KITCHEN CONFIDENTIAL? NORMS FOR THE USE OF TRANSFERRED KNOWLEDGE IN GOURMET CUISINE

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When will knowledge holders share their knowledge with peers? Several studies suggest that norms of knowledge disclosure encourage knowledge transfer. More recently, scholars have hypothesized that norms of knowledge use *may indirectly promote it. In this article, we synthesize a theoretical framework of the effect of norms of knowledge use and test its predictions by means of a field experiment involving more than 500 Italian chefs. For the literature on knowledge transfer, we confirm the importance of norms, but we also show that they are not complete substitutes for other means of protecting private knowledge. For the literature on social norms, we provide evidence of how actors assess others' propensity to conform and how this influences the intention to participate in the norm-regulated exchange.* Copyright © 2013 John Wiley & Sons, Ltd.

INTRODUCTION

The value to society of knowledge transfer is unmistakable. Scientific and economic progress is based on the ability of individuals to "stand on the shoulders of others" by building on their ideas (Fleming, 2001; Schumpeter, 1942). Unfortunately, access to others' ideas is often impeded by the incentive of knowledge holders to protect the private value of knowledge by keeping it secret.[1] When actors strategically withhold knowledge, important economic activities may be impeded, such as innovation (Gans and Stern, 2003), access to capital (Dushnitsky and Shaver, 2009), and the development of clusters of expertise or centers of

excellence (Frost, Birkinshaw, and Ensign, 2002; Porter, Ketels, and Delgado, 2007). Formal institutions, like nation states, can encourage the transfer of ideas by creating systems of property rights that regulate the use of transferred knowledge (Nordhaus, 1969), but in many settings such rights are unavailable or intractable (Cohen, Nelson, and Walsh, 2000). In these contexts, what prompts knowledge holders to share their knowledge?

One possibility is that social norms—"powerful standards of behavior that are rooted in widely shared beliefs about how actors should behave" (Philippe and Durand, 2011: 969)—encourage people to reveal private knowledge. Merton (1973), for example, argues that norms among scientists encourage knowledge holders to distribute their private information to members of the scientific community. Most studies linking norms and knowledge transfer have followed Merton's focus on norms that govern the behavior of the knowledge *holder* (cf. Constant, Kiesler, and Sproull, 1994; Gächter, von Krogh, and Haefliger, 2010; Haas and Park, 2010). Only recently have a few

[1] We follow scholarly tradition in using the term "private value" to mean the economic rents obtained from the limited use of knowledge.

scholars proposed that social norms governing the behavior of the knowledge *recipient* might indirectly encourage knowledge transfer. These scholars suggest that, by dictating how received knowledge may be used, such "norms of knowledge use" may act like legal property rights insofar as they protect the knowledge holder from misappropriation and misuse of the transferred knowledge (Fauchart and von Hippel, 2008; Loshin, 2008; Oliar and Sprigman, 2008).

The claim that norms of knowledge use can encourage knowledge transfer has generated widespread interest and excitement among scholars, practitioners, and policy makers. Popular outlets like *The New Yorker* have reviewed recent work on the topic,[2] and hundreds of management and policy blogs have conjectured that norms of knowledge use may encourage innovation in contexts in which ideas cannot be legally protected. Some social scientists have even proposed that norms of knowledge use may actually outperform legal rights. In a recent review, for example, the economist Rajiv Sethi (2010) made the remarkable claim that "norms not only accomplish the goals of laws, they can often do so more efficiently."[3]

Despite such enthusiasm, significant uncertainties remain. First, existing empirical evidence cannot separate the role played by norms of use from other explanations of knowledge transfer. For example, scholars have proposed that knowledge holders, to gain public recognition of their creativity, may prefer to reveal their knowledge rather than to protect it from use by others (Lerner and Tirole, 2002; McLure-Wasko and Faraj, 2005). If so, knowledge holders might transfer ideas for self-interested reasons and then explain the disclosure of information based on their faith in norms of use—a rationalization that affords them social approval or provides an emotional warm glow. More research is needed to identify clearly whether norms of knowledge use directly influence the intention to transfer knowledge, as well as to what extent they mediate the influence of other factors.

Another potential problem with conjectures about the role of norms of knowledge use is that they require knowledge holders to form expectations about the behavior of potential knowledge recipients. For norms of knowledge use to function, knowledge holders must be aware of potential recipients' understanding of, and respect for, a norm of knowledge use, and then evaluate whether the knowledge recipient will conform to the norm. Such "conformance assessment," defined here as one party's inference about another's propensity to abide by a social norm, is an important but often overlooked component in the study of norms. Bicchieri and Muldoon (2011) argue that such assessments are fundamental to the functioning of norms but note that they have been little researched. In the case of norms of knowledge use, almost nothing is known about how assessments affect "the intention to act," that is, the actual intention to transfer knowledge.

In this article, we synthesize a theoretical framework connecting characteristics of the context in which knowledge is transferred, expectations of conformance to norms of knowledge use, and the intention to transfer knowledge. Our framework predicts that a knowledge holder's expectation that a knowledge recipient will abide by norms of knowledge use is shaped by characteristics of the context in which knowledge is transferred (for parsimony, we refer to this construct henceforth as the "context of the transfer"). In particular, we examine the role of three characteristics: the reputation of the recipient, the degree of competition between the knowledge holder and recipient, and the visibility of the recipient's behavior in the social group. We further postulate that, when a knowledge holder expects a knowledge recipient to abide by norms of knowledge use, this expectation will be associated with a higher propensity to transfer private knowledge. Finally, we hypothesize that the expectation of norm conformance mediates between the context of the transfer and the intention to transfer knowledge. In other words, conformance assessment is not just a by-product of the context of the transfer but directly predicts the intention to act.

We test our predictions in the context of gourmet cuisine, an industry in which private creativity is important (Rao, Monin, and Durand, 2003, 2005), knowledge transfer is widespread, and scholars have previously proposed that norms regulate the use of transferred knowledge (Fauchart and von Hippel, 2008). In particular, we test our theoretical framework via a scenario-based experiment

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[2] http://www.newyorker.com/talk/financial/2007/09/24/070924 ta_talk_surowiecki [15 July 2013].

[3] http://rajivsethi.blogspot.it/2010/03/norms-as-substitute-for-laws.html [15 July 2013].

(Florey and Harrison, 2000; Gomez, Kirkman, and Shapiro, 2000; Schminke, Ambrose, and Noel, 1997) administered to an extensive sample of Italian chefs. Results from our analyses provide evidence that expectations of norms of knowledge use are associated with the intention to transfer knowledge. They also provide a map of the conditions that influence these expectations (namely, the reputation of the recipient and the degree of geographical competition between the knowledge holder and the recipient) paralleling our proposed model. But our results also provide evidence that the effect of these norms is more complicated and contingent than previously reported. Our finding that conformance assessments partially mediate the relationship between the context of the transfer and the intention to transfer knowledge suggests that, despite evident power, norms of knowledge use are only one part of a menu of strategies used to protect private knowledge.

For the literature on knowledge transfer, we empirically validate the role of norms of knowledge use in fostering the transfer of private knowledge and untangle the competing effects of the context of transfer and conformance assessment. For the literature on social norms and other decentralized institutions, our results extend existing work on the role of expectations about normative behavior by evaluating a situation in which others' norms may particularly influence behavior and by uncovering field evidence that links a real-world competitive context to assessments and the intention to act (Bicchieri and Muldoon, 2011). Finally, our work contributes to the emerging literature on the interplay between strategy and institutions (Deephouse, 1999; Kraatz and Zajac, 1996; Oliver, 1988, 1991; Philippe and Durand, 2011) by revealing the conditions under which social actors are expected to conform to social norms.

THEORY AND HYPOTHESES

Social norms are "regular behavioral patterns" (Bettenhausen and Murnighan, 1991: 21) that represent "the informal rules that groups adopt to regulate and regularize group members' behavior" (Feldman, 1984: 47). A "social norm is a powerful behavioral standard whose function is to summarize the behavior of a reference group or category by specifying what is approved within the group

and what ought to be done in a given setting" (Philippe and Durand, 2011: 970).

Scholars from many disciplines long have been interested in the role social norms play in governing interpersonal relationships (Coleman, 1990; North, 1990; Ostrom, 1990). With respect to knowledge transfer, previous studies have considered primarily how norms of open disclosure encourage knowledge holders to share private information. Studies since Merton (1973) have shown that knowledge transfer is more likely when knowledge *holders* share such norms (Constant *et al.*, 1994; Gächter *et al.*, 2010; Haas and Park, 2010).

Recently, some scholars have argued that social norms might support knowledge transfer by regulating the behavior of the knowledge *recipient*, as opposed to that of the knowledge holder. These scholars argue that norms of knowledge use encourage knowledge holders to transfer knowledge (Fauchart and von Hippel, 2008; Loshin, 2008; Oliar and Sprigman, 2008). In their study of French chefs, Fauchart and von Hippel (2008: 187) observe that such norms could "offer functionality similar to law-based intellectual property systems with respect to both the nature of rights protected and the effectiveness of the protection provided." In a similar vein, Loshin (2008) proposes that a handful of norms govern how secrets, techniques, and presentations are treated in the community of magicians. Consistently, Oliar and Sprigman (2008) describe the emergence of a strict injunction against joke stealing as the major norm that governs the conduct of stand-up comedians.

The problem with these conjectures is that they are based largely on anecdotal reports of the relationship between norms of knowledge use and the transfer of knowledge. Although intriguing, this evidence does not preclude the possibility that unobserved conditions influence both norms of knowledge use and the intention to act, making existing reports of a link between norms and behavior potentially spurious. Theoretically, these nascent theories of norms of knowledge use also imply several different relationships among the variables of interest: relationships that must be validated for their role to be verified. These theories suggest that expectations of conformance to norms of use will influence the intention to transfer knowledge, but they do not specify what attributes of the knowledge, knowledge holder,

Mediation Effect
Hypothesis 3

Conformance assessment, i.e., expectation that a knowledge recipient will conform to norms

Link A
Hypothesis 1

Link B
Hypothesis 2

Context of the transfer
(a) Reputation of recipient
(b) Degree of competition
(c) Visibility of recipient's behavior

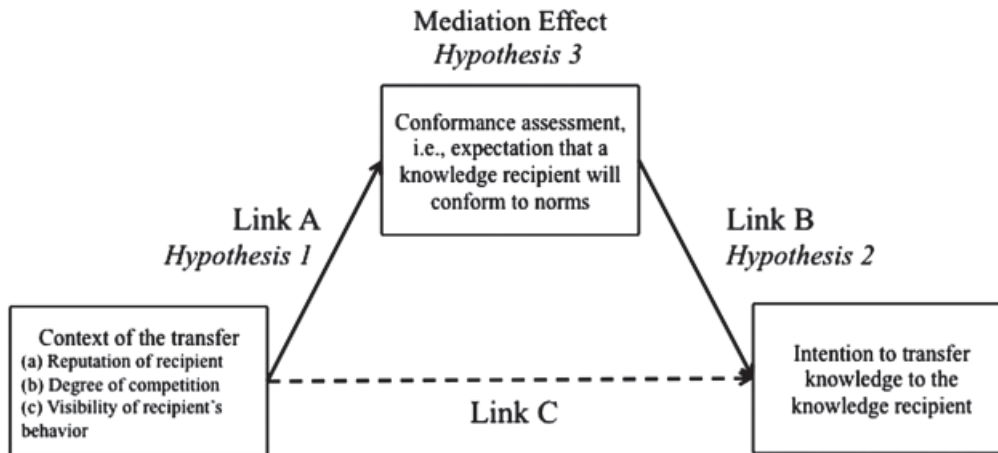Intention to transfer knowledge to the knowledge recipient

Link C

Figure 1.   Our theoretical framework

or knowledge receiver influence these expectations. Nor do they evaluate whether expectations of norm conformance mediate the direct effect of these attributes on the intention to transfer knowledge.

In this paper, we specify and test a model connecting attributes of the context in which knowledge is transferred to both expectations of norm conformance and the intention to transfer knowledge. We propose an underlying structure connecting these three elements (see Figure 1). First, we theorize links between characteristics of the context of the transfer and the knowledge holder's expectation that the knowledge recipient will conform to norms of knowledge use (link A). Second, we propose that an individual's assessment that others will conform to norms exerts an independent and direct effect on the intention to transfer knowledge (link B). Finally, recognizing that the context of the transfer is likely to influence directly the intention to transfer knowledge (link C), we hypothesize and test a mediation effect exerted by expectations of norm conformance on this direct relationship. Because our model involves a structure with a mediation effect, we chose to follow the standard expositional order for introducing the hypotheses associated with each link (see, for instance, Bunderson and Boumgarden, 2010).[4] We first discuss predictors of the mediating variable and then consider the effect of the mediation.

Characteristics of the context and expectations of norm conformance

Existing research suggests that people use contextual cues to form expectations about how a counterpart will behave (Mayer, Davis, and Schoorman, 1995; McKnight, Cummings, and Chervany, 1998). Extending this theory to expectations of norm conformance, we hypothesize that knowledge holders will assess a knowledge recipient's propensity to conform to norms of knowledge use based on the context in which knowledge is to be transferred. To show such an effect, we first identify three characteristics of the context that may be important.

Reputation of the knowledge recipient

Reputation is defined as an actor's ability to deliver valued outcomes (Rindova and Fombrun, 1999). With respect to firms, it "refers to the perceptions by [an actors]'s audience about the [actor]'s ability to provide value" (Philippe and Durand, 2011: 971). Previous research on knowledge transfer and reputation has emphasized the repute of the knowledge holder. Sine, Shane, and Di Gregorio's (2003) examination of the propensity of universities to license their knowledge, for example, concluded that more reputable knowledge holders are more likely to share their knowledge, and Borgatti and Cross (2003) showed that knowledge holders with expert standing are more likely to transfer knowledge to other individuals.

We consider instead the reputation of the knowledge receiver and anticipate that knowledge

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[4] We acknowledge the guidance of our reviewers in clarifying our exposition by pointing out this standard.

holders will expect more reputable recipients to be more likely to abide by norms of knowledge use. Many scholars have argued that one's reputation can act as a credible signal of good intentions (Kirmani and Rao, 2000) because reputation creates strong priors and constitutes the basis for evaluating others' behavior (Durand and McGuire, 2005). Thus, scholars propose, reputation serves among managers of firms "as a heuristic to evaluate ... adherence to the norm" (Philippe and Durand, 2011: 974). If so, knowledge holders, in our context, should "read" reputation as a cue signaling the propensity to adhere to norms of knowledge use.

Qualitative evidence gathered during the exploratory phase of our research suggests that chefs expect those with a reputation for culinary skill to follow norms of knowledge use. Such highly reputed chefs may turn to others for inspiration, but they are expected to reinterpret and transform whatever they learn. For instance, in the course of our interviews, one chef remarked: "The idea of this dish of mine was 'used' by [a highly reputed chef], and that was annoying because, in my perspective, such an important chef should not copy dishes in such an open way." In total, these arguments suggest the following:

Hypothesis 1a (H1a): Knowledge holders will expect more reputable knowledge recipients to be more likely to conform to norms of knowledge use.

Competition between the knowledge holder and the knowledge recipient

Previous research on competition and knowledge transfer has reported that competition may be associated with reduced knowledge transfer. For instance, considering knowledge transfer within organizations, Reagans and McEvily (2003: 246) argue that "the potential for increased competition is one reason why people avoid sharing what they know." Although previous research does not explicitly address the effect of competition on expectations of norm conformance, we can extend to this context the arguments put forward by the literature on the trustworthiness of competitors. Transferred knowledge might enable "the competitor to improve its position in the marketplace" (Schrader, 1991: 156), and the threat of increased competition can harm trust relationships in the long run (Keck and Karelaia, 2012). Put simply,

a knowledge holder will be more guarded when considering the potential behavior of a competitor. Take for instance the expectation that a colleague will adhere to standards of behavior. In this context, scholars have shown that employees expect competitors to advance themselves by violating norms of knowledge transfer (Ferrin and Dirks, 2003).[5]

Consistent with this claim, anecdotal evidence collected through interviews with chefs during the pilot phase of this study confirmed that competition reduces expectations that others will conform to norms. As one informant put it, knowledge transfer requires a lack of "fear that your innovation is going to be stolen from you. And this becomes more difficult when you are in competition."

These observations suggest the following hypothesis:

Hypothesis 1b (H1b): Knowledge holders will expect knowledge recipients with whom they are in competition to be less likely to conform to norms of knowledge use.

Visibility of the behavior of the knowledge recipient in the social group

Scholars studying norms of transfer among knowledge holders have argued that the visibility of norm compliance influences the likelihood that knowledge holders will reveal their knowledge (Haas and Park, 2010). Research also shows that a greater ability to monitor compliance is associated with norm-conforming behavior (Allcott *et al.*, 2007; Ostrom, 1990). For example, empirical studies have shown the visibility of smoking and voting influences compliance with social norms (Alesci, Forster, and Blaine, 2003; Panagopoulos, 2011).

The particular importance of visibility has also been remarked upon by the literature on social networks, which argues that dense social groups

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[5] One might wonder if conditions of competition might actually lead to "coopetition" (Brandenburger and Nalebuff, 1996), and thereby foster higher levels of cooperation with respect to knowledge transfer. Ultimately, this conjecture must be settled empirically, but prior research in the hospitality sector suggests that at least two predictors of competition (proximity and similarity) tend to increase rivalry more than they increase cooperation (Baum and Mezias, 1992; Kalnins, 2004). We will return to coopetition when looking at our results and some unexpected findings on one of our two measures of competition.

facilitate the visibility of violations and their consequent sanctioning (Coleman, 1988, 1990). Studies of tight-knit communities show that the inherent visibility of violations makes it difficult to escape the notice of others and increases the likelihood that independent third parties will sanction inappropriate behavior (Granovetter, 2005). This heightened monitoring ability and greater potential for sanctioning increases the incentives to comply with social rules (Allcott *et al.*, 2007). Fauchart and von Hippel (2008) argue that online review communities, such as eGullet and Chowhound, increase the visibility of norm violations and the speed of sanctioning.

Our qualitative research yielded a number of reports that confirm these insights. In particular, chefs emphasized the role played by intermediaries, such as restaurant critics, as conduits of information among restaurants, thus increasing the visibility of players' actions. One informant related a case of a young chef who became famous for a dish learned from his master. Asked how chefs discovered the misdeed, the informant explained, "The critics who went to have dinner there wrote that they had that wonderful dish. We are talking about an historical dish. We know that guy worked for that restaurant. One plus one gives two! So this became known in our world."

Based on these observations, we hypothesize the following:

Hypothesis 1c (H1c): Knowledge holders will expect knowledge recipients whose behavior is more visible in the social group to be more likely to conform to norms of knowledge use.

Expectations of norm conformance and intention to transfer knowledge

We come now to the central premise of emerging theories of norms of knowledge use: knowledge holders are more willing to transfer knowledge when they expect certain uses to be proscribed by norms (Fauchart and von Hippel, 2008; Loshin, 2008; Oliar and Sprigman, 2008). This simple prediction is at the heart of our analysis and involves important assumptions and consequences.

First, emerging theories of norms of knowledge use assume that knowledge holders wish to restrict the use of their private knowledge. In contrast, earlier notions suggested that knowledge holders are

unconcerned about the use of knowledge and are motivated to transfer knowledge by norms of sharing or by self-interest (Constant *et al.*, 1994; Haas and Park, 2010; Lerner and Tirole, 2002; McLure-Wasko and Faraj, 2005; Merton, 1973). Theories of norms of knowledge use suggest, conversely, that knowledge holders want restricted use and distribution of their knowledge—even after benefiting from knowledge-based exchange. Indeed, it is in this regard that norms of knowledge use "offer functionality similar to law-based intellectual property systems" (Fauchart and von Hippel, 2008: 187).

Second, these emerging theories entail critical assumptions about the knowledge holders' expectations of others' norm conformance. In order for the knowledge holders' behavior to be affected, they must evaluate whether knowledge recipients will follow normative rules. In other empirical domains, scholars theorize that such "conformance assessment" is critical to understanding the functioning of norms (Bicchieri and Muldoon, 2011; Goldstein, Cialdini, and Griskevicius, 2008; Reno, Cialdini, and Kallgren, 1993). Some scholars have even proposed that conformance assessment distinguishes norms from personal values, because social rules that are always followed cannot be distinguished from individual preferences (Bicchieri and Chavez, 2010; Lewis, 1969; Ullmann-Margalit, 1977; Vandershraaf, 1995).

Finally, theories of the role of norms of knowledge use extend conformance assessment and normative control to asymmetrical exchange. Most previous research has considered cases in which norms are symmetrical, that is, in which their role is the same for all actors. Contributing to a common pool resource is an example of such a symmetrical case. In the case of norms of knowledge use, however, each event includes two social actors, the knowledge holder and the knowledge recipient, and two social norms, norms of knowledge transfer and norms of knowledge use. By specifically considering the latter norms, theories of norms of knowledge use (and our analysis) extend research on conformance assessment to the asymmetric case.

Following the fundamental premise of theories of norms of knowledge use, we hence hypothesize that the knowledge holder's expectation that a knowledge recipient will conform to norms of knowledge use will positively affect their intention to transfer knowledge:

Hypothesis 2 (H2): Accounting for the differing characteristics of the context, the higher the knowledge holder's expectation that a knowledge recipient will conform to norms of knowledge use, the greater the propensity of the knowledge holder to transfer knowledge to the knowledge recipient.

Taken together, Hypotheses 1 and 2 imply that expectations of norm conformance will mediate the relationship between the context of transfer and the intention to transfer. Evaluating this mediating relationship directly could aid interpretation of previously reported findings and improve understanding of the influence of norms of knowledge use on knowledge transfer. For instance, scholars have previously inferred that knowledge holders are more willing to transfer knowledge to individuals of greater reputation because they wish to curry favor with them (Hew and Hara, 2007; McLure-Wasko and Faraj, 2005). But a mediating effect of expectations of norm conformance could suggest a different interpretation. Greater knowledge transfer could be caused by the expectation that reputable individuals will abide by norms. Evidence of mediation could also influence an interpretation of the effect of competition on the intention to transfer. For example, a negative relationship between the two is commonly interpreted to mean that knowledge holders do not want to help competitors (Darr, Argote, and Epple, 1995; Schrader, 1991), but mediation through expectations of norm conformance could suggest that knowledge holders are disinclined to transfer knowledge to competitors because they do not expect them to abide by norms. Distinguishing between the two mechanisms could have important theoretical implications. For example, shared pedigree and training might increase competition but simultaneously increase expectations of norm conformance by facilitating social capital. Similarly, visibility brought about by close proximity in a cluster of restaurants might have two complementary effects: increasing both the awareness of available ideas and the expectations that people will use transferred ideas appropriately.

Accordingly, we propose the following mediation hypothesis:

Hypothesis 3 (H3): A knowledge holder's expectation that a knowledge recipient will conform to norms of knowledge use will mediate the effect of competition, reputation, and visibility on the propensity of the knowledge holder to transfer knowledge to the knowledge recipient.*

RESEARCH SETTING AND METHODOLOGY

Empirical strategy

We developed above a theoretical framework of the role played by norms of knowledge use in explaining the intention to transfer knowledge. Testing this relationship is empirically challenging. A simple survey of attitudes would be subject to a host of problems occasioned by endogeneity and respondent bias. Archival analysis is rendered impractical by the need for detailed measures of attitudes and behavior. A laboratory experiment would remove actors from the conditions that support norms. To overcome these problems, we chose to adapt methods used by other scholars previously (Florey and Harrison, 2000; Gomez *et al.*, 2000; Schminke *et al.*, 1997) and conduct a scenario-based experiment with real industry players, namely, high-end Italian chefs.

Our study uses a mixed between- and within-subject randomized experimental design. Each scenario consists of a description of another chef/restaurant with a random combination of five attributes meant to manipulate our independent variables. Using an experiment with randomly assigned treatments reduces the potential for unobserved variables to bias our coefficient estimates. Also, we administer to each respondent *two* separate and randomly assigned scenarios. By receiving two responses per subject, we can use subject-level "fixed effects" to remove any unobserved attributes that could bias our estimates. This allows us to estimate correctly our mediating relationship, as it removes the potential that any unobserved, subject-level attribute could explain both conformance assessment and the intention to transfer knowledge.[6]

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[6] Such a direct evaluation of an endogenous variable may surprise scholars who work with archival data. In such cases, as Shaver (2005) notes, a system of instrumental variables must be employed because correlated error terms within the

Table 1. Manipulated variables and corresponding treatments

	High	Low
Reputation	Zagalin: cuisine rating 28*. Comments: "creative," "innovative," "unique style."	Zagalin: cuisine rating 20*. Comments: "lacks imagination," "unoriginal," "ordinary style."
Proximity	Geographically very close to your restaurant	Geographically very distant from your restaurant
Positioning	Cuisine style and ambience similar to your restaurant	Cuisine style and ambience different from your restaurant
Review	Frequently reviewed by local media and customers (among the restaurants with more reviews)	Rarely reviewed by local media and customers (among the restaurants with fewer reviews)
Experience	Chef has 20 years of experience in the industry	Chef has 1 year of experience in the industry

Experimental procedure

We administered our scenario-based experiment to the head chefs of the 2,529 restaurants listed in the 2009 Italian edition of the *Michelin Guide*. We contacted all of them by telephone to announce the administration of the experiment via a mailed survey and to emphasize the importance of their feedback. The mailing included a cover letter that briefly described the study, a copy of the survey, and a password for accessing a website at which the survey could be completed online.

Following methodological recommendations, we developed our treatments and measures through interviews with a set of informants, namely, eight Michelin chefs working in Milan, Italy. After questioning them about their training and style of cuisine, we asked these chefs about knowledge transfer, social norms, and relationships with colleagues and intermediaries. These direct interviews were fundamental to identifying constructs of interest and devising ways to measure them in a scenario-based experiment. Upon completing a draft of the instrument, we interviewed four informants a second time for the purpose of assuring face validity. Lastly, to ensure that our treatments exerted influence and to validate that the questions were well understood, we pretested the instrument with a sample of 224 restaurants that were not part of the final sample.

Each survey included three parts; (1) a randomly assigned treatment scenario describing a hypothetical restaurant and its chef followed by questions regarding the respondent's intention to transfer knowledge and his or her expectations with respect to the recipient's norm conformance; (2) a randomly assigned treatment scenario describing a different hypothetical restaurant followed by identical questions regarding expected norm conformance and the respondent's intention to transfer knowledge; and (3) a set of questions about the respondent and his or her restaurant. Each scenario consisted of a random combination of five treatments manipulating our independent variables (see Table 1). The manipulations were randomized both within and between subjects; that is, each respondent received a random assignment of manipulations in the first scenario and a random assignment of different manipulations in the second scenario.

Our interviewees reported that culinary knowledge is often grouped into three different types: recipes, recipes of signature dishes, and cooking techniques. Recipes are the most basic type of knowledge, codifying the ingredients to be used and the procedures to be followed in the preparation of dishes. Among the different dishes one could provide a recipe for, a signature dish is a dish that uniquely identifies a chef and is commonly associated with his or her cuisine. This type of dish is almost always inserted in the menu, as it represents the artistry, style, and approach to cuisine of its inventor. Finally, cooking techniques refer to particular process knowledge that is meant to obtain specific culinary preparations, such as *sous-vide* cooking.

As a result of the existence of these three types, we used a "repeated measures" approach and asked, after each scenario, identical questions about each type of knowledge. Asking about each type separately enabled us to measure relative differences in conformance assessment and the intention to transfer knowledge in each of the three cases. This implies that for each respondent

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system of equations can occasion biased estimates. Our use of an experimental design and fixed effects avoids the need for instrumental variables because the remaining disturbance terms in our two regression equations are uncorrelated by construction.

Table 2. Descriptive statistics of population and sample

	Population (n = 2,529)		Respondents (n = 534)		Nonrespondents (n = 1,995)		T-test		Cohen's d
	Mean	S.D.	Mean	S.D.	Mean	S.D.	t	Sig	d
Characteristics of restaurant									
Forks	1.81	0.70	1.95	0.76	1.77	0.68	−5.36	0.00	0.25
Price[a]	44.60	17.53	48.52	21.89	43.54	16.00	−5.87	0.00	0.26
Stars	0.12	0.38	0.22	0.38	0.09	0.33	−6.95	0.00	0.36
Characteristics of local area									
Residents[b]	170.11	474.06	145.24	441.91	176.77	482.21	1.36	0.17	−0.68
Disposable income[c]	16.95	4.18	17.10	4.09	16.91	4.21	−0.93	0.35	0.05
Agglomeration	3.92	3.20	3.90	3.11	3.92	3.22	0.16	0.88	−0.01

[a] Average price, expressed in Euros.
[b] Number of residents in the municipality, year 2010, thousands.
[c] Average disposable income per tax payer in the municipality, year 2007, thousands Euros.

and scenario, we gathered three observations (one each for recipes, signature dishes, and techniques) and thus we obtained a total of six observations per subject. These repeated observations allow us to use fixed effects and differencing to remove common-method biases and other shared unobserved subject- and treatment-level disturbances. However these six observations are not fully independent, and we must account for this when conducting our analysis. We discuss how we address this interdependence among observations in the section on our estimation methods.

Sample

Our target respondents were the head chefs of the restaurants listed in the 2009 Italian edition of the *Michelin Guide*. The *Michelin Guide* has been used as a basis for many studies grounded in gourmet cuisine (e.g., Durand, Rao, and Monin, 2007; Fauchart and von Hippel, 2008; Rao *et al.*, 2003, 2005). Restaurants must satisfy a quality standard to be selected into the *Michelin Guide*. Each restaurant is then rated on a five-point scale, in which each point corresponds to a "fork." Restaurants that offer particularly good cuisine are also awarded from one star (i.e., "a very good restaurant in its category") to three stars ("exceptional cuisine, worth a special journey"). A Michelin star signals quality and creativity; obtaining one is among the top achievements of a chef. Limiting our analysis to establishments in the *Michelin Guide* guarantees a sample of restaurants that exceed a standard for quality while

being heterogeneous across the dimensions of food, décor, ambience, and price.

The 2009 Italian *Michelin Guide* included 2,529 restaurants, 275 of which received stars (236 one star, 34 two stars, and 5 three stars). The participation of the head chefs of all of these restaurants was invited via postal mail, email, and phone. The response rate was 21.1 percent, with 492 complete surveys out of the 534 returned.[7] Our respondents were primarily male (82%) and both the owner and head chef of the restaurant (78%). They ranged in age from 23 to 80 (average age, 46), and quite a few had earned stars (74 one star, 16 two stars, and 2 three stars).[8]

As can be seen in Table 2, respondents and nonrespondents were located in areas that do not differ significantly in terms of number of residents, disposable income, and agglomeration.[9] Respondents were slightly more expensive and higher rated than the target population. Although

[7] Note that 94 percent of respondents returned exactly two scenarios, the remaining 6 percent more than two scenarios (having completed the survey both in paper form and online), for a total of 1,012 scenarios. Our analyses include all responses. Results are consistent if we restrict our analyses to respondents who returned exactly two scenarios.

[8] We effect coded variables for gender (*male*) and ownership (*owner*). The means reported in Table 4 are hence calculated for values between −1 and +1. As such, they do not indicate percentages of cases, which are reported instead in the text.

[9] We measure *agglomeration* based on the measure of geographic concentration suggested by Sorenson and Audia (2000) and computed only for the 20 nearest neighbors. Our measure is $Agglomeration = \sum_{j=1}^{20} \frac{1}{D_{ij}}$, where D_{ij} is the great circle distance between firms i and j, and the sum is computed for j's nearest 20 neighbors.

Table 3. Descriptive statistics of population and sample across treatments

	Characteristics of restaurant		
	Forks	Price[a]	Stars
Respondents (n = 534):	Mean = 1.95, t = −5.36, p = 0.00	Mean = 48.52, t = −5.87, p = 0.00	Mean = 0.22, t = −6.95, p = 0.00
if Reputation = 1	Mean = 1.97, t = −4.97, p = 0.00	Mean = 48.66, t = −5.03, p = 0.00	Mean = 0.24, t = −6.53, p = 0.00
if Proximity = 1	Mean = 1.97, t = −4.94, p = 0.00	Mean = 48.54, t = −4.85, p = 0.00	Mean = 0.23, t = −5.99, p = 0.00
is Positioning = 1	Mean = 1.97, t = −5.14, p = 0.00	Mean = 49.47, t = −6.05, p = 0.00	Mean = 0.23, t = −6.26, p = 0.00
if Review = 1	Mean = 1.96, t = −4.66, p = 0.00	Mean = 48.73, t = −5.13, p = 0.00	Mean = 0.26, t = −7.75, p = 0.00
if Experience = 1	Mean = 1.95, t = −4.36, p = 0.00	Mean = 49.24, t = −5.65, p = 0.00	Mean = 0.24, t = −6.96, p = 0.00
	Characteristics of local area		
	Residents[b]	Disposable income[c]	Agglomeration
Respondents (n = 534):	Mean = 145.24, t = 1.36, p = 0.17	Mean = 17.1, t = −0.93, p = 0.35	Mean = 3.90, t = 0.16, p = 0.88
if Reputation = 1	Mean = 150.86, t = 0.95, p = 0.34	Mean = 16.92, t = 0.15, p = 0.88	Mean = 3.82, t = 0.68, p = 0.49
if Proximity = 1	Mean = 144.27, t = 1.28, p = 0.2	Mean = 16.76, t = 1.04, p = 0.3	Mean = 3.86, t = 0.43, p = 0.67
is Positioning = 1	Mean = 145.17, t = 1.24, p = 0.21	Mean = 16.6, t = 1.87, p = 0.06	Mean = 3.97, t = −0.36, p = 0.72
if Review = 1	Mean = 143.27, t = 1.33, p = 0.18	Mean = 16.71, t = 1.28, p = 0.2	Mean = 3.83, t = 0.6, p = 0.55
if Experience = 1	Mean = 146.75, t = 1.16, p = 0.25	Mean = 16.86, t = 0.46, p = 0.65	Mean = 3.67, t = 1.75, p = 0.08

[a] Average price, expressed in Euros.
[b] Number of residents in the municipality, year 2010, thousands.
[c] Average disposable income per tax payer in the municipality, year 2007, thousands Euros.

statistically significant, these differences are small in importance, as shown by the small Cohen's D (less than 0.5 in all cases).

Finally, we conducted tests to ensure that our treatments were truly independent from respondent attributes. Although we randomized the assignment of treatments *ex ante* within our population of respondents, we wanted to ensure that this randomization was preserved *ex post* among our actual respondents. As shown in Table 3, we find no evidence that respondents differed across the assigned treatments.

Variables

Our empirical data include a dependent variable, a mediating variable, a set of independent variables, and a series of controls. A list of the variables and details of their operationalization is presented in Table 4.

Our ultimate dependent variable, *knowledge transfer intention*, is the reported likelihood that a respondent, if asked, would transfer culinary knowledge to the chef described in the scenario. It is measured separately for each of three types of knowledge: recipes for dishes, recipes for signature dishes, and cooking techniques. Specifically, we asked chefs (in Italian): "*If the chef in the scenario asked you for it, how likely is it that you would

provide the recipe for a dish/the recipe for one of your signature dishes/information about a cooking technique?*" Following *each* of the two scenarios in the survey, we measured, using a 7-point Likert scale (1 being very unlikely, 4 neutral, and 7 very likely), the intention to transfer each of these three types of knowledge. We did not aggregate responses for the three types of knowledge to a single measure because we wished to measure relative differences in the intention to transfer different types of knowledge. To enable us to compute results for our dependent variable (*knowledge transfer intention*), while isolating the effect of knowledge type, we marked responses to the three different types of knowledge with dummy variables (*recipe*, *signature*, and *technique*).

Our mediating variable, *conformance assessment*, is the reported likelihood that a respondent would expect the chef described in the scenario to conform to the social norms operating in the industry, specifically, the three norms of behavior described by Fauchart and von Hippel (2008), the existence of which we confirmed in our interviews (see Appendix). Following each scenario, and for each type of knowledge, we measured (on a 7-point Likert scale) the chef's expectation that the chef described in the scenario would; (1) not copy exactly, (2) credit the author, and (3) not pass transferred knowledge to a third party absent

Table 4. Variables and measures

Variable	Measure	Operationalization
Dependent variable		
Knowledge transfer intention	Likelihood that, if asked, the respondent would provide the requested knowledge to the chef in the scenario.	*7-point scale, where 1 is very unlikely and 7 is very likely.*
Mediating variable		
Conformance assessment	Likelihood that the chef in the scenario would conform to the three social norms regulating the use of transferred knowledge (i.e., don't copy, cite the source, don't pass on).	*7-point scale, where 1 is very unlikely and 7 is very likely. Single scale:* $\alpha = 0.73$
Independent variables		
Reputation of recipient		
Reputation	The restaurant in the scenario has X ratings and reviews.	*Manipulated* X: Excellent = 1, Average = −1
Degree of competition		
Proximity	The restaurant in the scenario is geographically very X compared to the respondent.	*Manipulated* X: Close = 1, Far = −1
Positioning	The restaurant in the scenario has a cuisine style and an ambience very X to those of the respondent.	*Manipulated* X: Similar = 1, Different = −1
Visibility of recipient's behavior		
Review	The restaurant in the scenario is X reviewed by local media and customers.	*Manipulated* X: Frequently = 1, Infrequently = −1
Control variables		
Knowledge holder		
Experience	The chef in the scenario has X of experience in the industry	*Manipulated* X: 20 years = 1, 1 year = −1
Knowledge type		
Signature	Transferred knowledge is a signature recipe.	True = 1, False = −1
Technique	Transferred knowledge is a cooking technique.	True = 1, False = −1
Knowledge recipient		
Owner	Position of the respondent in the restaurant.	Owner = 1, Nonowner = −1
Male	Gender of the respondent.	Male = 1, Female = −1
Chain	Affiliation of the respondent with a chain.	Chain = 1, Independent = −1
Tenure	Years of experience of the respondent in the industry.	Integer count in years
Stars	Respondent has been awarded one or more Michelin stars.[a]	One or more stars = 1, No stars = −1

[a] From *Michelin Guide*, 2009 Italian edition.

permission to do so. Specifically, chefs were asked (in Italian): "*If you provided the recipe of a dish/the recipe of one of your signature dishes/information about a cooking technique, how likely is it that this chef would (a) modify it rather than copy it exactly, (b) credit you as its creator, (c) ask permission before passing it to others?*" Within each knowledge type and scenario, the Cronbach's alpha for the three norms' measures is high ($\alpha = 0.73$), thus validating our combination of the three measures into a single measure for a given knowledge type. Nevertheless, to test the robustness of our findings, we also conducted separate analyses using each measure of norm conformance (i.e., "don't copy exactly," "cite the source," and "don't pass on").

Our independent variables were manipulated experimentally through the treatments included in the two scenarios presented to each subject. To investigate our hypotheses, we wished to manipulate; (1) the reputation of the knowledge recipient, (2) the degree of competition between knowledge holder and recipient, and (3) the visibility in the social group of the knowledge recipient's behavior.

We manipulated the reputation of the knowledge recipient by providing the restaurant in each scenario with a hypothetical food rating and reviewer comments akin to those provided by Michelin and the well-known restaurant survey company Zagat™. Scholars argue that ratings contribute

substantially to the construction (or demolition) of industry players' reputations (Ferguson, 2004). Chefs who explained to us the significant role played by ratings and comments emphasized the importance of the Michelin guide as a determinant of reputation. Explained one respondent: "I only look at the evaluation from Michelin because it is sharp, and it is not about gossip or about your celebrity as a chef. You have one, two, or three stars, or you just have forks. Straight to the point and easy to understand." Some informants observed Zagat™ to be an interesting alternative to the classic Michelin. "Do you know about Zagat?" inquired one informant. "We have 29 out of 30 for cooking, and I think this is very good. [. . .] And the beautiful thing is that there you have real people evaluating you. Not the inspector, but you, the gentleman from Reykjavik, the lady from Budapest, the grandfather from Cape Town." We manipulated *reputation* by describing a restaurant as either "Zagalin cuisine rating 28. Comments: creative, innovative, unique style" (*high reputation*) or "Zagalin cuisine rating 20. Comments: lacks imagination, unoriginal, ordinary style" (*low reputation*). We explained the fictional Zagalin rating as equivalent to a Zagat™ rating from 0 to 30. To check the manipulation, we asked respondents to evaluate, on a 7-point Likert scale, to what extent the chef described in the scenario was likely to be considered by colleagues to be highly prestigious. The manipulation was successful (F[1, 1061] = 57.00, p < 0.00).

We manipulated the degree of competition between the knowledge holder and knowledge recipient by means of two variables. All of our interviewees suggested that competition is best assessed by two measures: geographical proximity and product positioning. In the words of one informant: "If we had someone here located at a distance of 100 m cooking the same things that we cook here . . . well, that would be problematic." This practical report is consistent with theoretical arguments that "individuals attend to cues in the environment, [and] interpret the meaning of such cues" to infer who are competitors (Porac, Thomas, and Baden-Fuller, 1989: 398). The role of geographical proximity and product positioning as important cues is also consistent with previous accounts in the hospitality industry (Baum and Mezias, 1992). We manipulated *proximity* by describing the restaurant as either "geographically very close to your restaurant" (*high*

proximity) or "geographically very distant from your restaurant" (*low proximity*). As recommended by our informants, to avoid subjectivity in interpretation we did not insert a reference point (such as 5 miles away or within the same block). Moreover, because our treatment is a concrete statement of fact, no manipulation check was needed (Perdue and Summers, 1986). We manipulated *positioning* by describing the restaurant as either "cuisine style and ambience similar to your restaurant" (*similar positioning*) or "cuisine style and ambience very different from your restaurant" (*different positioning*). We performed the manipulation check by asking respondents to evaluate, on a 7-point Likert scale, to what extent the restaurant described in the scenario was comparable to their own restaurant in terms of positioning. The manipulation was successful (F[1, 1065] = 8.43, p < 0.00).

We manipulated the visibility of the behavior of the knowledge recipient with a final treatment. According to our informants, such visibility varies with the degree to which the actions of a particular recipient could be observed by intermediaries like customers and critics. We manipulated *review* by describing the restaurant as either "frequently reviewed by local media and customers (among the restaurants with more reviews)" (*high review*) or "rarely reviewed by local media and customers (among the restaurants with fewer reviews)" (*low review*). We did not insert a reference point (such as "among the five percent top-reviewed restaurants") on the advice of the chefs with whom we piloted the design. Our treatment being a concrete statement of fact, no manipulation check was needed (Perdue and Summers, 1986).

We included several controls in our analysis. At the level of the knowledge recipient, we included one final treatment as a control. Originally, this was meant to account for any moderation of the effects caused by experience, consistent with the argument that experience can influence the response to reputation and competition (Baron and Markman, 2000; Chung, Singh, and Lee, 2000). As a result, we included the *experience* of the chef in the scenario. The chef was described in the scenario as having "20 years of experience in the industry" (*high experience*) or "1 year of experience in the industry" (*low experience*). The reference points of 1 and 20 years were selected on the advice of the chefs with whom we piloted the design. Again, no manipulation check was needed for such a statement of fact (Perdue and Summers,

Table 5.   Descriptive statistics and correlations

Variable	Mean	SD	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Knowledge transfer intention	4.80	1.97	1	7	1													
2 Conformance assessment	3.72	1.32	1	7	0.21	1												
3 Reputation	0	1	−1	1	0.06	0.12	1											
4 Proximity	0	1	−1	1	−0.10	−0.05	−0.04	1										
5 Positioning	0	1	−1	1	0.02	−0.03	−0.02	−0.02	1									
6 Review	0	1	−1	1	0.00	0.01	0.02	−0.01	0.02	1								
7 Experience	0	1	−1	1	0.00	−0.03	−0.01	−0.02	0.03	0.00	1							
8 Signature	−0.32	0.95	−1	1	−0.26	0.04	0.00	0.00	0.00	0.00	0.00	1						
9 Technique	−0.32	0.95	−1	1	0.22	−0.02	0.00	0.00	0.00	0.00	0.00	−0.52	1					
10 Owner	0.58	0.82	−1	1	−0.03	−0.05	−0.02	−0.01	−0.03	0.00	0.03	0.00	0.00	1				
11 Male	0.64	0.77	−1	1	0.03	−0.03	0.01	0.01	0.06	−0.04	−0.04	0.00	0.00	−0.18	1			
12 Chain	−0.88	0.47	−1	1	0.03	−0.01	0.03	−0.04	0.10	0.09	0.04	0.00	0.00	−0.12	0.10	1		
13 Tenure	26.71	9.93	4	60	−0.04	−0.09	−0.03	0.02	0.00	0.02	−0.04	0.00	0.00	0.19	0.01	−0.03	1	
14 Stars	−0.63	0.78	−1	1	0.07	0.09	0.03	−0.01	0.02	0.06	0.04	0.00	0.00	0.06	0.00	0.17	−0.07	1

1986). After testing for moderation effects, we retained the variable as only a control.

Since we asked separate questions for each type of knowledge, we must account for any potential differences in response to each type. In order to do this, we marked the cases in which the knowledge is a "signature dish" or a "cooking technique" with the dummy variables *signature* and *technique*. In our analysis, we then benchmarked the coefficients for *signature* and *technique* against the "base case" of an ordinary *recipe*.

Finally, we used two approaches to control for respondent attributes. The most robust was a fixed-effect specification that created a dummy variable for each respondent. Including these dummies in our analysis removes all observed and unobserved attributes for the respondent, restaurant, and common survey method. In models without subject fixed effects, we controlled for the effect of differing subject attributes by including measures of whether the chef also owned the restaurant (*owner*), the chef's gender (*male*), years of experience in the industry (*tenure*), and whether a respondent had been granted one or more Michelin stars (*stars*). We also measured the association of the restaurant with a chain (*chain*). Descriptive statistics and correlations for all variables are provided in Table 5.

Estimation methods

We estimate a set of equations of the responses of each subject i to each scenario j for each knowledge type k. In most models, we include fixed effects (e.g., dummies) for each subject. Thus all variables are differenced from the subject's average response, for example: $\underline{Y}'_{ijk} = Y_{ijk} - Y_i$

$$Y'_{ijk} = \alpha M'_{ijk} + \beta X'_{ij} + BD'_{ik} + \epsilon_{ijk} \qquad (1)$$

$$M'_{ijk} = \mathrm{B}X'_{ij} + \mathcal{B}D'_{ik} + e_{ijk} \qquad (2)$$

The dependent variable Y'_{ijk} (*knowledge transfer intention*) is a function of the endogenous mediating variable M'_{ijk} (*conformance assessment*), the vector of treatments across the two scenarios X'_{ij} (*reputation*, *proximity*, *positioning*, *review*, and *experience*), and the vector of the knowledge types D'_{ik} (*recipe*, *signature*, and *technique*). The variable M'_{ijk} (*conformance assessment*) is a function of the vectors X'_{ij} and D'_{ik}. Both equations also include error terms (ϵ_{ijk} and e_{ijk}). Our use of fixed effects prevents us from estimating the coefficients for fixed respondent-related controls (*owner*, *male*, *chain*, *tenure*, and *stars*). To estimate these coefficients, we also estimated a less accurate random-effects specification that assumes subject-level disturbances to be uncorrelated with M and X.[10]

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[10] Our use of differencing in Equations 1 and 2 removes the potential for bias from unobserved subject-level disturbances, but an unobserved disturbance at the subject + knowledge level could still bias our estimates. To remove this bias, we also differenced each subjects' responses for a particular type of

Our observations are not fully independent because each subject provides three responses to each scenario. Consequently, our standard errors could be deflated by an overestimate of the true degrees of freedom. To correct this problem when estimating the equations, we clustered the standard errors at the level of the subject. Using clustered errors relaxes the assumption that our error terms (ϵ_{ijk} and e_{ijk}) are independently and identically distributed. This treatment of errors is an example of the Eicker-Huber-White-robust treatment of errors, also known as the Huber-White-sandwich estimator (Huber, 1967; White, 1980; Wooldridge, 2002). Because the sandwich estimator can estimate correlation in error only along the diagonal of the variance–covariance matrix, we also performed a bootstrap estimation of our error structure to account for other possible disturbances. The latter estimation was implemented by constructing 5,000 resamples of the observed dataset, each obtained from the original dataset by means of random sampling with replacement (Mooney and Duval, 1993). This procedure enabled us to estimate the unobserved error structure, correct for undesirable correlations among the errors, and confirm the significance of our coefficient estimates.

RESULTS

In this paper, we attempt to untangle whether and how norms of knowledge use encourage knowledge holders to reveal private knowledge. We hypothesize that the context of transfer influences knowledge holders' expectations of norm conformance. We expect such conformance assessment to predict a knowledge holder's intention to transfer knowledge.

Table 6 presents results of the regression analysis used to test hypotheses 1a, 1b, and 1c, which hold that characteristics of the context of transfer will influence the expectation of norm conformance (see Figure 1, link A). We

knowledge e.g., $Y''_{ijk} = Y_{ijk} - Y_{ik}$) and estimated two new equations.

$$Y''_{ijk} = \alpha M''_{ijk} + \beta X''_{ij} + \epsilon_{ijk} \quad (3)$$

$$M''_{ijk} = B X''_{ij} + e_{ijk} \quad (4)$$

Clearly, this specification does not allow us to estimate the effect of knowledge type. Thus, we report estimations of 1 and 2 but check the consistency of each coefficient estimate with those from 3 and 4.

estimate specifically the impact of the reputation of the knowledge recipient (H1a), the degree of competition between knowledge holder and knowledge recipient (H1b), and the visibility to third parties in the social group of the knowledge recipient's behavior (H1c). The first two models report results from a fixed-effects OLS regression in which we first entered control variables only (model 1), and then inserted our independent variables (model 2). In model 3, we report results from a random-effects GLS regression that allows inspection of estimated coefficients for fixed subject attributes. This final model does not pass the Hausman test for consistency (Hausman, 1978), so caution should be exercised in interpreting the coefficients.

Results of our regressions confirm H1a: *conformance assessment* is positively related to reputation. We also find support for H1b: *conformance assessment* is negatively related to competition (measured by *proximity*). It is worth noting, however, that we do not estimate a statistically significant coefficient for one expected attribute of competition, *positioning*. One explanation for this is that similarity of positioning increases both competition and the potential for cooperation. Chefs sharing a similar positioning may end up feeling part of the same faction. On the one hand, they will be viewed as substitutes in the eyes of consumers, particularly in the case of high-end restaurants whose gourmet customers may be willing to travel a distance in order to have dinner at a particular establishment. This should increase the competition among similar restaurants. On the other hand, sharing a similar positioning may create a feeling of affinity among these restaurants, putting them in a position to be able to interact and engage better in beneficial exchanges. This dual effect of similarity (competition and exchange benefits) has been found empirically in the past (Rosenthal and Strange, 2003). One chef we interviewed prior to our experiment eloquently encapsulated this tension: "You know, it is a small world. [. . .] You never want to burn any bridges in the industry because you might need something. You might need some dinner napkins at the last minute because you are running low. Or you might need 5 pounds of swordfish. Or you might need a busboy really badly." The absence of a significant effect of similarity of positioning on the expectation of norm conformance may be the result of these conflicting forces: the coopetition engendered by

Table 6.   Determinants of conformance assessment (Link A, Figure 1) [a]

	Model 1		Model 2		Model 3	
	Coef	se	coef	se	coef	se
Control variables						
Experience	−0.011	0.030	−0.002	0.029	−0.016	0.028
Signature	0.043**	0.019	0.042**	0.019	0.046**	0.020
Technique	−0.018	0.020	−0.019	0.020	−0.015	0.021
Owner					−0.092*	0.054
Male					−0.045	0.063
Chain					−0.113	0.094
Tenure					−0.010**	0.004
Stars					0.149**	0.062
Independent variables						
Reputation of recipient						
Reputation			0.220***	0.028	0.202***	0.027
Degree of competition						
Proximity			−0.079***	0.027	−0.071***	0.026
Positioning			0.007	0.029	−0.006	0.028
Visibility of recipient's behavior						
Review			0.047*	0.029	0.033	0.027
_cons	3.726***	0.017	3.726***	0.016	4.079***	0.157
N	3,036		3,036		3,036	
F	3.431***		11.948***			
Chi^2					93.532***	
R^2 (ω)	0.003		0.041		0.041	
Hausman test					Not passed	

[a] A Hausman test of a random-effects model with just the manipulated variables confirms the estimations to be consistent. Within-R^2 (ω) reported for fixed and random effects.
***$p < 0.01$, **$p < 0.05$, *$p < 0.1$ two-tailed tests.

similarity may blunt the sense of competition and its influence on expectations regarding norm conformance.

In our most accurate model (model 2), we find moderate evidence to support H1c, that visibility to third parties (measured by *review*) influences expectations of norm conformance. We do not estimate a significant coefficient in our GLS random-effects model (model 3), but we also know from the failed Hausman test that this result may be biased and that coefficient estimates in model 2 are more accurate. In total, we conclude that we find moderate evidence in support of our hypothesis but also judge that caution is appropriate. We speculate that visibility to generic third parties may be less important than we originally thought. Chefs with whom we discussed our results suggested that they are interested predominantly in the extent to which norm violations are visible to other chefs, rather than to third parties in general. To explore this conjecture, we conducted an additional test using a measured variable assessing chefs' subjective sense of the visibility of a violation to other chefs, and we found strong evidence ($p < 0.001$) in support of the conjecture. We hope to test the nuanced effects of different types of visibility in future studies.

Interestingly, we do find that one type of knowledge influenced expectations of norm conformance. With respect to the transfer of *signature* dishes, respondents were more likely to expect knowledge recipients to conform to norms of knowledge use, which behavior they suggested might be due to the heightened visibility of signature dishes. Chefs told us that copying, or failing to credit the original chef for, such dishes is much more apparent to the community: "A chef would not follow one of my recipes exactly and then serve it in [his] restaurant because eventually you are found out [...] everybody knows where he got that idea [...]. Chefs would know."

Consideration of the other treated and control variables in our study provides some intriguing clues for future research. We find no evidence that *experience* influences expectations of norm conformance. In results not shown, we further find

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Table 7. Determinants of knowledge transfer intention (Link B, Figure 1)[a]

	Model 1		Model 2		Model 3		Model 4	
	coef	se	coef	se	coef	se	coef	se
Control variables								
Experience	0.018	0.039	0.034	0.039	0.034	0.039	0.025	0.037
Signature	−0.407***	0.027	−0.407***	0.027	−0.413***	0.027	−0.416***	0.029
Technique	0.242***	0.025	0.241***	0.025	0.244***	0.025	0.244***	0.026
Owner							−0.017	0.078
Male							0.080	0.090
Chain							0.056	0.137
Tenure							−0.002	0.007
Stars							0.146*	0.082
Independent variables								
Reputation of recipient								
Reputation			0.172***	0.039	0.142***	0.038	0.118***	0.037
Degree of competition								
Proximity			−0.227***	0.038	−0.217***	0.038	−0.204***	0.036
Positioning			−0.096**	0.038	−0.097***	0.037	−0.059	0.036
Visibility of recipient's behavior								
Review			−0.004	0.037	−0.010	0.036	−0.010	0.035
Mediating variable								
Conformance assessment					0.136***	0.029	0.183***	0.028
_cons	4.743***	0.025	4.748***	0.024	4.240***	0.111	4.194***	0.255
N	3,036		3,036		3,036		3,036	
F	139.435***		70.818***		63.838***			
Chi^2							515.138***	
R^2 (ω)	0.166		0.193		0.201		0.199	
Hausman test							Not passed	

[a] A Hausman test of a random-effects model with just the manipulated variables confirms the estimations are consistent. Within-R^2 (ω) reported for fixed and random effects.
***$p < 0.01$, **$p < 0.05$, *$p < 0.1$ two-tailed tests.

that experience did not moderate the effect of any of the other treatments. The coefficients for *owner* and *tenure* are significant in our random-effects model. Although the failed Hausman test suggests caution in interpreting these results, we conjecture that owners' heightened awareness of competition makes them less likely to expect others to conform. However, additional tests (not shown) provided no evidence that these variables moderated the reported effects for the treatment variables. Interestingly, it appears that chefs with more experience are more skeptical and highly prestigious chefs (*stars*) are more trusting when considering others' expected conformance to norms of knowledge use.

Table 7 presents results of the regression analysis used to test H2 that conformance assessment will have a positive effect on the intention of a knowledge holder to transfer knowledge (see Figure 1, link B).[11] The first three models report

results from a fixed-effects OLS regression in which we first enter control variables only (model 1), then insert our independent variables (model 2), then include our mediating variable (model 3). Looking at the (within) R^2 of our models, we estimate that control variables explain 16.6 percent of the variance and independent variables explain an additional 2.70 percent (Table 7, model 2). When we include our mediating variable, we experience an increase of 0.81 percent in explanatory power, to a total of 20.1 percent (Table 7, model 3). Even though we report within R^2 (thus removing variance explained by individual differences), the power of our manipulations is in line with previous field studies relying on scenario-based field experiments (e.g., Florey and Harrison, 2000; Schminke *et al.*, 1997).

[11] Because we effect-coded all of our treatment variables, the coefficients that we estimated are half as large as they would be if

estimated with a 0/1 binary variable. Thus, to estimate the effect of a treatment, the reported coefficient should be multiplied by two.

In model 4, we report results for the full model from a random-effects GLS regression to allow inspection of estimated coefficients for fixed subject attributes. The fact that this model does not pass the Hausman test for consistency recommends caution in interpreting its coefficients. Results show that context has a direct effect on the intention to knowledge transfer, as shown by the significant coefficients of *reputation*, *proximity*, and *positioning* across all models. This implies that context directly influences the intention to transfer knowledge. Consistent with H2, however, we find that *conformance assessment* retains significant explanatory power when controlling for the effect of the context (models 3 and 4). Expectations of norm conformance are truly associated with the intention to transfer knowledge above and beyond the effect of context.

It is worth recalling that several scholars have suggested that norms that regulate the use of transferred knowledge might substitute for the absence of intellectual property rights (Fauchart and von Hippel, 2008; Loshin, 2008; Oliar and Sprigman, 2008). For this to be true, norms must occasion a meaningful change in behavior. One way for us to assess this "meaningfulness" is to compare the relative explanatory power of expectations of norm conformance and the treatments on the intention to transfer knowledge. Looking at the (within) R^2 of our models, we compare the marginal increase in the explained variance when adding the treatments (i.e., the difference of 2.70% in R^2 between model 2 and model 1) with the marginal increase in the explained variance when adding the assessment of norm conformance (i.e., the difference of 0.81% in R^2 between model 3 and model 2). This simple "variance decomposition" shows a 1 to 3 ratio for the power explained by expectations of norm conformance to that explained by the treatments directly.

In total, we find strong support for H2: knowledge holders' expectation that knowledge recipients will conform to norms of knowledge use predicts their intention to transfer knowledge. Our empirical evidence provides support for both the indirect (links A and B) and direct (link C) paths connecting the context of the transfer with the intention to transfer knowledge. Thus, we confirm that conformance assessment has an independent effect on the intention to transfer knowledge but find that contextual characteristics play a direct role as well. We elaborate on this

finding after discussing results from our mediation analyses in the section below.

Mediation analyses

As stated in H3, we predict conformance assessment will mediate the relationship between the context of the transfer and the intention to transfer knowledge. In particular, we expect that higher reputation, a lower degree of competition, or higher visibility will dispose knowledge holders to expect knowledge recipients to conform to norms of knowledge use and that this will in turn be associated with a higher reported intention to transfer knowledge.

Traditionally, mediation effects have been detected using causal step methods, Baron and Kenny's (1986) stepwise approach being the most popular. According to this approach, the presence of a mediation effect is indicated if; (1) the independent variable significantly predicts the mediating variable, (2) the independent variable significantly predicts the dependent variable, and (3) the mediating variable significantly predicts the dependent variable while controlling for the effect of the independent variable. Results of the stepwise test confirm that *conformance assessment* significantly mediates the relationship between two elements of the context (*reputation* and *proximity*) and the intention to transfer knowledge. This is shown by; (1) the significant coefficients of *reputation* (coefficient = 0.220, $t = 7.700$, $p < 0.001$) and *proximity* (coefficient = −0.079, $t = −2.920$, $p < 0.050$) when explaining *conformance assessment*, (2) the significant coefficients of *reputation* (coefficient = 0.142, $t = 3.730$, $p < 0.001$) and *proximity* (coefficient = −0.217, $t = −5.740$, $p < 0.001$) when explaining *knowledge transfer intention*, and (3) the significant effect of *conformance assessment* on *knowledge transfer intention* when controlling for the context of the transfer (coefficient = 0.136, $t = 4.660$, $p < 0.001$). We were unable to show that *conformance assessment* mediates the effect of *positioning*, as this measure does not significantly affect our mediating variable (step 1 above). This is consistent with our earlier finding that *positioning* does not influence conformance assessment. We were also unable to show that *conformance assessment* mediates the effect of *review*, given the absence of a direct effect to be mediated. For ease of reading, we report the

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Table 8. Context of the transfer and knowledge transfer intention: The mediating role of conformance assessment [a]

	Baron and Kenny's stepwise approach									
	Effect of X on M			Effect of X on Y			Effect of M on Y			
	coef	T	*p*	coef	*t*	P	coef	*t*	*p*	
Reputation	0.220	7.700	0.000	0.142	3.730	0.000	0.136	4.660	0.000	*Mediation supported*
Proximity	−0.079	−2.920	0.004	−0.217	−5.740	0.000	0.136	4.660	0.000	*Mediation supported*
Positioning	0.007	0.230	0.821	−0.097	−2.600	0.010	0.136	4.660	0.000	*Mediation not supported*
Review	0.047	1.640	0.100	−0.010	−0.290	0.772	0.136	4.660	0.000	*Mediation not supported*

	Sobel test		
	z	**p**	
Reputation	3.987	0.000	*Mediation supported*
Proximity	−2.474	0.013	*Mediation supported*
Positioning	0.226	0.821	*Mediation not supported*
Review	1.549	0.121	*Mediation not supported*

	Bootstrapped estimate		
	Confidence Interval		
Reputation	0.018	0.042	*Mediation supported*
Proximity	−0.018	−0.004	*Mediation supported*
Positioning	−0.005	0.007	*Mediation not supported*
Review	−0.001	0.013	*Mediation not supported*

[a] Dependent variable (Y): Knowledge transfer intention; mediating variable (M): conformance assessment; independent variables (X): reputation, proximity, positioning, and review.

coefficient estimates meaningful to our analyses (from Tables 6 and 7), together with the results of the tests, in Table 8.

To ensure the robustness of our findings to alternative tests of mediation, we performed additional parametric (Sobel) and nonparametric (bootstrap) tests. We conducted four Sobel tests (Sobel, 1982), one for each of the measures of contextual characteristics used in our study (*reputation*, *proximity*, *positioning*, and *review*).[12] Results of these tests are in line with what we found using Baron and Kenny's approach: *conformance assessment* is a significant mediating variable between *reputation* and *knowledge transfer intention* (z = 3.987, p < 0.001) as well as for *proximity* (z = −2.474, p < 0.05). Again, we were unable to show that *conformance assessment* mediates the effect of

positioning and *review*. For our nonparametric test, we used the bootstrap approach developed by Preacher and Hayes (2004): estimating the indirect effect through the mediating variable using 5,000 bootstrap resamples and a bias-corrected and accelerated 95-percent-confidence interval (Preacher, Rucker, and Hayes, 2007). As with the two previous analyses, we again found that *conformance assessment* is a significant mediating variable between *reputation* and *knowledge transfer intention*, and again we were not able to show that *conformance assessment* mediates the effect of *positioning* and *review*.

In conclusion, our empirical evidence provides support for H3, which holds that conformance assessment mediates the relationship between the context of the transfer and the intention to transfer knowledge. However, we find evidence of a mediation effect for only two characteristics of context, namely, *reputation* of the knowledge recipient and the degree of competition between the knowledge holder and knowledge recipient, as measured by geographical *proximity*. Yet, despite these caveats, in total we find evidence in support of the coexistence of both the indirect (links A and B) and direct (link C) paths connecting the context

[12] Although it is more accurate than the Baron and Kenny stepwise approach, the Sobel test has low statistical power with small sample sizes, as it is based on the key assumption of normality. MacKinnon *et al.* (2002) suggest a rule of thumb to deal with this issue. According to the authors, a sample size of 50, 100, or 1,000 is recommended in order to detect, respectively, a large, medium, or small effect. Given the size of our sample, we can confidently report a significant mediation effect.
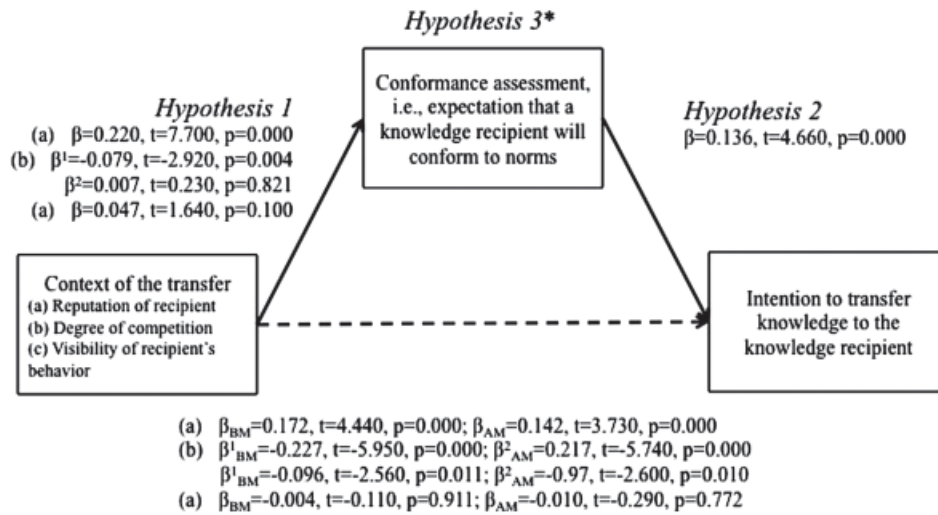
Figure 2. Summary of results. Note: β_{BM} indicates the coefficient *before* mediation is introduced in the regression; β_{AM} indicates the coefficient *after* mediation is introduced in the regression. For degree of competition, we indicate with the subscript 1 the coefficients related to *proximity*, with the subscript 2 the coefficients related to *positioning*. *We tested mediation with Baron and Kenny's stepwise approach, a Sobel test, as well the bootstrapped method (Preacher *et al.*, 2007). Results of these tests show that *conformance assessment* is a significant mediating variable between *reputation* and *knowledge transfer intention* as for *proximity*, but not for *positioning* and *review*.

of the transfer with *knowledge transfer intention*. Figure 2 displays the original Figure 1 with the relevant coefficient estimates.

It is worth noting that, for *reputation* and geographical *proximity* our results only support a *partial* mediation effect, as shown by the presence of a significant direct effect of these two variables on *knowledge transfer intention*. The presence of a partial mediation effect suggests that coactive motives and logics influence knowledge transfer. For example, our results highlight that chefs have, on average, a higher intention to transfer knowledge to reputed counterparts. Our partial mediation results suggest that one reason for this is that reputed parties are expected to follow norms of knowledge use. However, the fact that the mediation is only partial suggests that reputation also has a direct effect on the intention to transfer—regardless of the expectation of norm conformance. One possible explanation for this finding is that by transferring knowledge to reputed counterparts chefs expect to gain repute in return. Perhaps the fact that they have entered an exchange relationship with a well-regarded industry player signals something about their own quality, or possibly chefs want some of their recipes to be diffused (as long as they can claim paternity of a dish) and transferring to a reputed chef may increase the fame and distribution of a recipe.

Robustness tests

We conducted a series of tests aimed at assessing the robustness of our findings. We first evaluated whether knowledge holders' assessment of conformance to norms of knowledge use might be confounded with simultaneous assessments of norms that promote the transfer of knowledge, *à la* Merton (1973). To explore this possibility, we measured a knowledge holder's assessment of such norms by asking whether the other chef would be likely to ask for knowledge. If conditions are influencing norms that promote the free exchange of knowledge, this variable should measure any differences in these norms among knowledge holders. Analyses including this measure confirmed the sign and significance of the reported results.

We tested the robustness of our results for each of the three components of *conformance assessment* (i.e., "don't copy exactly," "cite the source," and "don't pass on"). Results confirm our previous reports that the context of the transfer influences expectations of compliance with each of these three norms and that this, in turn, influences the propensity to transfer knowledge.

Robustness tests on the mediation test using the three individual social norms also confirmed the reported results.

We also performed robustness checks on the generality of our findings by splitting the sample on the basis of respondent characteristics. To test the effect of restaurant ownership, we ran a separate analysis in which we included only chef-owners (78% of our sample) and confirmed that the reported effects were consistent for both chefs and chef-owners. We also ran a separate analysis distinguishing between chefs in restaurants with Michelin stars (17% of our sample) and chefs in restaurants without stars. Results were even stronger for chefs in starred restaurants.

Finally, we performed a series of robustness tests to ensure that our results were not biased by shared disturbances. Having two scenarios per subject and three responses for each of the three types of knowledge following each scenario, we could have both a shared disturbance for the subject and a shared disturbance for the three types of knowledge. To be certain our coefficient estimates are unbiased, we ran an alternative model with fixed effects at both the subject and knowledge level. We then ran a Hausman test comparing the coefficients between those models and the ones we report in this article and confirmed they did not change significantly. By this method, we validated that the reported results are unbiased (Wooldridge, 2002).

We took three extra steps to ensure that our standard errors are accurate. Clustering standard errors using the Huber-White sandwich estimator enabled us to relax the assumption that ϵ_{ij} is independently and identically distributed by allowing correlation in the disturbance terms within i. We cluster not only at the scenario−subject level (as presented in the paper), but also at the levels of subject (with a slight loss of significance for the effect of *review*) and city (without any significant change in results). We then used a bootstrap technique to estimate and correct for other types of disturbances in the error structure. This technique accommodates any error relationship, not just differences in variance across groups, as is the case for the Huber-White method. Results of a bootstrap estimation with 5,000 bootstrap resamples support the sign and significance of our reported results.

Finally, we ran analyses separately for each type of knowledge (*recipe*, *signature*, and *technique*). The results confirmed the findings reported in the paper, although obviously we could not estimate the coefficients for the main effect of different types of knowledge because the analyses considered only one type of knowledge at a time.

Despite our efforts to test the robustness of our findings, our results are subject to several limitations. One, intrinsic to the use of scenario-based experimentation, is that we measure planned rather than real action. As a result, we are measuring the coherence of expectations and the intention to act (Festinger, 1957). The need for such coherence has been shown to be a powerful driver of actual behavior, but it can also influence expectations. Without a true temporal analysis of real action, we can only conclude from our quantitative analysis that the two are associated. We tried to infer causation better supporting our quantitative data with evidence gathered in the course of qualitative fieldwork, and certainly chefs universally report that expectations lead to behavior. Nevertheless, in future research we hope to use experimental methods where we condition expectations and then measure subsequent behavior.

Second, limiting our investigation to a single industry and country with specific sets of social norms may reduce the generalizability of our results. Social norms may be more salient in status-based industries like fine fashion, academia, performing arts, consulting, and professional services and may work particularly well in relatively small, tight-knit communities, as in the case of professional élites like lawyers, doctors, and so forth (Abbott, 1983). This boundary condition is particularly relevant in light of an influential literature that finds the effect of networks and embeddedness in tight-knit communities to be a major driver of norm compliance (Coleman, 1990; Granovetter, 2005). The fact that we do not consider this network component in our research, although it limits the power of our findings, does not compromise our coefficient estimations. An individual's network connections are fixed for the individual at the time of our survey and thus not affected by our treatments. Although existing network relations should not influence our findings, our results may nevertheless provide a starting point for future research on network connections. We show people to be more trustworthy when interacting with distant or highly prestigious counterparts. Also, expectations of conformity to social norms increase when knowledge transfer involves certain types of knowledge (e.g., recipes

for signature dishes). These contextual characteristics may aid the formation of network ties.

DISCUSSION AND CONCLUSION

Knowledge transfer is critical to the welfare of a society. The influence of a creative idea is diminished if the idea is not dispersed among potential users. Yet those who hold private knowledge transfer it at their peril, because once transferred, knowledge may no longer provide private value. Recently, scholars have proposed that norms may facilitate the dissemination of private knowledge by governing its use.

In this paper, we use evidence from a field experiment to test the effect of norms of knowledge use on the intention of gourmet chefs to transfer knowledge. We illustrate that the intention to transfer knowledge is influenced by the expectation that recipients of knowledge will conform to norms of knowledge use. We find that characteristics of the context in which the transfer occurs (e.g., attributes of the knowledge holder and recipient, as well as the nature of the transferred knowledge itself) influence these expectations. Finally, we show that expectations of norm conformance partially mediate the effect of context on the intention to transfer knowledge.

Our research provides both a confirmation and a challenge for studies investigating the role of norms of knowledge use on knowledge transfer (e.g., Fauchart and von Hippel, 2008; Loshin, 2008; Oliar and Sprigman, 2008). Using rigorous experimental data, we refute a common criticism of this research by showing that knowledge holders are indeed concerned about the disposition of transferred knowledge and are more likely to transfer when they expect norms of knowledge use to be in force. However, we also show that the effectiveness of norms of knowledge use is not as simple or homogeneous as previously presented (e.g., Fauchart and von Hippel, 2008; Loshin, 2008; Oliar and Sprigman, 2008). Knowledge holders expect norm conformance to vary depending on the specific context in which the transfer takes place, with characteristics such as the reputation of the knowledge recipients, the degree of competition with them, and the visibility of their actions.

We clarify also the potential economic effect of norms as a means of protecting transferred knowledge. Previous researchers have extrapolated

that norms are so powerful that they can fully substitute for other means of protecting private knowledge (Fauchart and von Hippel, 2008; Sethi, 2010). Our finding of a partial mediation of expectations of norm conformance on the relationship between contextual characteristics and the intention to transfer suggests that norms of knowledge use are just one part of a menu of strategies chefs use to protect the value of their private knowledge. This inference is further reinforced by a variance decomposition that shows that norms play an important but partial role in affecting the intention to transfer knowledge. Hence, we conclude that knowledge holders use a multi-fold calculus when making decisions about whether to transfer knowledge that includes both private strategies and the potential protection of social norms.

For the broader literature on norms, our work emphasizes the central role of normative expectations in affecting the ultimate choice to transfer knowledge. Despite the theoretical importance placed on normative expectations, few studies have explored their influence (Bicchieri and Muldoon, 2011). In this respect, our work is one of the first to theorize and empirically test the antecedents and consequences of such expectations. We uncover field evidence of the role played by normative expectations in filtering the effect of contextual conditions on the intention to act (Bicchieri and Muldoon, 2011).

The role of normative expectations could be particularly important in cases where norms govern an asymmetrical exchange. Many studies (including those investigating knowledge sharing) assume symmetric roles across agents, for instance all are contributing to (or extracting from) a common resource. In our setting, one party contributes and another safeguards knowledge—making the latter the agent for the former's private knowledge. This might seem like an unusual condition but it is actually common and growing more so. Open innovation, for example, often emphasizes asymmetric relationships. Open programming competitions include algorithm developers and tweekers; music platforms include composers and samplers; product design platforms include solvers and selectors (Jeppesen and Lakhani, 2010). In all of these cases, issues of normative expectations are salient, as once again one party is the agent for another's intellectual property. Knowing the right attributes to look for when picking partners could be very valuable for both platform designers and content

providers, as shown by extant literature on the selection of partners in alliances (Rhodes-Kropf and Robinson, 2008) and in collaborations generally (Mindruta, 2013).

At a higher level of theoretical abstraction, our research contributes to a growing understanding of the interplay between strategy and institutions (e.g., Kraatz and Zajac, 1996; Oliver, 1991; Philippe and Durand, 2011). A pioneering body of research in the strategy literature has tried to discover how strategic choice influences responses to institutions (Kraatz and Zajac, 1996; Philippe and Durand, 2011). For example, Oliver (1988, 1991) demonstrates the importance of a strategic choice perspective in dealing with institutional pressures, and Deephouse (1999) develops a model of strategic balance whereby actors attend jointly to the institutional pressure toward conformity and the economic pressure to differentiate. Our contribution to this literature is twofold.

First, our results help clarify whether a "thin" or "thick" rationality perspective should be used to understand the role of norms. According to a "thin rationality" perspective, context and preferences are the ultimate source of action, and reports of norms are either the residual trace of economic analysis or an *ex post* justification of action (Brennan, 1991). In other words, people follow norms when they have concluded that it is in their interest to do so, and reports of "norms" may merely reflect *ex post* attempts to gain social approval (Haidt, 2001). In contrast, advocates of a "thick rationality" perspective argue that actors respond to varying characteristics of context by considering their self-interest, but the response to norms cannot be distilled to a purely coherent calculus (Elster, 1989; North, 1990; Ostrom, 1998). Evidence from our research suggests that actors use a type of thick rationality when interacting with social norms.

Second, we illuminate how industry players use cognition to make sense of their competitive environment (Porac *et al.*, 1989). In contexts where market cues are ambiguous and interorganizational variety is high, firms define their rivals based on cognitive interpretations rather than on economic criteria (Porac, Thomas, and Baden-Fuller, 2011). This is consistent with our interpretation of the absence of a significant effect of similarity of positioning on conformance assessment. Chefs fail to identify similar establishments as pure competitors, as overlapping positioning also triggers

a sense of potential for cooperation. Thus our research evidences the centrality of cognitive interpretations also characterizes studies of the social identity of strategic groups (Durand *et al.*, 2007; Peteraf and Shanley, 1997). According to this line of endeavor, similar cognitive and social identity among groups of firms may enable them to engage in beneficial knowledge exchange.[13] Over time, this could allow the formation of strategic groups (Ferguson, Deephouse, and Ferguson, 2000) and result in performance differences (Obloj and Capron, 2011).

We believe our research opens a number of avenues for future investigation. For example, it provides a springboard for research aimed at identifying the full range of cues that actors use in assessing the propensity for others to follow norms. Future research could examine how expectations of norm conformance are influenced by characteristics of the network of relationships in which a knowledge holder and knowledge recipient are embedded (Coleman, 1988, 1990). Our investigation also raises questions about how social norms are connected to the formation of relational contracts (Baker, Gibbons, and Murphy, 2002). Our research suggests that, under specific conditions, social norms might encourage ongoing exchanges and the development of relational contracts, which in turn could reinforce social norms.

Future research in other settings is needed to clarify when and why norms play a greater or lesser role in regulating the use of transferred knowledge. Similar systems of norms exist in many industries—fashion, graphic arts, news reporting, and so on. Indeed, expert confectioners tell us that these norms are even more pronounced there, and leading pharmaceutical drug designers tell us the effects we discover may influence the development of science and new drugs. In some cases, new technology is creating the opportunity to observe the development of these norms. For example, contributors to online "open innovation" tournaments must often share their work with a community of potential collaborators and competitors. Community discussions following thefts of creative ideas on some of these platforms may reveal how community norms are formed.[14]

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[13] We are grateful to one of our reviewers for suggesting this important implication of our findings.
[14] http://www.shapeways.com/blog/archives/170-i-love-threadless-ip-rights.html [15 July 2013]

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APPENDIX: Evidence of social norms per Fauchart and von Hippel (2008)

Rules	Example comment	Boundary condition	Reported by
(1) Don't copy	You do not replicate the same dish. Rather, you take an idea that may be interesting and create something else.	Except if citing, see rule #2	Informant #: 1; 2; 3; 4; 5; 6; and 8.
(2) Cite the source	If you cook the same recipe, you should write it in the menu. Otherwise you do not replicate it in the same way; you interpret in your own way and cook it in your own way.	Unless making substantial modifications, see rule #1	Informant #: 3; 7; and 8.
(3) Don't pass on	There is one recipe that I do not give away. I inherited that recipe. I feel like I am carrying that recipe, it does not really belong to me but I am carrying it. So it is not a recipe that I would give out.	Except (for some individuals) if sufficient time ($\sim$5 years) has passed.	Informant #: 2; and 3.