Episodic simulation and episodic memory can increase intentions to help others

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Empathy plays an important role in human social interaction. A multifaceted construct, empathy includes a prosocial motivation or intention to help others in need. Although humans are often willing to help others in need, at times (e.g., during intergroup conflict), empathic responses are diminished or absent. Research examining the cognitive mechanisms underlying prosocial tendencies has focused on the facilitating roles of perspective taking and emotion sharing but has not previously elucidated the contributions of episodic simulation and memory to facilitating prosocial intentions. Here, we investigated whether humans' ability to construct episodes by vividly imagining (episodic simulation) or remembering (episodic memory) specific events also supports a willingness to help others. Three experiments provide evidence that, when participants were presented with a situation depicting another person's plight, the act of imagining an event of helping the person or remembering a related past event of helping others increased prosocial intentions to help the present person in need, compared with various control conditions. We also report evidence suggesting that the vividness of constructed episodes—rather than simply heightened emotional reactions or degree of perspective taking—supports this effect. Our results shed light on a role that episodic simulation and memory can play in fostering empathy and begin to offer insight into the underlying mechanisms.

Prosociality is widespread in nature (1). Slime molds band together to overcome starvation (2), rats assist forcefully restrained cagemates (3), and chimpanzees console distressed partners (4). Nonetheless, humans' prosocial tendencies to collaborate with and help one another far exceed those of other species (5–7). People band with, assist, and console family and friends but, more strikingly, are willing to help strangers who suffer from plights they have not directly experienced themselves. Why are humans so willing to help others?

One approach to answering this question entails investigating evolutionary mechanisms that select behaviors to increase reproductive success (8, 9). Another approach is to delineate the cognitive mechanisms that underlie and promote willingness to help others (10, 11). The latter strategy has primarily focused on how the ability to adopt the thoughts and feelings of others (perspective taking) (12–14) and the subsequently provoked emotional concern for others' welfare support prosocial tendencies (15, 16). Here, we ask whether humans' prosocial tendencies arise not only because they can consider others' thoughts and feelings, but also because they can mentally construct the act of helping. Are humans more inclined to lend a helping hand because they can mentally extend it? Might episodic simulation and memory—the mental abilities to vividly imagine and remember experiences located in a specific time and place (17, 18)—contribute to a willingness to help others?

Although little is known about the prosocial functions of episodic simulation and memory (19–21), previous research has shown that elaborate and vividly imagined episodes increase willingness to interact with unfamiliar others (22, 23) and that imagining hypothetical experiences and remembering actual experiences depend on many of the same cognitive and neural processes (18, 24, 25). More tentatively, evidence from experiments

that have examined the neural basis of episodic simulation and memory on the one hand and empathy on the other suggests that there may be overlap between the brain networks that support episodic processes and empathy (19). If constructing episodes facilitates prosocial intentions, then both imagining and remembering helping a person in need should heighten participants' willingness to help. In the current study, we aimed to evaluate this prediction by examining the extent to which imagining and remembering helping a person in need increase willingness to help compared with merely learning about another person's plight and thinking of ways the person could be helped without generating an imagined or remembered episode.

To do so, we recruited adults ($n = 75$) to participate in three experiments described as examining reactions to stories adapted from online media (e.g., Twitter, Tumblr, *The New York Times*) (26, 27). Participants came into the laboratory and read 30 brief stories depicting everyday events of people in need (e.g., locked out of a house, dealing with storm damage, recovering from illness). After reading a story of need (10 s), participants completed tasks that elicited different types of helping reactions (1 min) using a within-subjects design for each experiment. In experiment 1 ($n = 15$), participants were asked to either (*i*) complete neutral math problems (No Helping: Math condition), or (*ii*) imagine a vivid scenario of helping the person in need (Imagine Helping condition) after reading a story of need. Once participants read and reacted to all stories, the stories were presented again, and participants rated their willingness to help the person in need from each story on a seven-point scale. Comparing these conditions allowed us to assess whether imagining an episode of helping facilitates prosocial

Significance

Humans are readily willing to help individuals in need, in part because they can adopt the thoughts and feelings of others. Here, we provide evidence of an additional mechanism facilitating empathic responses. Our experiments revealed that, when presented with a situation depicting another person's plight, participants who imagined an event in which they help the person (episodic simulation) or remembered a related past event of actually helping others (episodic memory) showed increased prosocial intentions. The findings reported here provide a starting point for research that could be used to develop new strategies targeted at episodic mechanisms for promoting empathy, as well as to guide research that attempts to characterize and improve empathic deficits in patient populations.

intentions beyond a baseline reaction to learning about another person's plight.

In experiment 2 (*n* = 30), we sought to (*i*) replicate the basic effect in a larger sample, (*ii*) gain insight into the underlying cognitive mechanisms by including additional dependent measures, and (*iii*) rule out alternative hypotheses by using more stringent control conditions. To accomplish these objectives, we removed the math task and added two new experimental tasks in which participants were asked to either (*i*) focus on the story by considering its journalistic style and online media source (No Helping: Story condition) or (*ii*) estimate how the person could be helped by visualizing a Web site that the story came from and comments posted on it describing how the person in need could be helped (Estimate Helping condition). These conditions were designed to recruit semantic retrieval, social cognition, and the generation of helping examples. By contrast, the imagine condition alone required simulating a temporally and contextually specific episode. After reading and reacting to all scenarios, participants were represented with the scenarios, and they rated, on a trial-by-trial basis using seven-point scales, their willingness to help the person in need, the degree to which they considered the thoughts and feelings of the person in need (i.e., perspective taking), their emotional experiences, and the sensory detail and coherence of their mental images (for estimate and imagine conditions only) (see *Materials and Materials* and *Supporting Information* for a full list of measures).

In experiment 3, we recruited a new sample of 30 participants. We repeated the procedures of experiment 2 with the exception of replacing the Estimate Helping condition with remembering a related past event of helping someone in need (Remember Helping). In addition to the same dependent measures as in experiment 2, participants also indicated the similarity of past events with the currently presented scenarios of need. This measure was included because having personally experienced similar episodes in one's past has been shown to increase empathy for others, and therefore the degree of relatedness may modulate prosocial intentions in the current study (28, 29) (further details are in *Materials and Methods* and *Supporting Information*).

Results

Across the three experiments reported here, participants were more inclined to help a person in need after constructing a vivid personal episode of helping that person.

Experiment 1. As an initial test of this effect, we examined whether imagining a scenario of helping a person in need would increase the willingness to help that person (Imagine Helping condition) compared with a baseline reaction to merely learning about a person's plight (No Helping: Math condition). This contrast revealed a significant increase in the willingness to help a person in need after imagining helping that person relative to only being exposed to the person's plight [t (14) = 5.13, $P < 0.001$] (Fig. 1). This finding suggests that episodic simulation can facilitate prosocial intentions to help others. However, because it is possible that the Imagine Helping condition merely elicited more attention to the story of need, we sought to examine the effect of episodic simulation on empathy under conditions that more tightly controlled for attention to the story of need. We also sought to evaluate a competing hypothesis that the effect of episodic simulation on empathy is attributable to conceptually priming participants to think in general about how a person in need could be helped (30, 31) rather than imagining a specific episode per se. Moreover, although the difference between the experimental and control condition in experiment 1 for willingness to help was very large (*d* = 1.32), we took a conservative approach and doubled our sample size in experiments 2 and 3,
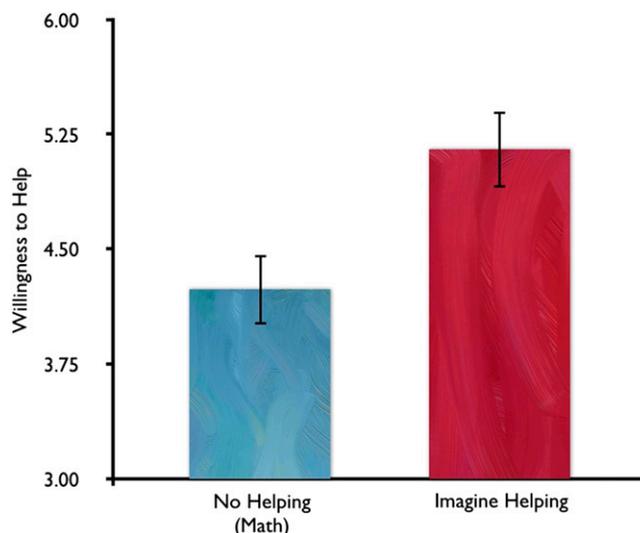

Fig. 1. Episodic simulation increases willingness to help. Participants were more willing to help (1, not at all willing; 7, very willing) when they imagined an episode of helping a person in need (Imagine Helping condition; mean = 5.15, SD = 0.97) compared with when they were exposed to a person's plight but were prevented from imagining a helping scenario by instead completing neutral math problems (No Helping: Math conditon; mean = 4.24, SD = 0.89) in experiment 1. This finding suggests that episodic simulation can facilitate empathy. Error bars, mean ± SE.

thus ensuring more than enough power to adequately detect differences across conditions (power > 0.80) (32).

Experiment 2. The results from experiment 2 further supported an effect of episodic simulation on intentions to help others (Fig. 2*A*). Participants indicated that they were more willing to help a person in need when they imagined helping the person than when they were exposed to the plight of others by considering the journalistic style and source of the stories of need [No Helping: Story condition; t (29) = 6.68, $P < 0.001$], and when they estimated ways a person could be helped by visualizing a Web site that the story came from and the comments posted on it describing how the person in need could be helped [Estimate Helping condition; t (29) = 5.03, $P < 0.001$]. Thus, imagining a helping episode promoted intentions to help others to a greater extent than focusing on the story of need or conceptually thinking of ways a person can be helped. Next, we consider a potential cognitive mechanism that supports this facilitating effect of episodic simulation on empathy.

Perhaps imagining an episode increased the vividness of that event relative to the control conditions, which in turn increased the subjective plausibility of the simulated event (33, 34). As the vividness of an imagined episode increases, the event can be brought to mind more easily, and thereby be used as diagnostic knowledge to inform decisions about the plausibility of the simulated event (35). Consistent with this possibility, previous studies have shown that more elaborately imagined events reduce anxiety, improve intergroup attitudes, and increase intentions to interact with unfamiliar others (22, 23). To evaluate the impact of vividness on facilitating prosocial intentions in experiment 2, we calculated how changes in sensory detail and coherence across participants predicted changes in willingness to help. These analyses revealed that sensory detail and coherence predicted willingness to help when imagining helping a person in need [r (28) = 0.43, $P = 0.018$; r (28) = 0.47, $P = 0.010$] but did not predict willingness to help in the estimating ways person could be helped [r (28) = 0.28, $P = 0.133$; r (28) = 0.27, $P = 0.148$] (Fig. 3 *A* and *B*). That is, participants who imagined more
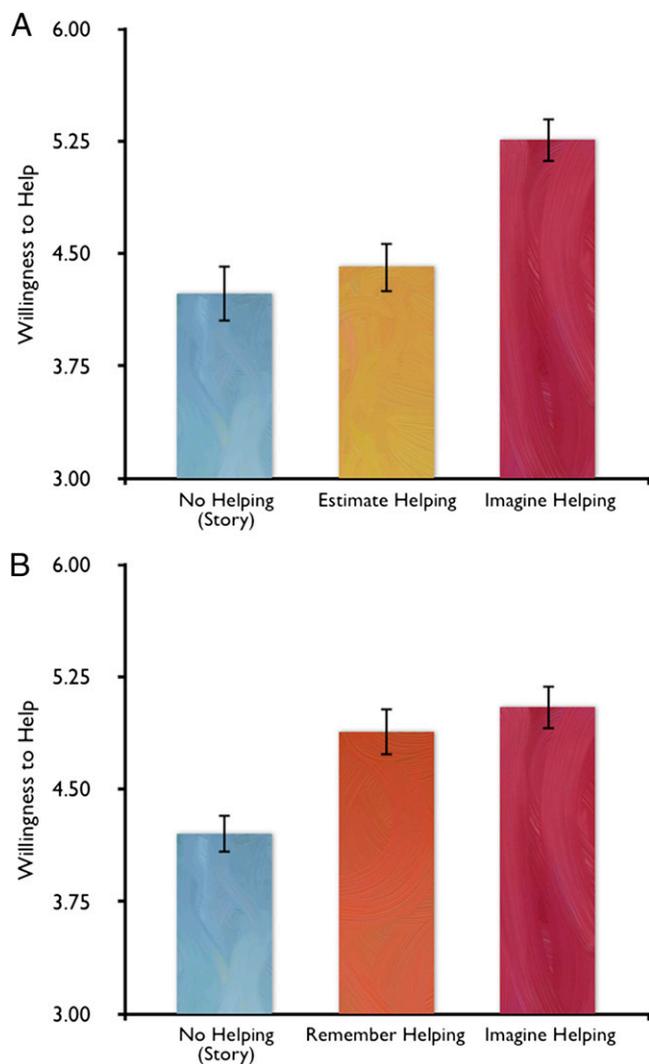
Fig. 2. Episodic processes (simulation and memory) increase willingness to help. (*A*) Imagining a helping episode (Imagine Helping condition; mean = 5.26, SD = 0.81) increased willingness to help (1, not at all willing; 7, very willing) more than focusing on the story of need (No Helping: Story condition; mean = 4.23, SD = 1.0) and estimating how the person could be helped (Estimate Helping condition; mean = 4.41, SD = 0.92) in experiment 2. (*B*) Both imagining a helping episode (Imagine Helping condition; mean = 5.05, SD = 0.82) and remembering a related helping episode (Remember Helping condition; mean = 4.88, SD = 0.86) increased willingness to help more than focusing on the story of need (No Helping: Story condition; mean = 4.19, SD = 0.70) in experiment 3. These findings replicate the effect of episodic simulation on empathy initially observed in experiment 1 and extend this effect to remembering related helping episodes, supporting the hypothesis that episodic processes (simulation and memory) can facilitate empathy. Error bars, mean ± SE.

detailed and coherent events were also more willing to help others. Although the direction of the correlation is the same in the Imagine Helping and Estimate Helping conditions and did not differ significantly at the participant level, this pattern of correlations nonetheless suggests that it may not be the vividness of imagery alone that underlies the effect of episodic simulation on empathy, but, more specifically, the vividness of imagery for the simulated personal episode of helping.

To further examine the relationship between vividness of constructed episodes and prosocial intentions, we ran a linear mixed-effects model, for each measure of vividness (detail or coherence) and for each condition (Estimate Helping or Imagine

Helping), that treated vividness as nested within participants. Vividness was treated as a fixed-effect predictor variable and the interaction between vividness and participants as a random effect. Willingness to help was treated as the outcome variable. These analyses allowed us to examine whether vividness predicted willingness to help on a trial-by-trial basis separately from the association between vividness and willingness to help at the between-participants level. We found that detail and coherence predicted willingness to help when imagining helping a person in need on a trial-by-trial basis [$B = 0.55$, $t(132) = 8.94$, $P < 0.001$; $B = 0.53$, $t(162) = 8.95$, $P < 0.001$], as did detail and coherence when estimating how a person could be helped [$B = 0.38$, $t(73) = 5.56$, $P < 0.001$; $B = 0.32$, $t(96) = 4.67$, $P < 0.001$]. However, when condition (Estimate Helping and Imagine Helping) was also entered as a predictor variable in a mixed effects model for each measure of vividness (detail or coherence), a significant condition by vividness interaction was revealed [$B = 0.18$, $t(202) = 1.95$, $P = 0.053$; $B = 0.22$, $t(252) = 2.50$, $P = 0.013$], indicating that detail and coherence of imagined helping episodes was a significantly better predictor of willingness to help than detail and coherence of estimated helping comments.

Differences between imagining helping and control conditions could reflect an effect on prosocial intentions that is unique to episodic simulation. Conversely, as noted earlier in the Introduction, recent work in psychology and neuroscience suggests that episodic simulation draws on many of the same mental and neural processes as episodic memory (18, 24, 25). This observation raises the possibility that the differences in willingness to help shown in experiment 2 are not uniquely associated with imagining a specific scenario of helping a person in need but
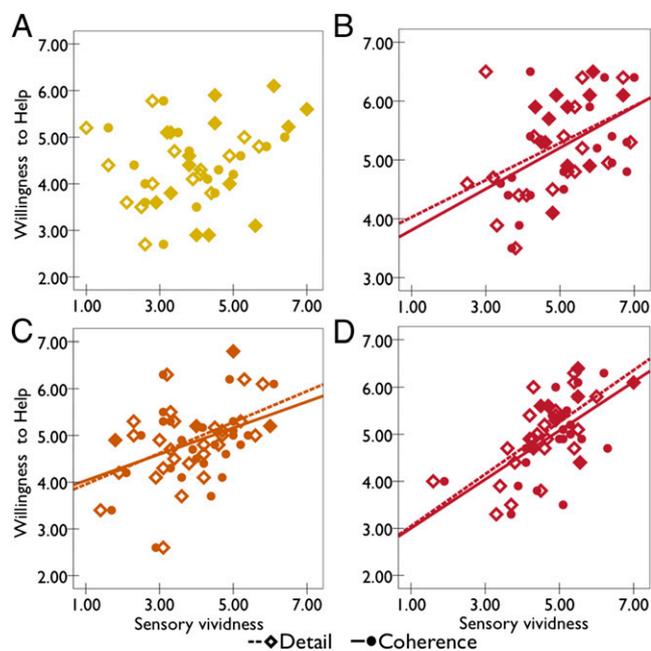

Fig. 3. Vividness of episodes predicts willingness to help. Scatter plots displaying the correlations between willingness to help and sensory vividness for (*A*) Estimate Helping and (*B*) Imagine Helping conditions in experiment 2 and (*C*) Remember Helping and (*D*) Imagine Helping conditions in experiment 3. Sensory detail and coherence predicted willingness to help when participants imagined or remembered a helping episode but did not predict willingness to help when estimating ways the person could be helped by visualizing comments posted on a Web site depicting how to help the person in need. Thus, it appears that the vividness of helping episodes—rather than the vividness of imagery in general—predicts willingness to help. Regression lines are presented for significant effects.

rather arise from constructing a specific helping episode regardless of whether it was imagined or remembered. In experiment 3, we attempted to distinguish between these competing accounts by determining whether the episodic effects observed in experiments 1 and 2 are limited to simulating imagined episodes or whether they generalize to remembering actual episodes.

Experiment 3. Results from comparing performance in the Imagine Helping, Remember Helping, and No Helping: Story conditions reinforced and extended the findings from experiments 1 and 2. Participants indicated that they would be more willing to help people in need when they imagined helping the person than when they were merely exposed to the person's plight [t (29) = 5.88, P < 0.001] (Fig. 2B). Remembering a past helping experience also increased willingness to help a person in need compared with exposure to the person's plight [t (29) = 4.88, P < 0.001]. Notably, imagining helping episodes did not promote willingness to help to a greater extent than remembering helping episodes [t (29) = 1.59, P = 0.123]. Therefore, the increase in prosocial intentions appears to be similar across episodic memory and episodic simulation. Next, we examined whether this effect operated through similar cognitive mechanisms.

Bolstering the findings from experiment 2, we again observed evidence that vividness of episodes influences willingness to help. We found that more detailed and coherent imagined episodes were associated with increased willingness to help across participants [r (28) = 0.67, P < 0.001; r (28) = 0.59, P = 0.001]. Similarly, more detailed and coherent remembered episodes were also associated with increased willingness to help [r (28) = 0.47, P = 0.009; r (28) = 0.38, P = 0.039] (Fig. 3 C and D). Participants who imagined and remembered episodes more vividly were also more willing to help people in need. Taken together, these results suggest that the vividness of a constructed episode may promote prosocial intentions regardless of whether the helping episode is imagined or remembered.

We next examined the relationship between vividness and prosocial intentions distinct from the between-participants level. As in experiment 2, we ran a linear mixed-effects model, for each measure of vividness (detail or coherence) and for each condition (Imagine Helping or Remember Helping) that treated vividness as nested within participants. The results showed that detail and coherence predicted willingness to help when imagining [B = 0.56, t(162) = 11.34, P < 0.001; B = 0.49, t(209) = 8.71, P < 0.001] and remembering events [B = 0.19, t(129) = 3.21, P = 0.002; B = 0.22, t(148) = 3.78, P < 0.001]. Entering condition (Imagine Helping and Remember Helping) as a predictor variable in a mixed-effects model for each measure of vividness (detail or coherence), revealed a condition-by-vividness interaction [B = 0.35, t(299) = 4.56, P < 0.001; B = 0.26, t(361) = 0.65, P = 0.002], suggesting that, relative to remembered episodes, the vividness of imagined episodes more closely tracked with prosocial intentions from trial to trial.

Although imagining and remembering fostered prosocial intentions to a similar extent, experiment 3 provided some evidence that imagining produces an advantage in the range of prosocial experiences it facilitates: (*i*) Participants were unable to retrieve helping experiences for several trials (13%) (Fig. 4) but were able to imagine a helping event for almost all trials (98.4%), chi-square test of independence [χ^2 (1, n = 600) = 28.35, P < 0.001]; (*ii*) on these "missed" memory trials, willingness to help was reduced to baseline levels; and (*iii*) the less related a memory was to the present situation of need the less willing the participant was to help [r (29) = 0.40, P = 0.028]. These findings underscore the prosocial utility of episodic simulation: It overcomes the narrowness of past experiences by allowing people to empathize with novel situations they have not directly experienced themselves.
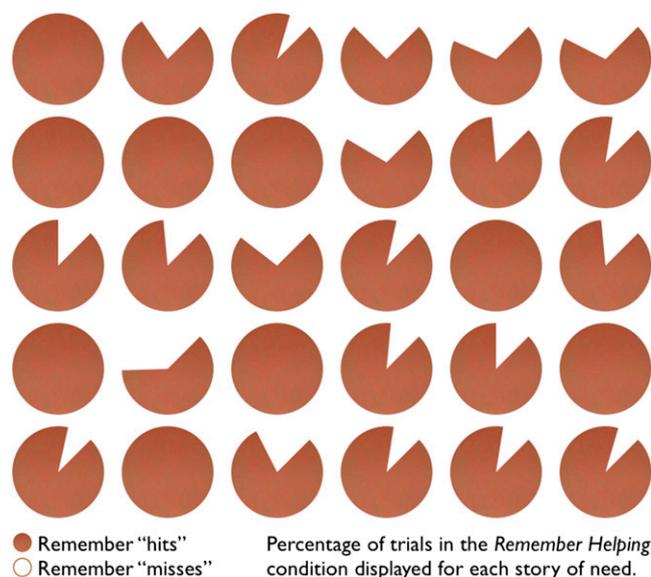

● Remember "hits"
○ Remember "misses"

Percentage of trials in the *Remember Helping* condition displayed for each story of need.

Fig. 4. The range of the empathic effect of memory is limited. Although imagining and remembering a helping event increased willingness to help to a similar degree, the empathic effect of memory depended on the successful retrieval of related helping events (Remember "hits") in experiment 3. Participants were able to imagine, but not remember, a helping event for almost all trials (Remember "misses"; 39/300 trials collected in the Remember Helping condition ranging across 21/30 stories of need). On failed memory trials, willingness to help was reduced to baseline (mean = 4.27). These findings highlight a flexible advantage of episodic simulation in facilitating empathy for situations of need that have not been personally experienced in the past. Charts displayed for descriptive purposes only.

Perspective Taking. Although we have emphasized the vividness of episodes in contributing to the facilitating effect of imagining and remembering on empathy, our previous analyses do not preclude a role of perspective taking in mediating this effect. One possible interpretation of our results is that access to vivid episodic representations does not directly facilitate prosocial intentions; instead, it may only serve to enhance adopting the thoughts and feelings (i.e., perspective taking) of people in need, which in turn elicits prosocial intentions to help. However, the data do not support this notion. If perspective taking fully accounts for the preferential and parallel increase in willingness to help produced by episodic processes (i.e., Imagine Helping and Remember Helping conditions), then perspective taking should significantly differ for estimating and imagining in experiment 2 and should not differ between imagining and remembering in experiment 3. In fact, estimating and imagining did not significantly differ with respect to perspective taking [t (29) = 1.8, P = 0.075] whereas imagining and remembering did [t (29) = 2.46, P = 0.020; remembering < imagining].

Emotional Concern. To assess the role of emotional reactions in supporting prosocial intentions, participants rated the degree to which they experienced 12 different emotions (intrigued, softhearted, troubled, warm, distressed, sympathetic, intent, compassionate, disturbed, tender, moved, and worried) for each story of need following the experimental task session. Selected from a subset of emotions measured in past studies, this constellation of emotions was used so as to include a measure of emotional concern within a larger array of emotions, thereby minimizing participants' awareness of this construct (11, 36). We did not observe evidence of a consistent relationship between willingness to help and emotional reactions. However, there was some tentative evidence suggesting that the emotion of sympathy may

contribute to willingness to help in the current paradigm (see *Supporting Information* for analyses).

This mixed pattern of results across experiments does not allow strong conclusions to be drawn about the relationship between sympathy and willingness to help in the current paradigm. However, it is consistent with previous work finding that sympathy is preferentially evoked by perceived need (37). Although sympathy may play a role in facilitating prosocial intentions, it does not appear to contribute to the effects of episodic simulation and memory on prosocial intentions that we have observed.

Discussion

In three experiments, participants increased prosocial intentions when they constructed episodes of helping people in need. Our findings show that these prosocial facilitating effects are difficult to explain in terms of the known prosocial influences of degree of perspective taking or emotional responses and suggest that the vividness of constructed episodes informs our willingness to help others. Although episodic simulation and memory facilitated prosocial intentions to a similar extent, the influence of memory was limited to the successful retrieval of related events whereas simulation was readily deployed to facilitate prosocial intentions more broadly, including situations that had not been directly and personally experienced.

Because demand characteristics are often a concern in research on socially desirable decision making, as people are typically motivated to appear prosocial or to not appear antisocial, perhaps willingness-to-help ratings in the Imagine Helping and Remember Helping conditions reflect perceived pressure on the participants to appear prosocial. However, this explanation would not account for the differences in prosocial intentions compared with baseline conditions. Moreover, at the conclusion of each experiment, subjects were asked to indicate what the hypotheses were. None indicated as a possible hypothesis that memory or imagination would selectively increase willingness to help others or that this effect would be supported by the vividness of remembered or imagined events. Nevertheless, to further minimize the potential effects of demand characteristics, future work examining the relationship between episodic processes and prosociality should consider adopting implicit measures of prosociality or should examine prosocial intent or actions under conditions in which subjects believe prosocial intent or actions will be costly.

Our studies provide evidence that episodic processes can be used to facilitate hypothetical intentions to help someone in need. An open question that arises from these findings is whether this effect will extend to actual helping behavior. Although empirical evidence is required to address this question, we are encouraged by previous work that shows that imagining an action increases the likelihood that the action will be taken in the future (38, 39).

Although it remains to be seen whether the prosocial intentions captured in the experiments reported here will translate into prosocial behavior, our results nicely align with a recent study of attenuated empathic responses in amnesic patients (40). Amnesic patients characterized by damage to the medial temporal lobe displayed lower levels of trait empathy, were less responsive to empathy inductions, and were less prosocial in a social–economic context (e.g., the Dictator Game) compared with healthy controls. However, the cognitive mechanisms underlying these empathic deficits were not directly examined in that study. Given that the vividness of episodes predicted willingness to help people in need in the experiments we reported here, an intriguing possibility is that amnesic patients' impaired abilities to remember and imagine episodes directly affected judgments of empathy, hindering access to diagnostic knowledge that can be used to guide decisions about future helping actions.

Another possibility is that the vividness of episodes impacts the perceived self–other similarity (41, 42), or degree of reward processing (43), which in turn impacts judgments of empathy. Although these possibilities await direct empirical investigation, the experiments reported here provide an important starting point for research that could be used to develop new strategies targeted at episodic mechanisms for promoting empathy, as well as to guide research characterizing and improving empathic deficits in patient populations suffering from deficits in episodic memory and simulation (40).

Rather than rule out a role of perspective taking or emotional concern in supporting prosocial intentions observed in previous studies, our experiments support past findings, but also build upon them by identifying an additional mechanism to increase prosociality. The pattern of results suggests that a distinction exists between the contributions of episodic simulation and memory to facilitating willingness to help on the one hand and the role of perspective taking on the other, at least in the experiments discussed here. An important direction for future work will be to further delineate the relation between episodic and perspective-taking processes (44) in fostering prosocial tendencies. Another promising direction would be to use neuroimaging methods to identify the neural underpinnings of the empathic effect of imagining and remembering helping events in an attempt to gain traction on the interaction of these processes.

Moreover, our results also do not eliminate a role for emotions in contributing to the effect of episodic simulation and memory on prosocial intentions. Indeed, previous studies have observed that (*i*) the perceived likelihood that an imagined event will happen can be selective to emotional experiences (33), (*ii*) imagining positive social interactions appears to be central to improving attitudes toward, and intentions to interact with, outgroup members (45), and (*iii*) remembering good deeds selectively increases charitable donations (46). Thus, we suspect that imagining and remembering positively valenced helping interactions may play a role in eliciting the episodic effects on empathy observed here.

Humans are an evolutionary success partially because of our ability to collaborate with and help those in need. To the extent that society seeks to foster these socially desirable tendencies, investigating and understanding mental processes that shape empathy are crucial. Several cognitive and emotional mechanisms have already been elucidated and extensively studied by psychology and neuroscience. However, humans may possess at least one more tool that can be used to facilitate prosociality: the ability to construct empathic episodes. By imagining and remembering our own experiences, it seems we can come to empathize with the experiences of others.

Materials and Methods

Participants. We recruited a total of 75 participants from a local college (restricted to students under the age of 35) to participate in three experiments described as investigations of their reactions to stories depicting real events adapted from various online media (e.g., Twitter, Tumblr, *The New York Times*) and how these reactions related to different mental abilities (26, 27). Participants received $10 per hour for their participation. All participants provided informed written consent in a manner approved by the Harvard University Institutional Review Board.

Procedure. After reviewing instructions and completing practice trials (one trial per condition) to ensure task comprehension, participants read 30 stories depicting a person in need presented for 10 s each. Following the presentation of each story, participants were pseudorandomly instructed to complete one of five tasks in a within-subjects manner: (*i*) complete math problems that involved social interactions unrelated to the story of need (e.g., "Martha starts with 3 cards. She gets 76 more from Emily. How many cards does Martha end with?"; No Helping: Math condition), (*ii*) consider the journalistic style and online source for stories of need (No Helping: Story condition), (*iii*) estimate ways the person in need could be helped by

visualizing a possible source Web site and discussion comments that would recommend how the person could be helped (Estimate Helping condition), (*iv*) imagine an episode of helping that person (Imagine Helping condition), or (*v*) remember a past experience of helping that person (Remember Helping condition). Control conditions were designed to recruit semantic retrieval, social cognition, and the generation of helping examples. The Imagine Helping and Remember Helping conditions alone required constructing a temporally and contextually specific episode. Participants had 1 min to complete each task for a given trial. Ten trials were presented per condition per experiment. Thus, a total of 20 trials consisting of tasks *i* and *iv* were collected for experiment 1 (*n* = 15, 13 females, mean age = 21.6 y, SD = 3.0), a total of 30 trials consisting of tasks *ii*, *iii*, and *iv* were collected in experiment 2 (*n* = 30, 24 females, mean age = 21.8 y, SD = 2.9), and a total of 30 trials consisting of tasks *i*, *iv*, and *v* were collected in experiment 3 (*n* = 30, 21 females, mean age = 20.3 y, SD = 2.4).

Next, all of the stories were represented, and participants rated phenomenological experiences, including their emotional reactions, sensory qualities (i.e., detail and coherence) of generated trials, degree to which the thoughts and feelings of the people from the stories were considered (i.e., perspective taking), and probability that they would be willing to help the people from the stories on 1–7 Likert scales in a self-paced manner, as well as provided brief descriptions of what ways they thought about, imagined, or remembered helping. Experiment 1, only, included a subset of these measures targeted at willingness to help and event descriptions to ensure task compliance. For experiment 3, in addition to the same dependent measures as in experiment 2, participants also indicated the similarity of past experiences with the currently presented scenarios of need. This measure was included because having personally experienced similar episodes in one's past has been shown to increase empathy for others, and therefore the degree of relatedness may modulate prosocial intentions in the current study (28, 29).

All together, experiments 2 and 3 each lasted ~2 h in the laboratory, and experiment 1 lasted ~1.5 h in the laboratory. For experiments 2 and 3, personality-trait measures were collected 1 to 2 wk before participation, but these measures did not reveal consistent results across experiments.

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