Speaking From Ignorance: Not Agreeing With Others We Believe Are Correct

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Values-pragmatics theory (Hodges & Geyer, 2006) predicts that people will sometimes disagree with others they believe are correct, for reasons similar to those explaining agreement with incorrect answers in an Asch (1956) situation. In 3 experiments, we found evidence that people in a position of ignorance sometimes do not agree with the correct answers of others in positions of knowledge. Experiments 1a and 1b found this *speaking-from-ignorance* (SFI) effect occurred 27% of the time. Experiment 2 introduced experimental controls and self-report data indicating that the SFI effect (30%) was generated by realizing values (e.g., truth, social solidarity) and pragmatic constraints to act cooperatively, rather than by a wide array of alternatives (e.g., normative pressure, reactance). Experiment 3 experimentally manipulated concern for truthfulness, yielding 49% nonagreeing answers, even though there were monetary incentives to give correct, agreeing answers. The overall pattern suggests that people are not so much conformists or independents as they are cooperative truth tellers under social and moral constraints. Results, while surprising for social influence theories, illustrate the dynamics of divergence and convergence that appear across studies in cultural anthropology and developmental psychology, as well as in social psychology.

Keywords: conformity, divergence, pragmatics, truth, values

We often find ourselves laughing at people who speak from ignorance, especially if they are politicians whose views we find distasteful or celebrities whose reputations we think are overblown. In occasional moments of insight, though, we may realize that we too have talked about a topic about which we knew little or nothing as if we were well informed, all the while showing our ignorance. The question we address in this article is, "What do people do when they are invited to speak from ignorance and they believe they are talking with people who know more about the topic than they themselves?" Suppose, for example, you find yourself in a situation in which other people can see what is going on, while you cannot, but these more knowledgeable others share what they see with you. If you were asked to speak, would you (a) make up your own answer or (b) repeat what others have told you?

Of course, the issue is much broader than just speaking from ignorance. Humans must regularly act from ignorance. For example, an individual is new to farming and does not know what to plant: Should she plant what her more experienced neighbors plant or something different? A tourist visits another culture about which he knows very little: Should he follow the lead of others who are more culturally sophisticated or just wing it? The eminently sensible thing to do, it appears, is to follow the lead of others who know more than we do (D. T. Campbell, 1990). When information is absent or ambiguous for an individual and others provide what is believed to be trustworthy information, the only sensible response seems to be conformity. Being guided by those with expertise is a fundamental tenet of cultural evolution (e.g.,

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Mesoudi, 2009; Richerson & Boyd, 2005). Nearly every theory in social psychology, especially those about social influence, would agree. There are many compelling reasons to do so. Two of the most powerful are believed to be the following: (a) People want to be correct, and the most likely way to be correct in this situation is to agree with others, and (b) people want to be accepted and liked by others, and one of the most reliable ways to do this is to agree with other people's views (e.g., J. D. Campbell & Fairey, 1989; Claidière & Whiten, 2012; Deutsch & Gerard, 1955).

The *speaking-from-ignorance* (SFI) situation, described earlier, appears tailor-made for conformity. However, we argue that it is considerably more complicated than it first appears. More specifically, we predicted that individuals asked to speak from ignorance would often choose not to agree with the correct answers of more knowledgeable others. Their reasons for doing so would not be stupidity, stubbornness, or independence. Rather, their failures to agree would be generated by pragmatic considerations for speaking to others in a cooperative and pragmatically warranted way and by their seeking to acknowledge values, particularly truth, social solidarity, and trust. The experiments tested a hypothesis explicitly posed by values-pragmatics theory (Hodges & Geyer, 2006), an account that has proved valuable for explaining Asch's (1951, 1956) well-known studies, in which he used a task that seems tailor-made for dissent. The overarching argument we offer is that a single set of complex dynamics can account for people sometimes agreeing when they might be expected to disagree (i.e., Asch situation) and sometimes disagreeing when they might be expected to agree (i.e., the SFI situation).

We begin by introducing selected aspects of values-pragmatics theory, illustrating it, first, using driving as an example, then applying it to Asch's (1956) speaking-from-knowledge situation. Then we turn to a more careful analysis of the SFI situation.

Values-Pragmatics Theory

Values-realizing theory is a general theoretical approach to perception, action, and cognition, which has been applied to perception-action tasks (e.g. Hodges, 2007b; Hodges & Lindhiem, 2006), social and developmental issues (e.g., Hodges & Baron, 1992; Hodges & Geyer, 2006), and language and cognition (e.g., Hodges, 2007a, 2009). Applied to social communicative contexts, values-realizing theory has sometimes been referred to as values-pragmatics theory (Hodges & Geyer, 2006), and that is the designation we use in this article. According to the theory, values are the real goods that define fields of action within ecosystems; that is, they constrain what is possible to do that makes an activity worth doing. Consider, for example, the ecosystem of driving. The act of driving brings into existence a field (in the sense used in physics) that guides the driver's actions. This field, which has been called the *field of safe travel* (Gibson & Crooks, 1938), is a very real physical field that opens up before the vehicle, is bounded by obstacles (e.g., buildings, trees, other vehicles), and is continuously changing its size and shape. It is also a social field, since it depends crucially, often moment to moment, on the actions of others. Values define the field of action and are obligatory: Unless s*afety, travel* (i.e., freedom of movement), and other values such as *accuracy* and *tolerance* (e.g., distance between vehicles) are realized sufficiently, the field will literally cease to exist (Hodges, 2007b).

According to values-pragmatics theory, values are not located in persons or in objects but are better thought of as real demands placed on relationships, so that action and perception are constrained by values, regardless of whether or not there is any explicit awareness or acknowledgment of those demands. For example, the field of safe driving is not a projection of the driver (e.g., it exists even if the driver is not looking), nor does it exist in cars, roads, or other objects. Rather, it exists as a dynamic field of possibilities "for good or ill" (i.e., *affordances*; Gibson, 1979/1986, p. 127) that obligate the driver's ongoing actions relative to cars, roads, and other objects. Thus, values constitute real ontological, epistemic, and ethical demands on possible actions, and as such, they cannot be equated with social norms, personal preferences, or biological needs. Individuals or groups may vary in how skilled they are in attending to and realizing particular values, but individuals and groups do not "possess" values. Rather, values define the goods that make their existence and action possible.[1]

According to values-pragmatics theory (Hodges, 2007b), any psychological activity is constrained by multiple goods. Driving, or any other psychological activity, is never about a single value, such as safety, or accuracy, or efficiency. If one cared only for safety, one would never drive; if one cared only for accuracy, driving would become intolerant and thus inefficient and unsafe. As a values-realizing activity, driving cannot be reduced to goal seeking (Hodges & Baron, 1992). These multiple values are heterarchically organized. *Heterarchical,* a term first used by Warren McCulloch (1945), means that

> actions are mutually constrained by all the values, so that there is no fixed, hierarchical ordering of values; rather, across time and task, values vary in their ordering for the sake of the joint realization of all the values (i.e., the ecosystem as a whole). (Hodges, 2009, p. 632)

In driving, for example, speed and accuracy may take priority over safety at one place or time but then reverse at another. These are not simple tradeoffs: Sometimes safety might lead to increased speed and increased accuracy (tighter tolerances). Good driving is a continuous balancing act, making ongoing adjustments to realize all the values. It is possible, of course, to engage in bad driving, but there are very real limits, and our very ability to identify such misbehavior depends on our implicit ability to recognize and enact the goods (i.e., values) of driving.

To illustrate and clarify the worth of this way of characterizing values, we review its application to Asch's (1951) social dilemma, in which he had people answer questions that others had answered incorrectly (see Hodges & Geyer, 2006, for an extended discussion).

The Dilemma of Speaking From Knowledge

In Asch's (1956) experimental paradigm, everyone could see the visual information about which they were being asked equally well; the participants answered questions from a position of knowledge. The only difficulty, of course, was when all of the other participants gave the same wrong answer. Although the

[1] Asch (1952, chapter 12) himself offered an account of values that has much in common with values-pragmatics theory (Hodges, 2007b), although he was influenced by the Gestalt tradition (e.g., Asch, 1968; Köhler, 1937/1966), while Hodges and Baron (1992) developed their account in relation to Gibson's (1979/1986) ecological psychology.

studies are famous for the number of times participants agreed with wrong answers (e.g., Moscovici, 1985), the bigger surprise may be the much larger number of times they dissented from the unanimous majority, about two thirds of the time (e.g., Friend, Rafferty, & Bramel, 1990; Harris, 1985). The most common behavior was to dissent most of the time but to agree occasionally, captured in the median response of nine dissenting answers and three incorrect answers on critical trials.

This basic result presents fundamental problems for the usual accounts offered to explain the results (Hodges & Geyer, 2006). Normative accounts simply do not address the massive amount of truth-telling dissent observed in Asch situations (over 70% of participants always or mostly dissent). Information-based accounts, which assume that the dilemma is about epistemological uncertainty, can plausibly account for diverse responses but suffer from findings that there is a sharp reduction in agreeing answers when answers are not publicly shared with one's peers (Asch, 1955, 1956). Results of this sort suggest that the dilemma is less a matter of epistemic confusion than it is a struggle to know what is appropriate to say in an awkward, tense situation.

Asch (1955, 1956) thought he had designed a moral dilemma, an all-or-nothing choice between right (i.e., answering the experimenter's question truthfully) and wrong (i.e., submitting to consensus rather than maintaining one's independence). Many psychologists since Asch seem to have adopted a zero-tolerance standard (Friend et al., 1990; Krueger & Funder, 2004) regarding agreement with wrong answers: A single agreement with a wrong answer is enough to count one as a conformist, implying that the person is not dissenting even if he or she disagrees 11 times out of 12. Effectively, this all-or-nothing approach renders dissent as uninteresting and uninformative.

Numerous researchers have questioned the conformity account of Asch's (1956) results (e.g., Friend et al., 1990; Harris, 1985; Hodges & Geyer, 2006; Krueger & Massey, 2009; McCauley & Rozin, 2003). One of the most interesting of these is D. T. Campbell (1990), who argued that Asch was wrong to view consensus in such a negative way; it is actually a necessary good, especially when viewed from an evolutionary standpoint. Thus, Asch's dilemma might better be regarded as a choice not between right and wrong but between multiple goods in tension. Following Campbell, Hodges and Geyer (2006) claimed that there are at least three salient values at stake in the Asch situation: truth (i.e., honestly expressing one's own view), trust (i.e., acknowledging the value of others' views), and social solidarity (i.e., integrating the views of self and others without deprecating either). Seeing the dilemma as a tension among values might naturally lead one to think of the situation in terms of tragic tradeoffs, but Hodges and Geyer proposed that there are pragmatic resources, which allow for a more creative, balanced response. One such resource is that there are 12 critical trials, which allow participants to vary their behavior rather than being trapped by an all-or-none dilemma.

A values-pragmatic analysis suggests a complex array of relationships and obligations are at stake in the Asch situation: "How does one speak the truth in a complex, tense, and frustrating situation . . . in a way that simultaneously honors one's peers, the experimenter, one's own perception, and the situation in which all are embedded?" (Hodges, 2004, p. 344). The nature of truth, as it functions in the Asch situation, is larger and more complex than can be captured by mere accuracy. Thus, the situation calls for people to speak truthfully but in a way that reveals something of the awkwardness and tension of the situation and that is respectful of others' views, even if one disagrees sharply with them. To repeat the wrong answers of others is to acknowledge that one hears and understands their point of view, even if one has otherwise made one's disagreement plain. Participants can realize multiple values in an inherently frustrating situation by varying patterns of dissent and agreement to communicate larger scale truths and cooperative intentions.

Agreeing some of the time with incorrect answers can function as a pragmatic signal of one's commitment to taking others' views seriously (i.e., social solidarity) and one's openness to further conversation about the situation. If a person always dissented from a group's expressed views, it would be easy for that person to be seen as arrogant or dismissive. It is because of the heterarchical relations among values that those participants who offer truthful dissent will increasingly be constrained to offer a sign of their trust and social solidarity with those from whom they are dissenting. Dissent, after all, cannot function if it is directed toward people who do not care what others think or if the people who offer it have no concern for those to whom the dissent is addressed. Dissent implicitly appeals to some sense of shared concern for truth and other goods that provide a common ground for communicative discourse and social interaction.

The complexity of the physical, social, and moral dynamics embodied in Asch's dilemma is not unlike the complexity that drivers face in negotiating the physical, social, and moral hazards of the road. Values must be realized continuously, in ways that require ongoing pragmatic judgments and adjustments. The dominant pattern observed, mostly disagreeing but sometimes agreeing (e.g., the 9/3 pattern), seems to do just this, as does the diversity of responses in the experiment as a whole (Asch, 1956; Hodges & Geyer, 2006). From this perspective, it was wrong for Asch to assume that an individual speaking to others with whom he or she has a sharp disagreement should say exactly the same thing he or she would have said when alone with the experimenter. Acting in a social dilemma requires sensitivity and finesse, not simply independence and honesty.

The Dilemma of Speaking From Ignorance

At first glance, the SFI situation seems quite unlike the Asch situation: Participants do not have visual information available that contradicts information provided by other witnesses. From this perspective, there should be no dilemma. To see more clearly how the SFI task could pose a dilemma for participants, however, consider the pragmatics of the situation. Pragmatics, which is the study of the contextual appropriateness of situated utterances, can itself be understood as grounded in values (Grice, 1991). For example, Grice's (1975) well-known cooperativeness principle is an attempt to delineate key demands (i.e., values), such as honesty, economy, and coherence, that speakers and listeners must realize if they are to function effectively in conversations. The pragmatic cooperativeness that is entailed in ordinary conversations usually involves the following: saying neither what you believe to be false nor that for which you lack adequate evidence (Grice, 1975). An SFI situation pulls and twists these two aspects of cooperation inside out, creating a frustrating tension. One solution is to consider the answers of others to be adequate evidence; the other

solution is to consider guessing at what one cannot see clearly, as an honest acknowledgment of one's ignorance. Neither of these solutions is entirely satisfactory. Thus, there is likely to be instability, with fluctuating tendencies between possible solutions, both within and across individuals, leading to considerable variability in responses to the dilemma.

The pragmatic analysis of the SFI situation suggests that the same three values at work in the Asch situation—truth, trust, and social solidarity—are also at play in the SFI dilemma. Asch (1952, 1955) thought it obvious that one should trust one's own eyes in preference to others' in his situation; however, in an SFI situation, it seems obvious that one should trust others and not oneself. Both predictions assume, though, that what is properly motivating participants' choices is the goal of answering as many questions correctly as possible. Perhaps participants' motivations are more complex than this. What if, for example, participants are motivated to speak truthfully in an SFI situation? If participants think they are being asked to speak based only on what they themselves can see, then they are likely to feel constrained to indicate their ignorance, answering incorrectly. They will have spoken truthfully but not correctly. Although it is often assumed that speaking truthfully would entail answering a question correctly, we have argued there are cases where being truthful cannot be reduced to accuracy. The Asch situation, we think, is one of those where the most comprehensive accounting of what is true will take into consideration the differing views of one's colleagues and the frustrating tension of the disagreement, given that one had good reasons to expect agreement.

If the pragmatics of the SFI situation make it difficult to know how to act cooperatively and if truthfulness might nudge some people some of the time to choose to reveal their ignorance, what role is played by social solidarity and by trust? Regarding trust, we assume that participants in a position of ignorance will trust others in better positions to know unless they have evidence to the contrary. Social solidarity, though, is not as straightforward. On the one hand, the SFI situation invites a sharing of views; on the other hand, participants are likely to feel there is nothing for them to say except to repeat what others have said. Ordinary conversational pragmatics lead people to expect they can make a unique contribution to a conversation based on their own point of view and experience. It is not wrong to repeat what other, better informed people have told you, but it is awkward to do so based only on blind trust. Thus, it also makes sense to offer honestly one's own perspective, even if it is likely to be incorrect.

Social solidarity involves more than simple consensus or uniformity. It is more concerned with maintaining the integrity of the relationship among group members and advancing the welfare and effectiveness of the group. This may require complementary actions, in which each member of the group fulfills differing roles in generating the overall action of the group. As numerous authors have pointed out, disagreements can be a reflection of interdependence and commitment to a group, rather than expressions of independence or disloyalty (e.g., Hornsey & Jetten, 2004; Packer, 2008). Generally, in an SFI situation, social solidarity would move one toward agreement (the others are correct after all), but since the agreement comes without pragmatic warrant, participants might feel constrained to acknowledge their ignorance at least some of the time.

Overall, it is the pragmatic relation among the various values in a particular task that can have an effect on decisions to agree or disagree. Generally, trust will tend to generate agreeing answers, but truthfulness will constrain that tendency, yielding significant amounts of disagreement. Social solidarity will generally encourage agreeing answers unless the situation is one in which those answers would threaten the well-being of the group or strain the relationship among its members. Given this general set of relations, it is reasonable to expect that most people most of the time will agree with correct answers of others. However, the pragmatic constraint to speak truthfully and with epistemic warrant will lead to a significant number of answers that do not conform to the correct answers of better informed others. We refer to these nonconforming, incorrect answers as the SFI effect. This effect, first predicted by Hodges and Geyer (2006), was tested in the experiments reported here as a way of testing whether people would conform when it seems like the normatively correct thing to do.

How large should such an SFI effect be, if it occurs? Perhaps, the best comparison is Asch's situation, which has been interpreted by a zero-tolerance standard. Any agreement with wrong answers is considered as constituting conformity (Friend et al., 1990; Hodges, 2004; Krueger & Funder, 2004). The SFI situation effectively inverts the Asch situation. When one has no information or entirely ambiguous information and others are believed to have clear, correct information that they share, there is every reason to believe that agreement with those answers will be unanimous. Thus, we assume a zero-tolerance standard as well. If people conform in an SFI situation, they would be expected always to give correct, agreeing answers. One could argue that the normative expectations (i.e., what seems socially appropriate) are even stronger in an SFI situation than in an Asch situation. If that is the case, it seems all the more appropriate for the SFI effect to be evaluated by the same criterion used to evaluate Asch's results.

Overview of Experiments

The first experiments we report (Experiments 1a and 1b) were exploratory: Is there evidence for an SFI effect? In the second experiment, participants gave answers both in a position of knowledge and in a position of ignorance. This manipulation allowed for a stronger test of the SFI effect and, along with self-report measures on motivations and perceptions of the task, enabled us to evaluate whether there was evidence supporting a values-pragmatics account (e.g., concern for truthfulness). In addition, it provided various means for testing whether there were alternative accounts (e.g., reactance, refusal to imitate) that might explain an SFI effect. In a third experiment, we manipulated participants' concern for speaking truthfully to see if this increased nonagreeing answers, as predicted by values-pragmatics theory.

Experiments 1a and 1b

Method

Procedure. Participants volunteered for a study on "visual processing from different angles and distances" and were told that they would be placed in different positions and asked to answer questions about information projected onto the screen. Their task would be to "give the most correct answer that you can" to each

question, which would require "looking and listening carefully." They were shown one sample slide, which demonstrated that the correct word could be easily identified when sitting in front of the screen. Then they were placed in Positions A, B, and C, as shown in Figure 1, and told that they would take turns giving their answers, by position, as called out by the experimenter. They were instructed to sit straight without leaning and reminded to give the most correct answer they could. The experimenter presented 18 slides. Answers were given in the order A, B, C on Trial 1; B, A, C, on Trial 2; and C, A, B on Trial 3; repeating for the remaining trials. After answering the 18 questions, participants completed a questionnaire about the task and were debriefed. Experiment 1b was a replication of Experiment 1a with one small change in procedure to be described later.

Stimulus materials and questionnaire. On each trial, participants were asked to identify a target word, which was superimposed on other words and/or visual patterns, as illustrated in Figure 2. These figures, called CAPTCHAs (Carnegie Mellon University, www.captcha.net), sometimes resized or reshaped, were positioned on the screen so that selected target words could be read from Positions A and B but not from Position C. Figures mostly appeared on the upper portion of the left side, the opposite side from which C was viewing the figures. To establish the inability of individuals at Position C to see clearly, a group of 10 people from the same pool as experimental participants followed the same procedure, except that they were alone. They were never able to give a correct answer to any of the slides.

After the experimental task, participants answered questions about their impressions of their viewing position, how they felt when they could not see clearly and others answered first, how many questions they thought each participant had answered correctly, how much weight they gave to others' answers relative to their own view in deciding what to say, whether they knew other participants and what their impression of them was (e.g., trusting, suspicious), and what their impression of the experiment as a whole was.

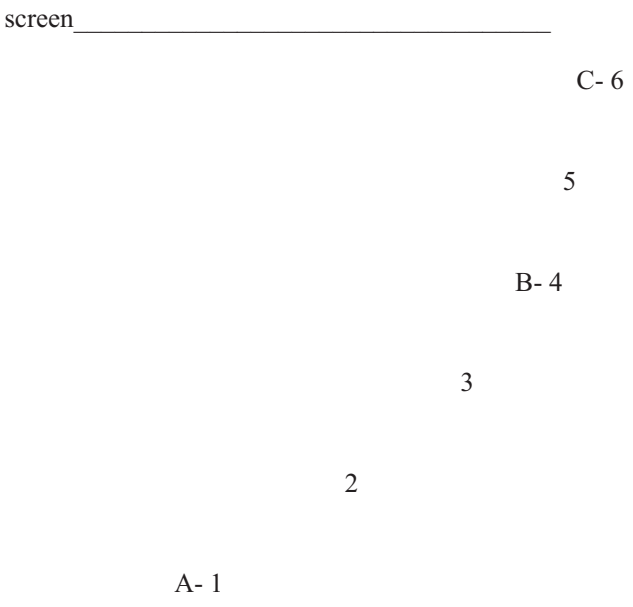

Figure 1. Positions (not to scale) of participants in Experiments 1a and 1b (A, B, C) and Experiment 2 (1, 2, 3, 4, 5, 6). In Experiment 3, Positions 2, 4, and 6 were used.

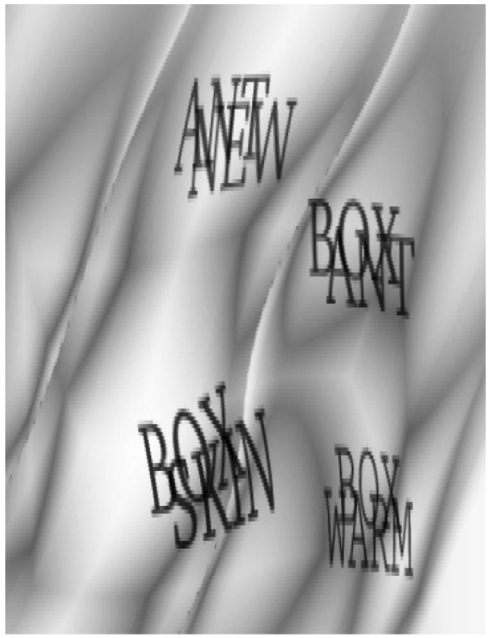

Figure 2. A sample slide used in experiments (reduced to black and white). The question asked was, "What is the bottom word in the lower right hand corner?" Answer: *warm*. (Sample question had indicated meaning of spatial terms, such as *bottom,* to be two-dimensional.)

Experimental layout. In order to assure that Participants A and B gave the same, correct answer to all questions, Participants A and B were trained confederates. Their answers were deliberate, confident, and accurate. All answers were single words (e.g., *sponge, mouth*). The true participant, C, was the last to answer on 12 trials: These were the critical trials in which participants, having heard two better positioned persons give the same answer, were confronted by their inability to see clearly. On the other six trials, participants at Position C answered first and, since they could not see clearly, were only able to guess. These trials reduced the likelihood that C would perceive the experiment as one that was focused on the relationship between his or her answers and those of A and B.

Position A was located about 6.5 m from the projected image on the screen and orthogonal to it, B was about 5.1 m at a 45° angle, and C was about 3.8 m at a 3° angle. The screen was approximately 2.5 m high × 3.0 m wide, and figures generally took up less than 0.4 m^2. These details matter less than whether their configuration meets the proper epistemological criteria. The critical participants at C must be able to see just enough that it is plausible that they are being asked to answer questions about the projected words but not so much that they can identify the correct answer. It must also be obvious to C that the other positions are much better for seeing clearly. Thus, participants in Positions A and B should be able to give correct answers easily if they are being attentive and careful. Pretesting established that Participant C was able to see that there were wordlike forms on the screen; occasionally, approximate length of words or individual letters were discernible,

although not necessarily within the word that was to be identified. In short, there was just enough information to encourage participants at C to try, and not enough to succeed in, reading the target word.

Participants and replication. Twenty-seven undergraduate students at a private liberal arts college participated in Experiment 1a, receiving extra credit in a course or $5 for their participation. The same was true in Experiment 1b, although three participants were dropped for not following instructions.

Ten participants in Experiment 1a asked questions or offered spontaneous comments indicating their ignorance and/or uncertainty (e.g., "I can't see. What am I supposed to do?") during one of the early trials. Experimenters tried to answer these questions in a helpful, noncommittal way, but since there were slight variations in responding that might have affected participants' answers, we replicated the experiment, standardizing the experimenter's response. Thus, in Experiment 1b, if participants in Position C made spontaneous comments about their task or asked questions, the experimenter instructed them to give a single word that they thought was "the most correct answer that you can give," effectively repeating the original instructions.

Table 1
Distribution of Disagreements and Percentages per Participant for Experiments 1a and 1b

Disagreements	Experiment 1a	Experiment 1b
0	14 (51.9%)	12 (50.0%)
1	4 (14.8%)	3 (12.5%)
2	0	1 (4.2%)
3	0	0
4	1 (3.7%)	0
5	0	2 (8.3%)
6	1 (3.7%)	0
7	0	0
8	0	1 (4.2%)
9	0	1 (4.2%)
10	1 (3.7%)	1 (4.2%)
11	2 (7.4%)	3 (12.5%)
12	4 (14.8%)	0
M	3.48	3.13

Note. Means are calculated by dividing total number of disagreements by total number of critical trials and multiplying by the number of critical trials per participant (i.e., 12).

Results

Manipulation and suspicion checks. Only one participant in either experiment gave any evidence of suspecting that Participants A and B were confederates, and she agreed on all critical trials. We retained her in analyses since her responses did not provide support for our hypothesis. Participants believed that A and B had answered all or very nearly all of the questions correctly ($M = 17.6$ out of 18) and that they themselves had answered many fewer questions correctly ($M = 7.8$ for Experiment 1, $M = 6.3$ for Experiment 2). When asked to describe their task in the experiment, participants indicated that that it was to give the correct answer, with two commenting on the difficulty of the task.

Participants were well aware that they "could see little or nothing" at Position C ($M = 16.5$ out of 18 items in Experiment 2). When asked what it felt like to be unable to see words clearly, 79% (Experiment 1b) wrote that it was "frustrating" (or something similar), often indicating their dependence on A and B. Others described straightforwardly the strategy they used to solve the dilemma (e.g., "I looked for intelligible letters, then supposed what the word might be").

Disagreeing and agreeing with correct answers. The first and second columns of Table 1 show the distribution of participants' disagreeing answers for Experiments 1a and 1b, respectively. The distribution was similar for the two experiments: In both, approximately half of all participants always agreed with A and B, a quarter disagreed one to six times, and a quarter disagreed more than six times.

To test for an SFI effect, we compared observed disagreements on the 12 critical items (i.e., those that A and B had answered correctly prior to C giving an answer) against an expected value of zero. In addition to this simple standard, experimental controls were introduced in later studies to provide more stringent assessments. The statistical procedure we adopted to test for the presence of an SFI effect was very conservative. Because number of disagreements was an overdispersed count variable with a large number of zeros, zero-inflated negative binomial regression was employed for this analysis. Consistent with our hypothesis, the number of disagreements on critical trials differed significantly from zero (in Experiment 1a: $b = 1.84$, Wald $\chi^2 = 29.70$, $p < .001$; in Experiment 1b: $b = 1.79$, Wald $\chi^2 = 50.41$, $p < .001$). Disagreeing answers were distributed relatively evenly across all 12 critical trials; there was no relation between order of trials and number of agreements, Experiment 1a: $Q(11) = 10.00$, $p = .53$; Experiment 1b: $Q(11) = 11.37$, $p = .41$.

Discussion

Two exploratory studies provided clear evidence for an SFI effect with 29% (94 out of 324) and 26% (75 out of 288) of responses disagreeing with the correct answers of better positioned others in Experiments 1a and 1b, respectively. The size of this effect is comparable to the average size of the agreeing-with-wrong answers effect in Asch-like situations (about 25%), based on results of meta-analysis (Bond & Smith, 1996), although in Asch's (1951) initial study, 34% answered incorrectly. This is true despite the fact that the normative expectation of agreement with correct answers in the SFI situation is stronger than is the expectation of disagreement with incorrect answers in the Asch-type situations. Evidence for this difference in normative expectations is found in the fact that over half of participants always agreed with A and B's answers on critical trials, while about a quarter of Asch's participants always disagreed.

Prior to running these experiments, we described them carefully to many people to see what they would predict. Invariably, they thought the experiments hardly worth running because obviously people would always agree with their more knowledgeable peers. Intuitively, it does not seem like there should be any conflict in an SFI situation, unlike the Asch dilemma. Nevertheless, results indicated that participants found the situation frustrating and awkward: Should they repeat what A and B have said, or should they make up a word that is theirs, one unique to their position and perspective but likely to be incorrect? As expected, the most common solution was always to agree with the answers of better

positioned others. However, a sizeable SFI effect occurred, one which cannot be explained by a lack of trust in others or a misperception of one's own (lack of) knowledge. Participants knowingly disagreed with correct answers.

Although Experiments 1a and 1b indicated that an SFI effect can occur and that it is likely not due to mistrust or inattention, they did not provide positive evidence in favor of a values-pragmatics account, nor did they consider possible alternative explanations. Experiment 2 was designed to begin to address these issues.

Experiment 2

The focus of Experiment 2 was to evaluate evidence that could provide clearer support for a values-pragmatics account of the SFI effect and that could begin to rule out various alternative hypotheses that might explain why some people some of the time choose to disagree with correct answers rather than conforming. The design of Experiment 2 included two important features not included in the earlier experiments. One was the addition of a new control condition: Participants were placed not only in a position of ignorance but also in a position of knowledge in which they could see, as well as hear, the correct answer. We set up six positions for Participant A, B, or C (real participant), with C alternating between Position 5, in which the participant could see clearly, and Position 6, in which he or she could not (see Figure 1). Participants were not informed in advance that they would be placed in both positions. A second feature was the addition of a series of self-report measures that assessed various possible motivations for how participants answered or other perceptions or feelings that might contribute to participants disagreeing with their peers.

These two features allowed us to test several alternative hypotheses for why an SFI effect occurs. One possibility is that people do not want to look like copycats, merely repeating what others have said. That is, perhaps disagreeing answers are refusals to imitate others (Wheeler & Arrowood, 1966). Another possibility is that people want to distinguish themselves from others, and answering correctly does not do that in this context (Brewer & Roccas, 2001; Griskevicius, Goldstein, Mortensen, Cialdini, & Kenrick, 2006). A third possibility is that those people who disagree with correct answers are simply more independent than those who always agree (Perrin & Spencer, 1981). A fourth possibility is that the experimental situation somehow invites or demands that people give differing answers when they have been placed in an odd position and asked to answer questions (Orne & Whitehouse, 2000). A fifth possibility is that experimenters expect people to disagree and somehow subtly and nonconsciously signal this expectation to participants who then act in accordance with those signals (Hazelrigg, Cooper, & Strathman, 1991). A sixth possibility is that participants are angry at the experimenter for asking them impossible questions and they respond aggressively by giving incorrect answers (Brehm & Brehm, 1981). A seventh possibility, which might be framed in attribution terms, is that participants think the experimenter knows they cannot see and is testing them to see if they will acknowledge it (Ross, Bierbrauer, & Hoffman, 1976).

Some of these alternatives were addressed by including relevant measures in the postidentification task (e.g., how angry did participants say they felt while in the position of ignorance?). Others, however, were addressed by comparing the number of disagreeing answers given in the position of ignorance with those given in the position of knowledge (e.g., are participants refusing to imitate?).

Predictions

First, in addition to hypotheses tested earlier (i.e., an SFI effect, despite trusting others' answers, and experiencing the situation as a dilemma), we predicted that there would be significantly more disagreements at Position 6 (Not see) than Position 5 (See). If this occurs it would undercut alternative hypotheses mentioned earlier, such as refusing to imitate, experimenter expectancy, wanting to appear distinctive, and demand characteristics.

Second, there should be some evidence of the attraction of truthfulness, social solidarity, and pragmatics on most if not all participants in a position of ignorance, not just those who choose to give disagreeing answers one or more times. Thus, we predicted that all participants, both those who always chose to agree with A and B (Agreers) and those who sometimes chose to disagree (Disagreers), would answer items directed at concerns for truthfulness, social solidarity, and pragmatics in ways that indicated their actions were constrained by values-realizing dynamics. Indexes of truthfulness, social solidarity, and pragmatics were expected to receive stronger endorsement than motivations to act agreeably or answer independently.

Third, we expected that Disagreers would score higher on measures of truthfulness and pragmatics than Agreers. Disagreers, we believed, would likely show greater sensitivity in an SFI situation to the demands of speaking truthfully and pragmatically than Agreers. On the other hand, we did not expect that there would be a difference in expressions of social solidarity between Agreers and Disagreers. If Disagreers do not care about other participants and are simply acting independently, we might expect expressions of social solidarity to be less than for Agreers. However, if they disagree primarily because they are speaking truthfully from their assigned perspective, then there is no reason to expect that they would express significantly less social solidarity than Agreers.

Fourth, we predicted that measures of agreement and independence would be relatively weaker than other motivations, despite the fact that participants would probably often choose to agree with others. Fifth, we expected that concerns to answer correctly would be expressed by virtually all participants since the task was defined in these terms. Furthermore, we expected that Agreers would be more likely than Disagreers to acknowledge correctness as a motivation for their actions. Finally, we predicted that an item indicating anger about their position would not be correlated with disagreeing answers at Position 6 and that there would be no difference between Disagreers and Agreers in this regard.

Method

Participants. Forty-seven undergraduate participants at a private liberal arts college completed the experiment for extra credit. One participant was omitted from analyses due to a procedural error, leaving 36 women and 10 men in the study.

Procedure. In order to test for possible experimenter expectancy effects, two experimenters unaware of the previous studies, including their rationale and results, were used, while two others were aware. Participants were recruited by e-mail solicitations so that they were not aware of how many people were expected at

each session. Six chairs were arranged in a semicircle as shown in Figure 1. Participants were instructed as in Experiment 1b, then randomly assigned either to Positions 1, 3, and 5 (or 2, 4, and 6), with the true participant sitting in Position 5 or 6. After seeing a sample question while seated in front of the screen, they were moved to their positions and were told the following.

> First, please sit straight in your chair without leaning to the left or right. Obviously, we have you in your positions for a reason. Second, as the example we just looked at illustrated, the answers you should give will always be a *word*. When giving your answer, please give the *word* that is the best answer. Please do not offer answers like "I'm not sure" or "It's hard to tell." Instead, please give a *single word* for your answer. Do the best you can to give the *correct* answer. Third, please wait to give your answer until I call on you. I will call on you in turn. You [pointing to A, etc.] I will call A, and I'll call you B, and you C.

The experimenter then presented the first nine items, recording answers. After the ninth item, the word *Break* appeared, and the experimenter instructed participants to move to a new position, one position to the right (if they began in 1, 3, 5) or one position to the left (if they began in 2, 4, 6). This change of position was unforewarned. Thus, the true participant moved either from a position in which he or she could see the correct answer to one in which he or she could not, or the reverse. All questions were answered verbally, and the order of answers always moved from Participant A to B to C. Thus, there were nine trials in which C answered last but could see, perhaps not quite as well as A and B but sufficiently well that the participant had personal visual warrant for his or her answers (i.e., in pretesting, participants were able to answer correctly alone from this position). On the other nine trials, the participant was in a position where he or she could not see well enough to answer correctly by him- or herself.

After completing the 18 trials of the identification task, participants answered a series of questions described below. Finally, all participants were debriefed with written statements and verbal reassurances, indicating that choosing to agree and/or disagree with others' answers in the SFI situation could be seen as appropriate responses to the situation.

Motivational indexes. Participants answered 6 two-item measures that indexed possible motivations that could have affected agreeing or disagreeing during the identification task. The six indexes were Agreement, Correctness, Truthfulness, Pragmatics, Social Solidarity, and Independence, and the items used to assess them are given in Table 2. The two items used for each index were intended to be separate samplings of the motivational domain rather than rewordings of the same question. All items were rated on scales from 1 (*Disagree*) to 7 (*Agree*). Although participants answered these questions after having been in both positions, questions were, when appropriate, worded to highlight the position of ignorance and participants' impressions of that situation.

Other indexes. Other items were constructed to serve as indexes of other variables relevant to predictions, or to provide supporting information. First, there were items designated as a Dilemma index ("Sometimes during this experiment I was faced with a dilemma between saying what I knew [from what others had said] and guessing incorrectly since I could not see clearly"), a Trust index ("I thought the people in the other positions were giving honest answers"), and a Suspicion index ("I thought the people in the other positions were actually working with the experimenter and that I was the only real participant in the experiment"). There was also an Anger index ("I felt angry when I could not see as clearly and others could").

Table 2
Motivational Indexes Across Positions of Ignorance and Knowledge

Index
Agreement
When giving my answers, I thought it was important to agree with others as much as possible, regardless of what I could or could not see.
Regardless of whether I could see the material on the screen clearly or not, I thought it best to give the answer others had given.
Correctness
When giving my answers, I thought it was important to give the correct answer, even if I could not see very clearly.
I was most concerned to give the correct answer, even if it meant I had to depend on others to provide me with the necessary information.
Truthfulness
I felt obligated both to give the correct answer and to indicate truthfully what I could or could not see.
It felt like it was "cheating" to give the answer that others had given when I could not see clearly.
Pragmatics
I did not feel like I was contributing much to the experiment if I just repeated what the others had said.
In giving my answers, I tried to make a distinctive contribution to "the conversation" rather than just doing what everyone else was doing.
Social Solidarity
I thought that others in better positions would want me to tell them my best guess, even when I could not see very clearly.
Even though I did not know the other persons in this experiment very well, I felt like I should pay attention to their answers and learn from them.
Independence
I mostly ignored what others said and said whatever I felt like saying.
I thought the people in the other positions were minding their own business and were not paying particular attention to my actions.

Two items indexed beliefs about experimenter expectations: (a) "I thought the experimenter wanted me to agree with the other people in the group, especially if they were in a better position than me," and (b) "I thought the experimenter wanted me to make the best guess I could about what I saw, even if it was incorrect." Finally, there were two items posing possible hypotheses about the experiment, one related to courage ("I thought that, although the experiment appeared to be about visual perception, it was really about whether I had the courage not to conform to the answers of the others") and the other related to humility ("I thought that the experiment was less about what I could see and more about whether I had the humility to depend on others, rather than trying to "do my own thing" when I was in a bad position to see clearly"). We had no explicit expectations about how much agreement these four items might attract, but we thought none would bear a close relation with participants' choices about how often to disagree or agree with A and B's answers.

Results and Discussion

Trust, dilemma, and going beyond correctness. The distribution of agreeing answers for Positions 5 (can see) and 6 (cannot see) is shown in Table 3. To assess the influence of the experimental manipulations, frequency of disagreements was regressed on position (5 vs. 6), order of positions (5 first vs. 6 first), and experimenter (informed vs. uninformed) using a mixed-effects, zero-inflated negative binomial regression, including all two-way and three-way interactions. The only significant effect was a main effect for position ($b = 1.04$, Wald $\chi^2 = 34.69$, $p < .001$): Disagreements at Position 6 ($M = 2.72$ of 9 possible) were significantly greater than at Position 5 ($M = 0.35$ of 9 possible). The lack of any experimenter effects indicates that knowledge of experimental hypotheses did not have an effect on disagreeing answers given at Position 6. There were no order effects either, indicating that the SFI effect was not moderated by the first position in which participants sat. As predicted, a sizeable and significant SFI effect occurred at Position 6: Of answers given at Position 6, 30.2% were incorrect, disagreeing answers, which is significantly different from the expected value of zero ($b = 1.76$, Wald $\chi^2 = 158.76$, $p < .001$). In contrast, disagreeing answers at Position 5 ($M = 3.86\%$) did not significantly differ from zero ($b = -0.22$, $p = .60$).

Table 3
Distribution of Disagreements and Percentages per Participant at Differing Positions in Experiment 2

Disagreements	Position 6	Position 5
0	25 (54.3%)	35 (76.1%)
1	3 (6.5%)	7 (15.2%)
2	2 (4.3%)	3 (6.5%)
3	2 (4.3%)	1 (2.2%)
4	0	
5	1 (2.2%)	
6	1 (2.2%)	
7	2 (4.3%)	
8	3 (6.5%)	
9	7 (15.2%)	
M	2.72	0.35

Note. Means are calculated by dividing total number of disagreements by total number of trials and multiplying by the number of trials per participant (i.e., nine).

Twenty-five participants (54.3%) always agreed (Agreers) with A and B while sitting at Position 6, while 21 participants (45.7%) disagreed sometimes (Disagreers), making up their own incorrect answers. As predicted, participants strongly endorsed the Dilemma index. It is important to note that this was not limited to Disagreers; in fact, Agreers ($M = 5.76$) felt like they were in a dilemma as much as Disagreers ($M = 5.43$), $t(44) = 0.67$, $p = .50$.

Analyses of self-report measures revealed that participants showed high levels of Trust ($M = 6.67$ out of 7), and low levels of Suspicion ($M = 2.91$) about the other participants and the task. There was no difference between Agreers and Disagreers on Trust, $t(44) = 0.06$, $p = .96$, but there was a significant difference on Suspicion, with Disagreers ($M = 2.14$) actually expressing less suspicion than Agreers ($M = 3.56$), $t(44) = 2.29$, $p = .027$. Further evidence of participants' trust in the integrity of the situation is provided by their estimates of questions answered correctly by A and B ($M = 17.8$ out 18). By contrast, their mean estimate of questions they answered correctly at Position 6 was 4.9 (out of 9), much lower than their estimate for Position 5 ($M = 8.6$), $t(42) = 6.34$, $p < .001$.

Truthfulness, social solidarity, and pragmatics. The motivational indexes with which participants most agreed were, in order, Truthfulness ($M = 5.74$ out of 7), Correctness ($M = 5.14$), Social Solidarity ($M = 5.08$), and Pragmatics ($M = 4.25$). By contrast, indexes of Independence ($M = 3.31$) and Agreement ($M = 2.67$) received ratings indicating a lack of agreement, if one assumes that the midpoint of the scale, 4, is neutral. In order to compare Agreers and Disagreers' self-reports regarding these motivational indexes, we conducted a 2 (level of agreement: Agreers vs. Disagreers) × 2 (order) × 2 (experimenter) multivariate analysis of variance (MANOVA) on all indexes. No significant order or experimenter effects were found for any of the indexes. Thus, we focused on direct comparisons of three sets of means presented in Figure 3. The figure presents comparisons between indexes of Truthfulness and Correctness, Social Solidarity and Agreement, and Pragmatics and Independence. The first index in each pair is the one highlighted by values-pragmatics theory, while the second in each pair addresses concerns traditionally considered as motivating conformity (Agreement, Correctness) or nonconformity (Independence).

The reason for these specific comparisons is as follows: First, Truthfulness is contrasted with Correctness because, ordinarily, being motivated to be truthful implies wanting to give the correct (i.e., true) answer. However, in the context of the SFI situation, people are aware that they (truthfully) cannot personally see the correct answer. Thus, participants who are particularly sensitive to the demands of truthfulness are expected to be more likely to forgo correctness in order to express the truth of their ignorance. Second, Social Solidarity is compared with Agreement because, ordinarily, being motivated to care about others would lead one to expect agreement. Social solidarity, however, involves more than simply agreeing with others and instead entails playing one's role to do what is most helpful for the group. Third, Pragmatics is juxtaposed with Independence because, in the SFI situation, Pragmatics tends to encourage making a unique, appropriate contribution to the task, which would tend to yield occasional disagreeing answers. How-

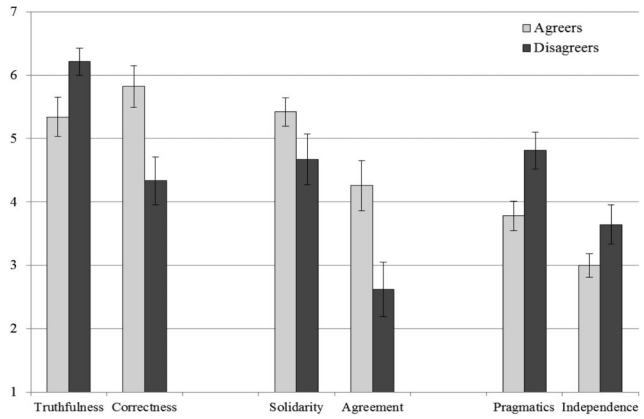

Figure 3. Means and standard errors of motivational indexes for Agreers and Disagreers for Experiment 2.

ever, the disagreement would be based on paying close attention to others and the conversation, rather than ignoring others and their contributions. Finally, it should be noted that while these comparisons are sensible, there are other plausible comparisons that could be made, given the interrelatedness of truthfulness, pragmatics, and social solidarity.

For each pair of motivations we compared, we first tested for a significant interaction between the motivation (e.g., Truthfulness vs. Correctness) and the participant behavior (Agreers vs. Disagreers). For Truthfulness versus Correctness, a significant main effect was found for motivation type, $F(1, 44) = 6.37$, $p = .015$, with higher ratings for the Truthfulness index. There was no main effect for participant behavior (Agreers vs. Disagreers) on these items ($F < 1$). A significant interaction was found for motivation and participant behavior, $F(1, 44) = 18.10$, $p < .001$. As shown in Figure 3, Truthfulness ratings were significantly greater than Correctness ratings for Disagreers, $t(20) = 4.58$, $p < .001$, and there was no difference between the two indexes for Agreers, $t(24) = 1.28$, $p = .21$. Disagreers expressed significantly more concern for truthfulness than Agreers, $t(44) = 2.24$, $p = .030$, while Agreers indicated greater concern for correctness than did Disagreers, $t(44) = 3.00$, $p = .004$. Thus, the pattern suggests that participants were concerned for both truthfulness and correctness but that truthfulness took the lead for Disagreers, while correctness and truthfulness were equally important for Agreers.

For the comparison between Social Solidarity and Agreement, a significant main effect was found for motivation type, $F(1, 44) = 31.93$, $p < .001$, with higher ratings for the Solidarity index. A significant main effect was also found for participant behavior (Agreers vs. Disagreers) on these items, $F(1, 44) = 7.65$, $p = .008$. The interaction between motivation and participant behavior (Agreers vs. Disagreers) was not statistically significant, $F(1, 44) = 2.45$, $p = .125$. As shown in the middle panel of Figure 3, ratings for the Social Solidarity index were significantly greater than ratings for the Agreement index for both Disagreers, $t(20) = 4.86$, $p < .001$, and Agreers, $t(24) = 3.04$, $p = .006$. Thus, even though Agreers always chose to agree, they indicated the priority of Social Solidarity as a motivating concern. There was not a significant difference between Agreers and Disagreers in their Social Solidarity ratings, $t(44) = 1.72$, $p = .093$, although Disagreers expressed significantly less agreement with the Agreement index than did Agreers, $t(44) = 2.80$, $p = .008$.

Finally, for the Pragmatics versus Independence comparison, a significant main effect was found for motivation type, $F(1, 44) = 13.87$, $p = .001$, with higher ratings for the Pragmatics index. A significant main effect was also found for participant behavior (Agreers vs. Disagreers) on these items, $F(1, 44) = 11.56$, $p = .001$. The interaction between motivation and participant behavior (Agreers vs. Disagreers) was not statistically significant, $F(1, 44) = 0.55$, $p = .463$. As shown in the right panel of Figure 3, both Agreers and Disagreers' ratings on the Pragmatics index were significantly greater than ratings on the Independence index, $t(24) = 2.69$, $p = .013$, and $t(20) = 2.57$, $p = .018$, respectively. Disagreers were significantly more motivated by pragmatic concerns than Agreers, $t(44) = 2.24$, $p = .030$, while the difference between Disagreers and Agreers in terms of expressing independence did not reach statistical significance, $t(44) = 1.85$, $p = .071$.

Overall, the pattern of results regarding motivational indexes shown in Figure 3 is remarkably clear. First, choices in the SFI situation are constrained by truthfulness and correctness, both for Agreers and Disagreers, but truthfulness takes the lead over correctness for Disagreers, while for Agreers they are equally important. Second, social solidarity and pragmatics have priority with respect to agreement and independence, respectively, as motivations for actions in the SFI situation, particularly for Disagreers. Third, the importance of truthfulness, social solidarity, and pragmatics is particularly impressive given that the situation is one that explicitly calls for correctness in answers, which can only be achieved by agreement. This suggests there was an important role for values-pragmatics considerations in the dynamics constraining participants' choices, which resulted in a large number of participants sometimes giving disagreeing answers.

Possible alternative explanations for SFI effect. While the results described thus far have provided encouraging support for a values-pragmatics account of SFI effects, it is possible that there are other reasons for disagreeing answers being offered at Position 6. The comparison of Positions 5 and 6, described earlier, provided a way to test the viability of some of these alternatives, while others were addressed by self-report measures. As noted earlier, all indexes were initially submitted to a MANOVA in which the only significant effects were due to differences between Agreers and Disagreers.

Demand characteristics, imitation, and uniqueness. While the strong SFI effect supports values-pragmatics theory, it poses problems for alternative accounts, such as accounts that claim disagreeing answers are to be expected when people are put in different positions in a perception experiment. If this were correct, we would expect as many disagreeing answers in Position 5 as in Position 6. A similar argument holds for the hypothesis that people disagree in order to differentiate themselves from others and/or to express their uniqueness: If disagreement is motivated by a differentiation motive, then there should be no difference between Positions 5 and 6. This finding is reinforced by the fact that there was no difference between Agreers ($M = 4.32$) and Disagreers ($M = 3.81$) on the item "I wanted to give the correct answer each time, but I also wanted to make a unique contribution to the experiment," $t(44) = 0.92$, $p = .36$. Finally, the large difference between disagreeing answers at Positions 5 and 6 is problematic for the hypothesis that people do not like repeating other people

and are refusing to imitate to avoid being viewed as a copycat. What seems crucial to the SFI effect is not merely being in a different position or being the final person to answer on each trial but one's epistemic and pragmatic position relative to others. It is an SFI effect, not a speaking-last effect, a speaking-from-a-different-position effect, a speaking-to-differentiate effect, or a self-presentation effect (e.g., drawing attention to oneself as unique or creative).

Anger or reactance. Regarding the possibility that participants might have been angry about having been placed in a position of ignorance, leading them to give disagreeing, incorrect answers, there was no difference on the Anger index between Agreers ($M = 4.56$) and Disagreers ($M = 4.62$), $t(44) = 0.17$, $p = .86$. Furthermore, the correlation between the Anger index and giving disagreeing answers at Position 6 was negligible ($r = .07$, $p = .66$).

Experimenter and participant expectancies. Earlier, we indicated that the SFI effect did not depend on experimenters' knowledge about values-pragmatics theory or specific hypotheses being tested. There were no effects of experimenter knowledge on any of the motivational indexes or other indexes (e.g., Suspicion, Trust) either (*p*s ranged from .24 to .99). When participants were asked whether they thought the experiment might "really" have been about the "courage not to conform" or having the "humility to depend on others," there was very modest agreement with both items (*M*s = 4.69 and 4.40, respectively) but no significant difference between items, $t(45) = 1.10$, $p = .28$, nor between Agreers and Disagreers, $t(44) = 0.66$, $p = .51$, and $t(44) = 1.67$, $p = .10$, respectively.

Finally, two items asked about participants' beliefs about what they thought the experimenter expected them to do. Agreers agreed more often than Disagreers that "the experimenter wanted me to agree with other people," $t(44) = 2.65$, $p = .011$, although even the Agreers' mean rating was relatively neutral ($M_{\text{Agreers}} = 4.20$, $M_{\text{Disagreers}} = 2.48$). On the other hand, Disagreers more than Agreers endorsed the statement "the experimenter wanted me to make the best guess I could, even if it was incorrect," $t(44) = 2.21$, $p = .032$, $M_{\text{Agreers}} = 5.08$, $M_{\text{Disagreers}} = 6.24$. The interaction between these two items and Agreers/Disagreers was significant, $F(1, 44) = 8.57$, $p = .005$. More specifically, for Agreers, there was no difference between these items, $t(24) = 1.20$, $p = .24$, while there was a significant difference for Disagreers, $t(20) = 6.06$, $p < .001$. Overall, participants tended to think the experimenter wanted them to make their best guess, and for most of them most of the time, that meant agreeing with better positioned others.

Independence. Differing amounts of disagreement at Positions 5 and 6 do not rule out the possibility that people who disagree are motivated to act independently of others. However, results from the motivational indexes suggest that any motives for independence were relatively weak compared to other motives. Both Social Solidarity and Pragmatics indexes are as strong as or stronger than the Independence index, even for Disagreers. There was a positive correlation between disagreements at Position 6 and the Independence index ($r = .34$, $p = .022$), so concerns for independence may play a role for some participants. However, given that there was not a significant difference in the Independence index for Agreers and Disagreers, it is difficult to rationalize how independence would lead so frequently to agreement with others.

Attribution. It might be suggested that participants who start at Position 6 become focused on the strangeness of being asked by the experimenter to identify words they cannot see. If participants also believe that the experimenter is expecting them to guess at answers without benefit of the information provided by A and B, then this set of attributions might yield disagreements. However, if this were the case, it is not easy to understand why so many participants at Position 6 always agreed and why one third of Disagreers agreed more than they disagreed. Furthermore, it is not clear why Agreers believed that the experimenter wanted them to "make the best guess about what I saw, even if it was incorrect" ($M = 5.08$) as strongly ($p = .24$) as they believed that the experimenter wanted them to agree with others who were in a better position ($M = 4.20$).

Gender. One more factor that might have influenced decisions to agree or disagree is the gender composition of the participants. If gender composition was incongruent (i.e., Participants A and B were male and the real participant was female, or vice versa), would this lead to an increase in disagreeing answers? This is unlikely, given that 27 of 46 groups were mixed (one male and one female confederate), but to address this concern, we compared gender-congruent, gender-incongruent, and mixed-gender groups, again using zero-inflated negative binomial regression. Neither gender-congruent groups ($b = .11$, $p = .83$) nor gender-incongruent groups ($b = -.40$, $p = .53$) differed significantly from mixed-gender groups in terms of rates of disagreements.

Dissent. A number of authors have discussed the possibility of anticompliance and dissent. Packer (2008) and Hornsey and his colleagues (Hornsey, Majkut, Terrie, & McKimmie, 2003; Hornsey, Smith, & Begg, 2007) proposed that individuals might engage in *loyal dissent,* as well as *uneasy conformity,* when individuals identify with a group but are disappointed with the group's actions. Neither of these interesting proposals seems to account for the SFI effect because others in the group are not viewed as wrong. One could argue that Agreers often acted as if uneasy conformity characterized their actions, but it was not because they were disappointed in the group but because they were frustrated with their own ignorance. In short, nothing in our experimental results suggests that the SFI effect is due to dissent or a refusal to comply with others.

Summary. The results of Experiment 2 provided considerable evidence in support of the account of SFI effects offered by values-pragmatics theory. Virtually all the predictions made by the theory were supported. By contrast, the available evidence from different positions and from self-report measures failed to provide clear support for any of the several alternative hypotheses considered. This does not mean that these alternatives have no explanatory power, at least for some people some of the time, but none of them appears to capture the broad ecological dynamics of the SFI situation in the way the values-pragmatics account does.

Experiment 3

The focus of Experiment 3 was to test whether manipulating participants' concern for speaking truthfully would affect the SFI effect. To do this we compared a truth-prime to a no-prime condition, predicting a larger SFI effect for the former. In order to create a demanding test of this prediction, we added a monetary incentive to agree with the correct answers for both truth-prime

and no-prime conditions. We expected that this additional reason for agreeing with correct answers would depress, or possibly even eliminate, the SFI effect in the no-prime condition. In the truth-prime condition, it would present a demanding test of whether concern for truthfulness is a motivating force in the SFI effect, as claimed by values-pragmatics theory.

Method

Participants. Forty undergraduates (22 females) at a private liberal arts college participated, receiving either course credit or $5.

Procedure. The procedure generally followed the same general procedure used in Experiment 2, but with a number of important changes. First, participants were only seated at Positions 2, 4, and 6 (see Figure 1), with the real participant at 6, and were not moved to other positions during the experiment. Second, six of the visual stimuli were repositioned so that they were visible and could be identified from Position 6, as established by pretesting with other subjects. Targets that were identifiable appeared on Trials 1, 2, 5, 10, 11, and 15. These trials encouraged participants in Position 6 to look carefully at the screen and to check it against what others said was the correct answer. They also served as a control condition for participants' willingness to repeat correct answers when they could be verified.

There were three changes from prior procedure in the instructions that were given. First, participants were randomly assigned to one of two instruction conditions. In both conditions, they were informed that they could win money by answering questions correctly. Each group was told that the group with the most correct answers (i.e., 3 points if all answered correctly, 2 points if two answered correctly, etc.) would win $30 and that if there was a tie, the winning group would be selected by random drawing from those tied. This monetary incentive was offered in order to make answering correctly even more obviously the socially normative thing to do. It was also intended to create a challenging test bed for the hypothesis that participants are motivated to speak truthfully and with pragmatic warrant.

Second, participants were then introduced to the identification task used earlier, except in this experiment, we asked them to identify a particular letter in a particular word, rather than the word (e.g., "What is the third letter in the word below the word *engine*?"). This change was expected to make the task seem even more precise and demanding, testing the robustness of procedures yielding an SFI effect.

Third, participants were randomly assigned to one of two instruction conditions. In the truth-prime condition, three sentences were included when introducing the study to participants: "One of the things that we have recently become interested in is cheating and the conditions under which it occurs. When do people cheat? What is about a situation that leads people to cheat?" These sentences were intended to frame the remaining instructions and task in a way that would increase the probability that participants would be especially sensitive to being honest and truthful.

After the letter-identification task, participants answered questions about the number of items they and others were believed to have answered correctly, a one-item index of whether they experienced the situation as a dilemma and what they thought the experimenter expected them to do (as in Experiment 2). Also included was a three-item Truthfulness index: Two items were the same as those used in Experiment 2 (see Table 2), with the addition of a third item, "When I could not see clearly, and I thought others could, I did not feel like it was wrong to repeat their answer," which was reverse scored. There were several other items participants answered after the letter-identification task but none about which we predicted differences relative to priming condition.

Scoring protocol. Unlike prior experiments, there were three possible answers that were accepted. Participants could name a letter that agreed or disagreed with others' answer or they could claim ignorance. If they said, "I can't see," or "I don't know," the experimenter reminded them of the instructions: "Please give the letter that is the best answer that you can give." However, if they persisted in stating their ignorance, the answer was accepted and recorded. On succeeding items, if ignorance was claimed, it was recorded without a reminder of the instructions to name a letter. Allowing statements of ignorance seemed appropriate since participants who chose this option were clearly undermining their chances to win money just as much as if they made an incorrect guess. Furthermore, it addressed a persistent question we had been asked about our earlier studies: "Don't people just say they can't see?" Finally, given that the instructions explicitly asked them not to give expressions of ignorance as an answer, for them to do so constituted another form of nonconformity, one that could be construed as their insisting on giving a truthful statement of their ignorance.

Results

Participants in both truth-prime and no-prime conditions strongly agreed that they experienced "a dilemma between saying what I knew (from what others had said) and guessing incorrectly" ($M_{\text{truth}} = 6.30$ out of 7, $M_{\text{no prime}} = 5.97$). They also trusted the accuracy of the answers of the people sitting at Positions A and B, estimating that they had answered virtually all the questions correctly (e.g., $M = 17.85$ out of 18 for Position A for truth prime, $M = 17.00$ for no prime). Participants' estimates of their own number of correct answers were lower ($M = 10.30$ for truth prime, $M = 13.60$ for no prime).

Answers given by participants at Position C were scored as agreeing, disagreeing, or claiming ignorance, as described earlier. All possible response patterns occurred in both truth-prime and no-prime conditions except one, disagree only. The most common patterns were agree only, agree-disagree, agree-ignorance, and agree-disagree-ignorance. Three times, participants gave an answer in one category, immediately adding a second answer that was different (e.g., gave a letter and then claimed ignorance, or the reverse). These were scored according to the first answer given, but scoring them differently makes no substantive difference in the results. For the truth-prime condition, disagreeing answers occurred 13.3% and ignorance answers 36.6% of the time; for the no-prime conditions, disagreeing answers occurred 6.7% and ignorance answers 12.9% of the time.

Given that statements of ignorance were not correct answers and would diminish any chances of winning money as much as disagreeing answers, we counted disagreeing and ignorance answers together as *nonconforming* or *nonagreeing answers*. The distributions for nonconforming answers are shown in Table 4. An experimental test of SFI effects was conducted by employing a negative

Table 4
Distribution of Nonagreeing Answers and Percentages per Participant by Prime and Epistemic Status in Experiment 3

	Truth prime		No prime	
Disagreements	See	Not see	See	Not see
0	16 (80%)	3 (15%)	19 (95%)	12 (60%)
1	0	3 (15%)	0	3 (15%)
2	4 (20%)	2 (10%)	1 (5%)	1 (5%)
3		1 (5%)		0
4		0		0
5		0		0
6		0		0
7		2 (10%)		1 (5%)
8		0		0
9		1 (5%)		0
10		4 (20%)		0
11		2 (10%)		1 (5%)
12		2 (10%)		2 (10%)
M	0.40	5.95	0.10	2.35

Note. Means are calculated by dividing total number of disagreements by total number of relevant trials and multiplying by the number of trials per participant (6 for See, 12 for Not see).

binomial regression, regressing nonconforming answers on prime (truth vs. none) for the 12 critical trials where participants could not see. As hypothesized, the effect of prime was significant (b = 0.46, Wald χ^2 = 3.92, p = .048), with those in the truth-prime condition offering more disagreeing answers than those in the no-prime condition. When using zero disagreements as the critical comparison, the SFI effect was significant in the truth-prime condition (b = 1.78, Wald χ^2 = 63.52, $p < .001$) but not in the no-prime condition (b = 0.85, Wald χ^2 = 2.72, p = .09). In contrast, a zero-inflated negative binomial regression on the six trials where participants could see revealed no significant effect for prime (p = .36). Moreover, nonagreeing answers were not significantly different from zero on these trials in either the truth-prime condition (p = .31) or the no-prime condition (p = .61).

Participants in the truth-prime condition agreed significantly more, $t(38) = 2.36$, p = .02, d = .77, with the Truthfulness index than those in the no-prime condition (M_{truth} = 5.53 vs. $M_{\text{no prime}}$ = 4.42). The correlation between the index and the number of disagreeing answers on critical items across truth-prime and no-prime conditions was significant (r = .56, $p < .001$). No other items varied with priming condition.

Discussion

A significant difference between truth-prime and no-prime conditions suggests that the values-realizing constraint to speak truthfully is sufficiently powerful that it overcomes what are considered to be strong desires by people to be correct, to be agreeable, and to increase their chances of winning money. Furthermore, the number of nonagreeing answers in the truth-prime condition was substantial, approaching half of all answers, providing a reminder of the power of truth (Asch, 1990) in social dilemmas. Comparisons with prior experiments are complicated by differences in procedure, but it is hard not to be impressed with an SFI effect approaching 50% when so many aspects of the situation point in the direction of agreement and conforming to expert testimony. The relationship between the Truth index and nonagreeing answers reinforces the priority of truth—sometimes, at least—over correctness, agreeability, and reward.

In addition to demonstrating the SFI experimentally, the comparison of critical and noncritical disagreements indicates that SFI effects are not due simply to participants finding themselves in an unusual viewing position, leading them to make up incorrect answers or to claim ignorance. Rather, the evidence suggests their disagreement is in response to their epistemic position and the pragmatic dilemma it raises. Participants are speaking truthfully and pragmatically, not independently.

One question a skeptic might raise is, Could not the "cheating" instructions have made it obvious that not agreeing with others was the appropriate behavior? Three facts militate against this possibility. First, participants in both the truth-prime and no-prime conditions predominately disagreed with the Experimenter Expectancy index (i.e., "I thought the experimenter wanted me to disagree with the other people in the group, even when they were in a better position than me"). Means were 3.76 and 3.25 on a 7-point scale for truth-prime and no-prime conditions, respectively, and for Disagreers, the means were even lower, 3.53 and 2.78, respectively. Furthermore, there was a small negative correlation (r = −.15) between this item and nonconforming answers. Second, an obvious alternative for participants who thought consciously about not cheating would have been to focus on not leaning in an attempt to see the correct answer. Third, although we did not systematically assess it, none of the 15 participants we asked was able to recall the cheating reference in the instructions. This does not support unconscious priming, but it does militate against some sort of self-conscious reasoning. Even if this occurred, it is unlikely the deduction would be to answer incorrectly.

Overall, then, these results are consistent with a values-pragmatics account claiming that a concern for the value of truth and a desire to speak with pragmatic warrant (i.e., cooperatively, truthfully) were sufficiently powerful to motivate participants to act counternormatively surprisingly often in a situation where normative assumptions about agreement are strong.

General Discussion

In three experiments, we found evidence of a substantial and robust SFI effect. As predicted by values-pragmatics theory (Hodges & Geyer, 2006), people did not agree with the correct answers of better positioned others a significant percentage of the time in a situation that appeared to encourage conformity in the same way that Asch (1951, 1956) thought his situation encouraged giving correct answers. Participants who could not see clearly yet heard two others provide the correct answer nevertheless offered disagreeing answers 27% and 30% of the time on critical trials in Experiments 1 and 2, and offered nonagreeing answers almost 50% of the time in Experiment 3 in the truth-prime condition, passing up a chance at winning money in the process. Given that participants were aware of their own ignorance and indicated their trust in the accuracy of their better informed peers, why did they not always agree with others' answers?

There are many possibilities, but Experiments 2 and 3 provided evidence supporting a values-pragmatics account of the SFI effect and posing difficulties for a number of the most prominent alternative hypotheses. Participants in both experiments made choices

and provided self-reports that were consonant with a concern to speak truthfully and with pragmatic warrant. Virtually all participants indicated their trust in the answers of others, and for those participants choosing to give disagreeing answers some or much of the time, they appeared to trust their peers to understand that the basis for their disagreement was their epistemic position, not their animosity or lack of concern for them. Experiment 2 suggested that values-realizing constraints and pragmatic concerns weighed on the choices of most, if not all, of the participants, even those who always chose to agree with better positioned others. However, the pattern of truthfulness taking priority over correctness, pragmatics over independence, and social solidarity over agreement was particularly clear for those who offered disagreeing answers. Even though the experimental instructions explicitly invoked correctness (i.e., accuracy) as the relevant task goal and the only way to achieve that was by agreement, participants refused to let their choices be guided by accuracy and agreement alone.

Experiment 2 showed that the SFI effect is robust and cannot likely be explained by experimenter or participant expectancy effects, demand characteristics, or anger or reactance due to the frustration of being in a position of ignorance. The effect also was not dependent on a within- or between-subjects design, gender composition of groups, or the effects of having been in a different position earlier. More substantive theoretical explanations, such as not wanting to imitate others (Wheeler & Arrowood, 1966), wanting to distinguish oneself from others in order to appear unique (e.g., Imhoff & Erb, 2009; Morrison & Wheeler, 2010), or wanting to act independently of others (Nail, MacDonald, & Levy, 2000), also found no real support. An attribution explanation that assumes participants do what they think others expect of them also appeared to have little plausibility, as did the possibility that people disagreed in order to dissent from the group.

In contrast, the values-pragmatics perspective found positive support in Experiment 3: Manipulating participants' sensitivity to truthfulness produced a marked increase in the frequency of nonagreeing answers. This result indicates that the SFI effect is clearly linked to the honest communication of one's own ignorance. The SFI effect appears to be real and to be explained better by a values-pragmatics account than by plausible alternatives, at least so far. What, though, is the larger meaning, practically and theoretically, of such a phenomenon? To address this question, we begin by placing the phenomenon in a larger context of language and learning.

The View From Language: Beyond Agreement and Disagreement

As we noted earlier, our reason for running these studies was purely theoretical. The experimental situation was intentionally odd, just as Asch's situation was. Nevertheless, the larger practical and theoretical significance of the SFI effect becomes clearer if we think about the purpose of conversing with others. Although it is often assumed that the purpose of language is to reach agreement, conversations would never need to occur if people always agreed with each other; the same would be true if they only disagreed with each other (Hodges, 2004). The purpose of conversing with others is to learn—about each other, about one's circumstances and one's topic, and about how all the parties in the conversation might coordinate their efforts to accomplish their common tasks and, more generally, to realize values (e.g., develop new, better ways to do their tasks; develop their friendships). In order to do this, agreements and disagreements need to occur, but it is the pattern of agreements and disagreements that provides information that orients and redirects the efforts of those involved.

How does this insight about conversing help us understand the SFI effect? What is the sense of disagreeing with someone's answer when in all likelihood it is correct? Trusting others and engaging in useful conversation with them involve more than always agreeing with them (or keeping quiet), even when one is in a position of ignorance. Readers may have witnessed, for example, a person who knew little about physics talking to some accomplished physicist as if the person knew what he or she was talking about. Why do people make fools of themselves in this way? Perhaps it is not so foolish. Inevitably, one's ignorance will be revealed, but one's willingness to expose one's ignorance becomes an act of trust, indicating one's interest and care either for the topic or for the person, or for both. Viewed with a longer lens, the willingness to disagree with an expert or to ask uninformed questions could function as a means of staying engaged and of trusting that one will become better informed over time. It is because of this that, although the SFI situation appears at first to be odd, we think it occurs whenever people find themselves in the role of teacher (position of knowledge) and learner (position of ignorance). Students are ignorant, but this does not mean that they should never act from their ignorance. The expressions of ignorance or awkwardness on the part of students are trustful offerings that, over time, the teacher can use as the basis for correcting and guiding their efforts. It is in this way that truth, trust, and social solidarity might all be better realized in the long run by expressing the ignorance of one's position at certain points in the relationship.

Rethinking Social Influence: Beyond Conformity and Independence

Having located the SFI effect in terms of language and learning, what lessons can we glean for understanding and advancing future social influence research? First, values-pragmatics theory questions the focus on conformity and independence that has framed much of the research on social interaction. Instead, it points to the pragmatics of cooperation and the ways in which people work together to realize values such as truth and social solidarity, not by individually planning to but by working within the complex array of constraints in which the immediate situation is embedded. We agree with Mason, Conrey, and Smith (2007) that considering simple, individual cognitive processes may not be the most productive way to appreciate the complex, dynamic interactions that occur among people interacting across time. Rather than focusing on particular cognitive mediators (cf. Bullock, Green, & Ha, 2010), the values-pragmatics account tries to capture important dimensions of ecosystem relations as a whole and to predict patterns of actions that are likely given the larger dynamics. The theory does not assume that individuals are conscious of these demands, strategies, or patterns, although they sometimes may be (Hodges & Geyer, 2006). By focusing on the values that guide and constrain the dynamics of a social ecosystem rather than isolated cognitive variables, values-pragmatics theory may be of aid in future work seeking to address the dearth of social psychological theorizing at the level of situations (Reis, 2008).

Second, our argument is that, both in the SFI situation and in the Asch (1956) dilemma, the pragmatic context is crucial, such that the actions of people in these situations are generally more nuanced than a conformity–independence dichotomy can begin to capture. In both the SFI situation and the Asch dilemma situations, people do something surprising, not because they are too weak or too confused to give the correct answer but because they are sensitive to larger, more complex truths and relationships and the need to communicate them appropriately in that context (Tetlock & Mitchell, 2010).

Third, the SFI effect complicates the common view that behavior in social interactions and group contexts is driven by normative and/or informational influences. The substantial number of incorrect, disagreeing answers we observed suggests that actions are motivated by more than wanting to be accurate and to be liked. Motivations cannot be reduced to goal seeking. Participants' actions appear to be guided by multiple values that are in cooperative tension (i.e., a heterarchy), such that what are often accounted as errors at one scale of analysis may reflect more complex, nuanced ways of negotiating frustrating situations when viewed at a larger scale. In both the SFI situation and Asch's (1956) dilemma, participants are confronted by a discrepancy between what they see and what they hear, but the evidence suggests that in both cases, participants work to speak in a way that respects the truth of what they see and hear while acknowledging social solidarity and trust with their peers and the experimenter.

Recent studies in developmental psychology reinforce the weaknesses of normative and informational accounts for giving incorrect answers in Asch-type situations and provide compelling evidence of the importance of truth and the sensitivity to pragmatic constraints. Corriveau and Harris (2010) and Haun and Tomasello (2011) have both done ingenious studies with young children (3–4 years) that present them with Asch-type dilemmas. The results are remarkably similar to those observed in adults and provide dramatic evidence that children trust their own vision and are willing to dissent from unanimous majorities of peers or adults. Results in Corriveau and Harris's study indicated that 76% of 4-year-olds and 58% of 3-year-olds always answered correctly. Overall, agreement with wrong answers was 20% in Corriveau and Harris's experiments and 34% in Haun and Tomasello's, and both sets of experiments found that agreement with wrong answers declined over trials. Furthermore, both found strong evidence that children were not confused about what was true regarding the sizes they were judging. The most dramatic effect was when the task involved a game in which the child had to pick the correct length of a bridge to allow a bunny to cross a river and retrieve a prize for the child: Children never erred, always dissenting from the majority (Corriveau & Harris, 2010, Experiment 2). If people, children especially, are fearful of humiliation, exclusion, or retribution, why do they openly dissent (and increasingly so as the experiment unfolds) an overwhelming majority of the time? Something deeper than normative and informational influence is operating to guide choices.

Fourth, decisions to converge or diverge from the judgments and choices of others are better described as dynamical and multilayered rather than as singular and categorical. Within and across tasks, there is ongoing variability and tension. Studies in anthropology (e.g., Richerson & Boyd, 2005) reveal that both convergence and divergence are crucial to the formation and evolution of culture, but evidence indicates that, generally, people use individually acquired information and experience in making decisions rather than doing what the majority of other people are doing (e.g., Eriksson & Coultas, 2009; Eriksson & Strimling, 2009). Claidière and Whiten (2012) concluded that evidence for what they called strong conformity (i.e., an increasing trend toward agreement or behavior matching) was particularly weak when people are motivated to be accurate. Efferson, Lalive, Richerson, McElreath, and Lubell (2008) have even observed behavior similar to the SFI effect we have described. They tested people's willingness to use social information to guide their own choices in a game, where learning from other's choices increased monetary rewards, and found that 30% of the time, participants did not follow the majority, failing to maximize their monetary outcomes. Ultimately, individuals engage in both convergence and divergence, and this variability can necessarily only be revealed over time. Therefore, future work is needed to reveal the potentially informative ways in which individuals in both Asch and SFI situations vary their responses across time.

Fifth, people seem quite willing to consider the viewpoints and information provided by others in guiding their own choices, but they exercise considerable epistemic and ethical vigilance in doing so (Sperber et al., 2010). They show little willingness to follow the lead of others blindly or completely (Hodges, in press). Participants' concern for acting in ways that realize multiple goods rather than simply choosing the most efficient route to a predetermined goal suggests that pragmatic warrant takes precedence over any concerns they might have for simply fitting in or for acting independently. Future studies can explore what occurs when trust and social solidarity are varied in SFI and Asch situations. Would friends (i.e., high trust, high social solidarity) conform less in an Asch situation than strangers, as predicted by Hodges and Geyer (2006)? Would such an effect be moderated by cultural pragmatics (e.g., Matsuda, 1985; Takano & Sogon, 2008; Williams & Sogon, 1984)?

The challenge for any alternative account to the values-pragmatics account is as follows: (a) Explain why an SFI effect occurs at all, (b) explain why it is especially strong when a concern for truth has been primed, (c) explain why people rarely disagree when they can see but disagree substantially often when they cannot see, and (d) explain the agreement and the disagreement that occur in the SFI situation and in the Asch situation with an integrated set of dynamics or processes. The point of our studying the SFI situation was not to produce some clever new effect but to invert the Asch situation to show that the dynamics underlying it are operative across a broad array of situations, including ones where conformity seems a foregone conclusion, instead of a dramatic discovery (as in Asch).

The dynamics of convergence and divergence are pervasive and deep. Specific phenomena such as agreement with wrong answers in an Asch dilemma or disagreeing answers in an SFI dilemma must be set within the larger dynamics of convergence and divergence. There is now considerable evidence over a wide range of domains, from social anthropology to developmental psychology to social psychology, that divergence is as pervasive as convergence in situations (e.g., imitation, mimicry, majority influence) where the emphasis has been almost solely on convergence (Berger & Heath, 2008; Hodges, in press; Strigul, 2009). Whether values-pragmatics theory or any other theory can address the

diversity and unity of these phenomena successfully is a challenge that awaits further work.

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