Talking to strangers: A week-long intervention reduces psychological barriers to social connection☆

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ABSTRACT

Although people derive substantial benefit from social connection, they often refrain from talking to strangers because they have pessimistic expectations about how such conversations will go (e.g., they believe they will be rejected or not know what to say). Previous research has attempted but failed to get people to realize that their concerns about talking to strangers are overblown. To reduce people's fears, we developed an intervention in which participants played a week-long scavenger hunt game that involved repeatedly finding, approaching, and talking to strangers. Compared to controls, this minimal, easily replicable treatment made people less pessimistic about the possibility of rejection and more optimistic about their conversational ability—and these benefits persisted for at least a week after the study ended. Daily reports revealed that people's expectations grew more positive and accurate by the day, emphasizing the importance of repeated experience in improving people's attitudes towards talking with strangers.

Research on well-being, conversation, and belonging has underscored the importance of social interaction for people's health and happiness (Clark & Watson, 1988; Diener & Seligman, 2002; Hawkley & Cacioppo, 2010; Helliwell & Putnam, 2004; Holt-Lunstad, Robles, & Sbarra, 2017; House, Landis, & Umberson, 1988; Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004; Mehl, Vazire, Holleran, & Clark, 2010; Myers, 2000; Pavot, Diener, & Fujita, 1990; Sun, Harris, & Vazire, 2020; Vittengl & Holt, 1998; Watson, Clark, McIntyre, & Hamaker, 1992). Despite the benefits of social interaction, people seldom strike up conversations with people they do not know. Instead, people wear headphones to avoid talking, stay glued to their smartphones in public places, or pretend not to notice a new coworker they still have not introduced themselves to (Goffman, 1963; Kushlev, Hunter, Proulx, Pressman, & Dunn, 2019). These impressive displays of "civil inattention," seemingly innocuous dodges in the moment, can collectively add up to a behavioral pattern that stymies social interaction before it begins (Kim, 2012; Zuckerman, Miserandino, & Bernieri, 1983).

Recent research suggests one reason for this behavior: people are remarkably pessimistic about almost every aspect of talking to strangers. For example, people expect that others will not be interested in talking to them (Atir, Wald, & Epley, 2021; Cooney, Boothby, & Schweitzer, 2021; Epley & Schroeder, 2014; Schroeder, Lyons, & Epley, 2021), people underestimate how much others like them after meeting for the first time (Boothby, Cooney, Sandstrom, & Clark, 2018; Mastroianni, Cooney, Boothby, & Reece, 2021), and people are skeptical of their ability to start and maintain such conversations (Atir et al., 2021; Sandstrom & Boothby, 2021). In a striking demonstration of this basic idea, Epley and Schroeder (2014) approached people waiting for a train in Chicago and showed that they systematically underestimated how rewarding it would be to strike up a conversation with a stranger during their commute. Our aim in this paper is twofold. First, to replicate past research showing that people underestimate how positively strangers will react to attempts at social connection. And second, to intervene on people's pessimistic beliefs, thereby allowing people to see the possibility of talking to a stranger as a positive opportunity rather than something to dread.

Fortunately, the same research that demonstrates people's pessimism about talking to strangers also shows that this pessimism is often misplaced—strangers are more willing to talk than people anticipate (Cooney et al., 2021; Epley & Schroeder, 2014; Sandstrom & Boothby,

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2021; Schroeder et al., 2021), conversations tend to go overwhelmingly better than people predict (Epley & Schroeder, 2014; Sandstrom & Boothby, 2021; Sandstrom & Dunn, 2014), and people are more conversationally competent than they expect (Sandstrom & Boothby, 2021; Welker, Walker, Boothby, & Gilovich, 2021). This suggests a promising intervention strategy: give people *concentrated* and *repeated* practice talking to strangers, so that they may realize their fears are exaggerated.

There have been surprisingly few attempts to improve people's attitudes towards talking to strangers, and those attempts have proved only partially successful (e.g., Sandstrom & Boothby, 2021). Here, we added to this new body of research, and aimed to improve on prior intervention efforts by creating a more lasting shift in people's attitudes. We did so by having people play a scavenger hunt game that prompted them to engage in repeated conversations with strangers over the course of a week. Why a whole week?

It would seem that sporadic positive interactions with strangers, like the ones that people have in their day-to-day lives, do not fully allay people's fears, and that the lessons from such positive interactions do not stick. Perhaps it is too easy for people to discount any single conversation that goes well as a pleasant exception to the unpleasant rule. Or perhaps because people talk to strangers relatively infrequently, it is difficult to detect a consistent pattern. For these reasons, we aimed to alter people's entrenched pessimism by having people repeatedly practice talking over the course of many consecutive days. Overall, our aim was to condition people to the (surprisingly positive) reality of talking to strangers, thereby reducing people's fears, and increasing people's recognition that these conversations typically go quite well.

1. Current research

We ran a week-long, multi-site intervention, in which participants were prompted by a scavenger hunt app to either start conversations with, or simply observe, at least one stranger every day for a week. As the intervention unfolded, we measured people's fears about rejection, their beliefs about their conversational ability, their expected awkwardness and enjoyment, and their beliefs about the impression they make on strangers. We aimed to find out whether repeatedly talking to strangers over the course of a week could make people less pessimistic about the prospect of talking to strangers.

2. Method

This manuscript reports the results of a time-consuming and resource-intensive intervention. Two consequences are that: (a) we pre-registered several research questions that could be answered with the resulting data; and (b) there were some slight deviations from our pre-registered plan.

(a) This paper reports the results of one of our pre-registered research questions (Q1): "Do repeated interactions with strangers improve attitudes towards talking to strangers?" (see https://osf.io/dvqez/). Correspondingly, we analyze only the measures that are associated with this research question. For example, the pre-registration contains measures related to whether repeated interactions with strangers increase social connection, but we do not address this question in the current manuscript, as it is related to a different stream of work. See OSF for complete materials.

(b) *Analyses.* Although we did not conduct the exact analyses that we had planned, they were conceptually very similar: we used condition, time, and condition x time as predictors of our outcomes, and focused on the specified comparisons that we pre-registered (baseline vs. end-of-study, and baseline vs. follow-up). For analyses of rejection, our count data were over-dispersed, so we used a negative binomial regression to analyze these data. Upon further reflection we also chose a regression framework to

analyze the other outcomes as well, instead of using the ANOVA framework that we had pre-registered.

Sample size was determined before any data analysis, and we report all manipulations and exclusions. Finally, please note that a subset of the data reported here were included as unpublished data in a meta-analysis (Sandstrom & Boothby, 2021; see p. 2 of the SOM for more details).

2.1. Participants

A total of 454 people started the study (see Fig. 1). Twenty-one were removed from analyses due to experimenter error. Of the remaining 433, 136 were removed due to pre-registered exclusion criteria: 68 completed fewer than four days (12% of participants in the control condition; 17% of participants in the treatment condition), a rate that is similar to past intervention studies (e.g., 15% of participants in Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008 were excluded for not attending enough sessions or not completing enough weekly reports). See SOM for analyses of participants who dropped out versus those who finished, and see Discussion for implications of these findings. A further 68 participants failed our honesty check (11% of participants in the control condition, 18% of participants in the treatment condition), a rate that is similar to an unpublished study in our lab (15%). In the main manuscript, we analyze the responses of the remaining 286 people (75 male, 209 female, 2 identified otherwise or preferred not to say; $M_{age} = 20.1$ years, $SD = 2.1$ years), but analyses including the participants who failed the honesty check leave the results unchanged (see the SOM for details).

This sample was recruited from two university campuses—one in the U.S. ($N = 135$) and one in the U.K. ($N = 151$). The majority of participants received course credit, but some were paid. A sensitivity analysis using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) suggests that our sample can detect effects where $f \geq 0.08$ (i.e., small effects). See SOM for payment details, full details of analyses testing the effects of attrition and exclusion criteria, additional details about the sensitivity analysis, and a discussion of self-selection.

2.2. Procedure

We created a scavenger hunt game using a mobile app called GooseChase (GooseChase Adventures, 2019). Participants used the app to complete the study. We designed 29 scavenger hunt "missions" that people could choose from. The goal of each mission was to find a stranger with certain characteristics (e.g., "find someone wearing interesting shoes" or "find someone who's drinking a coffee"; see Appendix for full list of missions). Participants received points on the app and an entry into a draw prize for every mission that they completed. The app allowed participants to see their performance (i.e., the number of missions they had completed) compared to other participants.

For logistical reasons, participants were recruited in weekly groups. On Monday, participants were brought to the lab to complete surveys (start of study and the first pre-conversation surveys; see Measures), to receive instructions, and to download and try out the scavenger hunt app (see Fig. 2; see SOM for more details on the procedure). After the lab visit, all communication (e.g., daily game codes and reminders to complete surveys) occurred by text message and email. All members of that week's group were assigned to the same condition: either a treatment condition (i.e., find, approach, and *talk to* a stranger; $N = 198$), or a control condition (i.e., find, approach, but simply *observe* a stranger; $N = 88$). Participants in the treatment condition either saw tips in their mission descriptions ($N = 98$) or not ($N = 100$), which is why the treatment condition was double the size of the control. As pre-registered, we collapsed across this factor for the current project, creating a single treatment condition (see SOM for details). In total, participants in the treatment condition had 1336 conversations with strangers.
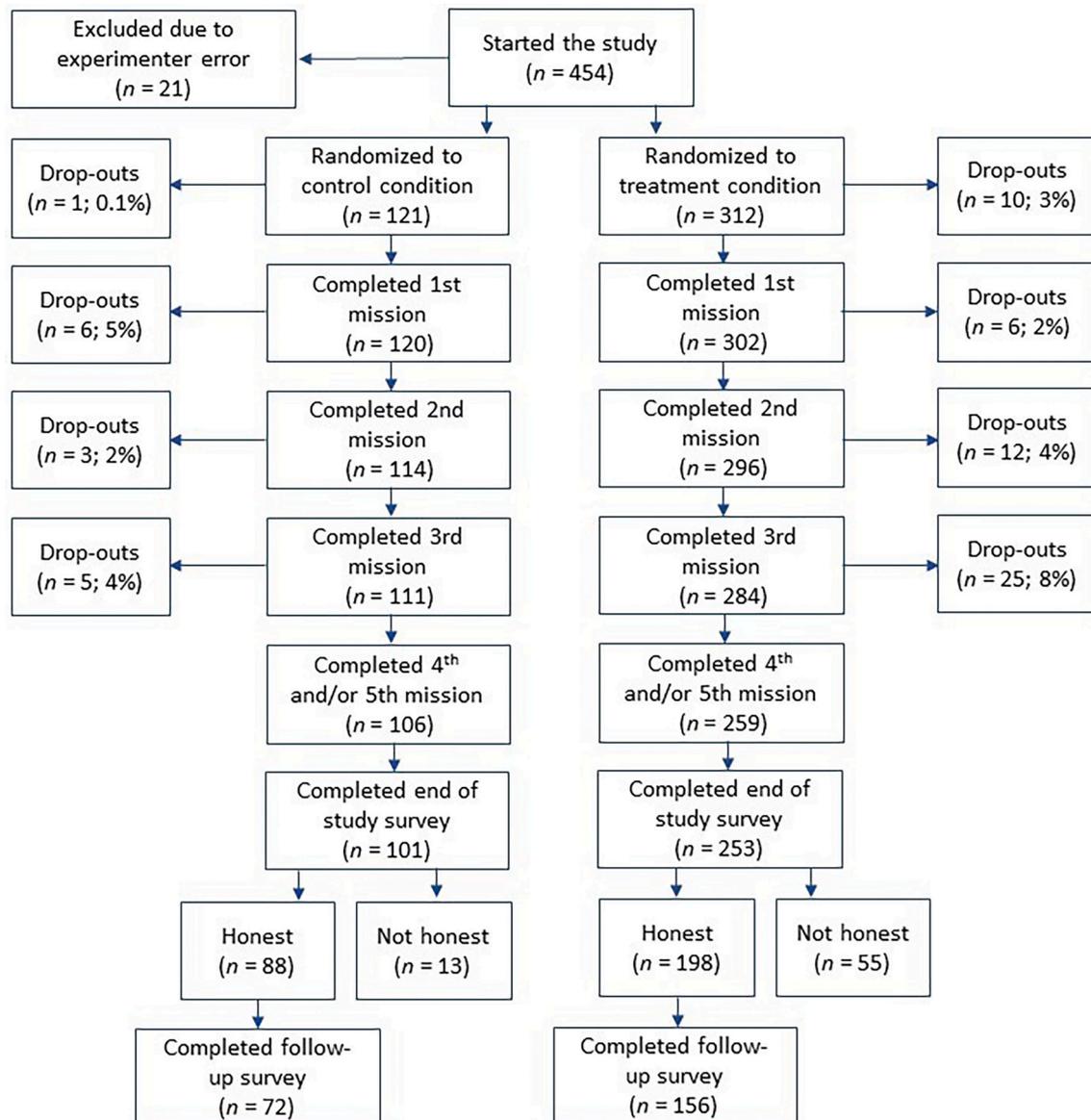
Fig. 1. *Flowchart depicting participant drop-outs and exclusions.*
Note. See SOM for analyses of participants who dropped out versus those who finished, and see Discussion for implications of these findings.

2.3. Measures

For one week—daily from Monday to Friday—participants played a scavenger hunt game that involved finding a stranger, and then either talking to (treatment) or observing that person (control). Participants completed both "General" and "Daily" surveys.

The General surveys were designed to capture the broader attitudinal and behavioral changes elicited by the intervention. Participants in both the treatment and control conditions completed general surveys at the *start of study* on Monday (see Fig. 1; Phase 1), at the *end of study* on Friday (see Fig. 1; Phase 3), and at *follow-up,* one week after the intervention had ended (see Fig. 1; Phase 4).

Participants also completed two types of Daily surveys: one at the beginning of each day, and one after completing each mission (see Fig. 1; Phases 1–3). Our primary interest in the daily surveys was to examine the time course of the intervention, and the underlying psychological processes of those in the treatment group. Participants in the treatment group made predictions about how their conversations would go on each day, in what we refer to as the *pre-conversation* survey, and reported on their experiences after completing their daily mission(s) in the *post-*

conversation survey. To ensure that all participants had a similar experience, we asked control group participants to also complete the daily surveys, even though we did not analyze their responses; control participants reported on their current mood in the first survey, and described the person that they observed in the second survey.

2.3.1. Rejection

We asked participants whether they thought the people they approached would be willing to talk to them. In the General surveys, we asked "How many people do you think you will need to approach in order to complete a mission (i.e., get someone to talk to you)?", and instructed them, for example, to enter "1" if they thought the first person they approached would talk to them. In the Daily surveys, the pre-conversation survey asked "How many people do you think you will need to approach in order to complete your mission today (i.e., get someone to talk to you)?", and instructed people to enter "1" if they thought the first person they approached would talk to them. In the post-conversation survey, we asked people to enter "1" if the first person they approached talked to them, otherwise "If the first person did not want to talk, please enter the number of people you approached, including the
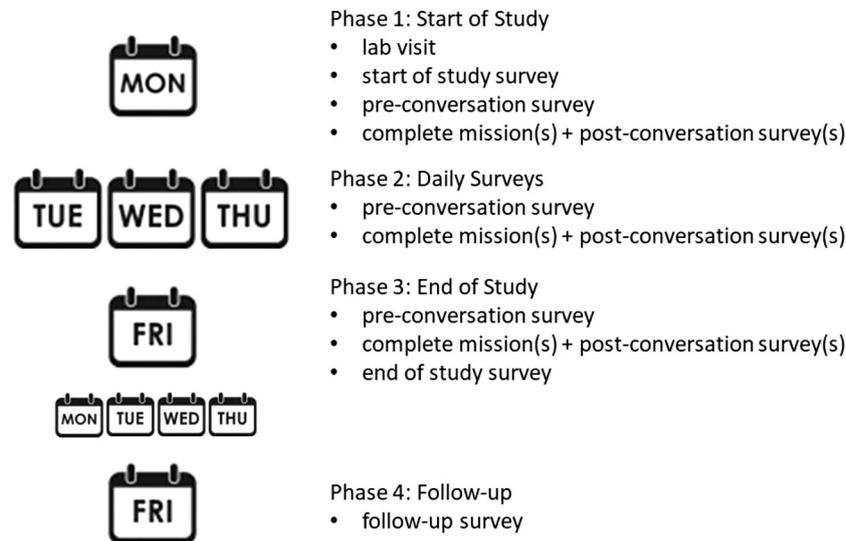
Fig. 2. Phases of the "talking to strangers" intervention study.

person who did talk to you." For interpretability, we created a measure of *rejection* by subtracting one from the number of expected/actual approaches (e.g., expecting to need to approach two people means expecting to be rejected by one person).

2.3.2. Conversational ability

We asked participants how skilled they were in talking to strangers (General survey: "It is hard [to start a conversation / to keep a conversation going / to end a conversation] with a stranger"; Daily survey: "It [will be / was] hard [to start a conversation / to keep a conversation going / to end a conversation]"). We created two composite measures of *conversational ability*, both assessed on a 7-point scale. The first was based on the General survey items, which were each measured at three time points ($\alpha_{start\_of\_study} = 0.60$, $\alpha_{end\_of\_study} = 0.63$, $\alpha_{follow-up} = 0.70$), and the second was based on the Daily surveys ($\alpha_{daily} = 0.62$). Since these items concern people's perceptions of "difficulty," they were reverse-coded before averaging to yield a measure of conversational "ability."

2.3.3. Awkwardness and enjoyment

We asked people how they felt about talking to strangers. We assessed both negative and positive feelings, in both the General surveys and Daily surveys, creating a composite for each: General awkwardness: "I feel [comfortable (reverse-scored) / awkward / nervous] talking to strangers," ($\alpha_{start\_of\_study} = 0.85$, $\alpha_{end\_of\_study} = 0.83$, $\alpha_{follow-up} = 0.81$); Daily awkwardness: "I [will feel/felt] [comfortable (reverse-scored) / awkward / nervous]" ($\alpha_{daily} = 0.82$); General enjoyment: "I enjoy talking to strangers," "When I talk to strangers, I [find them interesting / like them]," "Talking to strangers feels like [work (reverse-scored) / fun]" ($\alpha_{start\_of\_study} = 0.84$, $\alpha_{end\_of\_study} = 0.84$, $\alpha_{follow-up} = 0.84$); Daily enjoyment: "I [will enjoy talking to / will like / enjoyed talking to / liked] my conversation partners," "I [will find/found] my conversation partners interesting," "The conversations [will feel / felt] like [work (reverse-scored) / fun]" ($\alpha_{daily} = 0.84$). The General measures were assessed on a 7-point scale, and the Daily measures were assessed on a 5-point scale.

2.3.4. Positive impression

Participants reported what kind of impression they would make when talking to strangers (General: "The strangers I talk to [like me / find me interesting / enjoy talking to me"]; Daily: "My conversation partners [will like me / will find me interesting / will enjoy talking to me / liked me / found me interesting / enjoyed talking to me."] We then averaged these measures to create a composite for both the General

surveys ($\alpha_{start\_of\_study} = 0.92$, $\alpha_{end\_of\_study} = 0.90$, $\alpha_{follow-up} = 0.92$) and the Daily surveys ($\alpha_{daily} = 0.86$). The General measure was assessed on a 7-point scale, and the Daily measure was assessed on a 5-point scale.

2.3.5. Initiating conversations with strangers

Although our study was designed to test for changes in *attitudes* towards talking to strangers, we included an exploratory measure to test for changes in *behavior*: "How many strangers have YOU started a conversation with in the past 7 days?" We included some examples of conversations with strangers: "chatting with the barista, talking to someone while waiting in a queue/line, talking to a new classmate..." This item was included in the General surveys at the start of study and at the follow-up; we didn't include it in the end of study survey because we wanted a measure of spontaneous conversations with strangers, not the conversations that were required by participation in our study.

2.3.6. Noticing opportunities to talk to strangers

To test whether our intervention affected people's awareness of opportunities to talk to strangers, we also included an exploratory measure in the General surveys, on a 7-point scale: "I notice opportunities to talk to strangers."

2.3.7. Demographic items

At the beginning of the intervention, people reported their demographic information.

Please see the SOM for information about additional measures that were assessed but not included in this paper (a couple of items in the Daily surveys that were not relevant to the research question addressed in this paper; items in the General surveys that do not match the items in the Daily surveys), and see OSF for complete materials.

3. Results

3.1. General results: Change in perceived likelihood of rejection

At the start of the study, at the end of the study, and at a follow-up one week later, participants in the treatment condition predicted how likely they were to be rejected in their attempts to start a conversation with a stranger. Due to over-dispersed count data, we used a negative binomial regression to analyze these data. Because of the nested structure of the data, we used a mixed-effects model with a random intercept for participant. We estimated the model using restricted maximum likelihood. Time (start of study, end of study, or follow-up) and

condition (treatment or control) were included as fixed categorical independent variables (i.e., DV ~ Condition*Time + (1 | ParticipantId). We report the most relevant post-hoc contrasts with the estimated means for predicted rejections on the original scale, while using a multivariate t distribution to correct p-values and confidence intervals for multiple comparisons.

At the end of the week-long intervention, participants in the treatment group expected to be rejected by significantly fewer people than they had at the start of the study ($p < .001$; see Table 1 and Fig. 3). Additionally, one week after the intervention had ended, participants in the treatment group *still* expected to be rejected by fewer people, showing a lasting effect of our intervention ($p < .001$).

What about participants in the control group, who simply observed strangers for a week, but did not actually strike up conversations? They did not make predictions about rejection at the start of the study, in order to preserve the integrity of the control condition. However, at the end of the study, they were asked to imagine continuing the scavenger hunt for another week, but this time talking to people rather than simply observing them.

Participants in the control condition predicted that they would be rejected by as many people as participants in the treatment group had predicted at the start of the study, ratio of control to treatment = 1.11, 95% CI = [0.70, 1.74], $p = .97$. As expected, the beliefs of participants in the control group did not change from the end of the study to the follow-up, ratio of end of study to follow-up = 0.89, 95% CI = [0.57, 1.38], $p = .95$. At the end of the week-long study *and* a full week later, participants in the control condition resembled participants in the treatment condition at the start of the study, who had overly pessimistic expectations about the amount of rejection they would experience.

Directly comparing treatment and control conditions revealed that participants in the treatment group expected significantly less rejection compared to those in the control group—both at the end of the study ($p < .001$) and at the follow-up ($p < .001$).

As shown in the left panel of Fig. 3, it seems that a week-long intervention involving repeated conversations with strangers substantially reduced people's fears about rejection compared to controls, and these reductions persisted for at least one week following the end of the intervention.

3.2. General results: Change in conversational ability

To examine changes in perceived conversational ability over the course of the intervention, we used the same model as previously specified, except here we used a mixed-effects regression instead of a negative binomial.

As shown in Table 1 and the right panel of Fig. 3, participants in the treatment group felt more positive about their general ability to talk to strangers at the end of the study ($p < .001$), as well as at the follow-up one week later ($p < .001$), compared to how they felt at the start of the study. Meanwhile, participants in the control group did not experience the same improvement in their perceived ability to carry out a conversation. At the start of the study, participants in the treatment and control groups did not differ in their feelings about their ability to talk to strangers ($p = .88$), but at the end of the study and a week later, participants in the treatment group felt more positive than participants in the control group about their ability to talk to strangers ($p = .01$, $p = .004$).

3.3. General results: Change in awkwardness

Participants in the treatment group felt less awkward about talking to strangers at the end of the study ($p < .001$), and a week later ($p < .001$), compared to how they felt at the beginning of the study (see Table 1 and the left panel of Fig. 4). Participants in the control group reported no change in awkwardness between the beginning of the study and either the end of the study ($p = .54$) or a week later ($p = .99$).

Directly comparing treatment and control conditions revealed no difference in predicted awkwardness at the start of the study ($p = .87$), but participants in the treatment group expected to feel less awkward than those in the control group, both at the end of the study ($p = .05$) and at the follow-up ($p = .03$).

3.4. General results: Change in enjoyment

Participants in the treatment group expected to enjoy their conversations with strangers more at the end of the intervention ($p < .001$) and a week later ($p = .002$), compared to how they had felt at the start of the study. Meanwhile, participants in the control group did not report a change in how much they expected to enjoy conversations with strangers from the start of the study to the end of the study ($p = .18$) or to the one-week follow-up ($p = .51$).

Directly comparing treatment and control conditions revealed no difference in how much people expected to enjoy conversations with strangers at the start of the study ($p = .99$), but also, unexpectedly, no difference at the end of the study ($p = .83$), or at the follow-up ($p = .99$).

In short, as shown in Table 1 and the middle panel of Fig. 4, participants in the treatment condition showed an improvement in their expectations of how positively they would feel about their conversations, which lasted a week after the intervention ended, and although participants in the control condition did not experience this improvement, the difference between treatment and control was not significant.

3.5. General results: Change in making a positive impression

Participants in the treatment group expected to make a more positive impression after talking to strangers for a week ($p < .001$), and a week after the study had ended ($p < .001$), compared to the start of the study. Participants in the control condition exhibited similar, though smaller, effects; they expected to make a more positive impression when talking to strangers at the end of the study ($p = .01$) and a week later ($p = .004$), compared to their predictions at the start of the study.

Directly comparing treatment and control conditions revealed no difference in expectations about making a positive impression when talking to strangers at the start of the study ($p = .94$), but also, unexpectedly, no difference at the end of the study ($p = .63$), or at the follow-up ($p = .79$).

In sum, as shown in Table 1 and the right panel of Fig. 4, participants in the treatment condition showed an improvement in their beliefs about how positive of an impression they made, which lasted a week after the intervention ended. However, note that participants in the control condition also showed some improvement. It appears that simply approaching and observing strangers also made people less pessimistic about the impressions they would make, perhaps because it lowered people's anxiety, although we urge caution in interpreting this unpredicted result.

3.6. Exploratory analyses: Changes in initiating conversations and noticing opportunities

3.6.1. Initiating conversations

Participants in the treatment condition reported more positive attitudes towards talking to strangers after completing the intervention. Did these more positive attitudes lead people to have more conversations with strangers? After removing responses more than three standard deviations from the mean (e.g., some participants reported talking to fifty or more strangers as part of their job), we found that, at the one-week follow-up, participants in the treatment group reported having had more conversations with strangers in the previous week than they had had in the week prior to the start of the study, $p = .01$, whereas participants in the control group reported no change, $p = .88$ (see Table 1). However, directly comparing treatment and control conditions revealed no difference in how many conversations with strangers

Table 1

Descriptive and inferential statistics for the general survey results.

Measure	Time/ Comparison	Treatment	Control	Treatment vs. Control
Rejection	Start of study	$M = 0.89$, $SE = 0.09$	n/a	n/a
	End of Study	$M = 0.23$, $SE = 0.04$	$M = 0.99$, $SE = 0.14$	**Ratio = 4.22, 95% CI = [2.47, 7.20], $p < .001$**
	Follow-up	$M = 0.32$, $SE = 0.05$	$M = 1.11$, $SE = 0.17$	**Ratio = 3.49, 95% CI = [2.00, 6.09], $p < .001$**
	Start vs. End	**Ratio = 3.82, 95% CI = [2.56, 5.69], $p < .001$**	n/a	
	Start vs. Follow-up	**Ratio = 2.81, 95% CI = [1.87, 4.22], $p < .001$**	n/a	
Convo ability	Start of study	$M = 4.34$, $SE = 0.08$	$M = 4.20$, $SE = 0.12$	$\Delta M = -0.14$, 95% CI = $[-0.54, 0.25]$, $t(499) = -0.97$, $p = .88$, $d = 0.12$
	End of Study	$M = 4.77$, $SE = 0.08$	$M = 4.28$, $SE = 0.12$	**$\Delta M = -0.50$, 95% CI = $[-0.89, -0.11]$, $t(498) = -3.38$, $p = .01$, $d = 0.43$**
	Follow-up	$M = 4.81$, $SE = 0.09$	$M = 4.27$, $SE = 0.13$	**$\Delta M = -0.54$, 95% CI = $[-0.96, -0.12]$, $t(582) = -3.44$, $p = .004$, $d = 0.46$**
	Start vs. End	**$\Delta M = -0.43$, 95% CI = $[-0.64, -0.23]$, $t(506) = -5.70$, $p < .001$, $d = 0.37$**	$\Delta M = -0.08$, 95% CI = $[-0.38, 0.22]$, $t(505) = -0.70$, $p = .97$, $d = 0.07$	
	Start vs. Follow-up	**$\Delta M = -0.47$, 95% CI = $[-0.69, -0.25]$, $t(522) = -5.64$, $p < .001$, $d = 0.41$**	$\Delta M = -0.07$, 95% CI = $[-0.40, 0.26]$, $t(518) = -0.58$, $p = .99$, $d = 0.06$	
Awkwardness	Start of study	$M = 3.78$, $SE = 0.09$	$M = 3.94$, $SE = 0.14$	$\Delta M = 0.16$, 95% CI = $[-0.28, 0.61]$, $t(420) = 0.97$, $p = .87$, $d = 0.12$
	End of Study	$M = 3.34$, $SE = 0.09$	$M = 3.78$, $SE = 0.14$	**$\Delta M = 0.45$, 95% CI = $[0.001, 0.89]$, $t(420) = 2.66$, $p = .05$, $d = 0.35$**
	Follow-up	$M = 3.45$, $SE = 0.10$	$M = 3.95$, $SE = 0.15$	**$\Delta M = 0.51$, 95% CI = $[0.04, 0.97]$, $t(490) = 2.87$, $p = .03$, $d = 0.40$**
	Start vs. End	**$\Delta M = 0.45$, 95% CI = $[0.25, 0.64]$, $t(505) = 6.18$, $p < .001$, $d = 0.33$**	$\Delta M = 0.16$, 95% CI = $[-0.12, 0.45]$, $t(505) = 1.51$, $p = .54$, $d = 0.12$	
	Start vs. Follow-up	**$\Delta M = 0.33$, 95% CI = $[0.12, 0.54]$, $t(516) = 4.19$, $p < .001$, $d = 0.26$**	$\Delta M = -0.01$, 95% CI = $[-0.32, 0.30]$, $t(514) = -0.08$, $p = .99$, $d = 0.05$	
Enjoyment	Start of study	$M = 4.34$, $SE = 0.08$	$M = 4.37$, $SE = 0.11$	$\Delta M = 0.03$, 95% CI = $[-0.33, 0.39]$, $t(422) = 0.20$, $p = .99$, $d = 0.03$
	End of Study	$M = 4.70$, $SE = 0.08$	$M = 4.55$, $SE = 0.11$	$\Delta M = -0.14$, 95% CI = $[-0.50, 0.22]$, $t(422) = -1.06$, $p = .83$, $d = 0.14$
	Follow-up	$M = 4.58$, $SE = 0.08$	$M = 4.51$, $SE = 0.12$	$\Delta M = -0.07$, 95% CI = $[-0.44, 0.31]$, $t(493) = -0.46$, $p = .99$, $d = 0.07$
	Start vs. End	**$\Delta M = -0.36$, 95% CI = $[-0.52, -0.20]$, $t(505) = -6.13$, $p < .001$, $d = 0.34$**	$\Delta M = -0.19$, 95% CI = $[-0.42, 0.04]$, $t(505) = -2.14$, $p = .18$, $d = 0.17$	
	Start vs. Follow-up	**$\Delta M = -0.24$, 95% CI = $[-0.41, -0.07]$, $t(516) = -3.71$, $p = .002$, $d = 0.19$**	$\Delta M = -0.15$, 95% CI = $[-0.40, 0.11]$, $t(514) = -1.55$, $p = .51$, $d = 0.07$	
Positive impression	Start of study	$M = 4.25$, $SE = 0.07$	$M = 4.14$, $SE = 0.11$	$\Delta M = -0.10$, 95% CI = $[-0.45, 0.25]$, $t(476) = -0.79$, $p = .94$, $d = 0.11$
	End of Study	$M = 4.62$, $SE = 0.07$	$M = 4.44$, $SE = 0.11$	$\Delta M = -0.18$, 95% CI = $[-0.53, 0.17]$, $t(476) = -1.37$, $p = .63$, $d = 0.18$
	Follow-up	$M = 4.66$, $SE = 0.08$	$M = 4.50$, $SE = 0.12$	$\Delta M = -0.16$, 95% CI = $[-0.53, 0.21]$, $t(557) = -1.14$, $p = .79$, $d = 0.14$
	Start vs. End	**$\Delta M = -0.38$, 95% CI = $[-0.55, -0.20]$, $t(506) = -5.80$, $p < .001$, $d = 0.38$**	**$\Delta M = -0.30$, 95% CI = $[-0.56, -0.04]$, $t(506) = -3.08$, $p = .01$, $d = 0.28$**	
	Start vs. Follow-up	**$\Delta M = -0.41$, 95% CI = $[-0.60, -0.22]$, $t(521) = -5.79$, $p < .001$, $d = 0.36$**	**$\Delta M = -0.36$, 95% CI = $[-0.64, -0.08]$, $t(518) = -3.42$, $p = .004$, $d = 0.27$**	
Talking to strangers	Start of study	$M = 4.68$, $SE = 0.33$	$M = 5.70$, $SE = 0.48$	$\Delta M = 1.01$, 95% CI = $[-0.43, 2.45]$, $t(421) = 1.73$, $p = .26$, $d = 0.24$
	Follow-up	$M = 5.81$, $SE = 0.36$	$M = 5.32$, $SE = 0.53$	$\Delta M = -0.49$, 95% CI = $[-2.07, 1.10]$, $t(464) = -0.76$, $p = .85$, $d = 0.10$
	Start vs. Follow-up	**$\Delta M = -1.12$, 95% CI = $[-2.06, -0.18]$, $t(245) = -2.97$, $p = .01$, $d = 0.25$**	$\Delta M = 0.37$, 95% CI = $[-0.99, 1.73]$, $t(235) = 0.68$, $p = .88$, $d = 0.08$	
Noticing opportunities	Start of study	$M = 3.99$, $SE = 0.11$	$M = 4.03$, $SE = 0.16$	$\Delta M = 0.04$, 95% CI = $[-0.48, 0.56]$, $t(490) = 0.20$, $p = .99$, $d = 0.03$
	End of Study	$M = 4.45$, $SE = 0.11$	$M = 4.06$, $SE = 0.16$	$\Delta M = -0.39$, 95% CI = $[-0.91, 0.12]$, $t(489) = -2.03$, $p = .23$, $d = 0.26$
	Follow-up	$M = 4.42$, $SE = 0.12$	$M = 4.00$, $SE = 0.17$	$\Delta M = -0.42$, 95% CI = $[-0.97, 0.12]$, $t(571) = -2.01$, $p = .24$, $d = 0.28$
	Start vs. End	**$\Delta M = -0.46$, 95% CI = $[-0.72, -0.19]$, $t(506) = -4.62$, $p < .001$, $d = 0.30$**	$\Delta M = -0.02$, 95% CI = $[-0.42, 0.37]$, $t(505) = -0.15$, $p = .99$, $d = 0.02$	
	Start vs. Follow-up	**$\Delta M = -0.43$, 95% CI = $[-0.71, -0.14]$, $t(521) = -3.95$, $p < .001$, $d = 0.29$**	$\Delta M = 0.03$, 95% CI = $[-0.39, 0.45]$, $t(517) = 0.18$, $p = .99$, $d = 0.02$	

Note. Analysis of rejection used a negative binomial regression: descriptives are estimated means for predicted rejections, and comparisons between groups and between time points are ratios. For all other measures, a mixed-effects regression was used: comparisons between groups and between time points are mean differences. Significant effects indicated in **bold**. We recognize that the best practice for calculating effect sizes for multilevel models is unclear. Nevertheless, in the interest of supporting meta-analytic work, we report effect sizes (Cohen's d) which we calculate based on pairwise comparisons.
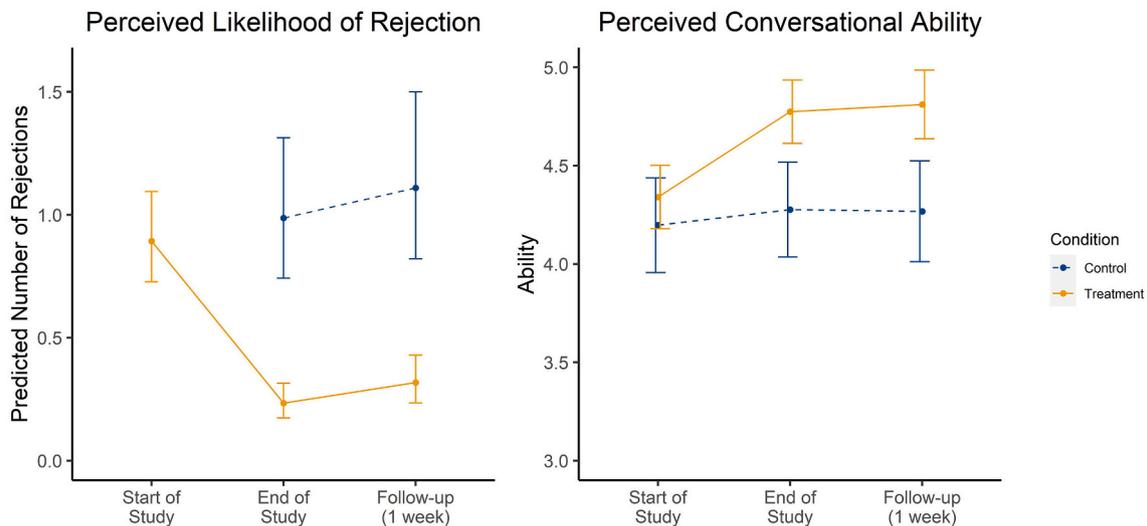
Perceived Likelihood of Rejection

Perceived Conversational Ability

Fig. 3. General results for perceived likelihood of rejection and perceived conversational ability.
Note. The effect of a "talking to strangers" intervention on people's perceived likelihood of rejection (i.e., people's beliefs about how many strangers would reject them before they could find someone to talk to) and people's perceived conversational ability (7-point scale). Error bars represent 95% confidence intervals.
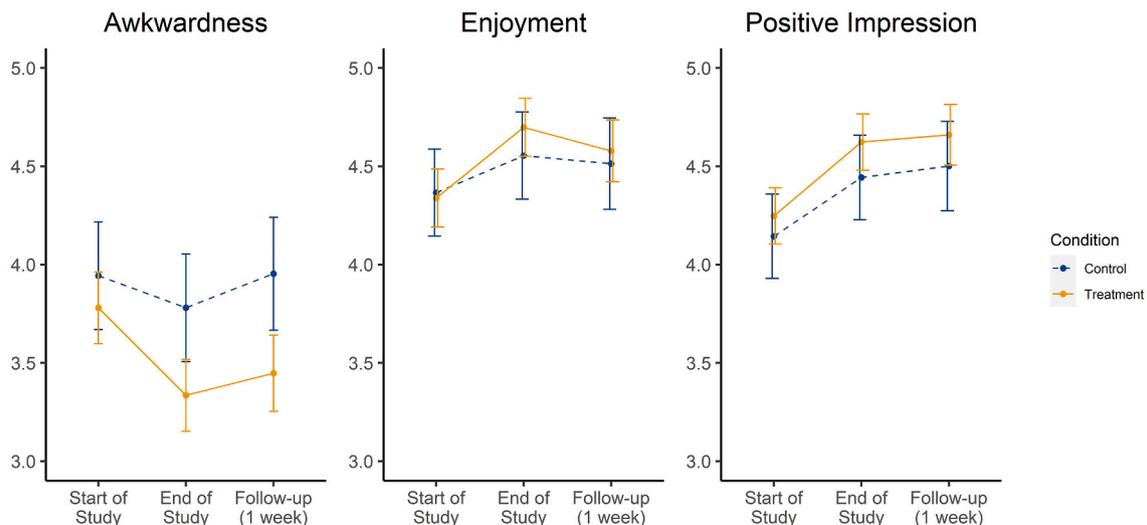
Awkwardness

Enjoyment

Positive Impression

Fig. 4. General results for awkwardness, enjoyment, and making a positive impression.
Note. The effect of a "talking to strangers" intervention on people's feelings of awkwardness and enjoyment when talking to strangers, and people's perceptions of how positive of an impression they made on their partners (all 7-point scales). Error bars represent 95% confidence intervals.

participants had had in the week prior to the start of the study, $p = .26$, or in the week prior to the follow-up, $p = .85$.

3.6.2. Noticing opportunities

At the end of the intervention, and after the week-long follow-up, participants in the treatment group (but not participants in the control group, $ps > .99$) noticed more opportunities for conversations with strangers than they had at the start of the study, $p < .001$ (see Table 1). However, directly comparing treatment and control conditions revealed no difference in how many opportunities were noticed overall, $ps > .22$.

Although our studies were not designed to examine behavior change, these measures provide suggestive evidence that changes in attitudes may ultimately lead people to strike up more conversations with strangers in their everyday life.

3.7. Daily results: Predictions vs. experiences

After undergoing our intervention, participants in our treatment

condition displayed less pessimistic attitudes towards talking to strangers. This pattern of results was true across a number of different measures. Here, we focus on the daily changes in our measures, in order to answer two critical questions:

(1) What is the time course of our intervention on people's beliefs?
(2) How do people's beliefs compare to reality?

The answers to these questions provide some evidence for the psychological processes responsible for the changes we saw as a result of our intervention.

Regarding the first question, if people's beliefs changed gradually over the course of the week, this would suggest that *repeated* experience is a necessary component of the intervention, as we hypothesized. Alternatively, it is possible that just one or two conversations with a stranger were sufficient to bring about the observed changes.

Regarding the second question, we know that people's *predictions* grew less pessimistic over the course of the week, but it is important to

consider these predictions in relation to people's actual *experiences*. Using people's beliefs about the possibility of rejection as an example, if the actual number of rejections people experienced was low, this would suggest that our intervention worked by bringing people's beliefs more in line with reality over the course of the week. On the other hand, if the actual number of rejections was high, this would suggest that instead our intervention worked by making people feel more confident in their ability to approach people, regardless of reality. Finally, the number of actual rejections people experienced may, in fact, have decreased over the course of the week; this would suggest that our intervention worked by making people better at approaching strangers and avoiding rejection.

3.8. Daily results: Change in perceived likelihood of rejection

Daily surveys consisted of people's pre-conversation predictions about the number of rejections they would experience on a particular day, and their post-conversation reports of the actual number of rejections they experienced that day. Again, we used a mixed-effects binomial regression estimated using restricted maximum likelihood, with a random intercept for participant, rating type (predicted vs. actual) as a fixed categorical independent variable, and time (day of the week) as a fixed continuous independent variable (i.e., DV ~ RatingType*Day + (1 | ParticipantId).

Directly comparing daily predicted and actual rejections revealed that participants expected significantly more rejection than they experienced ($p < .001$; see Table 2). Indeed, on the first day of the study, only 40% of participants in the treatment condition thought the first person they approached would talk to them, when in fact participants managed to have a conversation with the first person they approached 92% of the time. Over the course of the study, of the 1336 conversations that participants had with strangers, 1164 (87%) occurred with the first person that participants approached.

Critically, there was also a significant rating type x time interaction, $p < .001$. Follow-up tests revealed that people's predicted rejections decreased over time ($p < .001$), whereas the number of rejections people actually experienced did not change over time ($p = .37$). In other words, as shown in the left panel of Fig. 5, the number of rejections people actually experienced while trying to talk to strangers was consistently low, and people's predictions about the number of rejections they would face decreased over the course of the week to more accurately reflect reality.

3.9. Daily results: Change in conversational ability

Overall, participants expected lower conversational ability than they actually reported having after talking to strangers. Critically, there was also a significant rating type x time interaction ($p < .001$), suggesting that the gap between people's predictions about their own conversational ability and their actual conversational ability varied over the course of the week. Follow-up tests revealed that people's predicted ability increased over time ($p < .001$), while their actual ability also increased but at a lower rate ($p < .001$; see the right panel of Fig. 5). In short, people's predictions about their own conversation ability, which had been overly pessimistic, grew more optimistic as the intervention wore on.

3.10. Daily results: Change in awkwardness

Overall, participants expected to feel more awkward than they actually did. This was qualified by a significant rating type x time interaction ($p = .003$). Follow-up tests revealed that people's predicted awkwardness decreased over time ($p < .001$), while their actual awkwardness also decreased but at a lower rate ($p < .001$; see left panel of Fig. 6). Once again, our week-long intervention appeared to narrow the gap between people's overly pessimistic predictions and their actual

experiences.

3.11. Daily results: Change in enjoyment

Participants expected to feel less enjoyment than they actually experienced. However, the rating type x time interaction was not significant ($p = .37$). Unlike the previous measures, our intervention did not have a discernible effect on the gap between people's predicted enjoyment and their actual enjoyment (see middle panel of Fig. 6). This effect is surprising given the strong effects that our intervention had on awkwardness, and future research might fruitfully explore why negative affect was more strongly influenced by repeatedly talking to strangers.

3.12. Daily results: Change in making a positive impression

Finally, participants expected to make a less positive impression than they actually thought they made, on reflection. The rating type x time interaction was again not significant ($p = .15$). Follow-up tests revealed that people's predicted positive impression and their actual positive impression both increased over time (see right panel of Fig. 6). These results are consistent with the results from the general survey, which also showed increased positivity from participants in both the treatment and control groups, suggesting the possible benefits of simply observing strangers.

Overall, the results from the daily surveys are broadly consistent with the proposal that our intervention worked, in part, by *repeatedly* conditioning people to the reality of talking to strangers. Strangers are typically open to talking, and people's conversations with strangers typically go quite well. As such, our week-long intervention made people's predictions about talking to strangers steadily more positive, thereby reducing important barriers to social connection.

4. Discussion

People are remarkably pessimistic about the prospect of talking to strangers. Our novel "talking to strangers" intervention aimed to reduce people's fears about talking to strangers by prompting them to repeatedly have conversations with strangers over the course of five days. By the end of the study, participants in our treatment group reported significantly more positive attitudes towards talking to strangers: They anticipated less rejection, reported less awkwardness, and felt more confident in their conversational ability compared to controls—positive effects that persisted for at least one week after the intervention had ended.

Our intervention also improved people's enjoyment and the impressions people thought they made on strangers. Note, however, that participants in the control condition also experienced modest improvements on these two measures, suggesting that even simply observing strangers may have some benefits.

Finally, our analysis of the daily surveys highlighted the dimensions on which our intervention seemed most effective: fear of rejection, perceived conversational ability, and awkwardness. Such analyses revealed that people's overly pessimistic expectations grew more positive and more accurate by the day, emphasizing the importance of repeated experience in improving people's attitudes towards talking with strangers.

4.1. What features contributed to the effectiveness of our intervention?

4.1.1. Repeated practice

Our intervention prompted people to *repeatedly* strike up conversations with strangers over the course of a week, which proved highly effective in reducing people's fears about talking to strangers. But could our intervention have achieved the same results in a less time-intensive manner? The answer appears to be no—people's beliefs changed gradually over the course of the week, as people engaged in more

Table 2
Descriptive and inferential statistics for the daily survey results.

Measure	Time/Comparison	Predicted	Actual	Predicted vs. Actual
Rejection	Monday	$M = 0.65$	$M = 0.06$	
	Tuesday	$M = 0.47$	$M = 0.15$	
	Wednesday	$M = 0.36$	$M = 0.14$	
	Thursday	$M = 0.41$	$M = 0.10$	
	Friday	$M = 0.29$	$M = 0.12$	
	Overall	$M = 0.43, SE = 0.04$	$M = 0.11, SE = 0.01$	**Ratio = 3.75, 95% CI = [3.18, 4.43], $z = 15.58, p < .001$**
	Estimated simple slopes & Rating type x time interaction	**$b = -0.18, SE = 0.03$, 95% CI = [−0.25, −0.12], $z = -5.47, p < .001$**	$b = 0.04, SE = 0.05$, 95% CI = [−0.05, 0.14], $z = 0.90, p = .37$	**$b = 0.23, SE = 0.06$, 95% CI = [0.11, 0.34], $z = 3.87, p < .001$**
Conversational ability	Monday	$M = 4.18$	$M = 5.01$	
	Tuesday	$M = 4.39$	$M = 5.10$	
	Wednesday	$M = 4.72$	$M = 5.31$	
	Thursday	$M = 4.72$	$M = 5.31$	
	Friday	$M = 4.94$	$M = 5.32$	
	Overall	$M = 4.58, SE = 0.06$	$M = 5.19, SE = 0.06$	**$\Delta M = -0.61$, 95% CI = [−0.69, −0.53], $t(2069) = -15.55, p < .001$**
	Estimated simple slopes & Rating type x time interaction	**$b = 0.19, SE = 0.02$, 95% CI = [0.15, 0.23], $t(2052) = 9.23, p < .001$**	**$b = 0.09, SE = 0.02$, 95% CI = [0.06, 0.12], $t(2065) = 5.12, p < .001$**	**$b = -0.10, SE = 0.03$, 95% CI = [−0.15, −0.05], $t(2057.23) = -3.72, p < .001$**
Awkwardness	Monday	$M = 3.10$	$M = 2.47$	
	Tuesday	$M = 2.82$	$M = 2.27$	
	Wednesday	$M = 2.59$	$M = 2.17$	
	Thursday	$M = 2.59$	$M = 2.14$	
	Friday	$M = 2.42$	$M = 2.06$	
	Overall	$M = 2.71, SE = 0.04$	$M = 2.24, SE = 0.04$	**$\Delta M = 0.48$, 95% CI = [0.42, 0.53], $t(2070) = 16.13, p < .001$**
	Estimated simple slopes & Rating type x time interaction	**$b = -0.16, SE = 0.02$, 95% CI = [−0.19, −0.13], $t(2054) = -10.46, p < .001$**	**$b = -0.10, SE = 0.01$, 95% CI = [−0.13, −0.07], $t(2066) = -7.69, p < .001$**	**$b = 0.06, SE = 0.02$, 95% CI = [0.02, 0.10], $t(2058.78) = 3.00, p = .003$**
Enjoyment	Monday	$M = 3.26$	$M = 3.60$	
	Tuesday	$M = 3.28$	$M = 3.58$	
	Wednesday	$M = 3.28$	$M = 3.61$	
	Thursday	$M = 3.26$	$M = 3.62$	
	Friday	$M = 3.35$	$M = 3.76$	
	Overall	$M = 3.28, SE = 0.03$	$M = 3.63, SE = 0.03$	**$\Delta M = -0.35$, 95% CI = [−0.40, −0.29], $t(2083) = -12.71, p < .001$**
	Estimated simple slopes & Rating type x time interaction	$b = 0.02, SE = 0.01$, 95% CI = [−0.01, 0.04], $t(2056) = 1.16, p = .25$	**$b = 0.03, SE = 0.01$, 95% CI = [0.01, 0.06], $t(2077) = 2.74, p = .01$**	$b = 0.02, SE = 0.02$, 95% CI = [−0.02, 0.05], $t(2066) = 0.89, p = .37$
Positive impression	Monday	$M = 3.21$	$M = 3.43$	
	Tuesday	$M = 3.32$	$M = 3.46$	
	Wednesday	$M = 3.24$	$M = 3.54$	
	Thursday	$M = 3.28$	$M = 3.51$	
	Friday	$M = 3.36$	$M = 3.65$	
	Overall	$M = 3.28, SE = 0.03$	$M = 3.51, SE = 0.03$	**$\Delta M = -0.23$, 95% CI = [−0.28, −0.18], $t(2080) = -9.18, p < .001$**
	Estimated simple slopes & Rating type x time interaction	**$b = 0.03, SE = 0.01$, 95% CI = [0.001, 0.05], $t(2054) = 1.98, p = .05$**	**$b = 0.05, SE = 0.01$, 95% CI = [0.03, 0.07], $t(2073) = 4.57, p < .001$**	$b = 0.03, SE = 0.02$, 95% CI = [−0.01, 0.06], $t(2061) = 1.45, p = .15$

Note. Analysis of rejection used a mixed-effects binomial regression: descriptives are estimated means for predicted and actual rejections, and comparisons between predicted and actual are ratios. For all other measures, a mixed-effects regression was used: comparisons between predicted and actual are tests of the mean difference. The rating type x time interaction is reported in the predicted vs. actual column; follow-up simple slopes analyses are reported in the predicted and actual columns. Significant effects indicated in **bold**.

conversations with strangers. Moreover, past research suggests that after a single pleasant conversation with a stranger, people fail to generalize their experience, instead returning to their more pessimistic expectations when anticipating another such conversation with someone new (Sandstrom & Boothby, 2021). Repeated practice appears to be a critical ingredient in our intervention's success.

This emphasis on repeated experience is reminiscent of cognitive behavioral therapies (Butler, Chapman, Forman, & Beck, 2006), but while our intervention does rely on repeated behavioral experience, the "cognitive" component is not explicitly present. In other words, people in our intervention were not explicitly prompted to challenge or restructure their thoughts about strangers—although we suspect that people may have done so naturally over the course of the week. Intriguingly, there is evidence that explicit cognitive restructuring is less important than practice for the treatment of anxiety and social phobias in particular (Clark, 1995; Longmore & Worrell, 2007).

4.1.2. Gamification

In light of people's aversion to talking to strangers, we suspect that part of the effectiveness of our intervention may be attributable to the fact that it was delivered via a scavenger hunt game. We drew on several features of "gamification" to encourage participants to repeatedly perform a behavior that they normally tend to avoid altogether. For example, we gave participants a choice of which missions to tackle each day, and participants reported appreciating this freedom, which may have helped them see talking to strangers as a challenge rather than a threat. Anecdotally, participants also seemed to enjoy the points they received for each mission, and kept an eye on the leaderboard that showed their relative ranking each week, which may have increased their motivation to talk to more strangers. Our research thus adds to existing literature that has harnessed gamification features to encourage people to adopt behaviors that support health and well-being (Johnson et al., 2016).
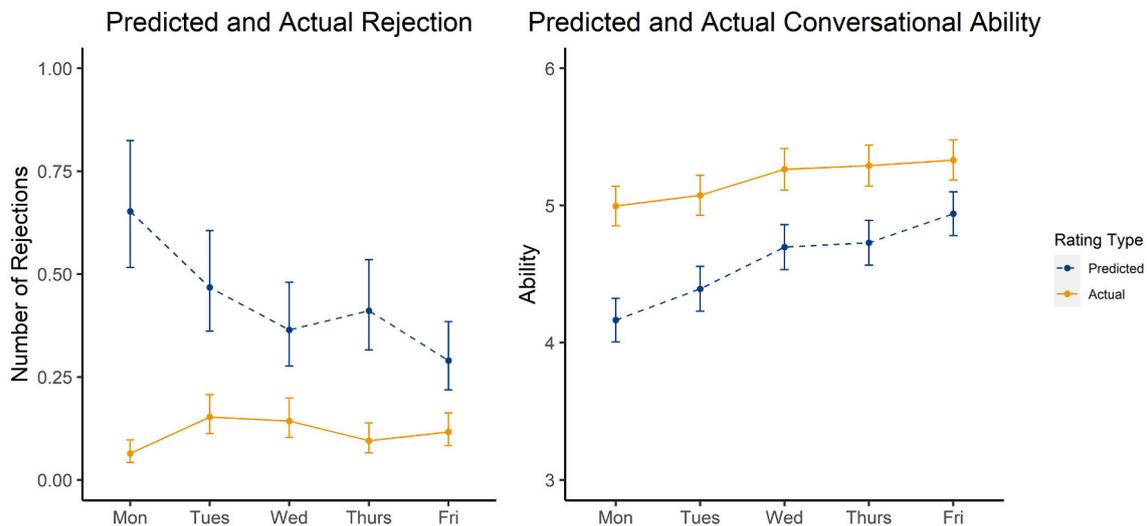
Fig. 5. Daily results for predicted likelihood of rejection and conversational ability and actual number of rejections and perceived conversational ability.
Note. The effect of a "talking to strangers" intervention on people's daily predictions about the likelihood of rejection compared to the actual number of rejections they experienced, and people's daily predictions about their ability to carry out a conversation compared to their post-conversation reflections about their ability (7-point scale). Error bars represent 95% confidence intervals.
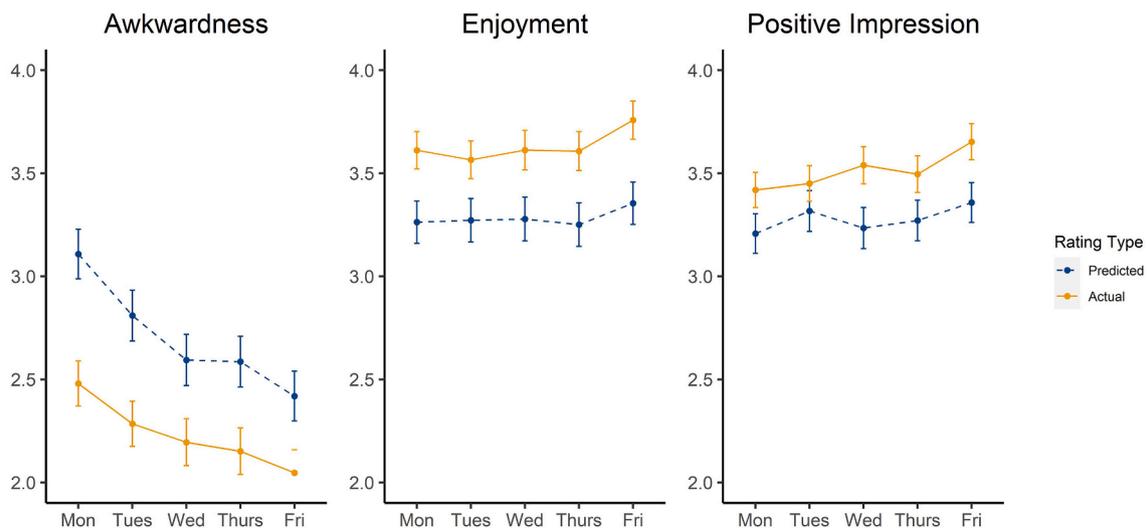

Fig. 6. Daily results for predicted and actual awkwardness, enjoyment, and making a positive impression.
Note. The effect of a "talking to strangers" intervention on people's daily predictions about their awkwardness, their enjoyment, and the positivity of the impression they will make on their partner, compared to their actual experience reported after they finished their conversations each day (all on 5-point scales). Error bars represent 95% confidence intervals.

4.2. Limitations of the current research

Although gamification may have made the intervention more engaging, the use of gamification poses a limitation: we do not know the extent to which the effects generalize to other less "gamified" ways of delivering the intervention. While gamification may have contributed to people's motivation, as long as an intervention has some mechanism to ensure participant compliance in actually having conversations, we have no reason to doubt that similar results would be observed.

As with most field research that requires participants to complete repeated tasks over time, our study suffered from some attrition. We carried out extensive analyses (see SOM), finding that participants who dropped out did not differ from those who finished the study on a range of personality traits and general attitudes towards talking to strangers. However, there is some evidence that drop-outs reported more negative experiences than finishers during their first day of conversations. That

said, most participants who eventually dropped out of the study persisted beyond the first day, at which point their responses on our primary dependent variables became statistically indistinguishable from those of participants who completed the study.

Finally, one unexpected limitation is that our intervention appeared to reduce negative outcomes, such as fear of rejection, more strongly than it improved positive outcomes, such as people's perceptions of the impressions they made on their partners. This is a limitation in that this pattern was not predicted, and we do not know exactly why it happened. On the other hand, assuming such a pattern is consistent, it suggests theoretical and practical implications that will allow future research to make more precise predictions, either when trying to modify our intervention for stronger effects, or more broadly, in future attempts to explore the underlying psychology of initial interactions with strangers.

4.3. Implications for encouraging more conversations with strangers

When people feel more optimistic about talking to strangers, do they actually initiate more conversations with strangers? Models of behavior change emphasize factors such as people's attitudes, perceptions of the norms, and perceived behavioral control as important predictors (e.g., Ajzen, 1985). Our intervention shifted measures that could be interpreted as indicators of people's attitudes (enjoyment), perceptions of the norms (rejection), and perceived behavioral control (conversational ability). It is therefore not unreasonable to think that our intervention might also shift people's actual behavior. And indeed, we found preliminary support for this hypothesis: participants in the treatment condition reported talking to more strangers in the week following the study compared to the week prior to the study. However, looking back, we wish our instructions had been more specific about exactly what type of conversations we were interested in (i.e., social, not instrumental); more than one participant mentioned that they worked in retail and had talked to dozens of customers. Further, our study was not primarily designed to assess behavior change; we simply asked people to remember how many conversations they had initiated over the course of a week, which is inevitably an imprecise measure. These results were also exploratory and so we urge caution in interpreting them, leaving the question of prolonged behavior change to future research.

4.4. Implications for loneliness

Our intervention may have special relevance now, as a growing number of scientists and public health officials are raising the alarm about increasing levels of loneliness, and the dire health consequences (Buecker, Mund, Chwastek, Sostmann, & Luhmann, 2021; Holt-Lunstad, Smith, Baker, Harris, & Stephenson, 2015). Emerging research has documented several promising classes of interventions to address loneliness, including increasing opportunities for social interaction, addressing maladaptive social cognition, and improving social skills (Masi, Chen, Hawkley, & Cacioppo, 2011). Our intervention does not fall neatly into one of these categories; rather, it fits in several.

First, our intervention increases opportunities for social interaction by making people more aware of the opportunities that already exist in their daily lives. Indeed, after our intervention, participants in the experimental condition (but not the control condition) reported noticing more opportunities to talk to strangers. Secondly, our intervention may have facilitated the disruption of maladaptive cognition, allowing people to develop an alternative, less pessimistic narrative about initial interactions (e.g., "Talking to strangers is much better than I expect—I

can do this."). Finally, while our intervention did not explicitly instruct people on *how* to improve their social skills, people did feel more conversationally skilled by the end of the intervention. More research is needed to determine the effects of our intervention on loneliness, but we can be certain that our intervention did lead people to make connections that continued beyond the study itself: 41% of participants in the treatment condition reported exchanging contact information and following up with at least one of their conversation partners—a promising start.

4.5. Conclusion

Ultimately, our novel "talking to strangers" intervention was successful, providing evidence that repeated experience talking to strangers can reduce people's fears about talking to strangers, and make them more accurate in their predictions about future conversations.

At its heart, our intervention is simple: it involves repeatedly approaching and talking to strangers. As such, this intervention is something that many people could self-administer. We encourage readers to try it, despite any natural instinct to avoid such interactions—which even the authors confess to sharing. As our research shows, these conversations really do get easier with practice, and the experience will be more positive than you expect.

Open practices

Materials, data and analysis scripts are available here: (https://osf.io/b76gf/).

Appendix

Table A1
Scavenger hunt "missions".

Name	Instructions
Al Fresco	Find someone outdoors, and [talk to/observe] them for a few minutes.
All Smiles	Find someone who seems friendly and [talk to/observe] them for a few minutes.
Artsy	Find someone who looks artistic and [talk to/observe] them for a few minutes.
Blue Mood	Find someone who looks sad and [talk to/observe] them for a few minutes.
Bossy Pants	Find someone who looks like a leader and [talk to/observe] them for a few minutes.
Caffeination Station	Find a barista/server and [talk to/observe] them for a few minutes.
Coffee Break	Find someone who's drinking a coffee and [talk to/observe] them for a few minutes.
Do Gooder	Find someone who seems like a nice or kind person and [talk to/observe] them for a few minutes.
Fashionista	Find someone who's accessorizing (e.g., wearing a scarf, hat…) and [talk to/observe] them for a few minutes.
Fun Fabric	Find someone wearing stand-out print (e.g., stripes, animal-print) and [talk to/observe] them for a few minutes.
Graphic Tee	Find someone who is wearing an interesting shirt and [talk to/observe] them for a few minutes.
Hot	Find someone whom you find attractive and [talk to/observe] them for a few minutes.
Hungry	Find someone who's eating and [talk to/observe] them for a few minutes.
Inked Up	Find someone who has a tattoo and [talk to/observe] them for a few minutes.
Inside	Find someone indoors and [talk to/observe] them for a few minutes.
Jock	Find someone sporty and [talk to/observe] them for a few minutes.

(continued on next page)

Table A1 (*continued*)

Name	Instructions
Kickin' It	Find someone who is wearing interesting shoes and [talk to/observe] them for a few minutes.
Line Up	Find someone who's waiting in a queue/line and [talk to/observe] them for a few minutes.
Manscape	Find someone who has a beard/goatee/etc. and [talk to/observe] them for a few minutes.
Minion	Find someone who is wearing a uniform and [talk to/observe] them for a few minutes.
Nailed It	Find someone who has funky nails (e.g., unusual shade, fancy design) and [talk to/observe] them for a few minutes.
Next Gen	Find someone who's from a different generation than you and [talk to/observe] them for a few minutes.
On Top	Find someone who is wearing a hat and [talk to/observe] them for a few minutes.
Ray of Sunshine	Find someone who looks happy and [talk to/observe] them for a few minutes.
Sexy	Find someone whose gender differs from yours and [talk to/observe] them for a few minutes.
Skin Deep	Find someone whose skin tone is different from yours and [talk to/observe] them for a few minutes.
Twins	Find someone wearing the same thing as you (hair style, shirt, shoes, etc.) and [talk to/observe] them for a few minutes.
Unicorn	Find someone who has eye-catching hair (e.g., pink tips), dyed hair, or a cool hair style and [talk to/observe] them for a few minutes.
Wild Card x 2	Find anyone of your choosing and [talk to/observe] them for a few minutes.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jesp.2022.104356.

References

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl, & J. Beckmann (Eds.), *Action-control: From cognition to behavior* (pp. 11–39). Heidelberg: Springer.

Atir, S., Wald, K., & Epley, N. (2021). *Conversation is surprisingly informative*. Manuscript submitted for publication.

Boothby, E. J., Cooney, G., Sandstrom, G. M., & Clark, M. S. (2018). The liking gap in conversations: Do people like us more than we think? *Psychological Science, 29*(11), 1742–1756.

Buecker, S., Mund, M., Chwastek, S., Sostmann, M., & Luhmann, M. (2021). Is loneliness in emerging adults increasing over time? A preregistered cross-temporal meta-analysis and systematic review. *Psychological Bulletin, 147*(8), 787–805.

Butler, A. C., Chapman, J. E., Forman, E. M., & Beck, A. T. (2006). The empirical status of cognitive-behavioral therapy: A review of meta-analyses. *Clinical Psychology Review, 26*, 17–31.

Clark, D. A. (1995). Perceived limitations of standard cognitive therapy: A consideration of efforts to revise Beck's theory and therapy. *Journal of Cognitive Psychotherapy, 9*, 153–172.

Clark, L. A., & Watson, D. (1988). Mood and the mundane: Relations between daily life events and self-reported mood. *Journal of Personality and Social Psychology, 54*, 296–308. https://doi.org/10.1037/0022-3514.54.2.296

Cooney, G., Boothby, E. J., & Schweitzer, M. (2021). *Overestimating others' preferences for homophily in initial conversations: Are dissimilar others more interested in talking than we think? Manuscript submitted for publication*.

Diener, E., & Seligman, M. E. (2002). Very happy people. *Psychological Science, 13*(1), 81–84.

Epley, N., & Schroeder, J. (2014). Mistakenly seeking solitude. *Journal of Experimental Psychology: General, 143*(5), 1980.

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*(2), 175–191.

Fredrickson, B. L., Cohn, M. A., Coffey, K. A., Pek, J., & Finkel, S. M. (2008). Open hearts build lives: Positive emotions, induced through loving-kindness meditation, build consequential personal resources. *Journal of Personality and Social Psychology, 95*(5), 1045.

Goffman, E. (1963). *Behavior in public places*. Simon and Schuster.

GooseChase Adventures. (2019). GooseChase [Mobile application software]. Retrieved from http://itunes.apple.com.

Hawkley, L. C., & Cacioppo, J. T. (2010). Loneliness matters: A theoretical and empirical review of consequences and mechanisms. *Annals of Behavioral Medicine, 40*(2), 218–227.

Helliwell, J. F., & Putnam, R. D. (2004). The social context of well-being. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences, 359*(1449), 1435–1446.

Holt-Lunstad, J., Robles, T. F., & Sbarra, D. A. (2017). Advancing social connection as a public health priority in the United States. *American Psychologist, 72*(6), 517.

Holt-Lunstad, J., Smith, T. B., Baker, M., Harris, T., & Stephenson, D. (2015). Loneliness and social isolation as risk factors for mortality: a meta-analytic review. *Perspectives on Psychological Science, 10*(2), 227–237.

House, J. S., Landis, K. R., & Umberson, D. (1988). Social relationships and health. *Science, 241*(4865), 540–545.

Johnson, D., Deterding, S., Kuhn, K. A., Staneva, A., Stoyanov, S., & Hides, L. (2016). Gamification for health and wellbeing: A systematic review of the literature. *Internet Interventions, 6*, 89–106.

Kahneman, D., Krueger, A. B., Schkade, D. A., Schwarz, N., & Stone, A. A. (2004). A survey method for characterizing daily life experience: The day reconstruction method. *Science, 306*, 1776–1780. https://doi.org/10.1126/science.1103572

Kim, E. C. (2012). Nonsocial transient behavior: Social disengagement on the greyhound bus. *Symbolic Interaction, 35*(3), 267–283.

Kushlev, K., Hunter, J. F., Proulx, J., Pressman, S. D., & Dunn, E. (2019). Smartphones reduce smiles between strangers. *Computers in Human Behavior, 91*, 12–16.

Longmore, R. J., & Worrell, M. (2007). Do we need to challenge thoughts in cognitive behavior therapy? *Clinical Psychology Review, 27*, 173–187.

Masi, C. M., Chen, H. Y., Hawkley, L. C., & Cacioppo, J. T. (2011). A meta-analysis of interventions to reduce loneliness. *Personality and Social Psychology Review, 15*(3), 219–266.

Mastroianni, A., Cooney, G., Boothby, E. J., & Reece, A. G. (2021). The liking gap in groups and teams. *Organizational Behavior and Human Decision Processes, 162*, 109–122.

Mehl, M. R., Vazire, S., Holleran, S. E., & Clark, C. S. (2010). Eavesdropping on happiness: Well-being is related to having less small talk and more substantive conversations. *Psychological Science, 21*(4), 539–541.

Myers, D. G. (2000). The funds, friends, and faith of happy people. *American Psychologist, 55*(1), 56.

Pavot, W., Diener, E., & Fujita, F. (1990). Extraversion and happiness. *Personality and Individual Differences, 11*, 1299–1306. https://doi.org/10.1016/0191-8869(90) 90157-M

Sandstrom, G. M., & Boothby, E. J. (2021). Why do people avoid talking to strangers? A mini meta-analysis of predicted fears and actual experiences talking to a stranger. *Self and Identity, 20*(1), 47–71.

Sandstrom, G. M., & Dunn, E. W. (2014). Is efficiency overrated? Minimal social interactions lead to belonging and positive affect. *Social Psychological and Personality Science, 5*(4), 437–442.

Schroeder, J., Lyons, D., & Epley, N. (2021). Hello, stranger? Pleasant conversations are preceded by concerns about starting one. *Journal of Experimental Psychology. General.* https://psycnet.apa.org/record/2021-90811-001.

Sun, J., Harris, K., & Vazire, S. (2020). Is well-being associated with the quantity and quality of social interactions? *Journal of Personality and Social Psychology, 119*(6), 1478–1496.

Vittengl, J. R., & Holt, C. S. (1998). A time-series diary study of mood and social interaction. *Motivation and Emotion, 22*, 255–275. https://doi.org/10.1023/A: 1022388123550

Watson, D., Clark, L. A., McIntyre, C. W., & Hamaker, S. (1992). Affect, personality, and social activity. *Journal of Personality and Social Psychology, 63*, 1011–1025. https:// doi.org/10.1037/0022-3514.63.6.1011

Welker, J. T., Walker, C., Boothby, E. J., & Gilovich, T. (2021). *Pessimistic assessments of ability in everyday conversation. Manuscript submitted for publication*.

Zuckerman, M., Miserandino, M., & Bernieri, F. (1983). Civil inattention exists—In elevators. *Personality and Social Psychology Bulletin, 9*(4), 578–586.

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