

“Does This Sound Like a Fair Deal?”: Antecedents and Consequences of Fairness Expectations in the Individual’s Decision to Participate in Firm Innovation

Nikolaus Franke, Peter Keinz, Katharina Klausberger

Institute for Entrepreneurship and Innovation, User Innovation Research Initiative Vienna,
 WU Vienna University of Economics and Business, A-1090 Vienna, Austria
 {nikolaus.franke@wu.ac.at, peter.keinz@wu.ac.at, kk@finderly.com}

The Internet has given rise to new organizational forms of integrating users into firm innovation. Companies willing to make use of external resources can now outsource innovation-related tasks to huge “crowds” outside the company. The extant literature on participation motives assumes a symbiotic relationship between the firm and external contributors in which both parties have largely complementary motives and are only interested in their own utility. In two experimental simulations, we show that this understanding has to be amended: potential contributors not only want a *good* deal, they also want a *fair* deal. Fairness expectations with regard to the distribution of value between the firm and contributors (distributive fairness) and the fairness of the procedures leading to this distribution (procedural fairness) impact the likelihood of participation beyond considerations of self-interest. Fairness expectations are formed on the basis of the terms and conditions of the crowdsourcing system and the *ex ante* level of identification with the firm organizing it. In turn, they impact the individuals’ transaction-specific reactions and also inform their future identification with the firm. These findings contribute not only to research on open and user innovation but also to theories on organizational fairness by enhancing our understanding of the emergent field of fairness expectations.

Key words: participation in firm innovation; crowdsourcing; user innovation; open innovation; fairness expectations; anticipatory justice

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1. Introduction

Threadless.com is an innovative Chicago-based T-shirt company that decided to cast off the established practice of relying on the creativity of a limited number of in-house or fixed-contract designers. Instead, the Threadless website invites virtually anyone in the world to create new T-shirt designs and to submit them electronically in an ongoing online contest: 1.5 million Web users have taken up this invitation, allowing the small company with few fixed-contract employees to tap a source of creativity that comprises four times the number of employees in the entire U.S. textile industry (National Textile Association 2011). Highly innovative designs and thus double-digit growth rates are the consequence. It appears that Threadless has learned the lessons from noncommercial virtual innovation communities and open source software projects quite well: (1) there is a lot of creativity outside the firm that is (2) openly revealed and shared online and, (3) if organized and integrated properly, might add up to enormous commercial value (Faraj et al. 2011; von Hippel 2005; von Hippel and von Krogh 2003, 2006; von Krogh and von Hippel 2006).

Threadless is only one example of a broad trend facilitated by the Internet. In recent years, many firms in diverse industries have begun to experiment with outsourcing innovation-related tasks such as new product

ideation, idea evaluation, prototype testing, or user assistance to “crowds” outside the company (Nambisan 2002, 2009; Nambisan and Baron 2009, 2010). Particularly in creative ideation tasks, crowds appear to be a promising source (Afuah and Tucci 2012; Nambisan and Baron 2009, 2010; Poetz and Schreier 2011; Terwiesch and Ulrich 2009), which is therefore the focus of this article. Firms issue open online calls for new ideas and solutions, and they offer rewards to those who submit the best ones (Bullinger et al. 2010, Füller 2006, Humphreys and Grayson 2008, Leimeister et al. 2009, Nambisan and Baron 2010, Ogawa and Piller 2006, O’Hern and Rindfleisch 2009, Sawhney et al. 2005, Terwiesch and Xu 2008). Systematically integrating individuals external to the organization into new product ideation is not only a phenomenon of practical importance. “Crowdsourcing” ideation systems also denote an emerging organizational form of high theoretical interest (Afuah and Tucci 2012, Dahlander and Magnusson 2008, Nambisan 2002, Ogawa and Piller 2006, Terwiesch and Xu 2008). Crowdsourcing communities consist of particularly large numbers of heterogeneous, self-selected, and voluntary individuals who engage in temporary, decentralized problem-solving activities for the firm. In most instances, only the transaction of submitting solutions is regulated by an up-front legal contract

(Felstiner 2010), and the entry and exit barriers for participants are very low (Bayus 2013, Dahlander and Frederiksen 2012, Fleming and Waguespack 2007). This loosely coupled organizational form (Brusoni et al. 2001, Dahlander and Wallin 2006, Jeppesen and Laursen 2009, Orton and Weick 1990) allows firms to obtain surprisingly innovative solutions for relatively little compensation (Bullinger et al. 2010; Harhoff and Mayrhofer 2010; Nambisan and Baron 2009, 2010; Poetz and Schreier 2011; Terwiesch and Ulrich 2009). On the other hand, their organizational properties make crowdsourcing systems volatile and fragile (Gächter et al. 2010, O'Hern and Rindfleisch 2009). Contributors dissatisfied with the system are more likely to react with "exit" than with "voice" (Felstiner 2010, Hirschman 1970), or they will show no inclination to join the system from the very outset. Apart from the celebrated success stories, therefore, there are also several failures (Euchner 2010), which raises the important question of what makes individuals contribute to firm innovation—or refrain from doing so. Extant research has identified a number of participation motives, such as using the product oneself, fun, a sense of belonging, recognition, money, etc. (Brabham 2010; Ebner et al. 2009; Füller 2006, 2010; Füller et al. 2006, 2008, 2009, 2010; Hall and Graham 2004; Jeppesen and Frederiksen 2006; Leimeister et al. 2009; Nambisan and Baron 2009, 2010; Shah 2006; Wu and Sukoco 2010). Although these are important insights, many scholars have called for more research on this issue (Hoyer et al. 2010, Nambisan and Baron 2010, Terwiesch and Xu 2008). We have identified two specific aspects that deserve more attention.

The first aspect is the neglected role of *fairness*. One cornerstone of the literature on open and user innovation (Baldwin and von Hippel 2011, Chatterji and Fabrizio 2012, Chesbrough 2003, Prahalad and Ramaswamy 2000, von Hippel 2005) is that the creative output of users is freely shared in communities and can thus also be used by other parties (e.g., Franke and Shah 2003, Lilien et al. 2002, Morrison et al. 2000, Urban and von Hippel 1988). Von Hippel and von Krogh (2003, 2006) hence suggested the "private-collective" innovation model, which states that users are willing to contribute to creating a public good (an innovation that can be used by anyone interested) because by contributing they obtain private benefits that are available only to them (and not to free riders), and these benefits exceed their costs. Users are "paid" in the currency of having fun, learning, a sense of belonging, recognition, etc., not with direct returns for giving away their creative accomplishments (Harhoff et al. 2003). This model was developed for understanding the motivation of noncommercial open source software projects, but its underlying rationale has also been used to explain why users contribute to *firm innovation*. Baldwin and von Hippel (2011, p. 1411) suggest that a "symbiotic relationship" is

possible in this case: the firm derives utility from selling the products developed using the users' ideas and concepts, and the contributors benefit from complementary factors similar to those in open source software. In this view, users are portrayed as relatively rational individuals who experience neither envy nor feelings of unfairness if other parties profit more than they do. They base their decision to contribute solely on *their own* net utility without comparing it to that of other parties, an assumption that is consistent with social exchange theory (Blau 1964). In contrast, fairness theory suggests that individuals also care about the allocation of resources and power *between* parties (Folger et al. 2005, Gillespie and Greenberg 2005). In the Threadless case, the expected hourly wage for an individual submitting a design to Threadless can be calculated as being a small fraction of the federal minimum wage in the United States. And, indeed, some users have complained about the firm making a fortune harvesting and selling the cheaply bought fruits of their labor, as visible in the comment made by Tee (2006) below:

Josh, it is absolutely about community; except when it comes to spreading the wealth. You have to agree that \$1,500 cash in your pocket with a winning design vs. up to \$450,000 (gross) cash in the Jakes' [Threadless Founders Jake Nickell and Jacob DeHart] pockets doesn't really favor the community does it?...

The guys are grossing almost 7M this year, let's get real here, eh? When you sell 1,000 T-shirts a day I think you can pony up a little more than \$1,500 for the designers. (emphasis in original)

The question of whether crowdsourcing is fair has also been brought up by scholars such as Felstiner (2010), Hoyer et al. (2010), Humphreys and Grayson (2008), O'Hern and Rindfleisch (2009), Wind and Rangaswamy (2001), and by the popular press (e.g., Hamburg 2008, Howe 2007). Some anecdotal evidence on the importance of fairness in open and user innovation has been reported by Di Gangi and Wasko (2009), Di Gangi et al. (2010), Füller et al. (2007), Mayrhofer (2006), and Shah (2006), but no systematic theoretical and empirical research has been conducted on this topic to date. We do not know whether the perceived fairness of the organizational arrangement is really an issue among contributors, nor do we know the extent to which fairness considerations influence their decision to participate in crowdsourcing or not.

The second aspect that deserves more attention is the *initial* decision to participate. To our knowledge, all previous studies on participation motives have used samples of crowdsourcing and brand community members. Such samples can generate important insights into the perceptions and behaviors of those individuals who have already decided to participate in firm innovation. They also provide answers to the question of why crowdsourcing participants continue to contribute

(or not). However, they preclude generalizations on the initial decision to contribute and on the majority of potential contributors—namely, those who have not yet considered participating or have even consciously decided not to participate. The initial decision to contribute to firm innovation is particularly important because of the volatile and loose nature of crowdsourcing systems, which implies that such systems constantly need to attract new contributors (Bayus 2013). It is also important from a practical perspective because we can expect many more firms to launch crowdsourcing initiatives, thus inducing fierce competition for new users (Cook 2008, Harhoff and Mayrhofer 2010, O’Hern and Rindfleisch 2009).

In this article, we address these two neglected issues and investigate the role of fairness expectations in the initial decision to contribute to a crowdsourcing system. Specifically, we investigate two research questions. First, we examine the *antecedents* of fairness expectations. What factors make potential contributors to crowdsourcing think that they will be treated fairly? Second, we ask what *consequences* fairness expectations have. Do they inform the individuals’ initial decision to contribute? Do they have further consequences? Answers to these questions are not only relevant for the emerging literature on user participation in firm innovation. They also contribute to the literature on organizational fairness. Over decades, organizational fairness research has focused on *ex post fairness judgments* based on concrete experience (see Cohen-Charash and Spector 2001, Greenberg and Colquitt 2005). Although this has undoubtedly increased our understanding of human behavior in organizational contexts invaluablely, people also make judgments *ex ante* to an actual experience by developing expectations (Olson et al. 1996). Shapiro and Kirkman (1999, 2001) were the first to study what they term “anticipatory justice”—namely, expectations regarding whether one will (or will not) experience fairness in the context of a future event. Since then, a few studies in the contexts of organizational change and employee selection systems have confirmed that such expectations are indeed formed and have affective, cognitive, and behavioral consequences (Bell et al. 2004, 2006; Derous et al. 2004; Rodell and Colquitt 2009). However, we still lack a great deal of knowledge. Particularly, “it remains unclear how perceptions of anticipatory justice are initially formed” (Rodell and Colquitt 2009, p. 989). Our findings thus not only highlight the need to consider fairness when inviting individuals to participate in firm innovation, they also allow us to contribute to the theory of organizational fairness.

2. Fairness Expectations in the Crowdsourcing Context

In our study, we build on Gilliland’s (1993) organizational justice model, which he developed to understand

fairness perceptions in employment selection systems. In some ways, the crowdsourcing context appears analogous to the situation of a job application. In both situations, the individual provides input (by demonstrating qualifications or submitting a design), and a selection process determines the outcome (whether he or she receives a job offer or wins the competition). Gilliland (1993) distinguishes two factors in fairness perceptions—namely, the fairness of the selection outcome (distributive fairness) and the fairness of the selection process (procedural fairness). The former relates to the perceived “rightness” of the distribution of outcomes to different actors (Adams 1965, Cohen-Charash and Spector 2001, Colquitt et al. 2001), and the latter is defined as the perceived fairness of the process by which these allocations are made (Leventhal 1980, Lind and Tyler 1988, Thibaut and Walker 1975). Both forms of fairness are assumed to have affective, cognitive, and behavioral consequences and have transaction-specific antecedents, i.e., various aspects of concrete experience during the selection process. Apart from minor adaptations (explained below), our model differs from Gilliland’s (1993) framework in two major ways (see Figure 1). First, we consider fairness perceptions *ex ante* to participation and not *ex post*. This means that transaction-specific antecedents of distributive and procedural fairness are not actually experienced but only anticipated on the basis of the terms and conditions of the crowdsourcing system. Second, we add the general antecedent of *ex ante* identification with the organizing firm.

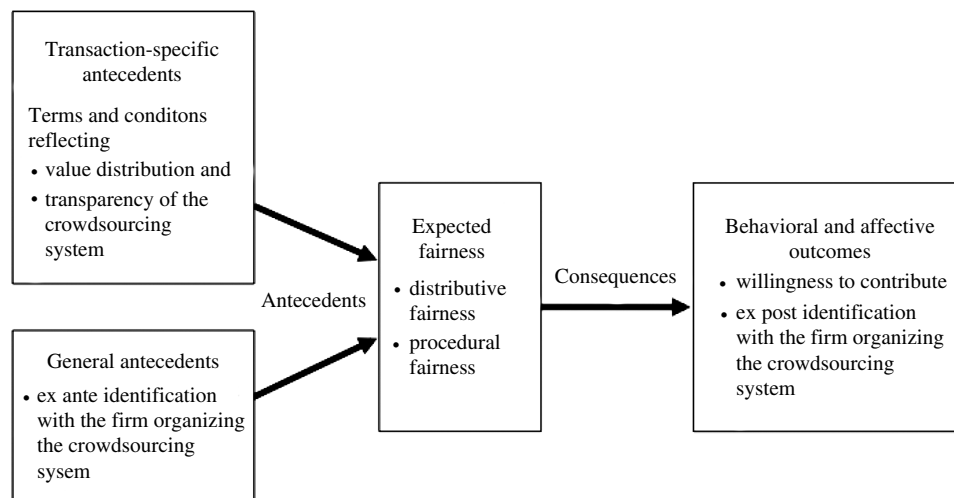
2.1. Antecedents of Fairness Expectations

An individual’s subjective evaluation that a given distribution is “fair” (or not) can be understood on the basis of the equity rule (Adams 1965, Smith et al. 1999, Tax et al. 1998). It states that individuals draw comparisons between perceptions of their own outcome-to-input ratio and what they feel they “deserve,” which is derived from the perceived outcome-to-input ratio of reference parties:

$$\frac{outcome_{individual}}{input_{individual}} = \frac{outcome_{reference}}{input_{reference}}. \quad (1)$$

If the right-hand term becomes greater than the left-hand term, the equity rule is violated and the individual feels that he or she is being treated unfairly. (Feelings of unfairness may also result from *overpayment*, i.e., if the right-hand term becomes smaller than the left-hand term; see Cropanzano et al. 2003. We do not pursue this possibility because it appears unlikely in our context.) This means that if potential participants perceive changes or differences in any of the four variables in the equation (or inequation), this will affect their fairness evaluation. We reason that different terms and conditions of the crowdsourcing system will induce such evaluation

Figure 1 A Model of Fairness Expectations in Crowdsourcing



and hence have an impact on expectations regarding the system's distributive fairness.

Who is the reference party? We argue that potential participants will naturally take the *organizing firm* as a point of reference. This constitutes an interesting deviation from most research on organizational fairness, where scholars usually assume that individuals draw on their peers for comparison when they evaluate their own outcome-to-input ratio. These reference parties are usually other employees or other applicants whom the individual may perceive as being privileged by the organization or its representatives (Ambrose and Arnaud 2005, Gilliland and Hale 2005, Kurland and Egan 1999, Wade et al. 2006). When considering participation in a specific crowdsourcing system for the first time, the individual is hardly aware of the outcome-to-input ratios of other potential contributors. Thus, it appears likely that potential participants will rather compare themselves with the firm organizing the crowdsourcing system: after all, the terms and conditions govern how the value generated will be shared between them and the firm, and this distribution rule (that is identical for all potential contributors) is defined by the firm.

Which forms of outcome will have the greatest impact on fairness perceptions? We reason that outcome factors in which rivalry exists (i.e., that constitute zero-sum games) will particularly matter (Barry 1989). Here, the firm's gains come at the *expense* of the participant. When rivalry exists, the outcome distribution can also be compared easily because it is expressed in the same "currency." In contrast, non-rival forms of outcome (such as learning) might affect only one side of the equation and also be difficult to quantify; hence, fairness effects will be much weaker. We thus focus on outcome factors that can be distributed between participants and the firm. Our selection is based on the likely importance for both the firm and the individual (Bagozzi and

Dholakia 2002, Crawford and Di Benedetto 2010, Tidd and Bessant 2009). The first factor is monetary profit. For firms, it might be the prime motive for engaging in innovation (Trott 2008), and although it might rank lower in the preference structure of individuals external to the firm, studies show that it also has some meaning among potential crowdsourcing participants (e.g., Leimeister et al. 2009). The second factor is reputation. Many people appear to joining crowdsourcing systems because they expect to gain reputation through such activities (Ebner et al. 2009, Füller et al. 2010, Jeppesen and Frederiksen 2006, Leimeister et al. 2009, Wu and Sukoco 2010). Reputational gains may foster their career prospects or create social benefits (Füller et al. 2007, Hoyer et al. 2010, Leimeister et al. 2009, Piller and Walcher 2006). The firm may support the successful contributors' reputation in many ways—or refrain from doing so and claim the innovative reputation for itself. Anecdotal evidence from interviews with potential contributors in the course of this research suggests that this might be a major issue for potential participants. In a similar vein, the announced allocation of property rights to the design submitted may affect equity and thus fairness expectations (Hoyer et al. 2010): Who is allowed to use the design for how long and for what purposes? Hoyer et al. (2010, p. 289) argue in their conceptual article that "tricky questions around ownership of intellectual property...might create perceptions of unfairness among consumer contributors." We summarize these equity-based arguments in our first hypothesis.

HYPOTHESIS 1 (H1). *The more the terms and conditions regarding value distribution favor the organizing firm (relative to the potential participants) with regard to (a) monetary profits, (b) reputation, and (c) intellectual property (IP) ownership, the more negative the*

potential contributors' expectations of distributive fairness of the crowdsourcing system will be.

In line with Gilliland (1993), we argue that crowdsourcing participants will care not only about the fairness of the outcome distribution but also about the perceived fairness of the underlying processes. *Procedural fairness* is conceptually distinct from distributive fairness (Cohen-Charash and Spector 2001). The former is high in cases where the procedures implemented and executed by the organizing institution are transparent, consistent, and nonarbitrary (Cohen-Charash and Spector 2001, Folger 1977, Kumar et al. 1995, Tax et al. 1998). As in the case of distributive fairness, the relevant research has focused almost exclusively on ex post procedural fairness perceptions based on concrete experience (Shapiro and Kirkman 2001). In this article, we argue that such perceptions will also form on the basis of process descriptions such as the terms and conditions of crowdsourcing systems. We focus on transparency because we reason that it plays a key role in the formation of procedural fairness expectations in our context. In general, transparency alone appears to hold value for many Web users. It also is a crucial variable determining the success of collaborations in new product development (e.g., Jassawalla and Sashittal 1998). In particular, it is highly valued by contributors when firms invite contributions to their innovation activities (Lakhani and Panetta 2007; Nambisan 2002, 2009; Nambisan and Baron 2010; Shah 2006). Transparency may refer to the goals of the competition, to the role the firm expects the user to play, to the innovation and value-creation processes, to the outcomes, and to the way the winning designs or ideas are determined (Nambisan 2002, 2009). In typical crowdsourcing competitions, most of these issues are clarified in the terms and conditions because it is in the firm's interest to make it clear what it wants from participants and to avoid misunderstandings and lawsuits (Nambisan 2002, Ogawa and Piller 2006). One exception may be the selection system. Here, transparency also has considerable disadvantages for the firm. It might forewarn competitors (Di Gangi et al. 2010, Nambisan 2009) and, in particular, preclude changes in selection criteria (assumed general attractiveness, strategic and competitive fit, production constraints, ethical considerations, etc.) or their relative weights in the assessment of submissions, thus reducing the firm's control. Firms have to balance these disadvantages with the risk of upsetting participants. Di Gangi and Wasko (2009) and Di Gangi et al. (2010) report on the "IdeaStorm" crowdsourcing competition, in which Dell's intransparent and seemingly arbitrary decision not to adopt the idea of preinstalling OpenOffice (although it had received high approval from participants) triggered strong negative reactions. We thus argue that the ex ante commitment visible in such transparency will be

an important signal for potential participants who form expectations of procedural fairness.

HYPOTHESIS 2 (H2). *The less transparent the terms and conditions regarding the contribution selection process are, the more negative the potential contributors' expectations of procedural fairness of the crowdsourcing system will be.*

In cases where individuals lack concrete experience regarding the specific transaction in question, research suggests that they form their expectations (additionally) upon their *general* relationship to the potential transaction partner (Bell et al. 2004, Lind 2001, Rodell and Colquitt 2009). When considering participation in a crowdsourcing competition, individuals may find that the terms and conditions are not sufficient to develop certainty regarding expected fairness because some of the terms are difficult to interpret and will also inevitably leave some room for actual execution and thus opportunism on the company's part (Di Gangi et al. 2010). We thus argue that their fairness expectations are partly determined by their general (ex ante) relationship to the firm organizing the crowdsourcing competition. Among the numerous constructs capturing this relationship, we focus on the *individuals' identification with the firm*. Organizational *identification* denotes the degree to which individuals feel a sense of connection to an organization (Ashforth and Mael 1989, Mael and Ashforth 1992) and define themselves with the same attributes and values they believe to define the organization (Dutton et al. 1994). Literature has convincingly shown that identification with an organization strongly affects the willingness of individuals to engage in activities favorable for this entity. For example, it has been found that strong customer-company identification leads to significantly better product evaluations by the customer (Ahearne et al. 2005, Dutton et al. 1994, Scott and Lane 2000), and customers who strongly identify with the firm often engage in defensive information processing behavior with a bias in favor of the company (Boiney et al. 1997, Einwiller et al. 2006). Motivated reasoning theory (Kunda 1990) explains why this is the case: attributing positive characteristics to the focal organization helps individuals maintain a favorable self-perception and protect self-defining beliefs (Bhattacharya and Sen 2003, Einwiller et al. 2006). Organizational identification occurs independently of formal membership and thus might also apply to prospective crowdsourcing participants (Einwiller et al. 2006, Scott and Lane 2000). We reason that in the context of crowdsourcing, this means that potential participants who identify with the firm are more likely to interpret given terms and conditions as fair than are individuals who do not identify with the firm. Thus,

HYPOTHESIS 3 (H3). *The lower the potential contributors' level of ex ante identification with the*

crowdsourcing organizer is, the more negative their expectations of (a) distributive fairness and (b) procedural fairness of the specific crowdsourcing system will be.

2.2. Consequences of Fairness Expectations

Research on organizational fairness has found clear evidence that perceived fairness has an impact on individuals' attitudes and behavior (Cohen-Charash and Spector 2001; Kim and Mauborgne 1993, 1998; Korsgaard et al. 1995; Li et al. 2007; Masterson et al. 2000). Individuals who perceive themselves as treated unfairly will experience distress, and this distress will motivate efforts to restore fairness within the relationship; failing that, individuals will seek ways to terminate the relationship (Adams 1965, Austin and Walster 1974). Although some scholars discuss the possibility of slightly different behavioral consequences (Lind and Tyler 1988), most agree that both distributive and procedural fairness will affect individual behavior (Ambrose and Arnaud 2005).

The literature on crowdsourcing participation has clearly emphasized the motive of self-interest in its various facets, but there is some initial evidence for the importance of fairness in the crowdsourcing context. Based on qualitative interviews, Shah (2006, p. 1011) proposed that "property and decision-making rights affected individuals' perception of fairness, which in turn affected their behaviors." Fuller et al. (2007) and Mayrhofer (2006) found examples of contributors who were annoyed because the company makes money on their contributions without offering appropriate compensation. Additionally, there is some evidence that contributors not only care about the fair distribution of the value created but also about fair process rules: Nambisan and Baron (2010) used a construct they termed "sense of partnership" and found that it is significantly related to the magnitude of contributions to crowdsourcing. A similar finding was obtained by Ågerfalk and Fitzgerald (2008), and Di Gangi and Wasko (2009) as well as Di Gangi et al. (2010) document negative reactions to perceived procedural unfairness in the Dell crowdsourcing competition.

All this research builds on ex post fairness judgments based on concrete experience. Research has shown, however, that mere fairness *expectations* can also have clear effects (Bell et al. 2006, Rodell and Colquitt 2009, Shapiro and Kirkman 1999). Therefore, we reason that fairness expectations will impact the potential contributors' decision to participate in the crowdsourcing system in question. Beyond these transaction-specific consequences, fairness perceptions might have consequences for the relationship to the firm organizing the crowdsourcing system. An individual's level of organizational identification with the entity forms on the basis of information and experience (Ahearne et al. 2005, Bhattacharya and Sen 2003). One source of such

information might be the crowdsourcing competition the firm offers. If the potential contributors evaluate a firm's crowdsourcing system as a fair offer, this will increase their identification. If, on the other hand, the individual interprets the crowdsourcing system as unfair, the self-serving mechanism of identification is disrupted (Bhattacharya and Sen 2003, Einwiller et al. 2006). We thus argue that fairness expectations with regard to the specific crowdsourcing transaction will impact the individuals' identification with the firm. Such a finding would be important because it implies that there is more at stake for the firm than just attracting a crowd or not.

HYPOTHESIS 4 (H4). *The more negative the potential contributors' expectations regarding the (a) distributive and (b) procedural fairness of the specific crowdsourcing system are, the lower their willingness to submit a design will be.*

HYPOTHESIS 5 (H5). *The more negative the potential contributors' expectations regarding the (a) distributive and (b) procedural fairness of the specific crowdsourcing system are, the lower their (ex post) level of identification with the firm organizing the crowdsourcing competition will be.*

3. Method

To test our hypotheses, we conducted two empirical studies that are complementary in terms of the population sampled and the stimuli employed. In Study 1, we use a sample of a population that is particularly qualified for crowdsourcing and thus exhibits high external validity. Because this sample includes a number of individuals who had previously participated in crowdsourcing, we are able to compare individuals with and without crowdsourcing experience in order to establish whether there are indicators of self-selection based on fairness issues in prior research. In Study 2, we use a nationally representative sample with the advantage of a high response rate. Regarding stimuli, we made an effort to manipulate the terms and conditions of crowdsourcing systems experimentally in Study 1, whereas in Study 2 we keep the terms and conditions constant to isolate the impact of ex ante identification with the company organizing the crowdsourcing system.

3.1. Study 1

We devised a between-subject experimental vignette study in which we asked participants to assess different variants of a crowdsourcing system involving the development of new design concepts for lamps. We opted for students from design schools as potential contributors. We chose lamps as the object of our study because a pilot study (20 interviews with design students) had revealed that designing lamps is perceived as very appealing by this population. High involvement in

the product category might augment the validity of the answers given. In the experiment, a fictitious lamp company named "XYZ.com" was described, which was said to source its innovative lamp designs from independent "crowds." We used a fictitious brand in this first study because we wanted to isolate fairness effects from the impact of organizational identification. In the between-subject experiment, we used the treatment of terms and conditions describing different crowdsourcing systems in text form (Thomson 2006). After inspecting the terms and conditions, subjects were led to a questionnaire in which we asked them about their expectations regarding the crowdsourcing competition's fairness and asked how likely they were to submit a design to XYZ.com (for analogous uses of this method, see, e.g., Homburg et al. 2005 or Sinha et al. 2010).

3.1.1. Stimuli. The description of the crowdsourcing terms and conditions consisted of five text elements in randomized order, each with two variants. We thus had a total of 32 different treatments ($2 * 2 * 2 * 2 * 2$), each of which described a different crowdsourcing system (see Table 1). To make the stimuli realistic, we drew on a series of exploratory studies involving the following steps: (1) We identified 14 crowdsourcing systems on the Internet and analyzed their terms and conditions. (2) We interviewed 17 crowdsourcing experts—both scholars and practitioners—worldwide and 42 crowdsourcing contributors. (3) We organized three moderated group

discussions with students from the authors' university, each involving 8–12 potential contributors to crowdsourcing. (4) We searched a large number of discussion forums, blogs, and chat rooms (in the realm of crowdsourcing communities as well as open innovation in general).

Value distribution with regard to monetary profits. Our exploration revealed that the intuitive approach of potential contributors is to look at the *profit* the firm makes on its crowdsourcing activities. The profit is interpreted as the relevant indicator of the firm's outcome-to-input ratio, although it is a *difference* and not a fraction as the conceptual model of the equity rule suggests. We found that potential participants were clearly unfamiliar with information such as the return on investment and related measures (which operationalize the outcome-to-input ratio of the firm in the strict sense) and hardly understood those measures. In addition, it is not common for firms active in crowdsourcing to reveal such information, whereas profits (and less clear qualitative accounts of general business success) are often disclosed in information about companies such as trade publications, the popular press, and Wikipedia. We thus used monetary profits as a stimulus to operationalize the value distribution. We must acknowledge, however, that other aspects of the distribution of monetary outcomes, such as the amount of money the organizer offers as a prize, may also have an impact on equity perceptions (and thus on fairness perceptions).

Table 1 Experimental Stimuli (Study 1)

	Stimulus variants	
<i>Value distribution with regard to monetary profits</i> (H1a)	Low profit for firm "XYZ.com is a successful producer of lamps, and its design community has many active members. In the past, XYZ.com has <i>hardly</i> made any <i>profit</i> by using designs from the community."	High profit for firm "XYZ.com is a successful producer of lamps, and its design community has many active members. In the past, XYZ.com has made <i>huge profits</i> by using designs from the community."
<i>Value distribution with regard to reputation</i> (H1b)	Reputation for contributor "The names of those designers whose submissions are selected for mass production will be <i>printed legibly</i> on the product. The design originator will therefore be <i>visible</i> to the buyers."	Reputation only for firm "The names of those designers whose submissions are selected for mass production will <i>not be printed</i> on the product. The design originator will therefore <i>not be visible</i> to the buyers."
<i>Value distribution with regard to IP ownership</i> (H1c)	Temporary transfer of intellectual property "Where a design is selected for production, intellectual property (IP) rights will be transferred from the originator to XYZ.com for a <i>limited period</i> of 180 days. After that period, the IP rights will be <i>transferred back</i> to the originator."	Unlimited transfer of intellectual property "Where a design is selected for production, intellectual property (IP) rights will be transferred from the originator to XYZ.com for an <i>unlimited period of time</i> . IP rights will <i>not be transferred back</i> to the originator."
<i>Transparency in the contribution selection process</i> (H2)	High transparency "The <i>community decides</i> which designs win and are produced (online voting by users). XYZ.com complies with the decisions of the users."	Low transparency "XYZ.com <i>decides</i> which designs win and are produced. Users do not participate in these decisions."
<i>Mode of profit sharing</i>	Percentage of sales "The winners of the design competition will get a <i>3% share of sales</i> (approx. €750 on average). The sum awarded therefore <i>depends</i> on the commercial success of the product."	Fixed sum "The winners of the design competition will get a <i>fixed award of €750</i> (approx. 3% of sales on average). The sum awarded therefore does <i>not depend</i> on the commercial success of the product."

Value distribution with regard to reputation. Our exploratory research revealed that one of the most effective ways of enhancing the reputation of the winning design's originator is to prominently feature his or her name on the product. Naturally, there are also other ways to support the designer's reputation, such as displaying the name on a website. However, the close link between the originator's identity and the artifact exogenous to his or her accomplishments appears to deliver a particularly high reputational gain. The idea of omitting this link provoked reactions of (distributive) injustice in many of our exploratory interviews.

Value distribution with regard to intellectual property ownership. To produce and market the designs created by the crowd, the company organizing the competition usually asks contributors to transfer all intellectual property (IP) rights to the designs by signing an upfront legal contract (Nambisan 2002, Ogawa and Piller 2006). It is interesting that existing crowdsourcing systems employ different IP systems: some take over the IP rights to the winning designs for an unlimited time (e.g., Threadless.com), whereas other companies only produce limited editions and return IP rights to the originator after the produced objects are sold (e.g., LaFraise.com). Our exploration revealed that potential contributors regard the duration of the IP rights transfer as a major concern and perceive the indefinite shift of IP from the originator to the firm as a loss that affects equity.

Transparency in the contribution selection process. We operationalized transparency as a selection decision by the community or by the firm. The former suggests transparency and a commitment to public accountability, whereas the latter implies nondisclosure and a lack of ex ante commitment to fair procedures. As with the other independent variables, transparency can also be achieved by numerous other means, and decisions by the firm can also be made transparent. Nonetheless, our qualitative interviews revealed that involving the community in the decision is valued highly, whereas contributors have serious reservations about in-house selection by the firm alone (see Di Gangi and Wasko 2009, Di Gangi et al. 2010, Fuchs et al. 2010).

Additionally, we included the *mode of profit sharing* dimension because this is an important feature for subclassifying crowdsourcing systems. Most firms offer a fixed sum as a reward (e.g., €750), but there are also examples where firms offer a percentage of sales (e.g., 3%). We used this dimension as a control variable.

3.1.2. Measurement.

Expected distributive fairness. We measured this construct on the basis of extant literature (Adams 1965, Smith et al. 1999, Tax et al. 1998). A sample item reads, "In this design competition, both participants and XYZ.com have a fair share." For a complete list of items, see Table 2. If not indicated differently, we generally

used 5-point Likert scales (where 1 = low agreement, 5 = high agreement) and averaged multi-item constructs to indices.

Expected procedural fairness. Again, we operationalized this construct on the basis of extant literature (Cohen-Charash and Spector 2001, Folger 1977, Lind and Tyler 1988, Tax et al. 1998). A sample item reads, "In the XYZ.com design competition, submitters participate actively in all processes."

Expected self-interest. This control variable was measured on the basis of extant literature (Fehr and Gächter 2000, Johnson and Allen 1972); e.g., "For submitters, the benefit offered for participating exceeds the effort required."

Willingness to submit. The subjects' willingness to submit a design was measured using a Juster scale (Juster 1966), an 11-point probability scale. Studies have shown that this scale consistently achieves higher correlations with actual behavior than other measures used for this purpose (Belk 1985, Uncles and Lee 2006).

Control variables. In the questionnaire, we also collected demographic data such as age, gender, and crowdsourcing experience. In addition, we measured the individuals' self-efficacy to come up with an innovative lamp design with a scale based on Clement (1987) and Lee and Bobko (1994). We included this variable because of the obvious managerial importance of highly skilled contributors and successfully validated our self-efficacy measure ($r = 0.48, p < 0.001$) with the individual's self-assessed trend position. The latter was measured using a four-item scale adapted from Franke and Shah (2003) and Morrison et al. (2000). The items read, "Usually I identify new trends in product design before others," "I am always aware of the newest trends regarding product design," "I am a trendsetter with regard to product design," and "I have already designed or further developed new products myself" (where 1 = low agreement, 5 = high agreement; Cronbach's $\alpha = 0.77$).

Because we had to use several adapted scales, we pretested the measurement using exploratory and confirmatory factor analyses on a sample of 200 business students with positive results (available from the authors upon request). After collecting the data throughout Study 1, we again conducted a confirmatory factor analysis to verify the quality of our scales. Table 2 lists all the constructs and items along with the results of the confirmatory factor analysis. The numbers (fit indices,¹ Cronbach's α values, average variance explained (AVE) values, critical ratios (CRs), and results of χ^2 difference tests) indicate that our measurement instruments are sufficiently reliable and valid. We also checked for a potential common method bias using Harman's one-factor test (Podsakoff and Organ 1986). An exploratory factor analysis using all variables from the latent constructs and the dependent variable provided a first indication that common method variance is not a problem.

Table 2 Measures (Study 1)

Constructs and items	SMC	α	AVE	Factor loadings	CR	χ^2 difference test
<i>Expected distributive fairness</i>						
In this design competition, both participants and XYZ.com have a fair share.	0.56			0.75	—	
Regarding the benefits to participants and XYZ.com, there is justice.	0.68			0.82	20.60***	
In my eyes, the money is split fairly between the participant with the winning design and XYZ.com.	0.53	0.82	0.54	0.73	18.37***	> 52.24
XYZ.com does not provide a fair share of the benefits to the participants who submit designs. (reversed) (1 = low agreement, 5 = high agreement)	0.38			0.61	15.48***	
<i>Expected procedural fairness</i>						
In the XYZ.com design competition, submitters participate actively in all process.	0.51			0.71	—	
I have the feeling that participants really have an impact on the processes in XYZ.com's design competition. (1 = low agreement, 5 = high agreement)	0.85	0.79	0.68	0.92	13.10***	> 75.18
<i>Expected self-interest</i>						
For submitters, the benefit offered for participating exceeds the effort required.	0.39			0.63	17.14***	
Submitting a design to XYZ.com might be a good deal for the submitter.	0.54			0.74	20.91***	
Participating might be profitable for the submitter.	0.66	0.87	0.57	0.81	—	> 52.24
Participating in XYZ.com's design competition is not worth the effort. (reversed)	0.58			0.76	21.72***	
I think that participating might pay off. (1 = low agreement, 5 = high agreement)	0.70			0.84	24.51***	
<i>Willingness to submit</i>						
Would you submit your design to XYZ.com? (0 = no chance, almost no chance (1%), 10 = certain, practically certain (99%))						
<i>Crowdsourcing experience</i>						
How often have you participated in design competitions like the one described, regardless of the product category? (1 = never, 5 = very often)						
<i>Self-efficacy</i>						
I have all the skills needed to come up with a pleasant lamp design. (1 = low agreement, 5 = high agreement)						

Notes. $n = 711$. Global fit indices: CMIN = 211.92, $df = 41$, CMIN/ $df = 5.17$, GFI = 0.95, AGFI = 0.92, IFI = 0.95, CFI = 0.95, RMSEA = 0.08. SMC, squared multiple correlation; α , Cronbach's alpha.

*** $p < 0.001$.

Also, no single factor emerged in the unrotated factor solution, nor did one general factor account for the majority of the covariance among the measures.

3.1.3. Sample. To ensure external validity, our participants had to represent the target group for real crowdsourcing competitions as closely as possible. Exploratory interviews with crowdsourcing experts revealed that students at design schools are among the most important target groups. Naturally, such students exhibit a high level of design skill on average, and many of them search actively for opportunities to apply and demonstrate their talent. Thus, we reasoned that the sample would include a number of individuals who had already participated in crowdsourcing (thus allowing comparisons of experienced and inexperienced participants). We contacted all design schools at the bachelor's

and master's levels in Germany and Austria. Seventeen of them agreed to cooperate in our study. In total, they represent 7,640 design students, or roughly 50% of the total number of design students in the two countries. The institutions allowed us to send direct emails to their students (plus one reminder) or to post invitations on the school's central website.

Our invitation referred to an academic study regarding "design communities," thus obscuring the real intention so that no potential self-selection bias (as in prior studies) would arise. As an incentive to participate, we announced that participants would take part in a raffle for prizes with a total value of €2,300. To prevent subjects from filling out the questionnaire repeatedly, the link could only be used once from the same computer. A total of 743 design students participated in

our study, which implies a response rate of at least 10%. Interviews revealed that our invitation had reached only about half of the targeted population because of address errors, accounts over their storage limits, inactive accounts, absence, spam filters, etc. This suggests that the true (unknown) response rate is probably higher (see Nambisan and Baron 2010 for a related argument). Thirty-two students were excluded because they had opened the website for fewer than seven minutes; in the two preliminary tests ($n = 64$ and $n = 200$), we had found that this is the minimum time required to answer the questionnaire. We were thus able to use the responses of 711 subjects for our analyses: 57.5% of them were female; on average, they were 25 years old and in their sixth semester, which indicates the absence of a sample bias because this largely corresponds to the characteristics of the overall population. In addition, 74.4% had never participated in crowdsourcing initiatives before and 25.6% reported previous experience, which allows us to compare the two groups. Table 3 shows summary statistics of our key measures.

A comparison of early and late respondents showed no significant differences, thus indicating the absence of response bias (Armstrong and Overton 1977). Tests showed that there are also no significant differences between the 32 treatment groups, which is an indicator of valid randomization.

3.2. Study 2

As in Study 1, we exposed participants to an online simulation describing the terms and conditions of a crowdsourcing tournament and then measured their perceptual reactions. In contrast to the previous study, however, we explained that the crowdsourcing competition was organized by a well-known company with a strong brand (namely, Apple Inc.), and we also included measures of organizational identification with the organizing company both before and after exposing subjects to the description of the crowdsourcing competition (stimulus).

3.2.1. Procedure and Stimulus. The study was conducted in the following sequence: First, we measured

participants' identification with and their general trust in the company Apple; this point in time is later referred to as t_0 . We chose Apple for our study because it is a well-known company with an unusually strong brand (according to Interbrand 2011, Apple ranks among the 10 most valuable brands worldwide). After measuring organizational identification with the company, we introduced the crowdsourcing system to participants on a new page. We informed them that Apple planned to launch a new game console named "iGamZ" and was holding a crowdsourcing competition to generate appealing and innovative designs for the console. The design task was to develop a graphic design for the 20×20 cm surface of the box, which could be done using any graphic design software. We chose this task because it was easy for most people to perform and would therefore hardly discourage sample members as a result of a lack of skills. In addition, video game consoles are a product category ensuring a high degree of product involvement among individuals within the sample. The terms and conditions of the crowdsourcing system were realistic, albeit not overly attractive: each week, up to 10 designs would be selected by Apple and awarded a fixed prize of €200, the identity of the designer would not be printed on the box, and the IP rights to the design would be owned by Apple. Subjects were then led to the main questionnaire. After they completed the main questionnaire (i.e., at t_1), we again asked participants to indicate their level of organizational identification with Apple to determine whether it was affected by exposure to the terms and conditions of the crowdsourcing system. Eventually, we explained that the scenario was entirely fictitious.

3.2.2. Measurement. To measure the variables of interest, we partly drew on the scales already used in Study 1. We adapted and complemented them with new scales based on the literature. A list of all items as well as reliability and validity measures is provided in Table 4. Again, the results of the confirmatory factor analysis are satisfying, and Harman's one-factor test did not indicate a common method bias.

Organizational identification (at t_0 and t_1). We used a scale developed by Bergami and Bagozzi (2000).

Table 3 Summary Statistics (Study 1)

Variables	Means	SD	1	2	3	4	5	6	7	8	9
1. Expected distributive fairness	2.23	0.89	—								
2. Expected procedural fairness	2.29	1.14	0.45***	—							
3. Expected self-interest	3.13	0.95	0.63***	0.37***	—						
4. Willingness to submit	5.88	2.79	0.38***	0.28***	0.48***	—					
5. Crowdsourcing experience (yes)	25.60%	0.44	-0.01	0.01	-0.04	0.04	—				
6. Self-efficacy	3.79	1.26	0.01	-0.03	-0.02	0.01	0.03	—			
7. Length of study (semesters)	6.03	4.16	-0.09*	-0.17***	-0.14***	-0.07	0.11**	0.09*	—		
8. Age (years)	24.82	4.48	-0.09*	-0.15***	-0.22***	-0.15***	0.05	0.09*	0.39***	—	
9. Gender (female)	57.70%	0.49	0.00	0.02	0.05	0.02	-0.14***	-0.18***	-0.07	-0.13***	—

Note. $n = 711$.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (two-tailed tests of significance).

Table 4 Measures (Study 2)

Constructs and items	SMC	α	AVE	Factor loadings	CR	χ^2 difference test
<i>Expected distributive fairness</i>						
Regarding the benefits to participants and Apple, there is justice.	0.64			0.80	7.74***	
In my eyes, the money is split fairly between the participants with the winning design and Apple.	0.66	0.77	0.55	0.81	7.78***	>5.63
Apple does not provide a fair share of the benefits to the participants who submit designs. (reversed) (1 = low agreement, 5 = high agreement)	0.36			0.60	—	
<i>Expected procedural fairness</i>						
In the Apple design competition, submitters participate actively in all processes.	0.78			0.88	—	
I have the feeling that participants really have an impact on the processes in Apple's design competition. (1 = low agreement, 5 = high agreement)	0.71	0.85	0.75	0.84	8.13***	> 7.38
<i>Expected self-interest</i>						
For submitters, the benefit offered for participating exceeds the effort required.	0.40			0.63	7.26***	
Participating in Apple's design competition is not worth the effort. (reversed) (1 = low agreement, 5 = high agreement)	0.73	0.70	0.57	0.85	—	> 5.63
<i>Identification with the company</i>						
Specify the degree of overlap between your own personal identity (self-image) and the company's identity by marking the appropriate box. (1 = no overlap, 8 = complete overlap)						
<i>Trust</i>						
I trust this brand.						
This is an honest brand.	—	0.91	—	—	—	—
This brand is safe. (1 = low agreement, 5 = high agreement)						
<i>Willingness to submit</i>						
Would you submit your "iGamZ" design to Apple? (0 = no chance, almost no chance (1%). 10 = certain, practically certain (99%))						
<i>Self-efficacy</i>						
I have all the skills needed to come up with a pleasant design for the "iGamZ." (1 = low agreement, 5 = high agreement)						
<i>Interest in crowdsourcing</i>						
Are you interested in such crowdsourcing competitions and would you like to receive a list of URLs to such competitions we have collected? (1 = no, 2 = yes)						

Notes. $n = 182$. Global fit indices: CMIN = 25.53, $df = 11$, CMIN/ $df = 2.32$, GFI = 0.96, AGFI = 0.90, IFI = 0.97, CFI = 0.97, RMSEA = 0.09. SMC, squared multiple correlations; α , Cronbach's alpha. *** $p < 0.001$.

It consists of a series of Venn diagrams indicating various degrees of overlap between the respondents and the focal entity. Subjects were asked to indicate the level that most appropriately reflected their relationship to Apple (for a similar use, see Nambisan and Baron 2010). To construct-validate organizational identification, we measured the subjects' level of brand trust in the company. Brand trust is usually highly correlated with organizational identification (Bhattacharya

and Sen 2003; Lewicki and Bunker 1995, 1996) because a firm's brands usually affect the corporate image, and vice versa. We measured brand trust using an adapted version of a scale suggested by Chaudhuri and Holbrook (2001). A sample item reads, "I trust this brand." Because organizational identification at t_0 is significantly related to trust in Apple at t_0 ($r = 0.59, p < 0.001$) and at t_1 ($r = 0.62, p < 0.001$), we assume valid measurement.

Expected distributive fairness. Distributive fairness was measured as in Study 1; we only shortened the scale by one item to save space. Note that the patterns reported above for Study 1 are not affected if we use this reduced scale in the analyses.

Expected procedural fairness. We employed the same scale as in Study 1.

Expected self-interest. To save space, we used a shortened version of the scale employed in Study 1. The new scale consisted of two instead of five items (see Table 4). The results of our confirmatory factor analysis show that the shortened scale exhibits a satisfying level of validity and reliability. Again, the patterns visible in Study 1 hold true if we use the (new) two-item version for analyses.

Willingness to submit. As in Study 1, we used a scenario-based approach to measure the respondents' willingness to submit a design to Apple. We instructed subjects to imagine the situation that they had a good idea for an "iGamZ" design and asked them to indicate whether they would participate in Apple's design competition and submit a design. The subjects' willingness to submit a design was measured using the same Juster scale (Juster 1966) as in Study 1.

Control variables. We measured the participants' age, gender, and self-efficacy to design such a console as in Study 1. In addition, we controlled for the participants' general interest in crowdsourcing competitions, which might affect an individual's willingness to participate in such an activity (see Table 4).

3.2.3. Sample. We used a nationally representative sample (provided by the leading national online panel) of frequent Internet users (i.e., those who use the Internet daily) between 18 and 30 years of age with an education level of a high school diploma or higher. We

used this subcategory of young and well-educated individuals with a strong attachment to the Internet for the sake of external validity (Füller 2010). Once again, to avoid self-selection bias, we obscured the real intention of our study. We sent invitations to participate to 449 persons. As an incentive to participate, we offered monetary compensation of €3.40 and the opportunity to take part in a raffle for 25 Amazon.com vouchers (each with a value of €20).

We received 182 valid and fully completed data sets, which makes for a satisfactory net response rate of 40.5%. We excluded questionnaires with an unrealistically short response time as well as the few individuals with prior crowdsourcing experience, and again a comparison of early and late respondents showed no significant differences. The high response rate and the absence of an (overt) response bias indicate sound representativeness, thus overcoming the sample limitations of Study 1. As for demographic characteristics, 56.0% of the participants were female, and on average, they were 25 years old. Table 5 shows summary statistics.

4. Findings

4.1. Antecedents of Fairness

Turning first to the transaction-specific antecedents of fairness, we find that our hypotheses are supported by the data (Models 1 and 4 in Table 6). It turned out that expected distributive fairness is lower if the value distribution announced in the terms and conditions favors the organizing firm. Higher monetary profits for the firm (Hypothesis 1a), no support of the originator's reputation (Hypothesis 1b), and claiming unlimited IP ownership (Hypothesis 1c) arouse feelings of unfairness

Table 5 Summary Statistics (Study 2)

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Trust in the company at t_0	3.50	1.01	—											
2. Trust in the company at t_1	3.25	1.05	0.76***	—										
3. Identification with the company at t_0	3.84	1.83	0.59***	0.53***	—									
4. Identification with the company at t_1	3.57	1.80	0.54***	0.62***	0.92***	—								
5. Expected distributive fairness	1.94	0.93	0.17*	0.46***	0.14	0.28***	—							
6. Expected procedural fairness	2.11	1.12	0.11	0.28***	0.12	0.20**	0.40***	—						
7. Expected self-interest	2.32	1.11	0.14	0.35***	0.09	0.19*	0.61***	0.42***	—					
8. Willingness to submit	4.67	3.03	0.21**	0.29***	0.16*	0.20**	0.36***	0.26***	0.38***	—				
9. Self-efficacy	3.16	1.28	0.07	0.01	-0.04	-0.04	0.03	0.14	0.07	0.06	—			
10. Interest in crowdsourcing (yes)	18.70%	0.39	0.09	0.02	0.12	0.11	0.01	-0.13	-0.06	0.13	-0.13	—		
11. Age (years)	24.86	2.82	0.05	0.05	-0.01	0.03	-0.05	-0.04	-0.05	-0.19*	-0.12	-0.03	—	
12. Gender (female)	56.00%	0.50	0.21**	0.06	0.01	-0.03	0.01	0.00	0.07	0.19*	0.01	0.00	-0.10	—

Note. $n = 182$.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (two-tailed tests of significance).

Table 6 Transaction-Specific Antecedents of Fairness

	DV = <i>Expected distributive fairness</i>			DV = <i>Expected procedural fairness</i>		
	Model 1: Total sample	Model 2: No crowds. experience	Model 3: Prior crowds. experience	Model 4: Total sample	Model 5: No crowds. experience	Model 6: Prior crowds. experience
Independent variables						
<i>Value distribution with regard to monetary profits (H1a)</i>	0.06 [†]	0.08*	−0.02	0.03	0.06 [†]	−0.05
<i>Value distribution with regard to reputation (H1b)</i>	0.05 [†]	0.08*	−0.05	0.00	−0.01	0.01
<i>Value distribution with regard to IP ownership (H1c)</i>	0.15***	0.15***	0.17*	0.02	0.02	0.02
<i>Transparency of the contribution selection (H2)</i>	0.03	0.03	0.03	0.33***	0.37***	0.22**
Control variables						
<i>Mode of profit sharing</i>	0.05	0.05	0.01	0.01	−0.02	0.07
<i>Length of study</i>	−0.07 [†]	−0.09 [†]	−0.03	−0.15***	−0.12**	−0.21**
<i>Age</i>	−0.05	−0.04	−0.08	−0.07 [†]	−0.07	−0.07
<i>Gender</i>	−0.01	0.01	−0.06	0.00	0.04	−0.09
Adj. <i>R</i> ²	0.03***	0.04**	0.00	0.14***	0.16***	0.08**
<i>n</i>	711	529	182	711	529	182

Notes. Standardized coefficients are shown. DV, dependent variable; H, hypothesis.

[†]*p* < 0.1; **p* < 0.05; ***p* < 0.01; ****p* < 0.001 (one-sided for hypotheses tests).

among participants. Only the support for Hypothesis 1c is highly significant; the other effects receive only weak support. One reason for this might be that the data were obtained using a between-subject design, which usually limits effect sizes (Greenwald 1976). In addition, it is also important to bear in mind that the descriptions of terms and conditions involved five dimensions, meaning that isolated differences within a single dimension are restricted. Hypothesis 2 is also supported (Model 4): when the selection process is transparent, this has positive effects on expected procedural fairness.

In Models 2 and 3 (distributive fairness) and Models 5 and 6 (procedural fairness), we divided the sample into two subsamples: those who have no prior crowdsourcing experience (74.4%) and those who do have such experience (Table 6). The differences are interesting: among those who have not yet participated in crowdsourcing, all our hypotheses receive far stronger support. In contrast, it appears that those who have prior crowdsourcing experience are less affected by the organizational antecedents; only IP ownership (Hypothesis 1c) and transparency (Hypothesis 2) are significant antecedents of fairness perceptions. Different interpretations are possible. Theoretically, it might be that experienced participants based their fairness judgments not only on the description we gave them but also on their own (past) experience. However, we argue that fairness issues are simply less important to them than self-interest. Their evaluations of the crowdsourcing systems thus contain a larger error term (noise), and consequently, patterns are weaker. This interpretation is supported by tests of consequences of fairness (see §4.2). When we tested whether fairness was also impacted by the

antecedents within the subgroup of potential contributors who display particularly high levels of design self-efficacy (defined as the top 10%), we found that patterns in this small subgroup are relatively similar to those of the total sample, although the small sample size precludes similar significance levels.

Turning to the general antecedents, we find that participants' initial identification with the crowdsourcing organizer positively affects their expectations of the crowdsourcing system's distributive (Hypothesis 3a; see Model 1 in Table 7) and procedural (Hypothesis 3b; Model 2 in the table) fairness with the terms and conditions held constant: the higher the initial level of

Table 7 General Antecedents of Fairness

	Model 1: DV = <i>Expected distributive fairness</i>	Model 2: DV = <i>Expected procedural fairness</i>
Independent variable		
<i>Identification with the company at t₀</i>	0.14* (H3a)	0.14* (H3b)
Control variables		
<i>Self-efficacy</i>	0.03	0.13 [†]
<i>Interest in crowdsourcing</i>	0.00	−0.13 [†]
<i>Age</i>	−0.05	−0.01
<i>Gender</i>	0.01	0.00
Adj. <i>R</i> ²	0.00 ^{n.s.}	0.03 [†]

Notes. *n* = 182. Standardized coefficients are shown. DV, dependent variable; H, hypothesis.

[†]*p* < 0.1; **p* < 0.05; ***p* < 0.01; ****p* < 0.001 (one-sided for hypotheses tests).

organizational identification with the company, the more fair the individual perceives the crowdsourcing system as presented in its terms and conditions.

4.2. Consequences of Fairness

Before turning to the main results, we note that both dimensions of fairness are significantly correlated ($r = 0.45$ in Study 1 and $r = 0.40$ in Study 2, both $p < 0.001$), which is a common finding in the literature on organizational fairness (see, e.g., the meta-analysis by Cohen-Charash and Spector 2001). Tests show that this caused no collinearity problems in our hypothesis tests. Ordinary least squares analyses yield support for Hypotheses 4a and 4b (Table 8): expectations regarding both distributive fairness and procedural fairness impact the likelihood of submitting a design to the crowdsourcing system—beyond expected self-interest (Models 1 and 4 in Table 8). This pattern holds for both populations studied (design students and the nationally representative sample). The impact of self-interest is consistently stronger than that of fairness. It is still clear that individuals do not base their decision to participate in crowdsourcing solely on self-interest expectations; they also consider the fairness (or unfairness) of the system. In Models 2 and 3, we again divided the sample into individuals with and without prior crowdsourcing experience, and once again the differences are striking: for those who have not yet participated in crowdsourcing, the importance of fairness is clearly higher. In contrast, it appears that those who have prior crowdsourcing experience do not care about fairness at all. Their decision to participate rests solely on the personal benefits they expect to obtain from the system. In §5, we offer an interpretation of this remarkable finding.

From a managerial perspective, qualifications matter more than experience. Firms employing crowdsourcing business models do not seek the “average” contributions likely to come from most contributors. Instead, they will be interested in the few ideas that have true commercial appeal. We therefore tested the extent to which the patterns found hold within the group with high design self-efficacy (defined as the top 10%). For the population of the design students, we find that fairness perceptions play an even stronger role in this group than among average individuals. Among the best potential contributors, distributive fairness is particularly important ($b = 0.23$, $p < 0.05$), even more so than self-interest ($b = 0.19$, $p < 0.1$). The same is true of procedural fairness ($b = 0.22$, $p < 0.1$). These patterns hold true for the representative sample as well, although the small sample size prevents clear significance levels. The willingness to submit a design in a crowdsourcing competition is rather affected by expectations of distributive fairness ($b = 0.22$, n.s.) and procedural fairness ($b = 0.35$, $p < 0.1$; one-sided test for significance) than by expected self-interest ($b = 0.19$, n.s.) among the top 10% potential submitters (based on their self-explicated self-efficacy).

Regarding Hypothesis 5, our findings are mixed. Although expected distributive fairness (Hypothesis 5a) impacts the potential contributors' ex post identification with the company quite strongly ($b = 0.13$, $p < 0.001$), expected procedural fairness (Hypothesis 5b) does not seem to have any effect ($b = 0.03$, n.s.). We conclude that the fairness of outcome distributions is much more important in determining organizational identification than fairness of procedures as such. It is interesting that ex post organizational identification is not influenced by self-interest at all.

Table 8 Consequences of Fairness

	Study 1			Study 2	
	DV = Willingness to submit			DV = Willingness to submit	DV = Identification with the company at t_1
	Model 1: Total sample	Model 2: No crowds. experience	Model 3: Prior crowds. experience	Model 4	Model 5
Independent variables					
Expected distributive fairness	0.10* (H4a)	0.12** (H4a)	0.02 (H4a)	0.15* (H4a)	0.13*** (H5a)
Expected procedural fairness	0.10** (H4b)	0.10** (H4b)	0.06 (H4b)	0.11† (H4b)	0.03 (H5b)
Expected self-interest	0.38***	0.38***	0.39***	0.23**	0.03
Identification with the company at t_0	—	—	—	0.09	0.89***
Control variables					
Length of study	0.03	0.01	0.07	—	—
Self-efficacy	0.02	0.02	0.00	0.03	-0.01
Interest in crowdsourcing	—	—	—	0.16*	0.00
Age	-0.06	-0.09*	0.03	-0.15*	0.04
Gender	0.00	0.03	-0.06	0.15*	-0.04
Adj. R^2	0.25***	0.28***	0.15***	0.23***	0.86***
n	711	529	182	182	182

Note. Standardized coefficients are shown.

† $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (one-sided for hypotheses tests).

5. Discussion

5.1. Contribution to Research on Open and User Innovation

Until today, literature on open and user innovation has suggested that individuals from outside an organization would be willing to support corporate innovation processes as long as they derive a net benefit from these activities (Baldwin and von Hippel 2011, von Hippel and von Krogh 2003). Our findings suggest that this perspective needs to be complemented. External contributors to firm innovation are not exclusively driven by the private net utility they derive; they are also driven by fairness considerations. Expectations of distributive and procedural fairness are impacted by the terms and conditions underlying the crowdsourcing system as well as the individuals' ex ante identification with the firm. In turn, fairness expectations have clear consequences because they inform the propensity of potential contributors to actually participate (even if we account for self-interest) and also affect ex post levels of identification with the firm—regardless of actual participation and in a much stronger way than self-interest. Thus, we suggest incorporating the component of fairness expectations into the "private-collective" innovation model as part of the individuals' motivation to contribute to firm innovation. Some immediate questions result from this.

What are the boundary conditions for the significance of fairness expectations in the context of participation in firm innovation? Our study is situated in a specific context, and thus several contextual factors could be necessary conditions for such effects. One such factor is the value at stake. In general, research has found that if individuals perceive their inputs as valuable, then fairness is more an issue than if contributions are petty (Brockner et al. 1998, Elkins et al. 2003). We have some evidence supporting these considerations. In our study, we have found that among individuals with high design self-efficacy, fairness plays a clearly enhanced role. It appears plausible that these more skilled individuals attribute increased value to their designs. The visibility of the value generated might also matter. In the context of our study, each contribution has one clear originator. It is not possible to "overlook" the significance of one's own contribution, as might be the case in some collective efforts (Füller 2006, 2010). Moreover, the benefit for the firm in our studies is very explicit—namely, money. This concreteness might also impact the importance of fairness (Greenberg and Colquitt 2005). "Value" can also refer to subjective psychological value. Each contributor has to put considerable effort into this task. Research on psychological ownership maintains that such investments of one's "self" into an object might lead to increased feelings of ownership, to an enhanced subjective value attribution, and, subsequently, to more sensitivity to violations of fairness (Belk 1988, Franke et al. 2010, Pierce

et al. 2003, Reb and Connolly 2007). In sum, we conclude from these considerations that fairness might play a role in specific forms of user integration into firm innovation. It might, for example, matter more when individuals directly contribute valuable creative output the firm attempts to sell, as in crowdsourcing activities similar to the Threadless case mentioned in the Introduction or in lead user projects where the value of user input might be enormous (Lilien et al. 2002). By contrast, it might matter less when users contribute to the firm in activities such as idea evaluation, prototype testing and commenting, problem reporting, user-to-user assistance, writing customer reviews, giving recommendations, etc. (Nambisan 2002, 2009; Nambisan and Baron 2009, 2010). In these settings, the individual contribution is less valuable, more indirect, or difficult to assess in its value.

Why has literature on open and user innovation not addressed the aspect of fairness expectations until now? If fairness considerations actually play such an important role in the individual's decision to participate, at least in specific forms of user integration into firm innovation, then why has this construct not been included in the numerous analyses of the motives of crowdsourcing contributors (Brabham 2010; Ebner et al. 2009; Füller 2006, 2010; Füller et al. 2006, 2008, 2009, 2010; Hall and Graham 2004; Jeppesen and Frederiksen 2006; Leimeister et al. 2009; Nambisan and Baron 2009, 2010; Shah 2006; Wu and Sukoco 2010) and in similar analyses of contributors to lead user studies (Lilien et al. 2002, Lüthje and Herstatt 2004, Urban and von Hippel 1988)? There is an important methodological difference between our studies and extant research. We sampled *potential* (instead of actual) contributors and are thus able to compare users who had positively decided to contribute to firm innovation prior to our research with those who had not done so. Our finding that fairness is important only to the latter group suggests that extant studies may suffer from sample selection bias (Heckman 1979). To our knowledge, all prior studies of participation motives are based on samples of crowdsourcing or brand community members or participants in lead user studies—in other words, users who had already decided to participate in firm innovation. If only those individuals participate for whom fairness is not a major issue, it is no wonder that the construct of fairness has hardly caught the attention of scholars in this field so far: it was simply not *visible* among the self-selected samples of contributors. As Mayrhofer (2006, p. 52) put it, "By including only users who have contributed in the past, one cannot know whether there are users who decided not to contribute due to their perception of fairness." It may therefore be the case that crowdsourcing attracts only a minority of individuals, whereas the majority indeed cares about fairness. If this is true, the significance of fairness for potential participants in firm innovation is

not an exception, but the rule—thus justifying inclusion in the private-collective innovation model.

5.2. Contribution to Theories on Organizational Fairness

Our study also contributes to the emerging literature on fairness expectations (Bell et al. 2004, 2006; Deros et al. 2004; Rodell and Colquitt 2009). This new line of research is quite important because there is a remarkable trend toward greater organizational dynamics, both within the firm and with regard to its external network (e.g., Jarvenpaa and Ives 1994, Tsoukas and Chia 2002), which means that individuals are forced to form expectations regarding future events even when they lack experience. Shapiro and Kirkman (2001) propose that these individuals' expectations also relate to fairness issues, and a few studies provide initial evidence for this assertion (Bell et al. 2006, Rodell and Colquitt 2009, Shapiro and Kirkman 1999). Thus, our first contribution is that we add robustness to extant findings by successfully replicating these initial studies in a different context. Beyond this, the results deliver answers to some open research questions.

What factors inform an individual's fairness expectations? Bell et al. (2006) and Rodell and Colquitt (2009) urgently called for more research on the antecedents of expected fairness. To our knowledge, only Rodell and Colquitt (2009) have investigated what prompts an individual to form an ex ante belief that a future event will be fair (or not). They limit themselves to one independent variable—the general perception of fairness individuals attribute to their supervisor based on past experience. This overarching, relationship-oriented judgment appears to be a significant predictor. Drawing on such a non-transaction-specific construct when forming fairness expectations seems reasonable. The "fairness heuristic" suggests that a fairness judgment is made quickly and without much cognitive effort (Lind 2001, Van den Bos and Lind 2002). We find a similar effect in the field of crowdsourcing; in our study, the non-transaction-specific antecedent of ex ante identification with the company organizing the crowdsourcing system informs the individuals' fairness expectations regarding this system. We complement extant research on fairness expectations with the finding that transaction-specific antecedents in the form of mere announcements (i.e., not real experiences), such as the terms and conditions of the event in question, also influence the individuals' fairness expectations. This is important because it suggests that the individuals do not fully rely on the fairness heuristic but undergo a cognitive process in which the rules that describe the transaction at question are thoroughly pondered and evaluated—even if they are not linked to any concrete experience.

How do expectations regarding distributive and procedural fairness relate to each other, and what are their

consequences? We find that expectations of distributive fairness have stronger consequences than expectations of procedural fairness do. The difference is only marginal in the dependent variable of the potential participants' willingness to contribute but quite clear in the individuals' future identification with the firm, where only distributive fairness has a (strong) influence. We suggest that the dominance of distributive fairness expectations may be understood in the light of the "concreteness effect" (Mackenzie 1986, Nisbett and Ross 1980). Concreteness, which can be defined as the degree of detail and specificity about objects, actions, outcomes, and the situational context, is one of the primary characteristics of information that determines the extent to which a message attracts and holds attention (Mackenzie 1986, Nisbett and Ross 1980). In our study, information about the distribution of profits between the parties involved is much more concrete than information about the process leading to this distribution. Consequently, potential contributors will focus their attention on distributive rather than procedural fairness, thus increasing the relevance of the former fairness dimension when firms invite users to participate. However, we are not sure how far this pattern can be generalized because it is obviously dependent on the concreteness of the information on which individuals base their fairness expectations. In a situation where the outcome and its distribution are ambiguous and the process is described precisely, it may be that the pattern reverses, and procedural fairness expectations dominate over distributive fairness expectations. Further research should continue to investigate the suggested role of information concreteness and other factors that might influence the relative importance of expectations regarding the two fairness dimensions. It remains an open question why expectations of procedural fairness have no influence at all on identification with the firm in our study. We argue that the concreteness effect will be further amplified when the individuals are directly affected by the process. This means that when they consider their own participation in the firm innovation system, individuals will be alerted even by weak signals and consider even relatively vague and unclear indicators of potential unfairness. On the other hand, when their general relationship to the firm is concerned, they will base their affective reactions on concrete rather than on abstract information. Again, it appears that more research is necessary to empirically substantiate this interpretation and determine boundary conditions and generalizability.

5.3. Implications for Managers Considering the Integration of External Individuals into Firm Innovation

Many managers acknowledge that there is much creativity outside their company and strive to develop methods and tools to make commercial use of that

potential. In various applications, the crowdsourcing business model portrayed in this article has proven successful as a way to systematically integrate individuals external to the firm into corporate innovation activities. But there is also quite a number of less celebrated crowdsourcing failures, implying that we do not yet fully understand how this new organizational form works. Our research suggests that managers planning to apply a crowdsourcing business system should focus not only on the users' self-interest but also on fairness. Perceptions of unfairness not only might prevent them from contributing but also might reduce the individuals' general level of identification with the firm.

So how can firms create expectations of fairness? In our experiment we measured the effects of concrete operationalizations of important dimensions of crowdsourcing systems. This allows some clear suggestions although it is important to bear in mind the specific context of our study (design students considering participation in a design-related crowdsourcing competition). We found that the transfer of IP rights had the greatest impact on the fairness perceptions. Thus, it may be an option for firms to consider demanding only a temporary transfer of IP rights. Of course, this implies that it is possible to sell the products only during that limited period of time, meaning that the opportunity costs due to the possibility of losing IP for a long seller have to be weighed against the gain of increased user participation. Second, we find that "sharing" reputational gains was perceived as fair by potential contributors. Again, the benefits and losses of giving public credit to user-designers have to be weighed. However, recent research suggests that publicly acknowledging users as originators of product ideas might even increase perceived customer orientation among customers who do not engage in ideation communities (Fuchs and Schreier 2011), thus questioning the zero-sum assumption that reputation benefits either the firm or the individual. Third, our findings suggest that firms should "avoid the impression that a successful company is ripping-off consumers" (Füller 2010, p. 116). This means, for example, that firms should communicate their profits from crowdsourcing with care because users tend to use this information to determine whether they get a fair share (see Wade et al. 2006 for an analogous example related to chief executive officer overpayment). Firms should instead make it clear that they are "paying back" the community and its individual members in an equitable manner (see Parmentier and Mangematin 2011 for examples). Finally, the commitment to a transparent selection process increases perceptions of fairness in our study. This can be achieved by including members of the community in the selection process, which has rarely been the case to date (Bullinger et al. 2010) and which might also be an effective way to deal with the problem that users often submit large numbers of ideas in

crowdsourcing systems (Ozer 2009, Toubia and Florès 2007). For example, Euchner (2010) mentioned a crowdsourcing system to which 20,000 ideas were submitted—quite a large workload for a small number of internal evaluators. At the same time, it reduces the firm's control over the outcome and involves the risk of forewarning competitors. This again suggests that more favorable fairness perceptions among participants come at a cost. Our finding that prior identification with the organizer impacts fairness perceptions suggests a final way to improve fairness perceptions among potential contributors: firms should work to enhance the crowd's level of identification with the company (see also Nambisan and Baron 2010). It is interesting that some crowdsourcing organizers seem to have understood this need intuitively. Many run their competitions among communities of brand enthusiasts (Füller et al. 2008; Jeppesen and Frederiksen 2006; Nambisan 2002; Nambisan and Baron 2009, 2010; Wu and Sukoco 2010), who we found to be less critical than nonenthusiasts with regard to fairness issues. Other companies, especially smaller firms or start-ups that do not yet have a strong brand to build on, work intensively to cultivate stable, value-based relationships with their contributors. In their online communities, they strongly emphasize values such as fun, collaboration, joint interests, and a sense of belonging (Füller et al. 2008)—a behavior that appears to improve fairness perceptions among potential contributors to firm innovation. Or, as one of the few participants who were skeptical about the fairness of Threadless put it in a nutshell, "Josh, it is absolutely about community; except when it comes to spreading the wealth" (Tee 2006).

5.4. Limitations

Our study suffers from a number of limitations that may constitute further opportunities for future research. First, we only employed *scenarios* describing the terms and conditions of crowdsourcing systems. We did our best to make them realistic, but they are only simulations, and we observed only stated intentions as opposed to real behavior (although we did successfully validate the willingness to contribute with a behavioral variable in Study 2). This naturally limits the external validity of our research. It might also be responsible for the relatively low level of variance explained in our models. If behavior is fictitious and has no real consequences, some study participants might answer perfunctorily, which creates noise and reduces R^2 (e.g., Ajzen et al. 2004). Second, as in any experiment, the choice of specific stimuli can be debated, such as our operationalization of the value distribution of monetary profits, which could also be achieved with a ratio measure in the narrow sense. In addition, there are, of course, other factors that might shape fairness perceptions among potential contributors. One example is the arbitrariness and inconsistency of processes, which should influence perceptions

of procedural justice and could be operationalized in future studies as a discussion by users in a forum complaining that the firm showed such behavior. Third, and on a related note, our scenarios did not include interactions between community members. We modeled the individuals' perceptions as a function of the terms and conditions of the crowdsourcing system and their ex ante identification with the firm alone. In many crowdsourcing communities, users interact heavily with each other (discussing designs, giving feedback, exchanging ideas, etc.), and past discussions can also be accessed prior to initially joining the community. These interactions might lead to strong and community-specific norms (see Muñiz and Schau 2005 for a fascinating example), which, in turn, might also affect perceptions and expectations among new members. Future research should also account for this factor. Fourth, we focused on the two main dimensions of fairness (distributive and procedural fairness). Fairness literature sometimes suggests a third dimension—namely, interactional fairness. It refers to the interpersonal side of organizational practices, that is, the way in which the organization behaves toward its members (Cohen-Charash and Spector 2001). We refrained from including this dimension in our simulation because we suspected it might be overly speculative for our subjects during their initial decision to participate. Fifth, we do not know whether the direction of causality we assumed in our discussion of why the literature on open and user innovation has not addressed the aspect of fairness expectations so far is justified. We argued that the importance an individual attaches to fairness considerations impacts the likelihood of participation (low fairness importance → increased participation likelihood). Because of the cross-sectional nature of our data, we cannot rule out the alternative interpretation that it is, in fact, vice versa: Concrete experience with firm innovation might somehow "disillusion" people and make them focus more heavily on their own interests (Dean et al. 1998, Simons 2002), meaning that the causal direction would instead be active participation → reduced importance of fairness. We also cannot rule out the alternative explanation that both experience (previously refraining from participation) and fairness expectations are in fact influenced by a third variable, resulting in a spurious correlation (third variable → high fairness importance + low participation likelihood). One such variable could be the personality trait of negative affectiveness. Individuals who exhibit high levels of negative affectiveness have a pervasive disposition to experience high levels of distressing emotions such as anger, hostility, fear, or anxiety to a given stimulus (Watson and Clark 1984). Such individuals have a tendency to refrain from situations of competitiveness (Aquino and Bradfield 2002); thus, it is likely that they would rather not participate in crowdsourcing competitions. It is also likely that they are particularly sensitive to issues of (un)fairness (Skarlicki et al. 1999).

If this were a typical case, our interpretation that expectations of unfairness are causal to participation in crowdsourcing would be wrong: the root cause would be the personality of the potential participant. There are probably more such variables that potentially confound our interpretation. Longitudinal studies would allow us to shed more light on this issue. One approach would be to investigate fairness perceptions and their affective, cognitive, and behavioral consequences among potential contributors prior to, during, and after active participation in firm innovation, ideally in a controlled experimental setting. It would be intriguing to examine the extent to which concrete experiences change individual perceptions and the relative importance of fairness and self-interest. It may well be that individuals undergo "life cycles" with different stages of fairness perceptions and subjective importance, thus requiring different organizational responses. Finally, we have used different reference firms in our two studies. We did so for good reasons because the fictitious company XYZ.com allowed us to study fairness independently of organizational identification and because using the well-known company Apple allowed us to study the relationship between identification and fairness. We did not replicate Study 1 entirely; thus, we do not know the extent to which transaction-specific fairness antecedents are moderated by ex ante identification or whether there are interaction effects. We must also keep in mind that we used a single, actual company (Apple) in our research and that any generalizations to other companies must be made with due caution. These limitations suggest that there are plenty of additional research opportunities in the field of (potential) participants' fairness perceptions when firms invite them to join their innovation systems. We hope that our findings inspire other scholars to study this important phenomenon.

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Endnotes

¹Indices include chi-square value (CMIN), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), incremental fit index (IFI), comparative fit index (CFI), and root mean square error of approximation (RMSEA).

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Nikolaus Franke is a full professor and director of the Institute for Entrepreneurship and Innovation at the WU Vienna University of Economics and Business Administration. He initiated and leads the User Innovation Research Initiative Vienna (<http://www.userinnovation.at>), a joint research effort dedicated to enhancing understanding of the phenomenon of user innovation and open innovation. He works on developing methods to help companies benefit from the enormous creativity of customers and users.

Peter Keinz is an assistant professor at the Institute for Entrepreneurship and Innovation at the WU Vienna University of Economics and Business Administration. As a member of the User Innovation Research Initiative Vienna, he mainly focuses his research efforts on user and open innovation. More specifically, he works on crowdsourcing-based methods and instruments to foster and support corporate innovation activities.

Katharina Klausberger is cofounder of the crowdsourcing firm Funderly GmbH (<http://funderly.com>). She received her Ph.D. from the WU Vienna University of Economics and Business.