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ABSTRACT

FOCAL SOCIAL ACTORS AND TACIT COORDINATION

by Christopher R. Chartier

Tacit coordination is a fundamental task for interdependent social actors. Everyday examples include negotiating rush hour traffic, working collaboratively on a group project, conversing smoothly, and meeting friends for lunch. Previous research (Schelling, 1960; Mehta, Starmer & Sugden, 1994) has focused extensively on differences between behavioral options that aid in small group coordination. Highly salient options are referred to as structural focal points, and are popular choices for actors. The current work presents a new type of focal point based on differences between social actors in a coordination problem. The focal social actor effect is hypothesized to occur when one group member is more salient than others, and actors correspond to behavioral options in a clear way. Three Experiments explored and ultimately supported this hypothesis. In Experiment 1, social information about group members was manipulated such that one group member was unique. Furthermore, players were identified by color. In a subsequent coordination game, players were more likely to select an option sharing an identifying color with the unique group member than an option corresponding to a common player. In Experiment 2, actors and options corresponded through slight payoff differences between group members across different behavioral options. Once again, players were more likely to select the option corresponding to the unique player. In Experiment 3, uniqueness was manipulated orthogonally to intragroup status by virtue of bogus feedback on a leadership questionnaire. The focal social actor served as a coordination cue, as players were more likely to select the option corresponding to the unique player. The focal social actor cue was found to be effective even in the presence of the previously established status cue for coordination (de Kwaadsteniet & van Dijk, 2010). Focal social actors serve as strong coordination aids for small groups, and may help explain portions of previously published tacit coordination findings.

FOCAL SOCIAL ACTORS AND TACIT COORDINATION

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Introduction

Coordination tasks are relatively easy to navigate if parties communicate about potential solutions to the problem they face (Cooper, DeJong, Forsythe & Ross, 1992). Tacit coordination, in the absence of communication, can be substantially more difficult. This lack of communication may arise because interacting parties are unable to communicate, unwilling to communicate, or think that communication is unnecessary. Cell phone batteries run out at inopportune times, such as when trying to reconnect with a family member who has become lost at an amusement park. When negotiating rush hour traffic, one cannot call all other commuters to see which roadway they will be using. When meeting a partner for lunch, one may believe that the meeting point is obvious and assumed by both parties. Whatever the reason for not communicating in a coordination problem, the result is a fascinating and often challenging social decision making task. The current research investigates a new type of coordination cue that small groups may use to coordinate more effectively in the absence of communication. While much research has focused on how the behavioral options available to interacting parties influence coordination performance, the current work focuses on how differences between the interacting parties themselves may aid in tacit coordination.

Early research on tacit coordination focused on what are called “pure” coordination games. Pure coordination games are marked by perfect correspondence between the interests of all parties involved. Players must choose among a fixed set of decision alternatives, all of which are equal in terms of value. A distinction between matching and mismatching coordination problems has been proposed (Abele & Stasser, 2008). In a matching game, players benefit to the extent that they coordinate by choosing the same decision alternative (meeting for lunch). In a mismatching game players succeed to the extent that they can choose different options, effectively distributing themselves across decision alternatives (cleaning different rooms of a house). The formal structure of a pure coordination game provides no basis by which players can distinguish between decision alternatives. Since there is no conflict, all parties are equally satisfied with coordination on any of the available options. In game theoretic terms, this means that all options are pure-strategy Nash equilibria (Nash, 1950). Specifically, each player’s best response is always to choose the same options others choose, in a matching game and any option others have not chosen in a mismatching game. Therefore, a game-theoretic analysis concludes

that groups will perform no better than would be expected from purely chance responding (von Neumann & Morgenstern, 1947). Intuition suggests that this is unlikely to be the case though. Thomas Schelling (1960) explored this intuition in his now classic book *The Strategy of Conflict*. He suggested that players of pure coordination games are likely to do far better than chance when the labels of decision alternatives lead to differential salience among them, an issue which is outside the purview of game theory. Schelling ran a series of informal studies, in which groups had to match their responses to problems such as naming any positive number (of which 1 was most commonly listed) and selecting a meeting place in New York City (Grand Central Station was popular). His players performed quite well at these games and he attributed their success to differential salience among possible response labels (1 is more salient than 2). This salience can arise from prominence, conspicuousness or uniqueness on the part of a decision alternative. He referred to the most salient or common response as a focal point, a term and concept that is still central to the study of tacit coordination. Focal points derived from salience differences between the response options have been termed structural focal points (Abele, Stasser & Chartier, *revise and resubmit*).

Mehta, Starmer and Sugden (1994) studied Schelling's predictions in a controlled experiment and confirmed that options in matching games differ in terms of their salience and that certain options, focal points, are more likely to be coordinated upon. A common example used to describe the process of tacit coordination is attempting to meet a group of friends for lunch without the aid of cellular phones. If one were trying to identify a structural focal point for this problem, they would look to traits of the possible meeting places. Perhaps there is a restaurant in a very prominent location in town; at the corner of Main and 1st. Alternatively, there may be only one restaurant with an all-you-can-eat buffet in town. Such options could serve as focal points and potentially enhance the coordination success of the group of friends. This perspective makes the conceptual leap that options in coordination games do in fact differ, and that these differences matter. It fails however to extend such logic to those playing the game, continuing to treat them as interchangeable and indistinguishable for the purposes of behavioral predictions.

An important step forward in our understanding of how players' traits may impact tacit coordination decisions was taken when the categorization of problems into matching and

mismatching coordination was recognized as an important distinction for identification of focal points (Abele & Stasser, 2008). They argued that a matching focal point can occur simply due to one option's popularity, as seen in Mehta and colleagues work (1994); however salience differences among options do not define a mismatching focal point. For example, if Bill and Ted want to meet for lunch, the fact that people often go to Chipotle makes it a focal point for meeting. However, if Bill and Ted are trying to avoid each other, the knowledge that people often go to Chipotle only suggests that the players should avoid it. However, if both players do so, they are more likely to meet at a different restaurant. Thus, Chipotle's popularity does not define a focal point for mismatching. In a similar way, social knowledge that identifies a focal point for matching typically does not identify a focal point for mismatching. Belonging to the same social category might, for instance, serve as sufficient social knowledge to define a focal point for matching. If you ask two Americans to match each other's choice of a city, they may quickly respond, "Washington." In other words, shared characteristics define matching focal points—salient solutions to a matching coordination problem. In contrast, distinguishing social characteristics may define mismatching focal points. For instance, if an American and a German are asked to mismatch each other's choice of a capital city, an obvious solution is for the American to respond, "Washington," and the German to respond, "Berlin." Thus, social differentiation—in the foregoing case, different citizenships—is the social knowledge that identifies a focal point for mismatching. Put differently, there can be no structural focal point in a mismatching task.

More recent work has begun to directly test the usefulness of these focal points of a more social nature. For example, explicitly providing dyads with a single piece of social information that is directly relevant to the task at hand improves coordination (de Kwaadsteniet, Homan, van Dijk & van Beest, 2011). Same sex dyads asked to match their selections between the color pink or the color blue do so relatively well when each partners' gender is revealed immediately before decisions are made. Social focal point theory (SFPT) more fully develops the underpinnings of this phenomenon, and suggests that when facing a coordination problem, social actors search their store of knowledge about those they are interacting with for any social cues that may assist in the coordination task (Abele, Stasser, & Chartier, *revise and resubmit*). First they identify a relevant social trait, and then establish the social category membership on that trait for each

actor. Note that trait is used in the most general sense; it may include traditional personality traits, behavioral tendencies and preferences. The store of possible relevant traits may include information provided in the immediate context of the task, but if the dyads know each other well, it is likely to include many possible traits. To fully understand the use and effectiveness of this social information one must consider two key factors: the standing of each dyad member on the relevant trait and the specific coordination task requirement. Specifically, whether the dyad is similar or different on the relevant trait, and whether the task requires coordination by matching or mismatching (Abele & Stasser, 2008). The coordinating parties' standing on the relevant construct must map on to the coordination requirement in order to promote coordination efficiency. Being the same on the relevant trait facilitates matching but not mismatching. Conversely, being different on a relevant trait facilitates mismatching but not matching.

These social focal points are effectively used not only in ad hoc dyads, but also by romantic couples, who are better than strangers at matching problems, but not mismatching problems, since they are much more likely to encounter a social focal point in matching problems due to their similarity to each other (Chartier & Abele, *under review*). These studies add to the work on structural focal points by suggesting that social factors may help create obvious solutions. We can return to the example of a group of friends meeting for lunch to illustrate the added power of considering social focal points. Perhaps no restaurant in town stands out or is salient in its own right. Therefore there is no structural focal point. The group may still successfully meet though, if they all prefer one restaurant over the other options, and they are all aware of this mutual preference. In this situation it is the shared trait and the shared knowledge of that trait which leads to coordination success.

The purpose of the current work is to push the focus on social focal points even further by focusing more directly on social actors as possible coordination cues. The FSA hypothesis is based on the general premise that coordinating parties *themselves* can serve as a type of focal point in a situations requiring coordination. That is, they can suggest a mutually agreed upon solution to a coordination problem in much the same way highly salient decision alternatives do. Two necessary and sufficient conditions for FSA to aid small group tacit coordination performance are proposed. First, a player must be highly salient to the coordinating parties. This salience can arise from prominence, conspicuousness or uniqueness, in the same ways a

choice alternative can become salient (Schelling, 1960). The only left-handed group member is unique, the mayor of a town is prominent, and the friend who is always wearing a tuxedo is conspicuous. Second, the behavioral options available to the coordinating parties must correspond to the players themselves in a mutually agreed upon way. This correspondence may also arise in many ways. It could be purely superficial, as when a possible meeting point shares the same first letter as a group member's name. Alternatively, it could derive from preference differences between group members for differing response options. Perhaps each group member has a favorite hangout which could serve as a meeting point. It is proposed that when a player does become focal, and that player is associated with a particular option, this can act as a cue to players suggesting how they can successfully coordinate. It is important to note that this impact is predicted to occur when the decision alternatives themselves provide no such cue and contain no strong focal point in the absence of a FSA. In this way, the FSA effect stands apart from theories of focal points established in the past and would contribute to our understanding of how small groups can tacitly coordinate their actions in otherwise ambiguous situations. We can once again revisit our hungry group of friends to illustrate this concept. If no restaurant stands out in its own right, there is no structural focal point to aid in coordination. Furthermore, if the group members don't share or are unaware of a common dining preference, then the current formulation of social focal point theory would predict that they would have difficulty meeting up. A FSA may help though. If it is Steve's birthday, he will likely be very salient to the group members. If his favorite restaurant is the Steak Ranch, there is an option that corresponds to Steve. It is likely that the group would coordinate by meeting at the Steak Ranch. Here a FSA leads to successful coordination not predicted by structural or social focal points. The current work will focus on matching tasks, which receive the majority of attention, especially in behavioral economics (Camerer, 2003). The correspondence between actors and options appears much more directly likely in matching tasks. The possibility of these principles extending to mismatching tasks is discussed later.

Focal Social Actors in Previous Tacit Coordination Research?

There is reason to suspect that FSA have served as coordination aids in previous studies, which focused on different phenomena. Many studies which are primarily interested in tacit coordination use an interesting experimental game call the battle of the sexes (BOS). The BOS

game, shown in Table 1, has been of interest to coordination researchers because, much like a pure coordination game, its formal structure provides no cue as to how the parties can coordinate their actions (Luce & Raiffa, 1957). The game is based on a stereotypical story where a husband and wife must agree on a date night activity without communication. The wife would enjoy going to the ballet, while the husband would enjoy attending a baseball game. Above all though, they both want to spend the evening together. The introduction of an element of conflict, which is not present in a pure coordination game, also enables researchers to assess the extent to which different manipulations confer a benefit on one player over others in the process of improving coordination. This detail of the game also inherently fulfills one of the proposed necessary conditions of the FSA effect, in that there is a very clear way in which players and options correspond. Each player's preferred option, the one which results in them receiving a higher payoff, is likely to be seen as "belonging" to or being associated with that player. One could argue then that the only missing ingredient for the FSA effect to occur is differential salience among players and have identified instances where this has occurred. Many interesting studies fall under the general umbrella of changing subtle factors regarding the players or the play of this game to improve coordination success (e.g. Cooper, DeJong, Forsythe & Ross, 1990; Amaldoss, Bettman & Payne, 2008). While each of these studies provides its own explanation for why a particular manipulation aids in coordination, it is proposed that several share a common thread which may explain a substantial portion of their effect on behavior. Specifically, they fulfill the first proposed requirement of the FSA effect; they create a focal *player*. Six studies have been identified and will be briefly summarized, which may have been impacted by the FSA effect. This is almost certainly not an exhaustive list however, given the popularity of the BOS and games like it for tacit coordination research.

Perhaps the most directly relevant approach for improving coordination in the BOS was demonstrated by de Kwaadsteniet and van Dijk's (2010) study on status as a coordination cue. In their first study, dyad members were randomly assigned the role of either the boss or employee in a work dyad. They then had to choose to meet at one of two train stations for a hypothetical work trip. One of the stations was said to be near the boss's house, and the other near the employee's house. Dyads performed very well, with most coordinating by meeting at the train station close to the boss's house. They explained this effect as a result of deference to

high status social actors. There is also a focal social actor; the boss who was most prominent in the dyad. There is also clear actor-option correspondence of a rather superficial variety; that of proximity between the stations and the members' homes. Subsequent coordination success was achieved by selecting the option that corresponded to the FSA, just as predicted in the current work. In Study 2, they had players take a leadership survey prior to playing a BOS game and then gave false feedback indicating that one player had scored highly and was therefore of high status while the other was of low status. Not surprisingly, coordination under these circumstances was better than without such feedback. Also, the increase in coordination was due to players matching on the high status player's preferred option. The authors concluded that a norm of giving high status people what they want led both players to understand that the high status player's preferred option should be selected. This status manipulation also affects the salience of both players by making one more prominent than the other. High status players may serve as FSA. Also, since a BOS game involves a clear correspondence between players and outcomes, this cue can be used to coordinate.

Another example of the potential impact of FSA has until now been explained using forward induction logic. Forward induction suggests that our behaviors within, or even before, coordination games can communicate or suggest our intentions to other players. These other players then behave in accordance with these indicated intentions. In their initial test of this phenomenon, Cooper, DeJong, Forsythe and Ross (1993) presented participants with a two-person BOS game. One player was given the option to either play the game, or opt out and accept a moderate, but certain payoff. For instance, using the BOS matrix shown in Table 1, one player would be given the option of forgoing play and instead receiving a guaranteed payoff of 1.5 for both players. They found that players who were given this opportunity, but decided instead to play the BOS game, were more likely to select their preferred option. Interestingly, their counterparts were also more likely to select the option preferred by the player who was given the outside option. The logic of forward induction suggests that by passing on a smaller, yet certain, payoff than they could achieve by successfully coordinating on their preferred option, they had communicated their intention to fare better in the game proper. After all, why else would they have chosen to play? Dyads in this situation performed well, by coordination on the option preferred by the player who passed on the outside option. This initial study seemed to

support forward induction logic, but a follow-up study which offered one player a small certain payoff, .5 each in our example, found very similar effects. Even passing up a clearly inferior outside option aided coordination and benefited the player given this option. This is not in line with forward induction logic, as passing on such a small payoff communicates nothing about one's intentions in the subsequent game, and instead suggests that offering the outside option has its impact through a different mechanism. Again, the FSA effect can provide an explanation for at least part of this effect. Offering one player an option while giving no such option to the other player likely makes the former player more salient and therefore focal. This would be the case whether the outside option is small, moderate, large, or even completely unrelated to the game. Since the BOS game was used, actor-option correspondence is fulfilled. Coordination success increases when a player receives an outside option, due to an increased frequency of participants selecting the FSA's preferred option.

Varying the timing of decisions has also been studied as a coordination aid in several coordination games and mixed motive games with a coordination element. Even pseudo-sequential play, where players decide sequentially, but players receive no feedback as to how earlier players decided, increases coordination success. Furthermore, the consistent finding is that first movers have an advantage in such situations, typically receiving higher payoffs. Rapoport (1997) implemented pseudo-sequential play in a three person version of the BOS game. He found a strong timing effect such that most group members selected the option which gave the first mover the higher payoff. A similar effect has been found in resource dilemma games. Budescu, Au & Chen (1997) studied behavior in a pseudo-sequential resource dilemma game, with a set pool of resources that players could draw from. Players receive payoffs equal to their requested draws from the resource as long as they do not collectively overdraw from the resource. If however, total requests exceed the resource pool, players receive no payoff. Players moved sequentially, but did not learn the requests of earlier players. They found that first takers of the resource drew larger quantities than later players. Timing makes one player focal, by giving them the first, most prominent, position in the decision order. In both games, the actors also correspond to options through payoff differences. Finally, coordination is enhanced, specifically through the selection of options preferred by the focal actor. Rapoport (1997) also reported a timing effect in a step-level public good game. This game was quite similar to the

resource dilemma game but involved contributions to as opposed to withdrawals from a communal resource. Players moved pseudo-sequentially and committed to contribute an amount from a personal endowment to a public account. If the collective contributions exceeded a certain amount, the group would earn a large bonus, otherwise they would earn nothing. A timing effect was once again detected. First movers consistently contributed less than later movers. Timing improved the coordination of reaching the bonus earning amount, and benefitted the first movers, again in line with the FSA effect.

Weber, Camerer and Knez (2004) designed an excellent experiment to test an explanation for the first mover effect based on the concept of “virtual observability” of moves. They argued that when decisions are made pseudo-sequentially, players act as if moves are observable and make specific predictions about what earlier players have done. Later players behave as if the first mover has publicly selected their preferred option, and recognizing this, first movers are indeed likely to do just that. Weber and colleagues saw the fact that an option could be associated with the highly salient first mover as a “confound” in earlier timing effect studies. So, they used a weak link coordination game, where options do not correspond to players, but behavior could still be impacted by perceived observability of earlier moves. In their game, shown in Table 2, there are safer options and somewhat riskier options. One’s outcome is jointly determined by their selection of a number between 1 and 7 and the selection of their partner between 1 and 7. The game is structured such that, one always hopes to have chosen the smaller number within the dyad, but simultaneously for both selected numbers to be as high as possible. To select the highest number (7), one must trust that another player will also select a high number, preferably 7 as well. They found that under pseudo-sequential timing, both first and second movers were more likely to select the higher paying, riskier options, strongly supporting the virtual observability explanation. Abele, Bless and Erhart (2004), found a similar effect and showed that players view the behavior of others as more predictable when under the pseudo-sequential protocol, while simultaneous protocols are perceived as unpredictable and similar to games of chance. Both of these studies show that there is a true timing effect that cannot be attributed to the FSA effect. However, the effect in Weber et al.’s (2004) study was substantially smaller than in the previously discussed timing studies which did include actor-option correspondence. This suggests that the FSA effect had a sizeable impact on behavior in

the six studies reviewed here that fulfilled both pre-conditions that are hypothesized as necessary for a FSA to serve as a coordination cue.

In summary there is suggestive support for the FSA effect in previous work on tacit coordination. Status differentials in a dyad aids in a pure coordination game by suggesting that dyad members meet at a location associated with the higher status member. Status differentials in dyads also aids in a BOS coordination game by suggesting members select the option where the high status member receives a higher payoff. Providing an outside option in a BOS game aids in coordination by suggesting that members select the option where the player who passed on the outside option receives a higher payoff. Pseudo-sequential play leads to better coordination and a first mover advantage in three player BOS games, resource dilemma games, and step-level public good games. Finally, while there is clearly a portion of the timing effect in coordination games that is not attributable to the FSA effect, when the actor-option correspondence precondition is removed, coordination suffers and the timing effect is diminished.

Overview of Experiments

All three of the present experiments start with the goal of creating one FSA within an interacting group. It is proposed that actors may become focal through prominence, conspicuousness or uniqueness, just as options can become focal, but the proposed experiments will use only uniqueness to create focal players. It is important to show that differential salience among players can have an impact independent of any changes to status or deference given to one player. Since direct manipulation of prominence or conspicuousness, perhaps by explicitly stating that one player is special in some way, may simultaneously create subtle status differences, such manipulations will be avoided. This also means that the use of three player groups is necessitated. In order to manipulate uniqueness, one player must be able to stand apart from others. In a dyad, uniqueness changes for both players in unison, but this is not the case for three person groups. The impact of FSA should not be limited to three person groups or to FSA created through uniqueness, but this structure provides the cleanest design for our initial tests of the FSA effect. Additionally, the present experiments used pseudo groups as opposed to truly interacting groups. This method allowed for more precise experimental control of the primary variables of interest. Since natural rates of participant responding were not relied on to achieve

the different experimental conditions, balanced cell sizes were ensured and the necessary number of participants in each experiment to adequately investigate our predictions was minimized.

In Experiment 1, uniqueness was created through feedback on an innocuous preference question. This feedback was manipulated to ensure one unique member in all pseudo groups. Players were also identified by color and then subsequently asked to coordinate by all selecting the same color car (which aligned with player colors) out of three options. It is predicted that unique players would be more likely to select the car which shared their identifying color than common players would be. Overall, it is predicted that the option sharing the unique player's color would be chosen more frequently than if the FSA were not used as a coordination cue. Experiment 2 extended the basic FSA effect by using a different type of actor-option correspondence. Instead of superficial (color) similarities, correspondence was created through options with small payoff differences between players. These differences dictated that for each option, one player received slightly more or less money than the other two players, who received identical payoffs, in the case of successful coordination. It is once again predicted that unique players will select their corresponding option (that which gives them a different payoff than the other two players) more often than common players, and that the unique player's corresponding option will be preferred overall by all players. Experiment 3 tested the FSA effect more strongly by introducing an orthogonal manipulation of status in addition to the uniqueness manipulation. Players filled out a leadership questionnaire and were given random feedback that they scored either high or low. Groups were constructed such that each contained a unique member on the questionnaire; either two high scores and one low score or one high score and two low scores. It is predicted that even against the backdrop of social status, unique players would select their corresponding option (that which gave them a different payoff than the other two players) more often than common players, and that the unique player's corresponding option would be preferred overall by all players.

Experiment 1

Experiment 1 served as a first test of the idea that a focal player can aid coordination in a three person group. In all groups, a focal player was created by manipulating social information given to participants to ensure that one player was unique on a particular status-neutral social

trait. Participants then played a pure coordination matching game with three options corresponding to each player based on an identifying color.

Method

Participants and Design

Participants were 38 Miami University undergraduate psychology students, drawn from the department's research pool. They were recruited and signed up for participation through the Sona online system. Only one variable was manipulated in this experiment: the number of group members who shared a social trait in common with the participant. Participants were randomly assigned to one of two uniqueness conditions: self-unique and other-unique.

Procedure

Participants came to room 245 of the Psychology building and were seated in individual cubicles to prevent the possibility of communication between participants. All materials were administered and all data were collected via Medialab, a computer program for basic experimental data collection. Participants first provided written consent and then answered demographic questions.

They then answered four activity preference questions. These questions asked participants to indicate their preference between indoor or outdoor sports as a form of exercise, attending an arts or a sports event as a form of entertainment, studying in the library or in their dorm/apartment, and going to the bars uptown or going to the movies on a Saturday night. These items were pretested using our participant population and responses fall roughly equally between the two options. Participants were then told that they had been randomly assigned to groups of three. For identification purposes, each player was assigned a color (Red, Blue or Green). In this and the subsequent experiments, player color was randomized, although it is not anticipated to impact the decisions of participants or our general pattern of results. One activity question was randomly chosen and participants were given feedback about their own and their other group members' responses. We manipulated the information they then receive about the other "members" of their group. Those in the self-unique condition were told that the other two members of their group differed from them on the activity preference question, thereby making them the unique group member. Those in the other-unique condition were told that one of the other members responded the same as they did, while another responded differently, making

another group member unique.

Following the social uniqueness procedure, participants were instructed on and subsequently played a pure coordination matching game with three decision alternatives. Players were shown, and asked to match by choosing between, three pictures of cars. Each picture showed a Ford Focus. They differed only in color, with a red, blue, and green car pictured. They read that in order for the group to be successful, all players must choose the same car. If they fail to do so, they fail at the task, and receive no payoff. Players saw the payoffs shown in Table 3 while making their selections. The rules of the game, and accompanying payoff table, dictate that no player has a preferred option and there is no conflict of interest between players imposed by the formal structure of the game. Players were then asked five comprehension questions to ensure full understanding of the game and the composition of their groups. Since groups were not actually playing, all participants received \$5 at the end of the experiment. They were thanked for their participation, paid and debriefed as to the full nature of the study.

Results & Discussion

Three participants were removed from subsequent analyses for responding incorrectly to two or more of the comprehension questions, indicating that they did not attend to or did not understand the instructions for the coordination game. First analyzed was the frequency with which participants selected the option corresponding to themselves (the car which shared their identifying color) or one of the options corresponding to another group member across both uniqueness conditions. A chi-square test of independence revealed that there were indeed differences in frequencies between the self-unique and other-unique conditions, $\chi^2(1, N = 35) = 5.04, p = .02, \phi = .38$. In the self-unique condition, 61% (11 out of 18) of participants selected the option corresponding to themselves, while only 24% (4 out of 17) of participants in the other-unique condition did (see Table 4 for response frequencies). This pattern provides promising initial support for the hypothesis that the FSA serves as a coordination cue.

Next analyzed was the frequency with which participants selected either the unique player's corresponding option or a common players' corresponding option, both overall and across uniqueness conditions. Overall, there was a tendency to select the option corresponding to the unique group member, with 51% (18 out of 35) of participants doing so. This is significantly more than would be expected (33%) if the FSA was not used as a coordination cue,

$\chi^2(1, N = 35) = 4.45, p = .03, \phi = .36$. This pattern was not moderated by uniqueness condition, which suggests that FSA were impactful whether the participant was the FSA or another group member was (see Table 5 for response frequencies). This overall pattern fully supports our predictions regarding FSA. In this experiment, FSA were created through uniqueness on a single trait. Actors and options corresponded through identifying color. These conditions led to the predicted tendency to select the unique player's corresponding option. At least with these particular manipulations of a FSA and actor-option correspondence, the FSA effect serves as a coordination cue.

Experiment 2

The purpose of Experiment 2 was to extend the FSA effect to situations where action-option correspondence is derived from preference differences. A focal player was created as in Experiment 1, but the coordination games used included a small element of conflict, so that options corresponded to group members through small payoff differences. One of our games was a three person version of the BOS. It is predicted that the option which gives the FSA a higher payoff will be selected more frequently than the other options. This prediction leads to the general question, of whether the presence of a focal player not only improves coordination generally, but also that it is beneficial to be the focal player. This was the case in each of the studies reviewed earlier, and would be if our predicted pattern in the BOS holds. Our analysis leads to no such prediction of general benefit to FSA however, and it is entirely possible given our theoretical foundation that if options corresponded to players in a different way, being focal could instead be detrimental to the focal player. To that end the impact of creating a focal player on coordination success in a game very similar to a volunteer's dilemma, where one and only one player must sacrifice and accept a lower payoff in order for the group to successfully coordinate is also investigated (Diekmann, 1985). This game will be the reverse of the three person BOS, and will be called the VOL game. This allows us to directly test the impact of an FSA created through preference differences, while removing the necessity of the FSA effect conferring a benefit on the focal player.

Method

Participants and Design

Participants were 90 Miami University undergraduate psychology students, drawn from

the department's research pool. They were recruited and signed up for participation through the Sona online system. The design was a 2 (uniqueness: self-unique or other unique) X 2 (game: BOS or VOL) between subjects factorial design.

Procedure

Participants came to room 245 of the Psychology building and were seated in individual cubicles to prevent the possibility of communication between participants. All data was collected via Medialab. Participants first provided written consent and then answered demographic questions.

Participants then answered the same four preference questions used in Experiment 1. They were once again assigned an identifying color and received feedback about one preference question. The information they then received about the other "members" of their group was manipulated. Those in the self-unique condition were told that the other two members of their group differed from them on the activity preference question, thereby making them the unique group member. Those in the other-unique condition were told that one of the other members responded the same as they did, while another responded differently, making another group member unique.

Participants then read the rules of their decision making task. For half of the participants this was a three person version of the BOS game. They read that all three players in the group must choose the same option for anyone in the group to receive a payoff. If they succeeded in matching on the same option, players would earn the payoffs associated with the matched upon option. These payoffs are shown in Table 6, which players saw before making their decisions. For example, if the Red and Blue players select A, while the Green player selects B, players would not receive any payoff. If the Red, Blue and Green players all choose option A, the Red player would earn \$5, the Blue player would earn \$6 and the Green player would earn \$5.

The other half of participants played the VOL game, a reversed version of the three person BOS game. It is shown in Table 7. All values were inverted from the BOS. This created a situation where instead of one player getting their preference for each successful pattern of responses, one player must instead take a lower payoff than the other two. This game requires one, and only one, "volunteer" for a group to receive any payoff. It is therefore referred to as the VOL game.

Participants answered five comprehension questions, and then made their selection for the game simultaneously. Since there were once again no actual other players, all participants were given the payoff associated with their selection had the group been successful in matching on that option. Specifically, if a participant chose another player's preferred option in the BOS game, they received \$5. If they chose their own preferred option in the BOS game they received \$6. Participants were then thanked, paid and debriefed as to the full nature of the study.

Results & Discussion

Eight participants were removed from subsequent analyses for responding incorrectly to two or more of the comprehension questions, indicating that they did not attend to or did not understand the instructions for the coordination game. First analyzed was the frequency with which participants selected their own corresponding option (the option yielding them the differing payoff) or one of the options corresponding to another group member across both uniqueness and game conditions. A chi-square test of independence revealed that there were differences in the frequencies between the self-unique and other-unique conditions, $\chi^2(1, N = 82) = 6.64, p < .01, \phi = .28$. In the self-unique condition, 50% (19 out of 38) of participants selected the option corresponding to themselves, while only 23% (10 out of 44) of participants in the other-unique condition did (see Table 8, for response frequencies). There were no differences across the game conditions, which descriptively had very similar response frequencies. This pattern once again supports the hypothesis that the FSA serves as a coordination cue.

Next analyzed was the frequency with which participants selected either the unique player's corresponding option or a common players' corresponding option, both overall and across uniqueness and game conditions. Overall, there was a strong tendency to select the option corresponding to the unique group member, with 49% (40 out of 82) of participants doing so. This is significantly more than would be expected (33%) if the focal social actor was not used as a coordination cue, $\chi^2(1, N = 82) = 8.81, p < .01, \phi = .33$. This pattern was not moderated by uniqueness condition, which suggests that FSA were impactful whether the participant was the FSA or another group member was (see Table 9 for response frequencies), and descriptively, there is very little difference across conditions. There were no differences across game condition, which again had very similar results descriptively. This overall tendency further supports our predictions regarding FSA, and is very similar to the pattern found in Experiment 1.

Furthermore, it shows that actor-option correspondence can be created through subtle preference differences. This correspondence was equally effective whether it singled out a player to receive more or less than other players. The FSA effect served as a coordination cue, but the FSA did not universally benefit from their standing as the FSA. This is important, because it strongly supports our claim that FSA are effective simply because they suggest a coordination solution, and not because they lead to any deference to or preferential treatment of the FSA.

Experiment 3

The purpose of Experiment 3 was to eliminate the potential alternative explanation that focal players created through social uniqueness are effective for coordination due to changes in status. It could possibly be argued that unique players are focal due to a general perception of higher standing in the group. Furthermore, Experiment 3 will investigate whether the status effect found by de Kwaadsteniet and van Dijk (2010) is simply one specific instance of the more general phenomenon of FSA, or truly driven by status per se. To this end, social status and social uniqueness will be manipulated orthogonally. Note that de Kwaadsteniet and van Dijk (2010) used dyads. It could be argued that in a dyad the higher status individual will naturally be more prominent and thus be focal. In order to allow for the possibility of a lower status individual becoming the focal player though, three person groups will be used. This allows for the potential that a low status player becomes salient by being unique on this social trait.

Method

Participants and Design

Participants were 77 Miami University undergraduate psychology students, drawn from the department's research pool. They were recruited and signed up for participation through the Sona online system. The design was a 2 (participant status: high or low) X 2 (uniqueness: self-unique or other-unique) between subjects factorial design.

Procedure

The procedure was very similar to that used in Experiments 1 and 2, however instead of answering an activity preference question, participants filled out the 26 item Management Assessment Inventory (MAI) used by de Kwaadsteniet and van Dijk (2010) on a five point scale from strongly agree to strongly disagree (Appendix). In order to create the experimental conditions, participants were randomly assigned to receive bogus feedback that they were either

of high or low status by virtue of being above or below the median score for college students on the MAI. Feedback was given following a one minute period during which the computer program purportedly scored the questionnaire.

Status was then used to manipulate uniqueness much in the same way as in Experiments 1 and 2. Participants were told that they had been randomly assigned to groups of three with each player identified by color. The information they received about the other “members” of their group was then manipulated. Participants were randomly assigned to one of two uniqueness conditions. Those in the self-unique condition were told that the other two members of their group differed from them in terms of status. Those in the other-unique condition were told that one of the other members was of the same status as them, while the other differed (see Table 10 for all feedback patterns). Participants then read instructions for, answered five comprehension questions about, and played the three person BOS game that was used in Experiment 2. They were then thanked for their participation, paid and debriefed.

Results & Discussion

Seven participants were removed from subsequent analyses for responding incorrectly to two or more of the comprehension questions, indicating that they did not attend to or did not understand the instructions for the coordination game. First analyzed was the frequency with which participants selected their own preferred option (the option yielding them the higher payoff) or one of the options preferred by another group member across both uniqueness and status conditions. A chi-square test of independence revealed that there were indeed differences in frequencies between conditions, $\chi^2(3, N = 70) = 24.48, p < .001, \phi = .59$. Next investigated was the possible effect of uniqueness, collapsing across status conditions, and found a significant difference in response frequencies, $\chi^2(1, N = 70) = 17.16, p < .001, \phi = .50$. In the self-unique condition, 67% (24 out of 36) of participants selected the option corresponding to themselves, while only 18% (6 out of 34) of participants in the other-unique condition did (see Table 11 for response frequencies). The possible effect of status was then investigated, collapsing across uniqueness conditions, and once again found a significant difference in response frequencies, $\chi^2(1, N = 70) = 5.52, p = .02, \phi = .28$. In the high status condition, 58% (19 out of 33) of participants selected the option corresponding to themselves, while only 30% (11 out of 37) of participants in the low status condition did. While both factors clearly impacted response

frequencies, it is important to point out that the effect size for the uniqueness effect is nearly twice as large as that for the status effect. Therefore, both cues seem to have been used, but the FSA effect was much stronger than the status effect, given these particular manipulations.

Next analyzed was the frequency with which participants selected either the unique player's preference or a common players' preference, both overall and across uniqueness and status conditions. Overall, there was a strong tendency to select the option corresponding to the unique group member, with 67% (47 out of 70) of participants doing so (see Table 12 for response frequencies). This is significantly more than would be expected (33%) if the FSA was not used as a coordination cue, $\chi^2(1, N = 70) = 36.01, p < .001, \phi = .72$. There was no significant difference across either uniqueness or status conditions. This overall tendency further supports our predictions regarding FSA, and is very similar to the pattern found in Experiments 1 and 2. Also analyzed was the frequency with which participants selected a high status player's preference or a low status player's preference. Overall there was a strong tendency to select an option associated with a high status player, with 69% (48 out of 70) of participants doing so. This is significantly more than the 49% that would be expected (the distribution of participants across status conditions lead to 49% of all players being labeled high status) if status was not used as a coordination cue, $\chi^2(1, N = 70) = 11.21, p < .001, \phi = .40$. This analysis shows more clearly that both cues were relied on in our experiment. Again though, the FSA effect was a much stronger cue than status. This experiment extended the creation of a FSA to a more meaningful social trait; status. The changes to the uniqueness procedure actually led to a stronger FSA effect. The effect size for the tendency to select the unique players' corresponding option, our primary variable of interest, was twice as large as in the previous experiments which used a more mundane trait to create FSA (see table 13 for all effect sizes). While these results support and extend the findings of de Kwaadsteniet and van Dijk (2010) to three person groups, they also fully support FSA effect predictions and suggest it is an even stronger coordination cue than player status.

General Discussion

These experiments show the effectiveness of FSA as tacit coordination cues in small groups. Experiment 1 showed that actors who are unique in their group and correspond to a behavioral option through identifying color serve as a helpful focal point. Experiment 2 showed

that this effect extends to instances of actor-option correspondence established through two types of preference differences. Importantly, it held whether the FSA had a most preferred option or least preferred option. Finally, Experiment 3 established that the FSA effect remains strong and helpful even against a backdrop of another quite powerful social cue, in this case status differences among group members. Taken together, this research shows that FSA exert a strong influence on small groups when there is no clear structural or social focal point to guide them. While the magnitude of the FSA effect's contribution to previously published findings is impossible to know, it now seems likely that FSA have had an impact in several situations. Bestowing the first move upon a player or giving one player an option outside of the subsequent game are prime examples (Cooper, DeJong, Forsythe & Ross, 1993; Rapoport, 1997) . Both of these manipulations place an emphasis on one player, making it likely that they served as a FSA. Any manipulation that leads to a differentiation among players could potentially lead to the FSA effect much the same way labeling strategies differently was originally found to lead to structural focal points in the earliest investigations of tacit coordination.

The FSA effect could also have a substantial impact on market entry coordination problems, which are similar to BOS games in that they are a mix of conflict and coordination. In a typical market entry game, the market has a known capacity, and all players would prefer to enter the market if the capacity is not exceeded, but would prefer to stay out of the market if the capacity is exceeded (Sundali, Rapoport, & Seale, 1995). For example, if a small town could support a new coffee shop, but two new coffee shops would be too many, potential entrepreneurs would prefer to open the shop if they do so without competition, but would prefer to invest elsewhere if another group is also opening a coffee shop in town. Here, actors clearly correspond to options. Each potential investment group corresponds to the option in which they open a shop and all others do not. If there is a clear FSA among them, it is likely that the problem will be solved by their opening a shop and others staying out of that particular market. It is easy to imagine in this example Starbucks serving as a FSA in many locations, and therefore entering prime markets while others stay on the sidelines. This example also illustrates the potential for FSA to aid coordination in mismatching tasks, since the same logic applies to any mismatching task where one party must pursue one option while all others pursue another. For example, a group of friends who are embarking on a road trip need one and only one member to

take the time figuring out directions. Here, the most efficient outcome is for one and only one member to take action, while the others do not. A FSA would likely aid in such a task, suggesting that the FSA take the action required of one member while others pursue the other option(s). So, while the FSA effect may provide little help in a typical mismatching task between two behavioral options, it may help when one option can be construed as being distinct from all other options.

The FSA effect has been proposed and tested as a coordination aid in the absence of a structural or task-relevant social focal point. To use an earlier example, it was suggested that a group of friends meeting for dinner would be likely to rely on a FSA if no restaurant stood out as an obvious structural focal point and there was no clearly shared preference in the group for a particular establishment. Real groups are unlikely to encounter such crisply divided coordination problems, however. An open area of possible inquiry is the decision process and coordination performance of groups when plausible focal points of two or even all three types are present within the problem being faced. In the absence of any social information, restaurant A may be the most salient and serve as a structural focal point. Within a group who mostly shares a love of Restaurant B, though, B would likely be salient and serve as a social focal point. Finally, on a particular member's birthday, their favorite restaurant, C, could be highly salient and serve as focal point derived from the FSA effect. It is likely that groups rely to some extent on all of these types of focal points depending on their relative strength and social sharedness. The question of when different types of focal points are utilized deserves more research attention, especially to further clarify behavioral predictions in applied settings that lack the control and sharp organization of extant studies on structural focal points, social focal points, and FSA.

An important question regarding the FSA effect is the stability of the FSA within a group. Is one member consistently focal? It is predicted otherwise, and that the FSA is rather context dependent. The easiest example is that of the group of dinner party friends searching for a gathering place on a member's birthday. It is Steve's birthday today, so he serves as the FSA tonight, but a month from now, on Emily's birthday, she may serve as a FSA for the same group facing a new coordination problem. Similarly, an individual who commonly serves as a FSA in one group, may find herself entirely unremarkable and common in another group and therefore unlikely to serve as an FSA when facing coordination problems with them. This phenomenon

applies equally well to structural focal points, but has never been directly investigated to our knowledge. It could be conceptualized as the figure-ground property of focal points. What is figure and what is ground among focal actors or behavioral options depends on the context of actors or options as well as the idiosyncrasies of the particular viewer of the problem. For example, Grand Central Station consistently serves as a structural focal point in the open-ended matching problem of naming any meeting place in New York City. If however, the problem was naming any meeting place in all of the US, a new focal point may arise, such as the White House in Washington D.C., even though Grand Central Station would still be a perfectly suitable and appropriate solution to the problem.

There is also the issue of incomplete actor-option correspondence within a group. In some problems, there may only be a subset of members who correspond clearly to an option. In the case where the FSA does not correspond to an option, it is predicted that groups will then re-engage in the FSA process and identify the next most focal actor, until one is found who corresponds to an option. It is possible then that a player could serve as a FSA even if they are otherwise the least salient member of the group, simply by being unique in having a clearly corresponding behavioral option for the particular problem being faced. Such a situation could also be thought of instead as a task relevant social focal point, since their preferences is the only preference known by the group. This would therefore suggest a solution without any direct dependence on the FSA effect.

This research is limited in several ways. First, all experiments created focal players through the manipulation of uniqueness among players. Players should theoretically be able to become focal through many different channels. While it is thought that this is the cleanest way to create a FSA, subsequent studies that attempt to manipulate the salience of players through different means, namely prominence or conspicuousness, would establish whether the effects found here are generalizable. Secondly, these experiments provided only a single social trait about fellow group members to participants. Tacit coordination usually occurs against a backdrop of much social information between interacting parties. Thus, subsequent research on the FSA effect should investigate the detection and use of this coordination cue when many possible traits could identify an FSA within a group. Finally, groups were ad hoc and had no history of interaction. The full strength of the FSA effect is likely to manifest itself in long term,

well formed groups. Such groups are likely to have a mutual understanding of focal members within their group; perhaps a manager on a work team. They are also likely to be able to associate behavioral options with the different members of the group by virtue of preferences, expertise, or relevant work experience. It would be worthwhile to demonstrate the impact of focal actors in such well formed groups where all the ingredients of the FSA effect should be present.

The present research contributes to our understanding of how interdependent entities coordinate their actions, a question which has interested social psychologists, economists, and laypersons alike. Until now, we had a more limited grasp on the use of social information as coordination aids. Previous work showed that highly salient response options can serve as coordination cues (Mehta, Starmer & Sugden, 1994). Furthermore, fortuitous alignment of the coordination task demand, matching or mismatching, and group members' standing on a task relevant trait can aid in tacit coordination (Abele, Stasser & Chartier, *revise and resubmit*). What was unclear, but now known, is that under certain circumstances, actors themselves can serve as focal points and aid in small group coordination. This new finding explains another avenue by which we can navigate common social interactions such as collaborative work, volunteering behavior, and traffic negotiation.

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Appendix

1. When I see a solution to a problem, I present it to others as soon as possible.
2. Once I have made a decision, I stick to it.
3. There has to be one leader in a team.
4. I really do not like talking to a big group of people, whom I do not know.
5. Once a group has made a decision, it is not beneficial to later discuss that issue again.
6. I like meeting new people.
7. As a leader you often have to act like a different person than you really are.
8. Punishing rule violators is, in general, an effective way to avoid violations in the future.
9. Whenever I have to make a decision, I first consider all possibilities (and consequences) carefully.
10. A leader has to be, primarily, creative to come up with new solutions.
11. When I am really convinced of something, I know how to convince others.
12. When I am forming a decision, I first consider what the possible reactions of others.
13. I prefer to make difficult decisions on my own.
14. A clear hierarchical differentiation between supervisors and subordinates is essential to success.
15. Creating a good working atmosphere is necessary for a leader, if they wish to achieve successful accomplishment of the tasks that need to be done.
16. I can often sense the mood of others very well.
17. When there is a group member who repeatedly performs poorly, then it is mostly better for the group if that person leaves the group.
18. One always has to fulfill their promises.
19. Freedom to make decisions is an essential precondition for successful leadership.
20. I try to restrict the number of conflicts in a group as much as possible.
21. I am able to deal with complex situations quickly.
22. The bigger the group, the longer it takes to make decisions.
23. A leader has to be able to command respect.
24. When I want to reach a certain goal, I usually achieve it.
25. People who always have doubts annoy me.
26. Leadership is a question of exerting influence on others.

Table 1

Battle of the Sexes Coordination Game

Player	Option	
	A	B
1	2,1	0,0
2	0,0	1,2

Note: Payoffs for Player 1 appear on the left of the comma. Payoffs for Player 2 appear on the right of the comma

Table 2

Weak Link Coordination Game

	Minimum value of X Chosen						
	7	6	5	4	3	2	1
Your choice of X							
7	1.30	1.10	.90	.70	.50	.30	.10
6		1.20	1.00	.80	.60	.40	.20
5			1.10	.90	.70	.50	.30
4				1.00	.80	.60	.40
3					.90	.70	.50
2						.80	.60
1							.70

Table 3

Payoff Table for Experiment 1

Player	Option

Red	5	5	5
Blue	5	5	5
Green	5	5	5

Table 4

Experiment 1 Decision Frequencies: Own Color vs. Other Color

Condition	Decision	
	Own Color	Other Color
Self-unique	11	7
Other-unique	4	13
Total	15	20

Table 5

Experiment 1 Decision Frequencies: Unique Color vs. Common Color

Condition	Decision	
	Unique Color	Common Color
Self-unique	11	7
Other-unique	7	10
Total	18	17

Table 6

BOS Payoff Table for Experiments 2 and 3

Player	Option		
	A	B	C
Red	5	6	5
Blue	6	5	5
Green	5	5	6

Table 7

VOL Payoff Table for Experiment 2

Player	Option		
	A	B	C
Red	6	5	6
Blue	5	6	6
Green	6	6	5

Table 8

Experiment 2 Decision Frequencies: Own Option vs. Other Option

Condition	Game	Decision	
		Own Option	Other Option
Self-unique	BOS	9	10
	VOL	10	9
Other-unique	BOS	4	19
	VOL	6	15
Total		29	53

Table 9

Experiment 2 Decision Frequencies: Unique Option vs. Common Option

Condition	Game	Decision	
		Unique Option	Common Option
Self-unique	BOS	9	10
	VOL	10	9
Other-unique	BOS	12	11
	VOL	9	12
Total		40	42

Table 10

Experiment 3 Feedback Patterns

Condition	Player	Status	
		High	Low
Self-unique	Participant	High	Low
	Other 1	Low	High
	Other 2	Low	High
Other-unique	Participant	High	Low
	Other 1	High	Low
	Other 2	Low	High

Table 11

Experiment 3 Decision Frequencies: Own Option vs. Other Option

Condition	Status	Decision	
		Own Option	Other Option
Self-unique	High	16	2
	Low	8	10
Other-unique	High	3	12
	Low	3	16
Total		30	40

Table 12

Experiment 3 Decision Frequencies: Unique Option vs. Common Option

Condition	Status	Decision	
		Unique Option	Common Option
Self-unique	High	16	2
	Low	8	10
Other-unique	High	8	7
	Low	15	4
Total		47	23

Table 13

Effect Sizes (ϕ) for Primary Analyses from All Experiments

Experiment	Analysis	
	Self Selection Differences	Preference for FSA's
	Across Uniqueness Conditions	Corresponding Option
1	.38	.36
2	.28	.33
3	.50	.72