Perspective neglect: Inadequate perspective taking limits coordination

Elanor F. Williams[*] Alicea Lieberman[†] On Amir[‡]

Abstract

People need to take others' perspectives into account in order to successfully coordinate their actions and optimally allocate limited resources like time, attention, or space. And yet, people often face frequent, but avoidable, coordination failures in the form of wait times, crowding, and unavailability of desirable options. Such poor coordination suggests that the necessary perspective taking (i.e., considering the likely motivations and behavior of others) may be either inadequate or incorrect. The current research suggests that coordination in such situations is frequently unsuccessful, not because people try to take others' perspectives and are mistaken, but because they neglect to consider those perspectives sufficiently in the first place. Six experiments across a range of limited-resource contexts (e.g., choosing when to visit a store, stream on a limited bandwidth service, go to a popular vacation location, etc.) find that encouraging decision makers to consider what others might do and why they might do it can ameliorate such coordination problems. We further demonstrate a boundary condition: in situations where people's motivations are inherently obvious, decision makers are naturally able to coordinate without an explicit nudge to perspective take. This research sheds light on a unique class of coordination problems in which people must consider others' motivations without directly communicating with them, and provides theoretical and practical contributions with the potential to ameliorate common coordination failures.

Keywords: decision making; coordination; preferences; perspective taking

1 Introduction

After years of debate, a "congestion charge" aimed at reducing traffic in New York City has been approved, and drivers will have to pay to enter certain areas of Manhattan during

[*]Washington University in St. Louis. Email: elanorfwilliams@wustl.edu. ORCID 0000-0003-2713-7405.
[†]University of California, Los Angeles. ORCID 0000-0002-8544-7279.
[‡]University of California, San Diego. ORCID 0000-0002-0364-8027

peak hours starting in 2023. This proposal, while somewhat controversial, is inspired by the success of congestion pricing in other cities across the globe. For example, London instituted a congestion charge in 2003, leveling what are now £11.50 fees on drivers who traverse the Congestion Charge Zone from 7:00am to 6:00pm on weekdays. This charge raises money for the London transportation system while also making travel smoother and less frustrating for drivers who choose to pay the fee. Some critics worried that the fee would merely punish drivers who had no other option than to travel through the zone and would not reduce traffic; however, traffic in central London decreased by over 10% in the decade after the fee was enacted (Transport for London, 2014). Many coordination failures like pre-charge London (or current New York City) traffic exist, where people converge on a valued but limited resource (e.g., roads and time) because they share the same reasons for desiring the resources as well as the same constraints (e.g., the desire to get someplace during peak hours). Despite these seemingly fixed motives and constraints, enough Londoners were able to change their driving behavior and improve outcomes for all — but this improvement came about only after a sufficient nudge to consider and account for the many others who might want to be on the road at the same time for the same reasons. In this paper, we demonstrate that an important reason why coordination problems like traffic congestion occur is because people routinely overlook or undercount others' perspectives, and ironically, fail to see that others might have the exact same motivations and constraints as they do. In particular, we find that such perspective neglect occurs not because it is too difficult for people to take those shared reasons into consideration, but because they simply do not do so sufficiently in the first place. Consequently, we show that a first step toward reducing crowding by improving coordination is merely encouraging decision makers to consider the perspectives of other people.

1.1   Getting what you want when others want it, too

Traffic is nowhere near the only resource whose quality is affected by crowding. At times, crowding can even improve experiences — the online video game Fortnite is more fun because so many people play it at once, and it is often more enjoyable to watch a movie in a full theater or watch a comedian perform to a crowd (at least in nonpandemic times). But some goods and services are degraded when more people seek them. Not only does more traffic make trips longer and less pleasant for everyone on the road, but more callers make wait times for customer service longer; greater load can make electricity more expensive or unreliable; and bigger crowds can make even amusement parks, zoos, and beaches less fun, among other problems. In each of these cases, if people were able to better coordinate, and thus be more optimally distributed, everyone's experience would be improved. But why do such coordination failures occur, and can they be fixed?

Within the negotiation and game theory literatures, most research on coordination focuses on situations between pairs or small groups of individuals making active efforts to obtain matched and mutually beneficial solutions. Whereas such negotiations usually

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entail some form of communication between the parties involved — and are thus joint decisions (e.g., Carroll, Bazerman & Maury, 1988) — the kinds of situations we investigate do not involve communication with or even necessarily *awareness* of one's competition. Yet, they still require people to match each other, in a way, to obtain the best outcome. This form of coordination — coordination without the ability to communicate — is called *tacit coordination* (e.g., Abele & Stasser, 2008; Schelling, 1960). We propose that, in order for tacit coordination to be accomplished, people must individually succeed on three dimensions: they must decide whether to match or avoid other people; they must have an accurate understanding of what other people are likely to do; and, they must take that understanding of others' behavior into account when deciding how to behave themselves.

First, to successfully coordinate, people must decide whether to do the same thing as others (i.e., matching), or something different (i.e., mismatching or anti-coordination) — the latter of which presents a particularly challenging coordination problem. Research suggests that, although people are able, with instruction, to anti-coordinate and do something different from others (e.g., Abele & Stasser, 2008; Abele, Stasser & Chartier, 2014), such mismatching is less likely to be attained and harder to encourage than matching (e.g., Krueger, 2013, 2019). One domain — helping — demonstrates how challenging the goal of anti-coordination can be. A classic mismatching task is the volunteer's dilemma (where people aim to figure out the most efficient way to solve a collective problem so that the fewest people are taxed or inconvenienced) in which there is a bias to volunteer — a tendency that can be beneficial but can also lead to inefficiencies via *overvolunteering* (Krueger, 2019). On the other hand, the bystander effect shows that when in an emergency situation, people may *undervolunteer* (e.g., Fischer et al., 2011; Latané & Darley, 1968). Coordination has received a fair amount of attention from researchers because it is common, challenging, and consequential. However, coordination failures that occur due to poor mismatching are less well understood but, as evidenced by the crowding examples earlier, are common and deserve further research.

Beyond having a matching or anti-matching strategy, the second thing people must do to successfully coordinate is to be correct in their intuitions about what other people are likely to do. Within behavioral economics, much coordination research involves tasks where people are explicitly asked to coordinate through stylized games in which they are better off if all participants choose based on the same focal point (see Camerer, 2003 for a review). However, the degree of coordination in such matching situations may be as high as 89% when there is a strong focal point (that is, a choice option with high "Schelling salience") or as low as 10% when many potential strategies exist (Mehta, Starmer & Sugden, 1994). Having one party in a coordination game announce their intentions dramatically increases the likelihood of matching relative to a no-communication condition, even when communication is nonbinding and could be seen as "cheap talk" (Cooper et al., 1989). This initial announcement appears to be effective because players announce what they intend to do and then follow through on their statement, and thus receivers consider what the

communicator intends to do when making their own choice, increasing the likelihood of correctly anticipating what others will do. Relatedly, the more that the parties who are trying to coordinate have a shared understanding of a situation, the more accurate their predictions will be, and thus the more likely coordination is to happen. For example, the aforementioned bystander effect seems to stem at least in part from people believing that other people act in ways similar to how they themselves are acting but for dissimilar reasons (Miller & Nelson, 2002), and is attenuated under conditions when it is clear that others have the same interpretation of a situation, as when there is an obvious (vs. ambiguous) emergency (Fischer et al. 2011). (It should be noted that common knowledge does not preclude people from strategizing their way out of helping when it suits them [Thomas et al. 2016].)

Third, successful coordination requires people to take into account their understanding of others' behavior. Some tasks encourage thinking about other people's behavior, and how to coordinate with them, more readily than others. Most of the work on coordination has involved explicit coordination tasks, including the original Schelling (1960) scenarios in which people opt to meet up at prominent landmarks at notable times. And even the small-scale coordination tasks that prompt the volunteer's dilemma, like who should pick up the kids from soccer practice or call the plumber, necessitate understanding someone else's thoughts to make sure the task is accomplished (Krueger, 2019) — although they are more implicitly coordination-related than being explicitly instructed to coordinate, such tasks still involve trying to mentally negotiate someone else's likely behavior. But other tasks, either because they do not involve an obvious need for coordination, or because they do not seem to involve another person whose thoughts need to be intuited, may not push people to incorporate other people's perspectives into their strategies. A trip to the grocery store or a load of laundry may not seem like coordination tasks, but they can be when it comes to avoiding long lines or paying off-peak prices for energy.

Drawing on these three dimensions we suggest are necessary for coordination, our work focuses on some of the trickiest coordination problems: those in which the goal is to mismatch others, and the task does not obviously reveal itself to be a coordination task (making it less apparent that one should consider others' behavior in the first place, much less incorporate those considerations into one's own choices). In other words, we examine coordination without the ability to communicate in which the goal is to do something different than others. Tacit coordination via mismatching has received relatively little attention in the literature compared to matching (see Abele & Stasser, 2008; Abele et al., 2014; de Kwaadsteniet et al., 2012). Many situations where crowding can be an issue may not necessarily seem like coordination problems to the individuals encountering them, making them quite difficult for people to resolve. In this research, we will show that even when people should have an accurate understanding of others' likely behavior, without an active prompt to consider what others might be thinking and doing, people underweight, or even completely ignore, it. Figure 1 depicts a number of common coordination outcomes

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and where they might fall on the three different dimensions, including the current work and other familiar coordination challenges mentioned here.
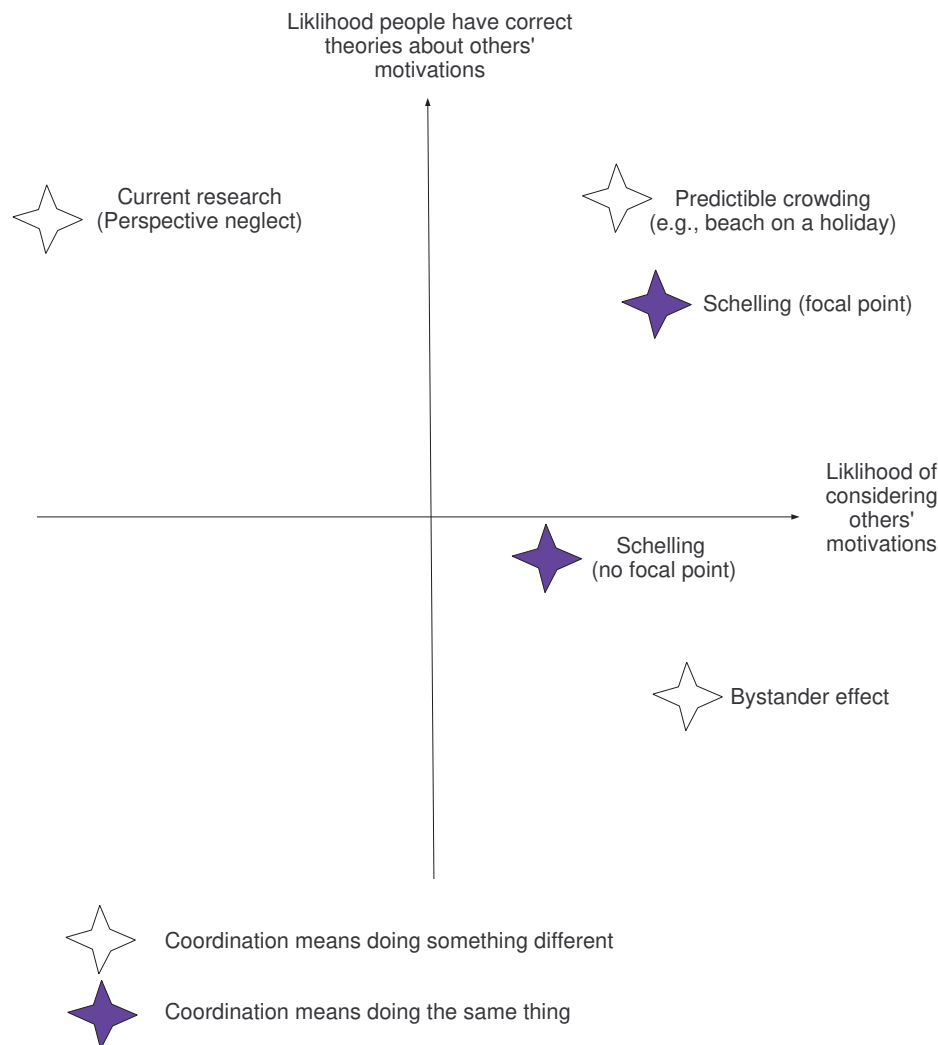

FIGURE 1: Three dimensions of tacit coordination and where common coordination challenges might fall along the dimensions.

To best predict someone else's behavior, one needs to foresee not only what someone else is likely *to do*, but also what they are likely *thinking*. Even tacitly, decision makers could access this information by reasoning through or intuiting other people's thoughts. This form of perspective taking might put people at an advantage for coordinating without communicating. It has been argued that taking an interaction partner's perspective can smooth interpersonal coordination with them (e.g., Galinsky, Ku & Wang, 2005), but that negotiators tend to ignore or downplay the potential consequences of their opponents' thoughts and possible actions to their detriment (Carroll et al., 1988). Further, better understanding one's negotiating partner, as measured by self-reported perspective taking

ability, makes one a better negotiator: people who reported being better able to understand their competition's perspective were better able to adjust to and exploit that perspective and reach agreements that were in their favor (Neale & Bazerman, 1983). In the workplace, teams whose members have an accurate and shared mental model of the situation are better able to coordinate decisions with each other, both explicitly and implicitly (e.g., Rico et al., 2008). Given the degree to which common understandings and social information can facilitate an understanding of another person's mind, de Kwaadsteniet and van Dijk (2012) posited that individuals who are more prone to perspective-take might also be more skilled at tacitly coordinating with others.

Put together, this past work suggests that a solution to those tricky coordination problems that involve crowding and require mismatching for success might be to encourage people to take others' perspectives more. There are cases where being encouraged to take someone else's perspective is likely to be particularly helpful for successful coordination or, in our case, anti-coordination. In particular, we suggest that individuals will be better able to mismatch others when they perspective-take in situations in which other people's motivations for acting are similar to one's own or are otherwise easily intuited (as when there is a Schelling salient focal point). Notably, perspective taking will provide an additional benefit only when the situation itself does not inherently encourage perspective taking, as when there is no specific person whose thoughts need intuiting, the social nature of a task is not obvious, the situation is familiar or ordinary so that others' reactions do not seem informative, etc. Thus, we predict:

H1: When a situation does not prompt consideration of others' thoughts (but those thoughts may be readily intuited), encouraging people to take other people's perspectives can improve their ability to coordinate, even when the need for coordination is tacit, coordination requires mismatching, and they must coordinate with multiple others at once.

1.2   Sharing your thoughts

The suggestion that decision makers should consider others' perspectives when making coordination decisions may seem obvious, or even unhelpful — do they not already do this? Notably, though, one major theme of the perspective taking literature is that such an important and seemingly well-practiced skill (e.g., Davis et al., 2004) is surprisingly poorly calibrated and underutilized. Research on perspective taking shows common ways in which people fail to use their perspective taking skills when they might be beneficial. One is that people do try to consider others' thoughts and possible behaviors, but they are not terribly accurate at doing so. Frequently, people try to intuit what others are thinking, and simply get it wrong, relying incorrectly on things like stereotypes (Ames, 2004), cynicism (e.g., Epley, Caruso & Bazerman, 2006; Kruger & Gilovich, 1999; Miller & Ratner, 1998), or even completely irrelevant factors like whether one is nodding or shaking one's head (Epley et al., 2004). In fact, perspective taking is largely unhelpful to people who are looking to better understand what others are thinking, though they often fail to recognize its lack of

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effectiveness, making "perspective getting" (i.e., asking directly for others' perspectives) a better strategy when trying to predict others' behaviors (Eyal, Steffel & Epley, 2018; Zhou, Majka & Epley, 2017). Inaccuracy is thus one potential explanation for low levels of coordination.

The other, more basic, explanation, and what we argue here, is that decision makers do not always consider what others might do or why they might do it in the first place. People approach the world egocentrically, and while they sometimes then adjust to consider others' perspectives (albeit insufficiently [Epley et al., 2004]), there are many contexts in which they may fail to consider others' perspectives without an explicit nudge to do so. Indeed, even when considering the actions of others, people may not automatically think of their motivating mental states (Keysar, Lin & Barr, 2003). The most basic support for this assertion is that, if people were already thinking enough about what others might do or think, explicitly encouraging them to do so should not have much of an effect on their predictions of others' behavior. But, consistent with past research (see Epley & Caruso, 2008 for a review), the subsequent studies in this paper show that merely encouraging people to consider what others might be thinking can have a meaningful impact on their choices.

An especially relevant example of failing to think about others involves "competitor neglect." Market entry decisions are notably prone to this sort of neglect, which in part explains why so many more businesses are established than succeed, particularly in popular domains (e.g., Moore, Oesch & Zietsma, 2007). An enlightening instance comes from eBay auctioning practices. One study revealed that sellers try to post auctions so that they will end when bidders are especially likely to be on eBay, without seeming to realize that many other sellers have the same thought and will do the exact same thing (Simonsohn, 2010). The spike in bidders is swamped by the size of the increase in sellers, so that although there are more potential buyers, there are even more competing auctions ending at the same time. This failure to consider that one's competitors are likely to have the same motives and behavior as oneself is costly, as auctions posted at popular times are more likely to expire without a bid, and those bids that are accepted tend to be lower.

An irony of people's failure to perspective-take is that the parties involved often only end up congested because they have overlapping, and thus conflicting, motivations. If decision makers would recognize the degree to which the reasons for their choices overlapped with others', they could anticipate when crowding is likely to occur and perhaps avoid it. For example, false uniqueness — the tendency to unrealistically see oneself as having special or unique traits, abilities, and trajectories — occurs in part because people find it easy to rely largely on self-relevant information when making judgments (e.g., Chambers, 2008). Similarly, pluralistic ignorance arises when people mistakenly think that their own and others' identical actions come about because of different internal processes (e.g., Miller & McFarland, 1987; Prentice & Miller, 1993). For example, in trying to determine whether a situation is an emergency, bystanders may try not to outwardly panic, but then assume that, because others appear calm (as they are also trying to play it cool), the situation must not

be urgent (Latané & Darley, 1968). Further, people readily admit that they themselves can have divergent preferences and desires, enjoying both the finest Camembert and the finest Cheez-Wiz, for instance, but assume more coherent preferences in others (Barasz, Kim & John, 2016). Despite the high degree of overlap between self and other in these contexts, people still perspective-take insufficiently.

But this insufficient perspective taking is not without boundaries. There are times when people are highly capable of seeing their overlap with others: they can be trained to notice their shared thoughts (Prentice & Miller, 1993), and perspective taking can help to increase how readily people see their own traits in others (Davis et al., 1996). This past research suggests that encouraging decision makers to perspective-take might also lead them to recognize that others have the same motivations as they themselves have. In addition, sharing a preference with another individual makes it easier to coordinate with them because it makes the option that they are likely to choose more obvious (Abele et al., 2014). Finally, the stronger the need to understand what others are doing, the better people are at coordinating. One field experiment examining the behavior of cyclists showed that when confronted with a solitary cyclist coming from the opposite direction, only 78% of the riders shifted from the middle of the path (compared to the 100% who presumably knew on which side they should ride), but this number increased significantly as congestion grew (Munro, 1999; cited by Camerer, 2003). Given the ways in which people do and do not anticipate their shared motivations and behaviors, we predict that:

H2a: Perspective taking improves coordination by increasing the degree to which people recognize, and take into account, the motivations they share with others.

H2b: When shared motivations are made situationally obvious, perspective taking may not be necessary to improve coordination.

1.3   The current research

Perspective taking could confer its benefits in two ways: it could make participants more accurate at understanding what other people might be thinking, or it could make them more likely to take that thinking into account in the first place. Throughout the paper, we will focus on one's *tendency* to perspective-take, as opposed to one's *accuracy* at perspective taking (Neale & Bazerman, 1983), by examining how merely increasing the likelihood that one takes the perspective of others (rather than increasing one's perspective taking accuracy) can improve coordination. Across six experiments, we will address an interesting and unique class of coordination problems, in which decision makers' ultimate task is to anticipate what other people are likely to do and then find another, less crowded way to obtain a desired resource — importantly, without communicating or negotiating with their competition. This kind of mismatching is a useful way to test the value of perspective taking, as it is more likely to require participants to perspective-take and recognize their shared motivations with others in order to successfully coordinate and do something different. Coordination

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problems such as these are common and potentially frustrating, and our studies demonstrate why they are challenging and how they might be ameliorated.

In Experiment 1, a field experiment with real monetary consequences for lack of coordination, participants in a lottery to potentially take part in another, appealing experiment chose time slots during which to participate. Participants were more likely to win when they first received a reminder to consider why other participants might select particular time slots. Experiments 2a and 2b replicate this effect with a new scenario involving the best time to go to the bank. Experiments 3a and 3b directly test whether participants induced to perspective-take do indeed report giving more weight to others' motivations, and whether this predicts their likelihood of choosing the less crowded option. These experiments further show that the perspective taking reminder changes the reasons why participants choose particular options, making them less likely to focus on their own preferences and more likely to focus on other people's motives. Finally, Experiment 4 tests a boundary condition: situations where the overlap between one's own and others' motivations is inherently obvious. We investigate whether these situations obviate the need to nudge people to perspective-take to improve coordination.

In all experiments, our target sample sizes were set before data collection began; we collected at least 100 participants per cell to give us sufficient power to detect a small-to-medium effect size (see exception in Experiment 1). We report all measures, conditions, and data exclusions. Data and study materials can be found at: https://osf.io/3zdvp/?view_only=d498c47743e94ad98ff856ba54c3ba46

2   Experiment 1: A study about participating in a study

Our initial demonstration of the power of perspective taking to facilitate coordination involved a consequential field experiment. Students could sign up to participate in another, unrelated but fun experiment for \$5; however, there were limited time slots, and only one person could participate at a time. Thus, if a potential participant signed up for a popular time slot, they were less likely to be selected in a random drawing to participate than if they chose a less popular time slot. Before they chose a potential time slot, we encouraged half of the participants to consider why people might choose various times. We expected to find that these participants would be better able to find a time slot that both accommodated their schedule and avoided other participants. Note that in this experiment, we are not making any equilibrium claims, due to the number of options and lack of feedback here. Indeed, if too many people were to switch to the same alternative (as might be predicted based on Camerer, Ho & Chong [2003], and which is a possibility here, given the study's constraints), we would not expect an overall increase in efficiency. As such, we are primarily interested here in the effect of a reminder to perspective-take on an individual's choices, rather than efficiency across participants.

2.1   Method

2.1.1   Participants

One hundred undergraduates in the business school at a large West Coast university completed this survey in exchange for the chance to participate in another, unrelated study for $5. The sample size was set a priori to be the number of people who chose to respond to an invitation sent to the potential paid participant pool in the business school.

2.1.2   Procedure

Participants who had previously indicated an interest in participating in studies for pay were sent an email advertising a new experiment, in which they could play a video game for 15 minutes to earn $5. The study was advertised as having a limited number of time slots and a lottery would be used to resolve conflicting registrations for each slot. In order to try to sign up for a slot, they were to complete a brief survey and choose their preferred time slot; they were told we expected the experiment to be popular and that "[w]e will use a lottery system to determine who will fill each slot, if more than one person signs up for each."

In the survey, all participants received a list of the 36 available time slots with instructions to choose their one preferred time slot. The 15-minute slots all fell within one week, and included 1:00pm, 1:15pm, 1:30pm, and 1:45pm each weekday, and 8:30am, 8:45am, 9:00am, and 9:15am three days that week. Participants chose one time slot out of the 36 available. Before they chose a time slot, participants randomly assigned to the *perspective taking* condition were instructed to consider which time slots would be the most popular to others and why:

> To give yourself the best chance of winning the lottery, you should consider which time slots will be most and least popular. Why might people like to participate at particular times, or be less likely to participate during others? Think about whether and why people would sign up for particular slots as you make your choice, so that you are most likely to be chosen to participate.

For the *control* condition participants, this passage was simply omitted and participants went right to the choice.

On the following page, participants chose a second-choice time slot (so that we could fill all the time slots for the experiment for which we were recruiting). Participants also indicated how convenient the morning, afternoon, and overall time slots were, and how convenient their first-choice time slot was, all on *1 = not at all convenient* to *7 = extremely convenient* scales.

2.2   Results

Our measure of coordination is the likelihood that each participant would be selected to participate during the time they chose, given the expected competition for that same time

slot. If the perspective taking manipulation encourages more effective coordination, we should find that participants in that condition choose less popular time slots and thus have a higher chance of getting to participate. To test this, we calculated the likelihood of being chosen for a time slot by using the control condition as the baseline rate of choice for each time slot, in order to compare perspective taking participants to those with whom they could expect to be in competition. We then calculated the likelihood of each individual in the perspective taking condition winning the drawing by comparing their choices to the distribution of choices in the control condition. The probability that someone in the control condition who signed up would win a particular time slot is $1/n$, with n being the number of sign-ups for that slot (a solo sign up would mean a 100% likelihood of participation [i.e., 1/1], if two people signed up it meant a 50% chance for each one [i.e., 1/2], and so on). Using these criteria, we find that participants in the control condition had on average a 36.0% (*SE* = .05) chance of winning their chosen time slot to participate, whereas participants in the perspective taking condition had a 45.2% (*SE* = .05) chance of winning when competing against those who did not receive a perspective taking reminder, $t(98) = 127.47$, $p < .001$.

Convenience did not significantly differ between control and reminder participants for the morning, afternoon, and overall time slots (all ts < 1.34, ps > .19), and the convenience of the selected slots did not significantly differ between participants in the perspective taking condition (*M* = 6.16, *SD* = 1.14) and the control condition (*M* = 6.32, *SD* = 1.02), $t(89)$ = .71, p = .48, d = .15). These results suggest that participants were shifting from their first-choice slots to similarly preferred ones, likely in many cases by making small changes in their choices. For example, if a participant is available at 1:00pm, the most popular time slot, chances are they will also be available at 1:15pm. Indeed, participants in the reminder condition were less likely to choose the 1:00pm time slots (46.0%) than those in the control condition (56.0%), and more likely to choose the 1:15pm time slots (14.0%), than those in the control condition (2.0%), $\chi^2(1,N=100) = 5.02$, p = .03, φ = .22.

2.3   Discussion

Experiment 1 suggests that a simple reminder to consider how other people might act, and why, may be able to increase coordination. This study had the benefit of being a field study, in that we show both the coordination error and a potential remedy in a situation with real consequences. Of course, this study also had the drawbacks of a field study, in that the experiment it was recruiting for had its own constraints. Our next studies use a more controlled and limited set of choice options, for which we can make specific predictions about what participants might choose when they are and are not reminded to consider other people's perspectives.

3   Experiments 2a and 2b: Banker's hours

In Experiment 1, lack of coordination had a literal cost: participants who failed to coordinate were less likely to be able to complete the other study, play a videogame, and earn $5. In many other situations, costs for coordination failures are paid in time or attention, rather than money. For example, service providers like banks often struggle with coordination issues, in that the number of customers they have at any given moment ebbs and flows, and many of their customers choose the exact same times to seek service because of shared constraints and preferences. If these organizations could get customers who are more flexible to choose less popular times and thus avoid those whose constraints are fixed, all customers would receive better, faster service and employees would experience less stress. In Experiments 2a and 2b, participants considered four potential times to visit their bank: at the beginning and the end of the workday, at lunch, and in the midafternoon. We expected that participants who are encouraged to consider which times other people might choose to visit the bank would be more likely to choose the midafternoon time slot, an objectively "right" answer that avoids times when the bank is more likely to be busy (i.e., right at the beginning and end of traditional work hours and around lunchtime). In Experiment 2a, we also asked participants to indicate their reasons for choosing the time they did, to examine the ways in which the perspective taking manipulation affected what they considered when making their choice. In Experiment 2b, we examined whether it is the prompt to perspective-take, in particular, and not just encouragement to try to better coordinate with others or to think more deeply about the decision, that helps participants optimize their choices.

3.1   Experiment 2a Method

3.1.1   Participants

Four hundred twenty-two adults participated via Amazon's Mechanical Turk platform, receiving $.30 in exchange.

3.1.2   Procedure

All participants were asked to:

> Imagine that you have a very busy Tuesday in front of you. You have a number of meetings, appointments, and errands to run, and your day is packed full from 8:30am to 6pm. The one obligation you have not yet scheduled is going to the bank.
>
> It is open typical bank hours: from 9am to 5pm. You have four fifteen minute slots free in that timespan, and you can't be late to the meeting you have after any of them. The bank sometimes has no line, and sometimes has a very long line, depending on the time of day, so you have to pick when you go carefully.

In the *perspective taking* condition, participants were then reminded:

> To give yourself the best chance of getting in and out of the bank on time, you should consider which times to go to the bank will be most and least popular. Why might people go to the bank at particular times, or be less likely to go during others? Think about whether and why people would go to the bank at various times during the day as you make your choice, so that you are most likely to pick a time when there's no line.

There were four blocks of time in which they could run this errand: 9:00–9:15am, 12:00–12:15pm, 2:30–2:45pm, and 4:45–5:00pm. (In a pretest, 101 participants from the same population ranked the 2:30pm block as the least busy of the four ($M = 3.11$, $SD = 1.06$), Friedman test: χ^2 (3, $N = 101$) = 43.84, $p < .001$, compared to 9:00am ($M = 2.65$, $SD = 1.08$), paired $t(100) = 2.70$, $p = .008$, $d = .96$, 12:00pm ($M = 1.98$, $SD = .96$), paired $t(100) = 6.56$, $p < .001$, $d = 2.50$, and 4:45pm ($M = 2.26$, $SD = 1.06$), paired $t(100) = 5.00$, $p < .001$, $d = 1.79$). Both *control* and *perspective taking* participants chose the one block during which they would opt to go to the bank. Next, they gave an open-ended description of their main reason for choosing that particular time slot. Participants advanced to the following page, where they were shown the answer that they had just given for choosing that time. They used a scale ranging from *1 = not at all* to *7 = very much* to self-code the degree to which the reason they provided was focused on: their own time constraints; other people's behavior; and the bank and how it functions.

3.2   Experiment 2a Results

If the perspective taking reminder helps participants better coordinate with their fellow customers, we should find that, consistent with our pretest, those participants become more likely to choose the 2:30pm time slot (when other customers are less likely to be at the bank), compared to the beginning and end of the workday or at lunchtime. Participants' preferred time slots do show a significantly different pattern between conditions, χ^2 (3, $N = 419$) = 26.82, $p < .001$, $\varphi = .25$. Specifically, participants in the perspective taking condition were significantly more likely to choose the 2:30pm time slot to go to the bank (55.9%) versus participants in the control condition (30.8%; χ^2 (1, $N = 419$) = 26.60, $p < .001$, $\varphi = .25$). See Table 1.

Clearly, in real life, a person's circumstances will provide constraints on when they can perform such errands. But in this experimental context, where such constraints were explicitly said not to apply to the available time slots, we see that encouraging participants to perspective-take improves their choices. The perspective taking manipulation seems not only to lead participants to choose a better coordinated option, but to do so specifically because they were thinking more about the preferences and behaviors of other individuals and thinking less about themselves and their own preferences. Participants in the perspective taking condition indicated that they focused significantly more on the behavior of other bank

Table 1: Percentage of participants choosing each time slot to go to the bank (Experiment 2a).

	Control condition	Perspective-taking condition
9:00–9:15	50.7%	33.7%
12:00–12:15	11.8%	6.7%
2:30–2:45	30.8%	55.8%
4:45–5:00	6.6%	3.8%

customers when selecting their time ($M = 6.17$, $SD = 1.38$) compared to the control condition ($M = 5.39$, $SD = 1.96$; $t(370.82) = -4.68$, $p < .001$, $d = .47$, equal variances not assumed). Further, perspective taking participants reported focusing significantly less on their own constraints ($M = 4.66$, $SD = 1.96$) than control participants ($M = 5.34$, $SD = 1.72$; $t(405.47) = 3.73$, $p < .001$, $d = .37$, equal variances not assumed), and also focusing less on the bank ($M = 4.39$, $SD = 1.93$) than participants in the control condition ($M = 4.85$, $SD = 1.80$; $t(412) = 2.48$, $p = .01$, $d = .25$). This suggests that the manipulation did guide participants to think more about others' choices and less about their own preferences. The fact that they report thinking of themselves less also suggests that the way they approached the choice changed, since the perspective taking manipulation does not suggest whether, or in what way, their thoughts about themselves should change.

A potential critique of Experiment 2a is that it does not allow one to tease apart whether the reminder led participants to perspective-take or to simply put more effort into coordinating (though the self-reported reasons certainly point to perspective taking as a driver of the difference between conditions). In Experiment 2b we added a third condition to help tease apart whether this improvement in coordination is a result of considering the motivations of others or merely an increased awareness of peak congestion times or deeper thought about the task. We expected that explicit encouragement to try to coordinate would be helpful, but without accounting for *why* others would act as they do, participants encouraged to coordinate would still be less likely to choose an optimal time than would participants encouraged to perspective take.

3.3   Experiment 2b Method

3.3.1   Participants

Three hundred four adults participated via Mechanical Turk, receiving $.30 in exchange.

3.3.2   Procedure

Participants were randomly assigned to one of three conditions and were all shown the bank scenario from Experiment 2a. In the *perspective taking* condition, participants were given

a reminder that even more explicitly encouraged them to perspective-take:

> To give yourself the best chance of getting in and out of the bank on time, you should consider what other people going to the bank may be thinking and planning. Why might people go to the bank at particular times, or be less likely to go during others? As you make your choice, think about why people might go to the bank during various times during the day, so that you are most likely to pick a time that works best for you.

In the *coordination only* condition, participants were instead reminded:

> To give yourself the best chance of getting in and out of the bank on time, you should consider which times to go to the bank will be most and least congested. Why might certain times be very busy while other times are less busy? As you make your choice, think about when you might be more or less likely to have to stand in a long line, so that you are most likely to pick a time that works best for you.

Participants then saw the same four blocks of time as in Experiment 2a during which they could run this errand. *Control, perspective taking,* and *coordination only* participants all chose the one block in which they would opt to go to the bank. Finally, serving as both a manipulation check and a further test of a shift towards thinking of other people and their motivations, participants indicated whose constraints they were most focused on when choosing their time slot, on a scale from *1 = entirely on my own constraints* to *7 = entirely on other people's constraints*.

3.4   Experiment 2b Results

If encouraging people to perspective-take uniquely enables them to coordinate with others, then we should find that those participants who were reminded to think about other people's motivations are more likely to choose the 2:30pm time slot relative not only to participants who received no reminder at all but also those who were more explicitly encouraged to coordinate. As expected, the selected time slots significantly differed across the three conditions, χ^2 (6, N = 304) = 13.25, p = .04, φ = .21. Like before, participants in the perspective taking condition were significantly more likely (55.0%) than the control condition (35.6%) to choose the 2:30pm time slot ($\chi^2(1,N=201)$ = 6.84, p = .009, φ = .18). Further, participants in the perspective taking condition were marginally more likely to choose the midafternoon time slot than those in the coordination only condition (41.7%; $\chi^2(1,N=203)$ = 3.06, p = .08, φ = .12). However, the coordination only condition and the control condition did not significantly differ from each other ($\chi^2(1,N=204)$ = 0.56, p = .45, φ = .05). This pattern of results suggests that the reminder to anticipate what other people think and do, rather than a reminder only to try to carefully coordinate or avoid congestion,

TABLE 2: Percentage of participants choosing each time slot to go to the bank (Experiment 2b).

	Control condition	Coordination only condition	Perspective taking condition
9:00–9:15	47.5%	42.7%	39.0%
12:00–12:15	12.9%	9.7%	6.0%
2:30–2:45	35.6%	41.7%	55.0%
4:45–5:00	4.0%	5.8%	0.0%

is more likely to help people optimize outcomes in situations where they share motivations to act with other people. See Table 2.

Our measure of participants' focus bolsters this account and also suggests that the control, perspective taking, and coordination only reminders had different effects on whether our participants chose the 'ideal' time slot ($F(2,301) = 4.06$, $p = .02$, $\eta_p^2 = .030$). Perspective taking participants reported focusing significantly more on others' constraints ($M = 4.60$, $SD = 1.91$) than participants in the control condition ($M = 3.78$, $SD = 1.98$; $t(198) = 2.96$, $p = .003$, $d = .42$), and marginally more than those in the coordination only condition ($M = 4.09$, $SD = 2.08$; $t(200) = 1.81$, $p = .07$, $d = .25$). As before, the control and coordination only conditions did not differ ($t(202) = 1.07$, $p = .28$, $d = .15$). This suggests that the manipulation did in fact lead perspective taking participants to focus more on the motivations of others when selecting their time slot and to a greater extent than a mere reminder to more carefully coordinate with the other bank patrons, despite the fact that both manipulations should in their own way prompt participants to anticipate the likely actions of others.

3.5   Discussion

In Experiments 2a and 2b, a controlled coordination problem again suggested that encouraging decision makers to consider how and why other people might act helped them to better anticipate others' choices, and thus avoid them, in order to maximize their own choices. This occurred even when there was a more objectively "correct" answer than in Experiment 1, which participants in a separate pretest recognized as least busy (and therefore best), and even though all participants knew that they were trying to get in and out quickly and avoid a long line. Experiment 2b further demonstrates that decision makers are more able to avoid others and maximize their own outcomes when specifically encouraged to consider others' motivations, above and beyond what they are able to do with a simple reminder to try to better coordinate with others. In addition, these studies provide support for the idea that, on their own, people do not necessarily adequately consider others' plans and motivations when trying to coordinate with them. Without specific encouragement to consider others' thoughts, people may recognize that the bank might be busy, but not *why* it might be busy — and it is the latter, the *why*, that is most helpful when one is trying to successfully coordinate

with others. It appears that in situations when others might have the same reasons for acting as they do, people are generally able to anticipate what others are likely to do in a way that is helpful to them, but they often require prompting to do so. The experiments so far suggest that people's default mode is to overweight their own preferences and constraints when scheduling and to underweight (or even ignore) the preferences and constraints of other people they might need to schedule around, leading to suboptimal outcomes.

A simple reminder to consider other people's motivations can improve outcomes by making people more inclined to think about how others may behave (especially in ways similar to themselves) and incorporate that information into their decisions. This means it is likely that poor coordination in our control conditions is due less to participants holding inaccurate beliefs about others' motivations, and more due to participants failing to give those beliefs appropriate weight in the first place. After all, the participants in Experiments 2a and 2b do shift to the time slot rated as least busy when they are prompted to perspective-take; they do not appear to shift at random. However, these experiments used a context that had the benefit of eliminating constraints on participants' time, but the drawback of making it somewhat artificial and less commonly encountered in modern life. Experiments 3a and 3b have participants make the same judgments about crowded contexts that they are more likely to have recently experienced in day-to-day life. Further, the shift to relying more on shared motivations suggests that if something especially notable and inherent to their current context would prompt people to consider others' thoughts and actions, active encouragement to consider others may be less effective or necessary. While both possibilities speak more to the underlying process in these coordination problems, the latter also addresses a potential boundary condition, which we further test in Experiment 4.

4   Experiments 3a and 3b: Shopping, streaming, and thinking of others

Experiments 3a and 3b serve several purposes. First is simply to demonstrate that people may still need explicit reminders to coordinate even when they are highly familiar with a context (although there are exceptions, as we will show in Experiment 4). Second, we aim to show that people who receive a reminder to perspective-take report thinking more about the likely behavior of others even when not specifically asked about it, which consequently improves coordination. Third, we test whether a subtle reminder to perspective-take can be as effective at changing behavior as the more standard message to perspective-take we have used thus far. A more subtle perspective taking instruction would help support the idea that people who perspective-take do approach the task differently rather than simply respond to instruction about what to think about, and would have the benefit of being easier to execute outside the lab.

In Experiment 3a, undergraduates considered when to go to a campus store that is busier during certain times of day, either with or without encouragement to consider others'

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perspectives. After deciding when they were most likely to go to the campus market, participants responded to an open-ended question about the reason for their preference. We expected that participants who were encouraged to think about others' motives and behavior would be more likely to choose to go to the market during a less busy time. Further, we anticipated that participants who reported thinking about the constraints of others (vs. only thinking about themselves) would be more likely to choose a less busy time of day to go to the market. In Experiment 3b, participants contemplated a different congestion scenario: online streaming. Participants considered when, during a busy day, they would schedule a time to watch their favorite show on Netflix, with the understanding that watching during heavy streaming times might result in reduced image quality.[1] There were two versions of a perspective taking reminder, including a subtler one that supplied only the general category of thoughts we would like them to consider, rather than information about the potential content of those thoughts. We predicted that participants who were encouraged to consider others' motivations, even when given less explicit instruction about what to focus on and think about, would be more likely to schedule the less busy time to watch the show than participants who did not receive a reminder.

4.1   Experiment 3a Method

4.1.1   Participants

Three hundred sixty undergraduates at a large West Coast university participated in exchange for credit in marketing classes. One participant indicated that they did not read the questions and that we should not include their results, and thus they were excluded from analysis; if nothing else, we appreciate his/her honesty.

4.1.2   Procedure

To start, participants in both conditions were asked to:

> Imagine that you have a very busy day in front of you. As you plan out the day ahead, you need to schedule a time to go to the [student center] and grab a few items from [the] Market. There are only a couple of times in the day that will work, given your other obligations, and you really want to be in and out of the market in 10 minutes or less.

Half of the participants were randomly assigned to the *perspective taking* condition, in which participants were reminded:

> To give yourself the best chance of getting in and out of [the] Market quickly, you should consider what other people going to the market may be thinking and

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[1]This study was run near the start of the COVID-19 pandemic when streaming services were actively reducing image quality to account for heavy streaming traffic in some places, and many people reported watching streaming video during the day and while they were working (Sykes Enterprises, 2021).

planning. Why might people be more likely to go to [the] Market at particular times, or be less likely to go during others? As you plan the best time to go to [the] Market, think about why people might go there at a certain time, so that you are most likely to pick a time that works best for you.

In the *control* condition, this reminder text was omitted. Participants were informed that the two times that best fit their schedule that day were 12:00pm and 2:00pm. Participants were asked which of these two times they would be more likely to choose for their trip to the market, on a scale from *1 = definitely leaning toward 12 pm* to *6 = definitely leaning toward 2 pm.* Importantly, the market is located in the university student center and becomes very busy during lunchtime (around 12:00pm).

Participants then indicated the reason for their decision by responding to a question with a blank text box: "In the space below, please describe in a sentence or two why you would choose to go to [the] Market at the time you were leaning toward and what considerations you took into account when choosing the best time to go." A research assistant who was blind to condition and hypothesis coded participants' stated reasons for their preference according to one of three themes: (1) the main reason given was about the self (e.g., "I have class," "I like doing things as early as possible so that I can go home early," "I will have more time to sleep in"); (2) the main reason given was about others (e.g., "other people will be eating lunch then," "crowded," "To avoid the lunch crowd"); (3) N/A (e.g., text was not related to the question or was left blank). The few reasons that seemed equally about self and others were recoded as being about the self, to be conservative. In the control condition, 4.4% of responses were coded as "N/A," and in the perspective taking condition, 3.9% of participant responses were coded as "N/A." Finally, participants reported their demographics and were thanked for their participation.

4.2   Experiment 3a Results

As predicted, participants encouraged to think about the thoughts and motivations of others leaned significantly more toward going to the market at 2:00pm (after the lunch crowd had subsided) versus 12:00pm, ($M = 4.65,$ $SD = 1.92$), compared to participants who were not given this reminder ($M = 3.93,$ $SD = 2.17$; $t(351.12) = 3.34$, $p < .001$, $d = .35$; equal variances not assumed).

Participants' reasons for preferring a certain time varied between conditions ($\chi^2(2,N=359) = 38.59$, $p < .001$, $\varphi = .33$). Specifically, perspective taking participants were significantly more likely to report considering the behaviors of others when choosing a time (67.8%) than were participants in the control condition (35.6%; $\chi^2(1,N=360) = 37.42$, $p < .001$, $\varphi = .32$). See Table 3.

We can also examine whether this tendency to report considering others predicts whether participants shift toward the less crowded time. We collapsed the mostly-about-self and N/A categories together, so that the reasons were coded as either mostly about others (1) or

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TABLE 3: Percentage of participants indicating each type of reason for going to the market when they chose (Experiment 3a).

	Control condition	Perspective-taking condition
Mostly about "self"	60.0%	28.3%
Mostly about "others"	35.6%	67.8%
N/A	4.4%	3.9%

not (0). Indeed, consistent with our proposed account, we found that the perspective taking manipulation predicted participants' reported reasons ($\beta = 1.34$, $z = 6.00$, $p < .001$), as well as their preference for a time to visit the market ($\beta = .72$, $z = 3.35$, $p = .001$). Further, the reasons mediator significantly predicted participants' time preference ($\beta = 1.92$, $z = 9.38$, $p < .001$), and the direct effect of the manipulation became nonsignificant ($\beta = .10$, $z = .51$, $p = .61$). A Sobel test, which we used due to the dichotomous mediator, was also significant ($z = 5.05$, $p < .001$).

4.3   Experiment 3b Method

4.3.1   Participants

Five hundred ninety-nine adults participated via Mechanical Turk, receiving $.20 in exchange. This study was preregistered at (https://aspredicted.org/blind.php?x=9bc3e9).

4.3.2   Procedure

To begin, participants were asked to consider a day working from home during the COVID-19 pandemic in April 2020 (when the majority of the world was under lockdown and asked to stay at home) in which they had a number of prior commitments. Specifically, participants read:

> Imagine that a new season of your favorite show just came out on Netflix and you want to schedule a time to watch it tomorrow. You also have a number of work commitments and activities that you need to get done now that you're working from home, but you want to be sure to *reserve a half-hour to watch the show.*

> Depending on the time of day and the demand for internet service, Netflix (and other streaming services) has been *reducing its image quality to reduce bandwidth usage, so you want to carefully consider which time to watch.*

In the *standard perspective taking* condition, participants were then reminded:

> To give yourself the best chance of watching the show with high image quality, you should consider what other people watching Netflix may be thinking and

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planning. Why might people be more, or less, likely to watch TV at particular times? As you make your choice, *think about why people might watch TV during certain times of the day* so that you are most likely to pick a time that works best for you.

In the *simple perspective taking* condition, participants were instead reminded:

Before choosing a time, take a moment to *put yourself in the shoes of other people who may be planning to watch Netflix tomorrow and consider their perspectives and motivations when making your choice.*

In the *control* condition, participants went straight from the scenario to the choice of times.

There were two time windows that participants had free in which to schedule a time to watch the show: 3:00pm and 8:00pm. Participants indicated which of the two times they would be more likely to reserve to watch their show on a scale ranging from *1 = definitely leaning toward 3 pm* to *6 = definitely leaning toward 8 pm.*

Participants then advanced to the next page and indicated what they were most focused on when choosing their time to watch. Specifically, they were asked, Participants then advanced to the next page and indicated what they were most focused on when choosing their time to watch. Specifically, they were asked,

When choosing a time, you might have been *thinking mostly about what works best for you*, or you might have been *thinking about others and when they might choose to watch*. Using the scale below, please indicate whether you were *focused mostly on yourself or focused mostly on others* when choosing a time.

They responded on a scale ranging from *1 = I was focused mostly on myself* to *7 = I was focused mostly on others*. Finally, participants reported their demographics.

4.4   Experiment 3b Results

We expected that providing people with a reminder to perspective-take would lead them to consider which time other people would be more likely to watch Netflix and, as a result, be more likely to lean toward the afternoon time slot (3:00pm), when there is less demand. Participants' preferred time did significantly differ across the three conditions, $(F(2,596) = 20.29$, $p < .001$, $\eta_p^2 = .06)$. As preregistered, a post-hoc Tukey HSD (honestly significant differences) test revealed that, relative to participants who did not receive a perspective taking reminder ($M = 4.45$, $SD = 1.82$), both participants who received the simple perspective taking reminder ($M = 3.77$, $SD = 1.99$) and participants who received the standard perspective taking reminder ($M = 3.23$, $SD = 1.96$) were more likely to lean toward watching the show at 3:00pm ($ps \leq .001$). Participants who received the standard reminder were also more likely to lean toward 3:00pm than those who received the simple

reminder ($p = .015$). These results suggest that although the standard perspective taking reminder shifted choice even more than the simple perspective taking reminder, the simple reminder was enough to significantly influence participants' decisions and improve their coordination relative to participants who did not receive any reminder at all.

It further appears that both perspective taking manipulations influenced participants' choices by shifting their focus away from themselves and onto others. When scheduling a time to watch, whether participants were most focused on themselves or others varied significantly across conditions ($F(2,596) = 18.74$, $p < .001$, $\eta_p^2 = .06$). A post-hoc Tukey HSD test revealed that participants who did not receive a perspective taking reminder ($M = 2.94$, $SD = 2.13$) were significantly more focused on themselves compared to participants who received the simple perspective taking reminder ($M = 3.47$, $SD = 2.24$) and the standard perspective taking reminder ($M = 4.28$, $SD = 2.24$; ps = .04 and < .001). Participants who received the standard perspective taking reminder were also more focused on others than participants who received the simple perspective taking reminder ($p < .001$). This pattern of results suggests that both standard and simple perspective taking reminders did what they were designed to do: they encouraged participants to first consider the perspectives of others (vs. simply focusing on themselves) before choosing a time to schedule watching their Netflix show.

In an exploratory analysis, we tested whether improved coordination in the simple perspective taking condition was driven by a shift from a self-focused to an other-focused perspective, as has been the case for the standard perspective taking manipulation in our other studies. A mediation analysis with 1000 bootstrapped samples (PROCESS model 4; Hayes, 2013) with condition (simple perspective taking reminder vs. control) as the independent variable, self- or other-focus as the mediator, and the preference for when to watch as the dependent variable yielded mediation via self- or other-focus (95% CI [−.40,−.05]). See Figure 2.

4.5   Discussion

Experiments 3a and 3b again demonstrate that nudging people to consider when and why others may choose to go somewhere or use a service can smooth congestion by encouraging them to choose a time that is likely less crowded. More importantly, Experiments 3a and 3b provide more direct evidence that the reason *why* participants in the perspective taking condition selected a different time is that they were more likely to consider the perspectives, constraints, and motivations of other people first and then adjust their own behavior accordingly. Further, Experiment 3b demonstrates that a subtler nudge can also successfully encourage perspective taking.

The previous studies suggest that coordination in congested contexts can be especially improved not just by having people consider other people's motivations but, in particular, by having people consider the motivations of others that match their own. It appears that, at least in part, common coordination failures occur because people do not immediately
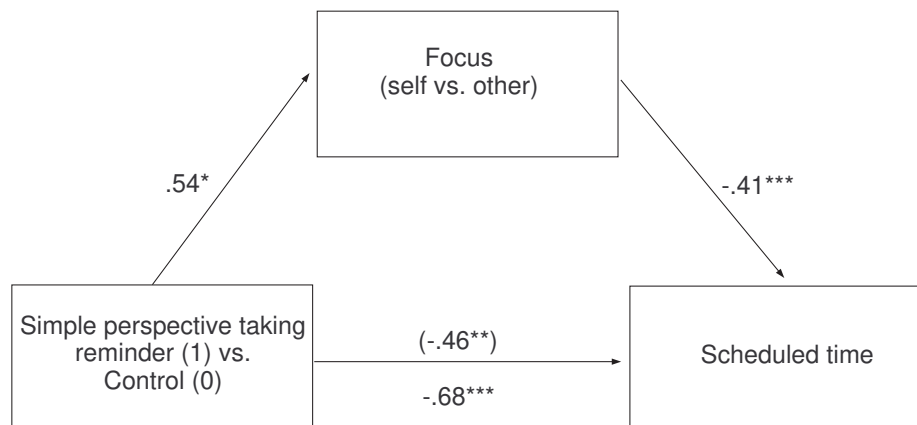
FIGURE 2: Focus on self versus others mediated the effect of experimental condition on time chosen to watch (Experiment 3b). Note: The path coefficients are unstandardized betas. Value in parentheses indicates the effect of condition on the dependent variable after controlling for the mediator. $^{+}p<.10$, $^{*}p<.05$, $^{**}p<.01$, $^{***}p<.001$.

recognize or consider that others often have the same reasons for acting that they themselves have. However, there are certain situations when overlapping motivations are inherently obvious, and perspective taking — and thus coordination — could occur without prompting. Experiment 4 examines one such situation, to suggest a boundary condition on the power of encouraging perspective taking to improve coordination.

5   Experiment 4: A long weekend

Imagine this familiar winter occurrence: the local meteorologist forecasts a blizzard in the next couple of days, and suddenly there are long lines at the grocery store and bare shelves where milk, bread, and bottled water are normally stocked. That many people will be trying to stock up on basic groceries in preparation to hunker down is an obvious and inherent consequence of an impending storm, and it takes little prompting to understand and consider other people's motivations for going to the grocery store. This means that people can, if not optimally coordinate with others, at least plan appropriately for the lengthy waits and competition for staples that are sure to arise from the upcoming storm. In Experiment 4, we use a similarly obvious occasion — a national holiday — to show that there are indeed some such situations where people naturally consider others, and their motivations, and thus are able to coordinate without prompting. Participants imagined deciding how to spend a long weekend during which they planned to go to the beach (an activity that requires coordination to avoid overcrowding at peak times). Half the participants considered a long weekend in which Friday was July 11th, a regular workday that they happened to have off, whereas other participants considered a long weekend in which Friday was July 4th, a national holiday on which many people would have off and would treat as a vacation. We expected to find that

encouraging the July 11th participants to consider others' motivations and behaviors would make them more likely to choose Friday for their beach trip, when most people would have a regular workday, whereas this prompting would have no effect on the July 4th participants, for whom others' reasons to go to the beach that day would be obvious.

5.1   Method

5.1.1   Participants

Four hundred and ten adults participated via Amazon's Mechanical Turk system, receiving $.20 in exchange.

5.1.2   Procedure

Participants imagined that they had an upcoming Friday off from work, so that they had a three-day weekend. In all conditions, they were to imagine that:

> You and your family are planning to make good use of your long weekend to both be productive and have a little fun. After some discussion, you've come up with three activities you want to make sure you do over the weekend, one for each day:

> --You want to get some minor repairs and deep cleaning done around the house, to get the place in tip top shape.

> --You want to use your grill for the first time this summer, and so you would like to have a barbecue and hang out on your patio.

> --You want to drive to a nearby beach, to go swimming and play in the sand, and relax by the water.

> Think about how you might plan your long weekend, and which activities you would schedule for each day. Keep in mind that you can only do one per day, so you'll have to plan in advance what to do when.

They then indicated on which of the three days — Friday, Saturday, or Sunday — they would choose to do each activity. Before they made their choices, participants in the *perspective taking* conditions also read instructions that told them:

> . . . to give yourself the best chance of enjoying your time at the beach, you should consider which days to go to the beach will be most and least popular. Why might people go to the beach on particular days, or be less likely to go on others? Think about whether and why people would go to the beach on various days as you make your choice, so that you are most likely to pick a time when it's not too crowded.

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Importantly, participants completed this survey on June 26th and 27th. Thus, for half the participants, the weekend in the scenario was the following weekend, so that Friday was July 4th, Saturday July 5th, and Sunday July 6th (i.e., the week after they completed the study, so that the meaning of the date was top-of-mind, and they would know that it was a national holiday and that most other people would also have that Friday off); for the other half, the weekend in consideration was the weekend after that, so that Friday was July 11th, Saturday July 12th, and Sunday July 13th (so that they would know that it was a regular weekend and that most other people would not have that Friday off).

5.2   Results

The reminder to think about why people might go to the beach on a certain day had different effects depending on which weekend participants were considering. Participants deciding when to go to the beach July 4th weekend were equally (un)likely to choose Friday, whether they were reminded to consider others (7.8%) or not (6.7%; $\chi^2(1,N=207) = .08$, $p = .77$, $\varphi = .02$). It appears that it is so obvious that the beach would be crowded on the holiday that it discouraged people from choosing that day, regardless of whether or not they were reminded to perspective-take. However, participants deciding when to go to the beach on the July 11th weekend were more likely to choose Friday for the beach day when they were asked to consider when other people would go to the beach (35.3%) than when they did not receive the perspective taking reminder (19.8%; $\chi^2(1,N=203) = 6.10$, $p = .01$, $\varphi = .17$). On this non-holiday weekend, the manipulation appears to have encouraged them to choose to go to the beach on a typical workday, when others would be less likely to go. A non-parametric analysis of this pattern is necessary because few people chose to go to the beach on July 4th in either condition (a Doornik-Hansen test rejects the normality of the data in both the control and reminder conditions ($\chi^2(2) = 678.28$ and 3667.02, respectively; both ps < .001); it reveals a significant interaction ($\chi^2(1,N = 410) = 23.14$, $p < .001$, $\varphi = .24$). See Figure 3. The perspective taking reminder seems to have an influence only when it is not inherently apparent what other people might choose. Indeed, the reminder had no impact on the decision to go to the beach on a day when others' motives and behaviors were glaringly obvious.

5.3   Discussion

Perspective taking reminders could improve coordination either because people have incorrect assumptions about others' motives and the reminders help them rethink their beliefs, or because they underweight their correct assumptions and the reminders help them incorporate this knowledge. The results of Experiment 4 suggest that under typical circumstances, people may not adequately consider others' motivations, and thus a perspective taking reminder encourages them to do so, improving coordination and outcomes for all. However, contexts that naturally offer reminders — like inherently crowded holidays, or an impending
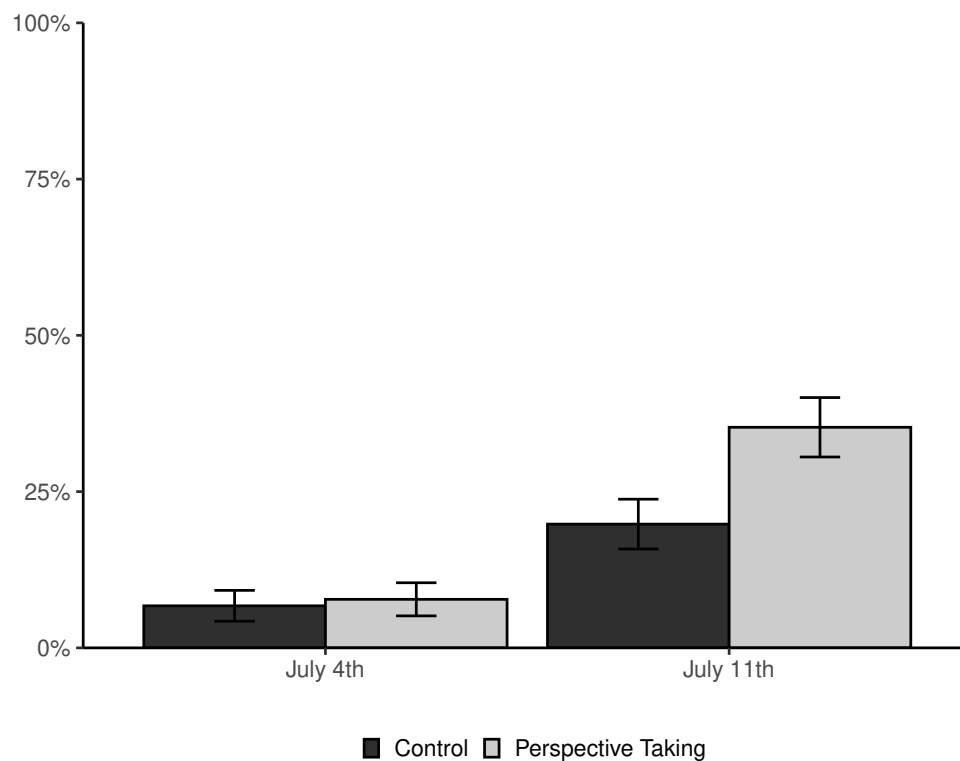
FIGURE 3: Percentage of participants choosing to go to the beach on Friday (Experiment 4). Error bars reflect standard error of proportions.

winter storm — seem to prompt people to perspective-take on their own. The data for the July 4th conditions suggests that the typical participant's preference is to go to the beach on a less crowded day. The prompt to take others' perspectives helped participants in the July 11th conditions choose a day more aligned with their preferences. This result is consistent with recent work suggesting that coordination in pairs on novel communication tasks can be improved without prompting when the pairs operate with constrained options and shared information (e.g., Sulik & Lupyan, 2018). Certain everyday situations seem likely to prompt this kind of perspective taking as well. For example, one may or may not contemplate why a guest showed up to an event a few minutes late, but may be very likely to try to understand why a guest would never show up at all. Likewise, gift recipients underweight why a gift giver chose an appealing gift, at least relative to the giver's expectations; however, when the gift in question is especially unappealing, its inaptness prompts recipients to consider why (in the world) it might have been chosen (Zhang & Epley, 2012). Here, we show that occasions that are especially well known for coordination issues, like going to the beach on a national holiday when many people have the day off, seem to prompt the same kind of automatic perspective taking.

6   General discussion

Across six experiments, we show that coordination can be improved, and congestion reduced, by encouraging people to consider what others are thinking and why they are thinking it. We propose that perspective taking reminders encourage people to choose alternative, but still appropriate, options. Further, such reminders can be effective even for some of the most challenging types of coordination problems: namely, those situations in which people en masse are unable to directly communicate with each other and for which the best solution is to understand what others are doing in order to do something different. Our results suggest that congestion in such situations is not caused by the difficulty or inaccuracy of perspective taking, but by people inadequately taking others' perspectives into consideration in the first place. What is notable about our findings is not that our participants are more likely to perspective-take and then coordinate when they are told to do so; it is that they are not more likely to perspective-take and then coordinate *unless* they are told to do so.

In Experiment 1, a field experiment with real monetary consequences for lack of coordination, a reminder to consider why others might choose particular time slots in a lottery to participate in an exciting and financially incentivized experiment made participants choose times they were more likely to win. Experiments 2a and 2b conceptually replicated this effect and provided evidence that such reminders appear to change behavior by leading participants to consider others' thoughts and motivations more, and their own less. Further, Experiment 2b demonstrates that reminders to perspective-take aid coordination above and beyond direct instruction to try to coordinate. Experiments 3a and 3b demonstrate that prompts to take other people's perspectives predict how heavily participants weight others in their decisions, and thus how well they coordinate with them, even when the instruction to perspective-take is subtle and their stated reasons for choosing were generated spontaneously. Finally, Experiment 4 suggests that the perspective taking reminder works because people do not automatically consider others' perspectives enough, except under certain circumstances in which others' behavior is inherently obvious.

Our findings build on research in other fields, including game theory and negotiation, to provide a simple way for individuals to ameliorate many coordination problems. We investigated coordination without communication, with no particular focal point, with no counterparts with whom to negotiate or synchronize, and where successful coordination results from a mismatch of behavior — quite a coordination challenge. Surprisingly, while this is among the first empirical examinations of this form of coordination, such situations may be even more common in everyday contexts than many of the stylized coordination games classically studied in the economics and management literatures. Indeed, the type of coordination problem we studied here occurs on a daily basis across a range of domains, including traffic, utility use, customer service and experience, social media marketing, vacation planning, entertainment satisfaction, sales and promotion effectiveness, the use of office and work space, and more.

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Many businesses rely on properly coordinated employees and customers to maximize efficiency and appeal, and avoid waste and frustration. It is critical for managers to ensure that people can get what they want and need without interfering with others' abilities to do so as well. Our studies are just a first step — although they are set in familiar contexts like banks, streaming video, and local shops, most were simplified situations that allowed us to most cleanly test our theory. Fortunately, researchers who investigate people's thoughts about and perceptions of other people are well-suited to examine this important type of coordination more deeply and to uncover the best methods to achieve the goal of reduced crowding and improved coordination for all.

Of course, we do not wish to suggest that perspective taking is always necessary or will solve all coordination problems. Study 4, for instance, shows that when the situation already prompts perspective taking because others' thoughts and motivations are inherently salient and obvious, being instructed to perspective-take is less effective, and likely unnecessary. How effective perspective taking is at improving coordination could also vary based on features of the decision maker, the person whose perspective is being taken, or the decision context. For one, if people have inaccurate ideas about what others are likely to do, perspective taking may lead them astray. Individuals at times infer greater differences between themselves and others than truly exist, for instance (e.g., Gershoff & Burson, 2011; Hoch, 1987), and it is possible that people might over-compensate and mismatch to the wrong option if they assume similar others are actually dissimilar. Conversely, if people are trying to anticipate what highly dissimilar others are likely to do, they might underestimate how similar their motivations are and mismatch for the opposite reason, as they regress to the mean from the other direction. Or if perspective taking prompts people to think cynically about others (e.g., Epley et al., 2006; Ratner & Miller, 2001), they may dig in their heels to act consistently with their own preferences or even try to sabotage the competition, rather than work around it. At times, perspective taking can even backfire and lead to less understanding and worse outcomes when one tries to take the perspective of someone perceived as a threat to the self (Sassenrath, Hodges & Pfattheicher, 2016). People tend to assume that others make choices because they want the chosen option, not because they are trying to avoid the unchosen options, even if avoidance underlies their own, similar choices (Miller & Nelson, 2002). If people misinterpret others' motivations in this way, they may find themselves choosing a less crowded but otherwise unpleasant option if they try to mismatch others' choices.

Further, features of the perspective taker should affect whether such an intervention is helpful. There is a great deal of variation between people in terms of how prone they are to take others' perspectives (e.g., Davis, 1980); people on the extreme ends of the scale may be less influenced by manipulations like ours, as people who are especially disinclined to perspective-take are unmoved by encouragement to consider others' thoughts, and those at the top end of the scale were likely already doing it anyway, so encouragement may not matter much. Perspective taking is most likely to be effective when an individual has

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different constraints than others (as in the bank scenario in Experiments 2a-b), or when there are few others actively perspective taking. As such, we suggest that our intervention is most suited to be an individual-level intervention, not something to apply to entire groups at once. Too many people attempting to anticipate others' behavior can lead to different but equally suboptimal outcomes, as in Keynesian beauty contests (e.g., Camerer et al., 2003). But it bears noting that the reason why our work is surprising is that the constraints and motivations in these scenarios are both easily foreseeable and avoidable, as they are commonly experienced. Thus, it should not be difficult to 1) understand what those constraints and motivations are, and 2) adjust for them. Despite this, many of our participants required reminders in order to do so. The irony here is that participants' own motives and those of their competition are routinely the same and thus quite easy to intuit, and yet participants do not take them into account enough, to their detriment, unless explicitly instructed to do so.

6.1   Extensions, implications, and future directions

In most of our studies, we used direct instructions to think about what other people might do and why, as direct instruction to perspective-take is the typical approach used in past research on perspective taking. For example, in work by Epley et al. (2006) examining the effect of perspective taking on egocentrism, participants were told: "Please take a minute to think about the other groups. As you can imagine, they may have different priorities than you do and are likely to view this situation from a different perspective. Thinking about the other groups, what amount will each of them indicate is fair for them to harvest?" Our reminder to consider other perspectives was similarly simple and effective. An explicit reminder may not always be a practical approach to encouraging such consideration, however. Therefore, investigating other approaches that can produce the same effect, and understanding when it might be necessary to implement them, would be useful future directions for research. Experiment 4 suggested one possibility, that some occasions so obviously involve coordinating with, or avoiding, other people that a reminder is unnecessary. The COVID-19 pandemic is another example where the reason to avoid crowds and crowding (such as at the grocery store or other places where one might encounter many people) was so obvious and so obviously shared that people were more likely than usual to consider what other people might be thinking and why before acting.

As another example, a follow-up study reported in the Web Appendix suggests that direct instruction is not the only approach that might work to induce perspective taking and increase coordination; rather than remind people that their perspectives might be different from others, one option might be to simply nudge people to think of the motivations that they share with others. For other scenarios, perhaps familiarity or expertise could provide another remedy. People who have first-hand experience with a situation are better able to anticipate how that situation would affect other people and are less likely to draw dispositional inferences about others' behavior (Balcetis & Dunning, 2008). In this way,

driving in your hometown, you are likely to anticipate the effects of rush hour on traffic and account for them, whereas it may be less likely to occur to you to consider rush hour's impact on traffic while driving on vacation. Likewise, a bank teller is likely to have more insight into the most and least popular times to go to a bank and has a better chance at choosing a well-coordinated time when they themselves need to run that errand. In the opposite vein, surprise might also have similar effects. Surprising events prompt sense-making (e.g., Wilson et al., 2005), and sense-making of this sort often involves consideration of other people's motives (e.g., Zhang & Epley, 2012). As such, a coordination task that involves a domain or situation that is unexpected or completely out of one's realm of experience may encourage more careful thought about when and why people might act. For example, perhaps when purchasing a membership at a new yoga studio, a person may take special care to ask which classes are most popular so that they can be sure to arrive early enough to get a spot.

Drawing attention to shared motivations might also be a worthwhile tactic for businesses. If customers do end up failing to coordinate properly, and, say, call a customer service center at a particularly busy time, they are likely to receive notification that the company is "experiencing heavy call volume," without an explanation as to why. Encouraging callers to think about the specific circumstances that may have motivated customers to call and thus led to that heavy volume, or supplying those circumstances themselves, might help reduce frustration and improve customer coordination. Similarly, services like Google Maps now report common busy times at restaurants, shops, and other businesses. It might be even more effective to smooth out business if in addition to when it is likely to be busy, such services suggested or nudged people to think about why they might be busy at those times.[2] The same logic might apply to stock outs, peak energy hours, and the like. Sometimes popularity is a sign of or even a contributor to quality; other times, it is a precursor to decline in quality, as each additional consumer spreads limited resources ever thinner. To that end, if all customers are given the same reminder and then proceed to follow it, congestion might form around a new time or location. Optimizing this issue might require supplying a random set of reminders to customers, or different types of reminders to different people, analogous to how the navigation app Waze might need to reroute some travelers to one route and others to another, to avoid creating a new jam along their suggested alternate route. Unfortunately, the solution to this optimization problem is beyond the scope of this project, but we hope our research has given managers, marketers, designers, and policy makers tools to solve it in the future.

People often have the same motivations and desires as others, but fail to recognize it, leading to coordination failures that could be easily foreseen and avoided. Our research shows that, although people do not necessarily take others' thoughts, feelings, and behavior into account, they can and will if encouraged to do so. When people think about what others think, they can coordinate even if they do not communicate, and everyone benefits.

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