of the room which she wiped up with some paper towels. She put the leftover paper towels on the floor, saying "…in case something needs to be wiped up later."

Manipulation phase. Children were asked to sit down to color. The experimenter then said that while children colored their pictures, she would paint her cardboard wall and to do that more easily, she would place it in a certain way. In the Bystander condition, she put the wall to the side (against the right wall in Figure 1b). In the Bystander-unavailable condition, she attached the wall to the barriers separating children's tables, such that the two confederates were fenced in and unable to leave their compartments. In this condition, the experimenter then commented on the wall with apparent surprise, saying, "Oh, I've just realized, now you two can't get out of here. Well, you are fenced in now briefly, but don't worry, you can get out as soon as we're finished here." In the Alone condition, the wall was put to the side (as in the Bystander condition) for half of the children, and attached to the barriers (as in the Bystander-unavailable condition) for the other half. In all conditions the participants were able to move freely. After this, all children were given pencils and were asked to start coloring, while the experimenter painted her cardboard wall. After approximately a minute, the experimenter then said she needed to clean her paintbrushes and sat down at her table with the cup of water and the paintbrushes.

Test phase. After approximately half a minute, E 'accidentally' knocked over the cup and spilled colored water all over her table. She tried to hold back the water with her forearms to prevent it from spilling onto the floor. During the first 15 seconds after spilling the water, E said, while looking down at the water, "Oops," and groaned. She repeated this two more times. After those 15 seconds, if participants had not yet helped, she said, "My cup has fallen over." After 30 seconds, E said, "The water is about to drip onto the floor." After 45 seconds, she said, "I need something to wipe it up," while

looking back and forth between the water and the paper towels on the floor. After 60 seconds, she said, “I need the paper towels there,” looking at the paper towels, out of her reach. She then looked for the first time at the children, starting with the participant on the left and then moving her gaze to the right to each of the bystanders and back to the left, and did so twice. By doing that, she looked at the participant and the bystanders in the two Bystander conditions, and at the participant and the two empty tables in the Alone condition. After 75 seconds, she said, “Could somebody give me the paper towels there” looking at the children again as described above. After 90 seconds, if the participant still had not brought her some paper towels, she appeared to realize that there were paper towels behind her that she could reach easily and so cleaned up the water herself.

Confederates had been instructed to be friendly throughout the study, but not talk, and especially to give no hints that they were confederates of the experimenter, that they had participated in the study before, or about what would happen later. In the test phase, they were instructed to look at the experimenter neutrally from time to time but to continue drawing, and not look at the participant. Coding and analyses of confederates’ behavior to check that their behavior was equivalent in the two Bystander conditions can be found in the Supplemental Material available online. Confederates were told that this was just play-acting for the sake of the study, and normally one should help in these situations.

Interview. We also interviewed participants after the main test phase was complete. This interview was based on the 5-step model of Darley and Latané (1970). An assistant that participants had interacted with briefly prior to the experiment interviewed

them alone. She expressed her regret that she had missed children's drawing session and, to measure whether children noticed the accident, she asked (1) what had happened and in particular whether there was anything that happened to the experimenter. To measure whether children understood that the experimenter needed help, she asked (2) whether the experimenter really needed help in the situation. To measure whom children thought was responsible for helping, she asked (3) whose job it was to help in the situation, and how participants knew who should help. To measure whether children knew appropriate means for helping, she asked (4) if participants knew how to help the experimenter, and finally, as a manipulation check (MC) to see whether the cardboard wall was a convincing barrier for participants in the Bystander-unavailable condition, she asked if anybody else could have helped in the situation.

At the very end of the test session, after the interview, the assistant emphasized to participants who had helped that it was good to help, and to participants who had not helped that generally helping is good, but it was probably OK not to help here as E was able to help herself eventually. Participants in the Bystander condition were told that probably the bystanders had not helped because they had not noticed that E needed help.

Coding and Reliability

Coding of helping. For the helping situation, the main measure was whether participants did or did not help the experimenter by bringing her at least one paper towel within the 90-second response phase. In addition, we also coded how quickly participants helped. This was coded on a 7-point scale indicating the phase in which children helped (phases corresponded to each 15-second step described above, during which the experimenter made her need for help increasingly more explicit). Children scored 1 if

they helped spontaneously in the first part of the test phase, 2, if they helped in the second part of the test phase and so on up to the sixth and final part of the test phase; if they did not help they were not included in these analyses.

Coding of social referencing. For the Bystander and Bystander-unavailable conditions, we also took a measure of social referencing, coding how often participants looked towards the bystanders. The number of looks was divided by the helping phase to correct for the time it took children to help. This resulted in a mean number of looks per helping phase for each child.

Coding of the interview. For the interview responses we coded for question (1) whether participants mentioned the water spilling incident or not, for question (2) "E needed help" versus "E did not need help", for question (3) when asked who had the job to help, whether children said "me" (versus "everybody", "nobody", or other), and when asked how they knew who should help, whether children said "because I had to do it" (versus "everybody could do it", "nobody could do it", or other), for question (4) "I knew how to help" versus "I did not know how to help", and for the (MC) question whether children mentioned the cardboard wall as a reason why nobody else could have helped.

Reliability. Videos of the helping situation and the interview were coded by the first author. Reliability coding by a naïve coder who was unaware of the hypotheses of the study on the full sample revealed perfect agreement on whether or not children helped ($\kappa = 1$) and the phase in which children helped ($r_s = 1$, with no difference between coders, Mann-Whitney *U*-Test: $p = 1$), and excellent agreement on the number of times participants looked towards the bystanders ($r = 0.95$, with no difference between coders,

Mann-Whitney *U*-Test: $p = .65$) and the interview responses (all κ's > 0.82). Disagreements were resolved by discussion.

Results

Helping

Preliminary analysis revealed that gender did not have an effect on the overall number of participants who helped (Fisher's exact test, $p = .51$), so we collapsed across gender in the following analyses. The number of participants who helped E was significantly different across the three conditions (Fisher's exact test, $p = .001$, Cramer's $\Phi = 0.487$; see Figure 2). Whereas the number of children who helped in the Alone and Bystander-unavailable conditions was identical, children were less likely to help in the Bystander condition. A post-hoc comparison revealed that the Bystander condition differed significantly from the other two conditions (Fisher's exact tests, Bystander – Alone: $p = .008$; $\Phi = 0.404$; Bystander – Bystander-unavailable: $p = .008$; $\Phi = 0.404$; Alone – Bystander-unavailable: $p = 1$; $\Phi = 0$).

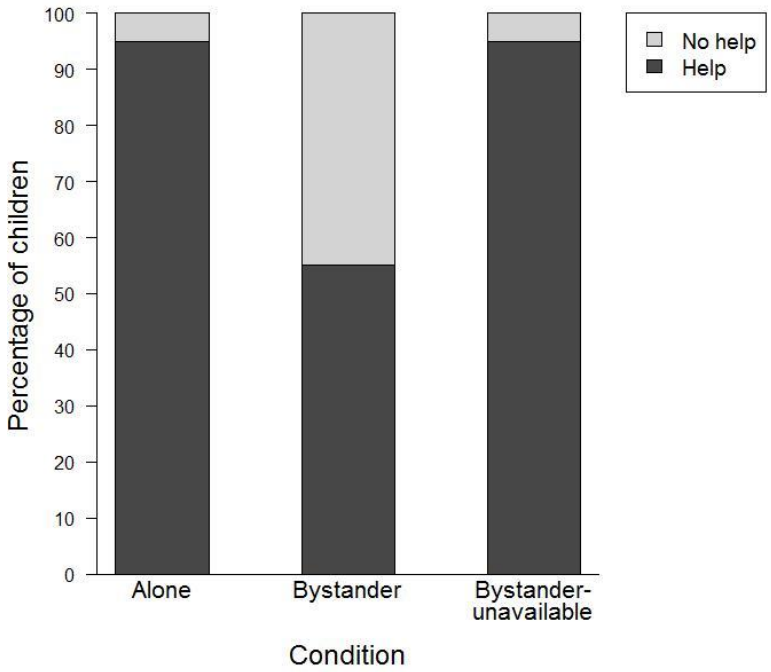

Fig. 2.

Percentage of participants who helped and did not help the experimenter in each condition (*N*=60).

Latency to help

Considering only those children who had helped E, an analysis of how quickly children helped (i.e., in which helping phase they helped) indicated a significant difference between conditions (Kruskal-Wallis H-test: $X^2(2) = 6.50$, $p = .039$). Children helped significantly earlier in the Alone condition (*Mdn* = 4, *range* = 1-6) than in the Bystander (*Mdn* = 5, *range* = 1-6, Mann-Whitney $U(n_1=19, n_2=11) = 54.5$, $p = .027$, $r = -0.40$) and the Bystander-unavailable condition (*Mdn* = 5, *range* = 1-6, Mann-Whitney $U(n_1=n_2=19) = 109.5$, $p = .034$, $r = -0.35$). There was no difference between the

Bystander and Bystander-unavailable conditions (Mann-Whitney $U(n_1=11, n_2=19) = 106$, $p = 0.97$, $r = 0.07$). One possible explanation for this pattern of results is that the situation was more complex in the two bystander situations and, as a consequence, it took children longer to process. Table S1 in the Supplemental Material available online provides a more detailed depiction of the latencies to help in each phase in each condition.

Social referencing

The mean number of looks to the bystanders per helping phase did not differ between the Bystander (*Mdn*: 0.29, *range*: 0 to 0.86) and the Bystander-unavailable condition (*Mdn* = 0.33, *range* = 0 to 1; Mann-Whitney $U(n_1=n_2=20) = 180.5$, $p = .61$, $r = -0.08$). The behavior of the confederates during the test phase in the Bystander and the Bystander-unavailable condition were comparable (see Supplemental Materials for details).

Interview

(1) Noticing the event. All participants noticed the event and were able to describe what had happened to the experimenter in all three conditions.

(2) Interpreting the need for help. The majority of children in all conditions judged that the experimenter really needed help, with no difference across conditions (Alone condition: 94.1%, Bystander condition: 73.7%, Bystander-unavailable condition: 94.4%, Fisher's exact test, $p = .19$, $\Phi = 0.293$).

(3) Responsibility to help. For the first question, 52.5% of children in both the Alone condition and the Bystander-unavailable condition said that it was *their* job to help, whereas only 11.8% said this in the Bystander condition (Fisher's exact test, $p = .015$, $\Phi = 0.385$; post-hoc Fisher's exact tests: Bystander – Alone: $p = .014$, $\Phi = 0.374$;

Bystander – Bystander-unavailable: $p = .014$, $\Phi = 0.374$; Alone – Bystander-unavailable: $p = 1$, $\Phi = 0$). For the second question, 52.9% of children in the Alone condition and 57.9% of children in the Bystander-unavailable condition said they knew who should help because *they* were the ones who had to do it, whereas only 5.3% said this in the Bystander condition (Fisher's exact test, $p < .001$, $\Phi = 0.494$; post-hoc Fisher's exact tests: Bystander – Alone: $p = .002$, $\Phi = 0.469$; Bystander – Bystander-unavailable: $p = .001$, $\Phi = 0.51$; Alone – Bystander-unavailable: $p = 1$, $\Phi = 0$).

(4) Knowledge of how to help. In the Bystander condition, 47.4% of children said that they had *not* known how to help the experimenter, in contrast to 10% in the Alone condition and 0% in the Bystander-unavailable condition (Fisher's exact test, $p < .001$, $\Phi = 0.519$; post-hoc Fisher's exact tests: Bystander – Alone: $p = .014$, $\Phi = 0.358$; Bystander – Bystander-unavailable: $p < .001$, $\Phi = 0.501$; Alone – Bystander-unavailable: $p = .487$, $\Phi = 0.115$). It was mainly the children who did not help in the Bystander condition who said this (i.e., 88.9% of children who did not help said "I did not know", whereas only 10% of children who did help said "I did not know").

Manipulation check. The manipulation check question revealed that the cardboard wall was a convincing barrier for the majority of participants in the Bystander-unavailable condition, with 80% of them explicitly naming this as the reason why the bystanders could not have helped.

Discussion

Young children showed the bystander effect: Five-year-olds were less likely to help someone in need when bystanders were present than when alone. Our control condition explained why. When bystanders were present but confined behind a barrier

and therefore unavailable to help, children helped just as often as they did when they were alone. Thus it was not simply the mere presence of bystanders that caused the effect (e.g., through shyness to act in front of others). Nor was it social referencing of the bystanders' passivity, as participants looked towards the bystanders equally often irrespective of their availability to help, and the bystanders' behavior was comparable in the two conditions (see Supplemental Material). Rather, it appears that the effect was driven by the diffusion of responsibility existing only in the Bystander condition. Children apparently recognized that they alone were responsible to help in the Alone and Bystander-unavailable conditions, whereas in the Bystander condition, responsibility was diffused among three potential helpers. This conclusion is supported by the interview, where children were more likely to report it was their job to help in the Alone and Bystander-unavailable conditions than in the Bystander condition. Children at this age therefore take responsibility into account when deciding whether to help.

It is interesting to consider why we found a bystander effect whereas three other studies have shown increased helping in the presence of others at this age (Engelmann et al., 2012; Leimgruber et al., 2012; Staub, 1970). The differences in results can be explained by differences in methods. Staub's study featured characteristics that meta-analyses have shown to reduce bystander effects (e.g., bystanders were not strangers, the situation was dangerous rather than ambiguous; Fischer et al., 2011; Latané & Nida, 1981). Furthermore, participants might not have felt competent to help the injured victim, and thus the presence of a peer might have reduced participants' discomfort or helplessness and therefore facilitated helping (Latané & Nida, 1981). In the other two studies, the observers were onlookers, rather than bystanders, because they were only

watching and did not have the means to help (Engelmann et al., 2012), or they were the recipients themselves (Leimgruber et al., 2012). Thus, as in our Bystander-unavailable condition, responsibility in those studies was clearly attributable to participants since they were the only ones able to help.

An outstanding (and related) question is why the Bystander-unavailable condition did not lead to enhanced helping due to participants' reputational concerns, as in this condition the bystanders could potentially hold the participant accountable for failing to help. This would link with findings in the adult literature that the presence of accountability cues can enhance helping (van Bommel, van Prooijen, Elffers, & van Lange, 2012, 2014). The current study was not designed to investigate reputation effects on helping behavior directly, and the fact that children helped almost at ceiling in both the Alone and the Bystander-unavailable conditions makes it difficult to determine whether reputational effects might have increased helping in the Bystander-unavailable condition. It is worth noting, however, that children helped more slowly in the Bystander-unavailable condition than in the Alone condition, suggesting that it was not the case that they were more motivated to help in the Bystander-unavailable condition. The relationship between bystander effects and reputation is an interesting question for future research, as factors that could lead to a promotion of helping have often been neglected in the bystander literature (Levine & Cassidy, 2010; Levine & Crowther, 2008).

One interesting finding from the interview results is that almost half the children in the Bystander condition (mainly those who had not helped during the test) said they had not known how to help. This is actually unlikely to be the case, because E

demonstrated how to use the paper towels before the test and directly asked for paper towels during the response phase. It could be that those children who had not helped gave post-hoc rationalizations for not helping, potentially to save face, or to make themselves feel better about not helping.

It would be interesting to know whether a similar effect is seen in even younger children. However, practically speaking, the current method would not work with younger children because of the demands of the confederates' roles. Piloting revealed that 5 years is the youngest age at which children have the necessary inhibition and acting skills to be reliable confederates. Since it is important to use similar-age peers as bystanders, because older bystanders might be expected to be more competent to help, this limits the use of this method to children of at least 5 years. An appropriate method for testing younger children still needs to be developed.

This study contributes to the helping literature by showing that although children are typically extremely helpful (Warneken & Tomasello, 2009), this tendency to help can be overridden in certain circumstances: Five-year-olds help at very high levels only when responsibility is clearly attributable to them. They are less likely to help when the presence of other potential helpers causes a diffusion of responsibility.

Humans are inordinately helpful, and there are good reasons for this. Yet the potential benefits of being helpful are not always sufficient to outweigh the costs associated with it. When others are available, we often wait for them to help. Here we show that young children do this as well. The findings that in some circumstances children help more and in some circumstances help less when others are present illustrates the complexity of young children's helping behavior. These results also have

practical applications. They suggest that interventions to promote helpfulness in bystander-type situations should address the issue of diffusion of responsibility early in development.

Author contributions

All authors contributed to the idea of the study and the design. Testing and data collection were performed by M. Plötner. M. Plötner performed the data analysis and interpretation under the supervision of H. Over, M. Carpenter, and M. Tomasello. M. Plötner drafted the manuscript, and H. Over, M. Carpenter, and M. Tomasello provided critical revisions. All authors approved the final version of the manuscript for submission.

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References

Caplan, M. Z., & Hay, D. F. (1989). Preschoolers' responses to peers' distress and beliefs about bystander intervention. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 30*(2), 231-242. doi: 10.1111/j.1469-7610.1989.tb00237.x

Craig, W. M., & Pepler, D. J. (1997). Observations of bullying and victimization in the school yard. *Canadian Journal of School Psychology, 13*(2), 41-59. doi: 10.1177/082957359801300205

Darley, J. M., & Latané, B. (1968). Bystander intervention in emergencies: Diffusion of responsibility. *Journal of Personality and Social Psychology, 8*, 377-383. doi: 10.1037/H0025589

Darley, J. M., & Latané, B. (1970). *The unresponsive bystander: Why doesn't he help?* New York: Appleton-Century-Crofts.

Diekmann, A. (1985). Volunteers dilemma. *Journal of Conflict Resolution, 29*(4), 605-610. doi: 10.1177/0022002785029004003

Engelmann, J. M., Herrmann, E., & Tomasello, M. (2012). Five-year olds, but not chimpanzees, attempt to manage their reputations. *PLoS ONE, 7. doi: 10.1371/journal.pone.0048433*

Fehr, E., Gächter, S., & Kirchsteiger, G. (1997). Reciprocity as a contract enforcement device: Experimental evidence. *Econometrica, 65*(4), 833-860. doi: 10.2307/2171941

Fischer, P., Krueger, J. I., Greitemeyer, T., Vogrincic, C., Kastenmuller, A., Frey, D., . . . Kainbacher, M. (2011). The bystander-effect: A meta-analytic review on bystander intervention in dangerous and non-dangerous emergencies. *Psychological Bulletin, 137*(4), 517-537. doi: 10.1037/A0023304

Hay, D. F., Castle, J., Davies, L., Demetriou, H., & Stimson, C. A. (1999). Prosocial action in very early childhood. *Journal of Child Psychology and Psychiatry, 40*(6), 905-916. doi: 10.1111/1469-7610.00508

Latané, B., & Darley, J. M. (1968). Group inhibition of bystander intervention in emergencies. *Journal of Personality and Social Psychology, 10*(3), 215-221. doi: 10.1037/H0026570

Latané, B., & Nida, S. (1981). 10 years of research on group-size and helping. *Psychological Bulletin, 89*(2), 308-324. doi: 10.1037//0033-2909.89.2.308

Leimgruber, K. L., Shaw, A., Santos, L. R., & Olson, K. R. (2012). Young children are more generous when others are aware of their actions. *Plos One, 7*(10). doi: 10.1371/journal.pone.0048292

Liszkowski, U., Carpenter, M., Striano, T., & Tomasello, M. (2006). 12-and 18-month-olds point to provide information for others. *Journal of Cognition and Development, 7*(2), 173-187. doi: 10.1207/s15327647jcd0702_2

Milinski, M., Semmann, D., & Krambeck, H. J. (2002). Donors to charity gain in both indirect reciprocity and political reputation. *Proceedings of the Royal Society B-Biological Sciences, 269*(1494), 881-883. doi: 10.1098/rspb.2002.1964

Rheingold, H. L. (1982). Little children's participation in the work of adults, a nascent prosocial behavior. *Child Development, 53*(1), 114-125. doi: 10.2307/1129643

Salmivalli, C., Lappalainen, M., & Lagerspetz, K. M. (1998). Stability and change of behavior in connection with bullying in schools: A two-year follow-up. *Aggressive behavior, 24*(3), 205-218. doi: 10.1002/(SICI)1098-2337(1998)24:3<205::AID-AB5>3.0.CO;2-J

Seinen, I., & Schram, A. (2006). Social status and group norms: Indirect reciprocity in a repeated helping experiment. *European Economic Review, 50*(3), 581-602. doi: 10.1016/j.euroecorev.2004.10.005

Staub, E. (1970). A child in distress: The influence of age and number of witnesses on children's attempts to help. *Journal of Personality and Social Psychology, 14*(2), 130-140. doi: 10.1037/h0028752

Svetlova, M., Nichols, S. R., & Brownell, C. A. (2010). Toddlers' prosocial behavior: From instrumental to empathic to altruistic helping. *Child Development, 81*(6), 1814-1827. doi: 10.1111/j.1467-8624.2010.01512.x

Thornberg, R. (2007). A classmate in distress: Schoolchildren as bystanders and their reasons for how they act. *Social Psychology of Education, 10*(1), 5-28. doi: 10.1007/s11218-006-9009-4

Tomasello, M., Melis, A. P., Tennie, C., Wyman, E., & Herrmann, E. (2012). Two key steps in the evolution of human cooperation. *Current Anthropology, 53*(6), 673-692. doi: 10.1086/668207

van Bommel, M., van Prooijen, J.-W., Elffers, H., & van Lange, P. A. (2012). Be aware to care: Public self-awareness leads to a reversal of the bystander effect. *Journal of Experimental Social Psychology, 48*(4), 926-930. doi: 10.1016/j.jesp.2012.02.011

van Bommel, M., van Prooijen, J.-W., Elffers, H., & van Lange, P. A. (2014). Intervene to be Seen The Power of a Camera in Attenuating the Bystander Effect. *Social Psychological and Personality Science, 5*(4), 459-466. doi: 10.1177/1948550613507958

Warneken, F., Hare, B., Melis, A. P., Hanus, D., & Tomasello, M. (2007). Spontaneous altruism by chimpanzees and young children. *Plos Biology, 5*(7), 1414-1420. doi: 10.1371/journal.pbio.0050184

Warneken, F., & Tomasello, M. (2006). Altruistic helping in human infants and young chimpanzees. *Science, 311*(5765), 1301-1303. doi: 10.1126/science.1121448 16513986

Warneken, F., & Tomasello, M. (2007). Helping and cooperation at 14 months of age. *Infancy, 11*(3), 271-294. doi: 10.1080/15250000701310389

Warneken, F., & Tomasello, M. (2008). Extrinsic rewards undermine altruistic tendencies in 20-month-olds. *Developmental Psychology, 44*(6), 1785. doi: 10.1037/a0013860 18999339

Warneken, F., & Tomasello, M. (2009). The roots of human altruism. *British Journal of Psychology, 100*(3), 455-471. doi: 10.1348/000712608X379061

Zahn-Waxler, C., Radke-Yarrow, M., Wagner, E., & Chapman, M. (1992). Development of concern for others. *Developmental Psychology, 28*(1), 126. doi: 10.1037/0012-1649.28.1.126

Supplemental online material for

Young children show the bystander effect in helping situations

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Method

Confederates' behavior

Coding. As a manipulation check, to ensure that there were no notable differences in the confederates' behavior in the Bystander and Bystander-unavailable conditions, we coded confederates' emotional expressions (on a 5-point scale ranging from negative/bored [-2] to neutral [0] to positive/happy [2]). We also coded the number of times they looked at the participant, and, because often participants did not show any signs of noticing these looks, the number of times participants actually saw the looks (i.e., made eye contact with the confederates). These numbers were divided by the number of helping phases it took that participant to help to correct for the time it took children to help. This resulted in a mean number of confederates' looks, and a mean number of seen looks, per helping phase for each child. In addition, we coded any occasions in which confederates deviated from their instructions.

Reliability. Reliability coding by a naïve coder who was unaware of the hypotheses of the study on the full sample revealed excellent inter-rater agreement on confederates' emotional expressions (r_s = 0.79, with no difference between coders, Mann-Whitney *U*-Test: p = .37), the number of times they looked at the participant (r_s = 0.93, with no difference between coders, Mann-Whitney *U*-Test: p = .87), and the number of times participants saw these looks (r_s = 0.77, with no difference between coders, Mann-Whitney *U*-Test: p = .37).

Results

Confederates' behavior

The behavior of the confederates during the test phase did not differ between the Bystander and the Bystander-unavailable condition with regard to their emotional expression (their expressions were mainly coded as neutral; Bystander: *Mdn*: 0, *range:* -2 to 1; Bystander-unavailable: *Mdn* = 0, *range* = 0 to 2; Mann-Whitney $U(n_1=n_2=20) = 198$, $p = .87$, $r = -0.012$). For some reason, confederates in the Bystander-unavailable condition looked to the participants more often (Bystander: *Mdn*: 0.54, *range*: 0 to 1.14; Bystander-unavailable: *Mdn* = 0.78, *range* = 0 to 2; Mann-Whitney $U(n_1=n_2=20) = 125$, $p = .042$, $r = -0.32$), but participants did not notice this difference: there was no significant difference between conditions in the mean number of looks that were seen by participants (Bystander: *Mdn*: 0, *range:* 0 to 0.2; Bystander-unavailable: *Mdn* = 0, *range* = 0 to 0.5; Mann-Whitney $U(n_1=n_2=20) = 176$, $p = .478$, $r = -0.12$). Confederates deviated from their instructions only very rarely, with no differences between conditions. They never talked during the test phase. As instructed, they drew silently and looked at E from time to time. The few minor deviations from the instructions (confederates accidentally dropping their pen, a confederate standing up briefly; n=3) were not noticed by the participants.

Latency to help

Table S1 depicts how quickly (i.e., in which helping phase) children helped in each condition.

Table S1

Number of children who helped in each helping phase per condition.

	Helping phase						
Condition	1	2	3	4	5	6	Did not help
Alone	2	1	4	8	3	1	1
Bystander	1	1	0	1	4	4	9
Bystander-unavailable	1	0	4	3	3	8	1