What Motivates People to Review Articles? The Case of the Human-Computer Interaction Community

Syavash Nobarany
Department of Computer Science, University of British Columbia, 201-2366 Main Mall, Vancouver, BC, Canada V6T 1Z4. E-mail: nobarany@cs.ubc.ca

Kellogg S. Booth
Department of Computer Science, University of British Columbia, 201-2366 Main Mall, Vancouver, BC, Canada V6T 1Z4. E-mail: ksbooth@cs.ubc.ca

Gary Hsieh
Department of Human Centered Design & Engineering, University of Washington, 414 Sieg Hall, 3960 Benton Lane NE, Seattle, WA 98195. E-mail: garyhs@uw.edu

Recruiting qualified reviewers, though challenging, is crucial for ensuring a fair and robust scholarly peer review process. We conducted a survey of 307 reviewers of submissions to the International Conference on Human Factors in Computing Systems (CHI 2011) to gain a better understanding of their motivations for reviewing. We found that encouraging high-quality research, giving back to the research community, and finding out about new research were the top general motivations for reviewing. We further found that relevance of the submission to a reviewer's research and relevance to the reviewer's expertise were the strongest motivations for accepting a request to review, closely followed by a number of social factors. Gender and reviewing experience significantly affected some reviewing motivations, such as the desire for learning and preparing for higher reviewing roles. We discuss implications of our findings for the design of future peer review processes and systems to support them.

Introduction

The ability to recruit expert reviewers contributes both to the quality and fairness as well as the ease of conducting peer review because all peer review processes rely on the expertise of researchers performing the reviews (Bloom, 1999; Eisenhart, 2002; Finke, 1990; Tite & Schroter, 2007; Tsui & Hollenbeck, 2009). Informal observations at journal editorial board meetings and conversations we had with authors, reviewers, and editors suggested that recruiting qualified reviewers is a common concern. Several journal associate editors expressed concern about the increase in declining to accept reviewing requests and lack of response from potential reviewers.

Declining of review requests by reviewers has two consequences: It may delay the review process (in the case of journals) and it may lead to editors recruiting reviewers who do not appreciate the value or potential impact of the work under review or who are not familiar enough with the latest related research to be able to evaluate the work effectively. In the first case, authors are dissatisfied; in the second case, it is the scholarly community as a whole that may be dissatisfied.

We studied both motivations for accepting a specific review request and general motivations for reviewing (What makes researchers value reviewing as part of their professional activities?). Previous studies have investigated reviewing motivations in various research communities and have provided often quantitative descriptions (Snell & Spencer, 2005; Tite & Schroter, 2007; Ware & Monkman, 2008). In contrast, we sought to understand how reviewing motivations differ across reviewers within a community. We chose the human-computer interaction (henceforth it) community as the focus for our study. We chose it because previous studies might not fully generalize owing to HCI's unique characteristics: interdisciplinarity; a relatively high level of involvement by practitioners; and significant contributions from students. Interdisciplinarity is known to increase the difficulty of identifying and finding suitable reviewers because of the smaller pool of qualified reviewers familiar with a specific mix of disciplines (Klein, 2008; Nowotny, Scott, & Gibbons, 2003). One might also expect

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that practitioners and students would have different attitudes toward reviewing, and they might be less experienced in the peer review process, which could impose constraints on reviewer selection. Another consideration is that, similar to many branches of computer science, much HCI research is published in conference proceedings rather than in journals (Patterson, Snyder, & Ullman, 1999), creating different temporal and social dynamics, such as episodic peaks of reviewing tasks right after conference submission deadlines, and concurrent involvement of a large portion of the community in reviewing and review assignment tasks for thousands of simultaneous submissions (Mackay, Baudisch, & Beaudouin-Lafon, 2013).

The premier conference in the HCI community is the Association for Computing Machinery's annual International Conference on Human Factors in Computing Systems (ACM CHI, henceforth just CHI). For a CHI conference, reviewers perform double-blind reviews; associate chairs (ACs; also referred to as program committee members) assign articles to reviewers, write single-blind metareviews, participate in face-to-face program committee meetings where most articles are discussed, and make acceptance decisions (usually with the involvement of subcommittee chairs and other ACs); program cochairs and subcommittee chairs are primarily involved in organizing the reviewing process and overseeing the program committee meetings.

With the HCI community as our primary target, we designed and conducted a survey questionnaire to elicit reviewers' opinions on reviewing motivations. We had four primary goals. First, we were interested in knowing the motivations that reviewers had for participating in the peer review process. Second, we wanted to investigate influences on the decision to accept a specific review request. Third, we were curious about how various background and demographic variables affect reviewing motivations. Fourth, we were interested in how different motivations are related to one another, and the various dimensions of motivation that exist for reviewing articles, if they do indeed exist.

Related Work

Reviewing motivations have been studied in various research communities. Snell and Spencer (2005) conducted a survey in the medical education community. They found that the most common reasons for reviewing were staying up-to-date, enjoying it, and considering it a responsibility. Similarly, Kearney, Baggs, Broome, Dougherty, and Freda (2008) found that keeping up-to-date was the primary motivation of reviewers for nursing journals. They also found that lack of time was the main reason for declining review requests. Francis (2013) found that helping the profession, followed by keeping up-to-date, were the primary reasons of library and information science researchers for reviewing. Lipworth, Kerridge, Carter, and Little (2011) conducted interviews with editors and reviewers of biomedical journals and found quality control, communal obligation, and self-interest in learning and networking opportunities to be important reviewing motivations. In another study of medical reviewers, Tite and Schroter (2007) found that the most important motivations for accepting review requests were contributions of articles, relevance of articles to the reviewer's own work, and opportunity to learn something new. Conflict with other workload was, by far, the most important reason for declining specific requests. Ware and Monkman (2008) found that playing a part as a member of the community, improving the quality of articles, and seeing new work ahead of its publication were the most important reasons for reviewing. They also found that free subscriptions, acknowledgment in the journal, and payment in kind by the journal (e.g., waiver of color or other publication charges) were the most preferred incentives. Mulligan, Hall, and Raphael (2012) found that not being expert in the topic of the article and not having time were important reasons for declining reviews, that most reviewers enjoyed reviewing, and that approximately half of the reviewers were against disclosing their names or their reviews to the public. Motivations for reviewing may not fully generalize across research communities owing to communities' different characteristics, but we took these previous findings as starting points for our investigation of motivations to serve as a reviewer within the HCI community.

No previous study that we know of has examined motivational differences between reviewers or the effect of background variables, such as experience, gender, job, or education, on reviewing motivations. We suspected that individual differences affect reviewing motivations and that understanding the diversity of the motivations could help in the design of the processes used for peer review and of the systems that support peer review processes. In particular, it should be possible to exploit various motivations to facilitate recruitment of a wider variety of reviewers. See Appendix S4 for a discussion of related studies of motivation for volunteer knowledge work in contexts other than scientific peer review.

Methods

We describe the questionnaire and recruitment process, provide a profile of survey participants, and summarize our approach to data analysis.

Materials (Questionnaire Design)

Our questionnaire had three sections. The first, outlined in Table 1, solicited background information about participants. Level of involvement is the number of types of reviewing roles held. For example, Level of involvement for someone who has experience as a reviewer (for journals or conferences), as a journal editor, and as an AC would be 3.

The second section of the questionnaire was about general motivations for participating in the peer review process, not specific to a particular reviewing request. Participants were asked how important they consider each of 12 potential motivations (Table 2) using a 5-point scale (*not at*

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TABLE 1. Profile of reviewers for the six background variables.

POSITION	
Full Professor	40
Associate Professor	39
Assistant Professor	56
Post-doctoral Fellow	23
Research Associate	18
Industry Researcher	50
Industry Practitioner	20
Student	48
Other	13
REVIEWING EXPERIENCE	
1 year or less	18
2–5 years	47
6–10 years	50
11–15 years	94
16–20 years	50
21–25 years	29
26 years or more	18
<missing>	1
LEVEL OF INVOLVEMENT	
1 (only reviewing)	155
2	63
3	47
4	24
5 (All reviewing roles)	4
<missing>	14
LAST EARNED DEGREE	
Bachelors	12
Masters	60
Doctoral	235
AREA OF EDUCATION	
Computer Science/Engineering	181
Cognitive Science and Psychology	36
Social Sciences	25
Other Engineering	17
Other	48
GENDER	
Female	106
Male	197
<missing>	4

TABLE 2. General motivations for reviewing papers.

PLEASE INDICATE HOW IMPORTANT YOU CONSIDER EACH OF THE FOLLOWING AS YOUR REASON FOR REVIEWING PAPERS?	
QUESTION (FULL LONG FORM AS PRESENTED IN THE QUESTIONNAIRE)	*SHORT FORM (FOR ANALYSIS)*
I learn about how to write more effectively through the process of reflecting on papers & coming up with of suggestions.	*LEARNING THROUGH REFLECTION*
I learn about how to write more effectively by learning more about the review process.	*LEARNING THROUGH THE PROCESS*
I want to help authors improve their work.	*IMPROVING THE WORK*
I want to know what is new in my field.	*AWARENESS*
I want to ensure that other researchers will be exposed only to valuable research.	*GATE KEEPING*
I want to influence my field of research and my research community.	*INFLUENCING MY FIELD*
Editors or program committee members ask me to review and I don't want to say no.	*RELUCTANCE TO SAY NO*
I want to encourage good research.	*ENCOURAGING QUALITY*
I want to establish or maintain a good reputation in my field.	*REPUTATION*
I receive reviews from the community, so I feel I should review for the community.	*GIVING BACK*
I want to gain experience and prepare for higher positions in the review process (AC, editor-in-chief, etc.)	*PREPARING FOR HIGHER ROLES*
I enjoy critically reading and reflecting on papers.	*ENJOYING CRITICAL READING*

all important to *extremely important*). Participants were also asked to name any motivations that were not included in the list and rank their top three general reviewing motivations.

The third section of the questionnaire was about what influences decisions to accept a specific reviewing request (15 items; Table 3) using a 5-point scale (*greatly reduces* to *greatly increases*). Participants were also asked to name any factors that were not included in the list.

Further details about the design of the questionnaire are in Appendix S1.

Participants

Survey participants were recruited by an invitation e-mail to all 1,952 reviewers who had reviewed at least one submission for CHI 2011. To encourage participation, invitations were sent by the SIGCHI Conference Management Committee on behalf of our research team. Over the 60 days the survey was open, 307 reviewers participated (16% response rate). Only one questionnaire failed our validity check and was not included or counted in our analysis. Table 1 summarizes the profiles of the 307 participants.

Data Analysis

We performed three analyses using data from the survey questionnaires.

Analysis 1: relative importance of motivations. We collected data through two different opinion measurement strategies: (a) absolute ratings of general motivations for reviewing and of motivations for accepting a specific review request and (b) rankings of the top three general reviewing motivations. We analyzed relative importance by applying Tukey's honestly significant difference (HSD) to the absolute ratings.

Analysis 2: effect of experience and demographics on motivations. To find out which of the background variables best

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TABLE 3. Motivations for accepting a specific review request.

Please indicate how much each of the following influences your motivation for reviewing a paper.	
Question (full long form as presented in the questionnaire)	*Short form (for analysis)*
Knowing that my review will influence the final decision about the paper	*Influencing decisions*
Knowing that the authors will apply my suggested changes	*Authors listen*
Personally knowing the authors (assuming that I am sure about who they are)	*Knowing the authors*
Knowing that the paper was written by well-known authors (assuming that I am sure about who they are)	*Famous authors*
My being an expert in the specific topic of the paper	*Being expert*
Being asked by a well-known researcher (who is an editor or a PC member) to review the paper	*Famous AC*
Being asked by a friend (who is an editor or a program committee member) to review the paper	*Friend AC*
Being asked to review the paper for a high-profile publication venue	*High-profile venue*
Having free time	*Free time*
Close relation of the paper and my current research	*Relevance to own research*
Close relation of the paper to another paper that I have read (e.g. 2 papers on different aspects of a project)	*Familiar paper*
Feeling that I am part of the community related to the publication venue that I am asked to review for	*Same community*
Being asked to review a well-written paper	*Well-written paper*
The length of the paper being short relative to other papers I have reviewed	*Longer paper*
The length of the paper being long relative to other papers I have reviewed	*Shorter paper*

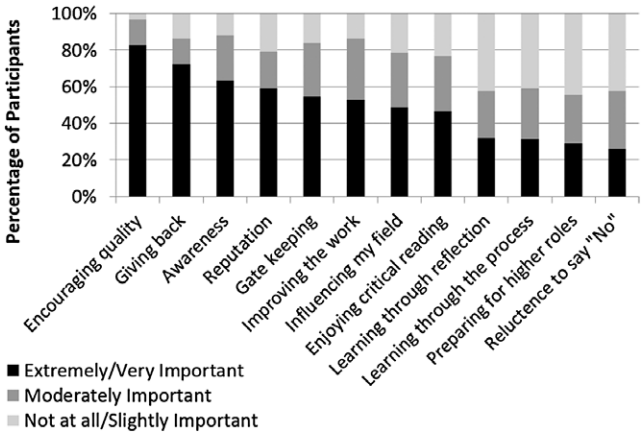

FIG. 1. General motivations for reviewing.

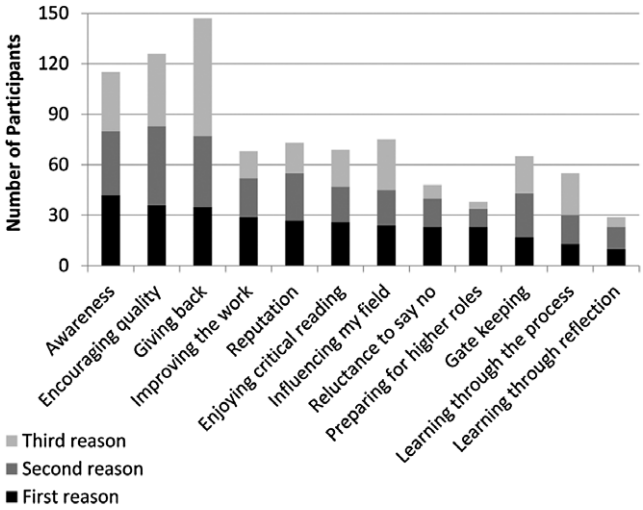

FIG. 2. Participants' top three general motivations for reviewing, sorted by frequency of being participants' top motivation.

predict reviewing motivations, we examined the effect of the six background variables, Reviewing experience, Level of involvement in peer review (reviewing roles taken), Area of education, Last earned degree, Position (job title or function), and Gender, on each of the motivation variables using multiple ordinal logistic regression analyses. Details of the analyses are in Appendix S2.

Analysis 3: factor analysis. Although volunteering to be a reviewer and considering it part of scholarly activities is not to be equated with accepting or declining a specific review request, we suspected that some of the underlying motivational factors would be the same, so we included all 27 questions in a single principal axis factor analysis. Details of the analysis are in Appendix S3.

Results

We analyzed general motivations for reviewing and motivations for accepting a specific reviewing request, and we conducted a factor analysis on all of the motivations.

Relative Importance of General Motivations for Participating in the Peer Review Process

Each motivation was considered very or extremely important by over one quarter of the participants (but not always the same quarter), as shown in Figure 1. Two of the top three reasons for reviewing (Figure 2), *Giving back* to the community and *Awareness* of new research, had previously been identified as top motivations by Snell and Spencer (2005), Ware and Monkman (2008), Kearney et al. (2008), and Francis (2013). Table 4 shows a pair-wise comparison of importance of reasons for reviewing.

Participants were asked to name other general motivations for reviewing. In addition to pointing out variations of the 12 general motivation items, participants mentioned the following: reviewing being a tenure requirement (4 participants), and three more motivations that were each

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TABLE 4. Pair-wise comparisons of reasons for participating in the peer review process, using Tukey's HSD test.

Encouraging quality	**A**
Giving back	**A B**
Awareness	**B C**
Gate keeping	**C D**
Improving the work	**C D**
Maintaining reputation	**C D**
Influencing my field	**D**
Enjoying critical reading	**D**
Learning through the process	**E**
Learning through reflection	**E**
Reluctance to say no	**E**
Preparing for higher roles	**E**

Note. Motivations followed by the same letter are not significantly different from each other (Piepho, 2004).

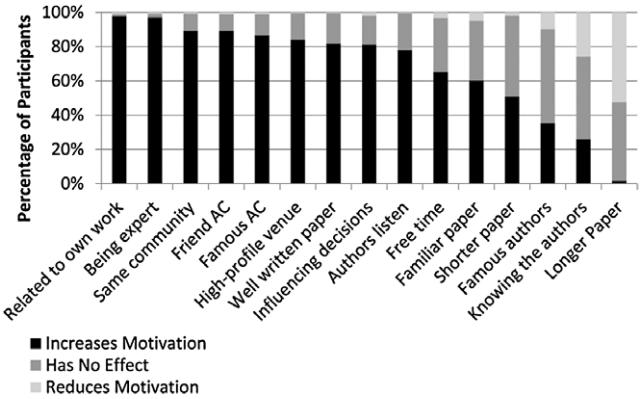

FIG. 3. Motivations for accepting a review request.

TABLE 5. Pair-wise comparisons of motivations for accepting a review request, using Tukey's HSD test.

Relevance to own research	**A**
Being expert	**A**
Same community	**B**
Friend AC	**B C**
Famous AC	**B C**
High-profile venue	**B C**
Well-written paper	**B C**
Influencing decisions	**B C**
Authors listen	**C D**
Free time	**D**
Familiar paper	**E**
Shorter paper	**E**
Famous authors	**F**
Knowing the authors	**G**
Longer paper	**H**

Note. Motivations followed by a same letter are not significantly different.

mentioned by a single participant—empathy with ACs, training graduate students (who collaborate in reviewing), and serendipity.

Relative Importance of Motivations for Accepting a Specific Reviewing Request

Figure 3 shows the distribution of ratings for each of the 15 potential motivations for accepting individual review requests. Table 5 shows pair-wise comparison of motivations for accepting a review request.

Participants were asked to name other motivations for accepting individual review requests. In addition to pointing out variations of the motivations included in the questionnaire, participants mentioned the following: novelty, quality, or importance of the article (15 participants); monetary incentives (7 participants); acknowledgment and feedback from the editor/AC (6 participants); being able to see other reviews to compare and learn (4 participants); knowing that other reviews' quality is high (3 participants); openness (3 participants); if an article cites the reviewer's work (3 participants); receiving feedback from authors and possibility of interaction with them (3 participants); paying back a favor (2 participants); and 15 more motivations that were each mentioned by a single participant—public acknowledgment, receiving personal e-mail before the automated one, clearly knowing the expectation of the conference, multiple rounds of reviewing to see the effect of the review on the article, helping junior authors or non-native authors, knowing that the process is fair, being anonymous, prospect of a dialog with other reviewers, "bonus points," guidance, simple process, templates and structure, not having to use a specific template for reviews, being able to choose articles, and the editor's wording suggesting being desperate.

Participants were asked to name additional demotivators other than the lack of the aforementioned motivations. Participants noted the following: poor English (14 participants); subsequent submission of a previously reviewed article without revising it (4 participants); last-minute requests (3 participants); too much structure or impersonality in the reviewing process (3 participants); high acceptance rates (3 participants); and nine more demotivators that were each mentioned by a single participant—too much math, too much theory, articles by people who do not contribute back to the system, having to discuss with other anonymous reviewers (i.e., not knowing the level of expertise and experience of the other reviewers was a demotivator), too many rounds of reviewing required, disagreeing with the review policies/guidelines, receiving unfair treatment from the venue on one's own article(s), receiving frequent rejections from the venue, and receiving poor reviews from the venue of one's own article(s).

Factors Underlying Motivational Variables

We analyzed the factorial structure of reviewing motivations using exploratory factor analysis, specifically, principal axis analysis of polychoric correlations of the motivational variables. Following the literature (Hair, Black,

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Babin, & Anderson, 2009), we considered loadings that were less than 0.4 to be weak and loadings less than 0.3 were ignored. Weak loadings in a factor suggest that the factor might be less coherent than other factors. Our factor analysis indicated 10 factors. Appendix S3 provides details of the factor analysis. We provide in this section quantitative and qualitative descriptions of the motivation items used in the factor analysis, grouped by the factors identified in that analysis. We adopt the convention that motivational variables (items) are in *ITALIC SMALL CAPS* and factors are in ***BOLD ITALIC SMALL CAPS***. For each factor, the loadings for items comprising it are given within parentheses after the item names.

FACTOR 1. *LEARNING:* Three items loaded onto this factor: learning to write more effectively through learning about the review process (*LEARNING THROUGH THE PROCESS*, 0.87) and through reflecting on papers (*LEARNING THROUGH REFLECTION,* 0.80) and *PREPARING FOR HIGHER ROLES* in the review process (0.36).

LEARNING THROUGH REFLECTION was rated highly (defined as extremely or highly important) by 32% of the participants and was the top motivation for 3% of them. One participant who rated it as extremely important wrote that: "This is by far, the most important motivation for me. Reviewing encourages one to be critical which feeds back into one's own work." Another noted that: "Being able to read the reviews of others is key . . . this process is not especially beneficial without being able to compare my review to those of others." Seven participants mentioned that it was a more important motivation earlier in their careers. Four participants pointed out that the high number of badly written articles makes reviewing less useful for this purpose. However, 2 of them still considered it to be an opportunity for learning; one said: "Reading badly written papers really makes me try to avoid writing such papers myself, as I realize again and again how painful they are to review." One participant, who thought this motivation is not important at all, explained that "it's hard to transfer critiques of others' work into ability to do better oneself."

LEARNING THROUGH THE PROCESS was rated highly by 31% of the participants and was the top motivation for 4%. Seven participants mentioned that it was a more important motivation earlier in their careers. One wrote: "I actually believe that this IS very important, but at this point, I think I know all that [I] care to about the review process!" One participant who rated this motivation as extremely important mentioned that, "This was more true for the first few times I reviewed. Now, I am more interested in learning what other members in my community think about specific pieces of research." A participant who rated it as very important wrote, "I didn't intend this when I started out but I certainly have gained perspective by 'seeing how the sausage is made.' " Two participants talked about learning norms of the community; one wrote, "reading other reviewers' reviews and discussions on the reviews helps to understand what is considered a flaw in a paper and, in a way, help see one's paper with someone else's eyes. . .", whereas the other preferred avoiding conformity: "I try not to conduct my research so that I can write to fit a pre-described format or style, although that may be more effective (but less innovative IMO)."

PREPARING FOR HIGHER ROLES is discussed in **FACTOR 2.**

FACTOR 2. *REPUTATION:* Three items loaded onto this factor: maintaining and establishing *REPUTATION* (0.84); gaining experience and *PREPARING FOR HIGHER ROLES* in the review process (0.43); and *INFLUENCING MY FIELD* of research and community (0.42).

Maintaining and establishing *REPUTATION* was rated highly by 59% of the participants and was the top motivation for 9%. A participant who rated this as very important noted that "when someone thinks you will be a good fit, it seems like a good opportunity to help. The person collecting reviews may notice my high quality review." Another participant mentioned the possibility of adding the reviewing to his curriculum vitae (CV). Two participants who did not feel that reviewing contributed to their reputations pointed out the anonymity and confidentiality of reviews.

PREPARING FOR HIGHER ROLES was rated highly by 29% of the participants and was the top motivation for 8%. One participant who rated this motivation as extremely important said, "I hope to be an AC at some point," and another who rated it as very important noted that "it is unclear how one progresses 'up the chain.' " Two participants who rated it as not at all important mentioned their experience with higher positions in the process, and one wrote, "I've been to the mountain already, there's nothing there."

INFLUENCING MY FIELD of research was rated highly by 49% of the participants and was the top motivation for 8%. Two participants pointed to the role of ACs, saying that "this is better achieved from the position of program committee member than reviewer," and that "Chairs often over-rule even unanimous reviewer recommendations." Another said, "I see the role of reviewers as helping to shape the field." One participant similarly wrote that: "As sometimes the reviews can also depend on taste and opinion to some extent, I want to put in my vote for the kind of work that I see as important." Although the wording of the question was intended to be neutral, some participants thought it had a negative connotation and rated *INFLUENCING MY FIELD* as slightly or not at all important; one called it "dishonest and sleazy" and another considered it to have an "ego-centric connotation."

FACTOR 3. *QUALITY CONTROL AND INFLUENCE:* Three items loaded onto this factor: *GATE-KEEPING* (0.82); *ENCOURAGING QUALITY* (0.71); and *INFLUENCING MY FIELD* of research and community (0.35).

GATE KEEPING or exposing researchers only to valuable research was rated highly by 55% of the participants and was the top motivation for 6%. One participant commented: "It's not only other researchers I am concerned about but also students. I do not want students to get the wrong impressions about human factors in computer systems or about the profession's standards for acceptable research practices."

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Another pointed out that: "This is important because conferences are expensive and should meet a certain quality." One participant who did not consider it to be an important motivation mentioned that: "I don't see myself as a filter for protecting other researchers." Another pointed out that "what is valuable is sometimes a matter of opinion as well, which often shows in how reviews on a paper can really differ a lot." Two participants noted that the value of articles cannot be determined at the time of review; one wrote: "I don't really think it's my place to decide what's 'valuable,' I decide what is good science and well written, whether that's valuable is up to the reader."

Encouraging quality research was rated highly by 83% of the participants and was the top motivation for 12%. One participant who disagreed with the importance of this motivation stated that "good research is entirely subjective."

Influencing my field is discussed in **Factor 2.**

Factor 4. ***Prestige/significance of the review:*** Being asked by a *Famous* AC (0.71) and desire for reviewing requests for a *High-profile venue* (0.67) positively loaded onto this factor.

Receiving the review request from a *Famous AC* was reported to increase motivation by 87% of the participants. Five participants mentioned that they feel honored to receive such a request; one wrote that: "When I know my review will be read by someone I greatly respect and they will know that I wrote it, that is a strong motivator." Two others mentioned that they feel more obliged in this situation. The participants who did not consider this to have any effect on them mentioned reasons such as not caring about impressing others, only caring about how qualified they themselves feel they are, or that it depends on who the person is.

Receiving the review request for a *High-profile venue* was reported to increase motivation by 84% of the participants. Two participants mentioned that the submissions tend to be of higher quality, and 2 others mentioned that it is an honor. Another participant noted that: "It increases my motivation since I know that the paper will [be] read [by] a wider audience if accepted."

Factor 5. ***Social obligation:*** Two items loaded onto this factor: having higher motivation when the associate chair is a friend (*Friend AC*, 0.87) and *Reluctance to say no* (0.48).

Receiving the review request from a friend (*Friend AC*) was reported to increase motivation by 89% of the participants. Four participants mentioned reciprocity as their reason; one wrote: "In the economy of reviewing, it means I may be able to armtwist that researcher to review a paper for me in the future." Others mentioned reasons such as helping friends, sympathy, and difficulty of refusing a friend's request.

Reluctance to say no to review requests was rated highly by 26% of the participants and was the top motivation for 8%. Two participants who rated this motivation as very or extremely important mentioned reputation concerns; one mentioned that "Turning down review requests can also get you branded" and the other wrote: "I think the editors/P.C. members will think I am foolish if I do not accept (it's a great learning and service opportunity) and may not want to ask me to review again if I decline this time around. I want them to know they can depend on me." Three participants mentioned that it depends on who asks. One wrote: "sometimes [I] need to repay a favor or might want a favor from this person in the future." Three participants mentioned the importance of helping the process; one wrote: "One often feels obliged to take on reviews to help people out."

Factor 6. ***Scientific ability and match with research interests:*** Two items loaded onto this factor: *Being expert* in the specific field of the paper (0.72) and *Relevance to own research* (0.31).

Being expert in the topic of the article was reported to increase motivation by 97% of the participants. Six participants mentioned that it makes it easier to understand and review the article, and 4 mentioned that it helps them to be more confident to help the authors or make meaningful comments. Two participants mentioned the difficulty of finding expert reviewers; one said: "It also greatly increases my guilt to say no to a review request when I know I am one of the most appropriate people who could have been asked." On the other hand, another participant noted that "sometimes I grow tired of a subject and prefer to review in a topic that I want to learn about."

Relevance to own research is discussed in **Factor 7.**

Factor 7. ***Convenience:*** Five items loaded onto this factor: *Relevance to own research* (0.62), having *Free time* (0.47), knowing the project (*Familiar paper*, 0.43), relatively short length of the article (*Shorter paper*, 0.38), and *Well-written paper* (0.31). All of these items reflect a desire for accepting reviews that require less effort or impose less inconvenience.

Relevance of the article to the reviewer's current research (*Relevance to own research*) was reported to increase motivation by 98% of the participants, which corroborates the findings of Tite and Schroter (2007). Two participants emphasized that an article should be related to their current work, not their past work: "Close relation of the paper and my 'future or ongoing' research will increase my motivation to review the paper, but close relation of the paper and my 'past' research will decrease my motivation to review the paper." Four participants mentioned that the goal is to stay up-to-date, and 2 mentioned that it makes it easier to understand and review the article. On the other hand, one participant noted that: "I am uncomfortable when a paper is too close to my current research, because I don't want to be influenced by the ideas of others before they are published (and therefore citable)."

Having *Free time* was reported to increase motivation by 65% of the participants. Thirty-two of 37 participants who commented on this question indicated having no free time and suggested using different wording for the question, such as using the term "flexible" instead of "free" or using a converse wording such as not "feeling overcommitted." One wrote: "I don't know that anyone in academia ever feels like

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they have 'free time.' As commitments come along, you carve out time for them." One of the participants who thought having free time increases his motivation mentioned that: "Certainly, reviewing is one of the first things to be dropped when pressed for time." On the other hand, one who thought it does not have any effect wrote: "I tend to think that reviewing for conferences is a great opportunity, probably because I am early in my career and lack experience. So, reviewing usually gets placed at the top of my priorities list."

Close relation of the article to another article that the reviewer has read (*FAMILIAR PAPER*) was reported to increase motivation by 60% of the participants. Six participants commented that they have not had such an experience. Two others who found it motivating mentioned that it facilitates the review, and 2 others mentioned that it helps them to write a more considered review. Two participants said that it depends on how good the original article was and how incremental the new one is.

The length of the article being relatively short (*SHORTER PAPER*) was reported to increase motivation by 51% of the participants and to decrease it by 2%. On the other hand, an article being long was reported to increase motivation by 2% of the participants and decrease it by 52%. Two participants noted that they prefer shorter articles because they are already too busy, and 2 explained it was "Not because I am lazy, I simply think good short papers are more elegant and often deliver more value." One participant said that this is his reason for not reviewing journal articles. Two participants pointed out that reviewing long articles is so much work that the reviewer should be acknowledged. One wrote: "Reviewing takes lots of time and if I do it right I feel that I should be almost a coauthor or get acknowledged in the paper," and the other pointed out that "If it's too long relative to papers submitted for that venue, I tend to assume it's poorly written or premature. I don't like authors using reviewers as editors (or collaborators!)." Two others preferred longer articles, because they contribute more and because it is easier to take into account reviewer's comments in revisions (in contrast with short articles).

Receiving a request for reviewing a *WELL-WRITTEN PAPER* was reported to increase motivation by 82% of the participants. Ten participants pointed out that they do not know if an article is well written when deciding to accept a review request and 4 others mentioned that well-written articles are rare. One participant noted that: "I also feel strongly that those papers that are not well-written may need the most attention, so I would not want to neglect the authors."

FACTOR 8. ***CONTENT BENEFIT:*** Three items loaded onto this factor: *ENJOYING CRITICAL READING* (0.60); desire for knowing what's new in the field (*AWARENESS*, 0.36); and not caring about the (long) length of the article (*SHORTER PAPER*, –0.47).

ENJOYING CRITICAL READING was rated highly by 46% of the participants and was the top motivation for 8% of them. One of the participants who rated it as very important said that: "I feel that regularly reviewing keeps one's critical skills sharp." Two participants (one who rated it moderately important, the other who rated it slightly important) mentioned that their busyness inhibits the joy; one wrote: "I'm so overwhelmed with reviewing and other responsibilities that it is always a burden. I do often enjoy it, but it always feel like there are more important things I'm not doing when I'm reviewing." Two other participants who rated it as slightly or not at all important mentioned that reading accepted articles can serve this purpose. Three participants noted that they enjoy it when they receive a good article for review.

AWARENESS of new research was rated highly by 63% of the participants and was the top motivation for 14%. One participant noted that: "Being a program committee member gives an even better vantage point to see what's new in the field." Among the participants who considered this motivation of little importance, two pointed out that reading published materials would be more helpful for this purpose: "you get that anyway from actual publications, a few months later, and with a broader view."

SHORTER PAPER is discussed in **FACTOR 7.**

FACTOR 9. ***RECOGNITION OF CONTRIBUTION:*** Two items loaded onto this factor: knowing that the review will influence the decision about the article (*INFLUENCING DECISIONS*, 0.84) and that the authors will apply the suggestions (*AUTHORS LISTEN*, 0.48). It reveals a desire for recognition of the reviewer's efforts.

Knowing that the reviewer's decision will influence the fate of the article (*INFLUENCING DECISIONS*) was reported to increase motivation by 81% of the participants. One wrote: "When my reviews are ignored in the final decision, I think twice about reviewing for that conference," and one considered it to be "the whole point of reviewing." Two participants that did not think it increases their motivation mentioned their fear of judgment errors; one wrote: "if I'm not too confident, then I'm scared I'll either ruin some poor person's career, or cause a poor manuscript to get published." Two others expressed doubts about reviewers' decisions having any effect on the fate of articles.

Knowing that authors will apply the reviewer's suggested changes (*AUTHORS LISTEN*) was reported to increase motivation by 78% of the participants. Four participants talked about feeling helpful when authors listen to them. However, 4 participants mentioned that it is hard to know in a one-step peer review process if the authors take the suggestions into account. Three participants mentioned that this is the author's decision and they are not concerned about it. Three others mentioned that authors often do not do it at all or they do the minimum.

FACTOR 10. ***IMPROVING PAPERS:*** Two items loaded onto this factor: knowing that the authors will apply the suggestions (*AUTHORS LISTEN*, 0.58) and desire for helping authors improve their work (*IMPROVING THE WORK*, 0.48).

Helping authors with *IMPROVING THE WORK* was rated highly by 53% of the participants and was the top motivation for 9%. One participant who considered it very important

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associated it with a feeling of usefulness: "The authors took my comments seriously, responded appropriately, and the revised version was excellent, it made me feel useful." Another participant mentioned that it is a very important motivation because of his desire "to contribute back to community." One participant did not consider it to be a motivation and explained that: "I don't see myself in a position to help others in this way, not senior enough as yet." Three participants were concerned about helping too much (one called it "hand holding an author") and that "mentoring and coauthorship" should serve this function. One thought that it is not a function of peer review: "I don't think the point of peer review is to help improve work, except for minor suggestions (e.g. look at this paper). Feedback should be provided from research collaborators."

AUTHORS LISTEN is discussed in **FACTOR 9.**

Other social motivations not associated with any factor. Three items (*SAME COMMUNITY*, *GIVING BACK*, and Knowing *THE AUTHOR*) did not appear to contribute to any factor. Though all three seem to be related to social interactions and needs, there is little correlation between them and none loads heavily onto the ***SOCIAL OBLIGATION*** factor. This suggests that social motivations are more complicated and multidimensional, and that further research may be required to fully understand them. We provide quantitative and qualitative information about these three items in this section.

GIVING BACK to the community was rated highly by 72% of the participants and was the top motivation for 11%. One participant explained that: "Because some reviews I've got are very helpful and improve my work, and I want to provide good thoughtful reviews back." Another mentioned that: "When my ratio of reviews to submittals gets too high, I excuse myself from review requests by pointing that out!"

Receiving the review request from the reviewer's community (*SAME COMMUNITY*) was reported to increase motivation by 89% of the participants. One participant considered reviewing as an activity that helps feeling connected: "I am one of very few faculty in my field at my school (a small liberal arts college). I feel somewhat isolated at times and can't afford to travel to many conferences. Reviewing helps me feel connected to the research community." Others indicated reasons such as being recognized in the community, understanding the norms of reviewing, and the high quality of the venues in which they participate. In contrast, one participant said that: "being invited into a new community in order to provide diversity is quite motivating too."

Personally *KNOWING AUTHORS* was reported to increase motivation by 26% of the participants, but it decreased motivation in the same percentage of the participants. Knowing that authors are well known (Famous authors) was reported to increase motivation by 35% of the participants. Eight participants stated that such articles will be high quality, and 2 indicated excitement or fun. One wrote: "It can be exciting to get a first look at what may be very good research, based on someone's reputation, and to have the opportunity to contribute meaningful feedback to them." Participants who did not find it motivating mentioned reasons such as being intimidated and the possibility of bias (mentioned by 4 participants). Concern for reviewer bias has been discussed extensively in the literature (Campanario, 1998; Lee, Sugimoto, Zhang, & Cronin, 2013; Shatz, 2004).

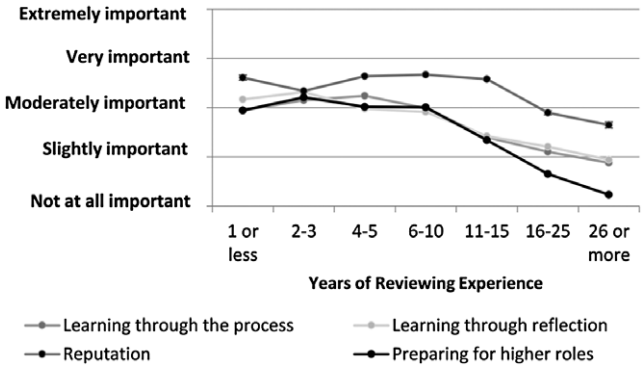

FIG. 4. Effect of reviewing experience on reviewing motivations.

Effect of Experience and Demographics on Motivations

We explored potential relationships between reviewing motivations and demographics using multiple ordinal regression analysis. Odds ratio (OR) and Wald's chi-square (χ^2) are reported for the significant predictors. We found that less Reviewing experience was associated with higher ratings of *PREPARING FOR HIGHER ROLES* (OR = .91, $\chi^2 = 17.2$, $p < .01$), *LEARNING THROUGH THE PROCESS* (OR = .93, $\chi^2 = 13.42$, $p < .01$), *LEARNING THROUGH REFLECTION* (OR = .95, $\chi^2 = 7.85$, $p < .05$), *REPUTATION* (OR = .63, $\chi^2 = 18.63$, $p < .05$), and *FAMOUS AC* (OR = .93, $\chi^2 = 10.88$, $p < .05$) (Figure 4).

On the other hand, higher Level of involvement was associated with higher ratings of *GATE KEEPING* (OR = 1.43, $\chi^2 = 7.74$, $p < .05$) and lower ratings of *PREPARING FOR HIGHER ROLES* (OR = 2.31, $\chi^2 = 12.94$, $p < .05$) (Figure 5).

Having a doctoral degree was associated with higher ratings of *LEARNING THROUGH REFLECTION* (OR = .24, $\chi^2 = 11.85$, $p < .05$) (Figure 6).

In comparison with males, females rated *PREPARING FOR HIGHER ROLES* (OR = .42, $\chi^2 = 13.2$, $p < .05$), *LEARNING THROUGH THE PROCESS* (OR = .46, $\chi^2 = 10.56$, $p < .05$), and *LEARNING THROUGH REFLECTION* (OR = .44, $\chi^2 = 11.27$, $p < .05$) significantly higher (Figure 7).

Finally, a reviewer's Position was a predictor of *AWARENESS* (OR = 5.37, $\chi^2 = 17.39$, $p < .05$, significant difference between industry practitioners and faculty members), *LEARNING THROUGH REFLECTION* (OR = .19, $\chi^2 = 15.08$, $p < .05$, significant difference between industry practitioners and faculty members), and *ENJOYING CRITICAL READING* ($\chi^2 = 15.7$, $p < .05$, but none of the pair-wise differences were significant) (Figure 8).

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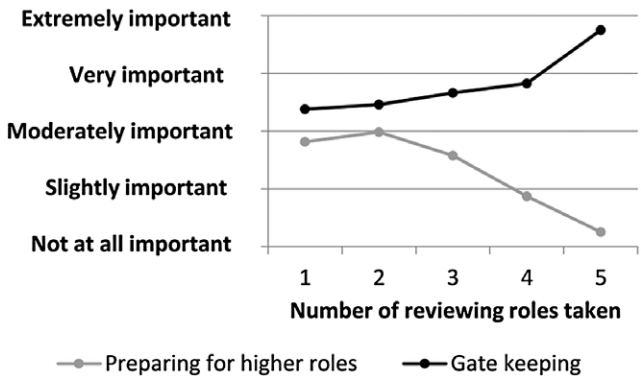

FIG. 5. Effect of level of involvement in the review process on reviewing motivations.

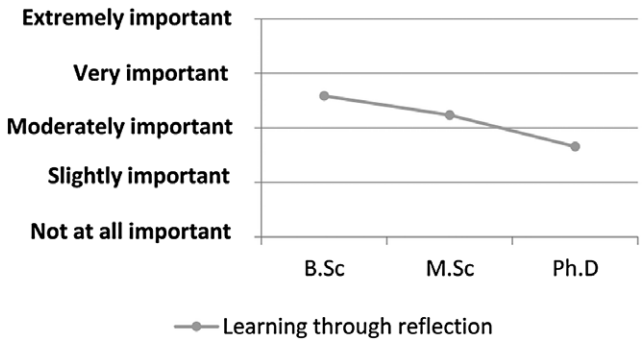

FIG. 6. Effect of last earned degree on learning through reflection.

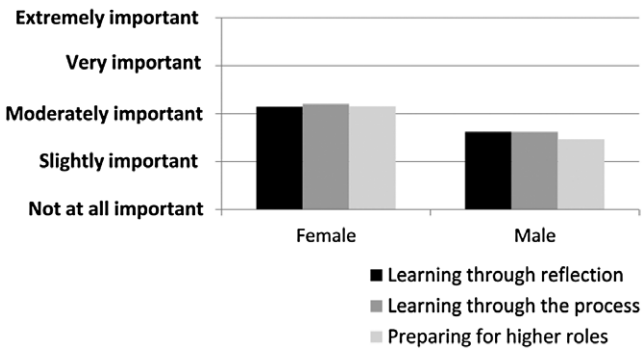

FIG. 7. Effect of gender on reviewing motivations.

Discussion and Implications for Peer Review

Our findings about the relative importance of reviewing motivations generally corroborate those of previous studies; however, there were a few differences. We found the importance of *ENJOYING CRITICAL READING* and *IMPROVING THE WORK* to be less prominent than we had expected based on previous findings by Snell and Spencer (2005) and Ware and Monkman (2008).

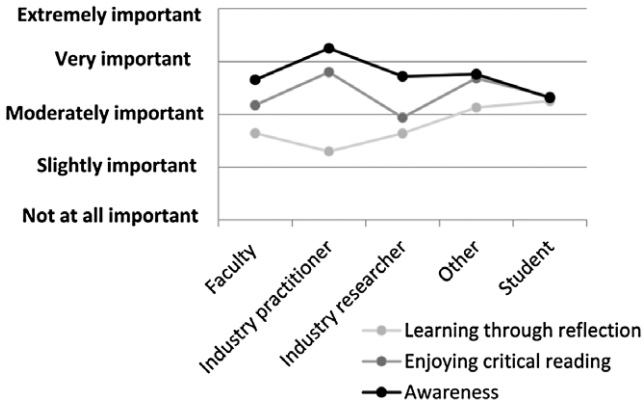

FIG. 8. Effect of position on reviewing motivations.

In the case of *ENJOYING CRITICAL READING*, previous work had elicited opinions about the joy of reviewing in general, rather than the joy of critical reading. We intentionally asked a more specific question in our study to ensure that the enjoyment was not related to benefits from other aspects of reviewing, such as interaction with the community or learning, but was derived instead from "critical reading" per se. Our data suggest that the prominence of joy of reviewing as a reviewing motive in previous studies might be attributed, in part, to other aspects of reviewing instead of the act of reviewing and critical reading per se.

We suspect that the relatively low importance of *IMPROVING THE WORK* as a reviewing motive may be attributed to the HCI community being one that is more conference than journal oriented. The peer review process for conferences does not usually allow for multiple rounds of revision and thus gives less opportunity for improving articles through the reviewing process. Instead, the focus is often on assessing articles in their initial state more or less "as is," rather than for their potential after revisions because revision time is often short, and thus does not allow for making significant revisions in response to reviewers' suggestions. This could account for a lack of motivation by HCI reviewers for using the review process for improving articles and helping authors. It might also explain an overly critical attitude of reviewers in computer science, which has been a characteristic noted by others (Keshav, 2011; Vardi, 2010). As HCI conferences, such as the Conference on Computer-Supported Cooperative Work, adopt new processes that allow for more significant revision cycles (Grudin, Mark, & Riedl, 2013), reviewers' attitudes toward *IMPROVING THE WORK* might change.

In addition to these findings, we drew a number of lessons that we think could shed more light on how peer review processes might better reflect the wants and needs of reviewers and also how computer-mediated systems to support a variety of peer review processes might be better designed.

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Different Reviewers Have Different Motivations

The findings from our survey strongly suggest that individual reviewers sometimes have very different attitudes and reasons for participating in the peer review process. Some differences are associated with level of experience, job title, and gender, whereas others appear to be individual differences in approaches to peer review and to science as a whole.

Reviewing experience was a significant predictor for valuing learning- and reputation-related motivations. This could be because there is more to learn for less-experienced researchers, and that *maintaining* reputation for more experienced reviewers might require less effort than does *establishing* reputation for less-experienced reviewers. We found that female reviewers rated all three items of the ***LEARNING*** factor higher than did males. This corroborates previous research that found female volunteers are motivated by learning and personal development more than are male volunteers (Burns, Reid, Toncar, Anderson, & Wells, 2008).

Implications for Design of Peer Review Processes and Systems that Support Them

Grudin (1988) noted that the discrepancy between who does the work and who benefits from it is one of the important reasons why collaborative systems fail. Compared to authors, publication venues, and readers of academic articles, it is reviewers who might benefit the least from the peer review process. Based on what reviewers consider beneficial to them and the motivational differences we identified, we believe it is especially important to provide reviewing venues that attract reviewers with varying attitudes to ensure that a wider cross-section of the community participates in peer review. The following are specific recommendations, based on our findings.

Finer granularity of reviewing roles and using reviewing teams. There is an opportunity for finer granularity of reviewing tasks to cater to reviewers' wide variety of reviewing motivations, as well as to their individual expertise. Current peer reviewing inherits its division of labor from a time when articles and reviews were transmitted by relatively slow and expensive conventional postal delivery services. Today's online peer review systems can support more complex, flexible, and effective divisions of labor. Various tasks for reviewers and ACs often respond to different motivations that reviewers may have. For example, reviewers motivated by learning through critical reading of articles may pay more attention to details, such as clear writing, thoroughness of the literature review, or proper statistical methods, whereas reviewers motivated by gaining awareness of what is new may prefer to assess articles at a higher level and focus more on the scientific novelty or importance of the research being reported. Because of this, we recommend assigning reviewing subtasks to reviewers based on their interests.

More generally, the review process for a manuscript could involve a team of researchers who are able to recruit qualified reviewers (who then become members of the reviewing team), scrutinize details, and assess the "big picture." It is often difficult to ensure that a team of reviewers can cover all aspects of interdisciplinary articles. Some medical journals already recruit statistical reviewers in addition to medical domain experts (Goodman, Altman, & George, 1998). However, interdisciplinary publication venues that try to find experts who are each familiar with the entire mix of relevant disciplines and methods can significantly reduce the pool of qualified reviewers for an article. Our findings suggest that being an expert in a reviewing task is a strong motivation for accepting it. We recommend that peer review systems build in mechanisms that help to recruit multiple reviewers, each responsible for reviewing some relevant aspect of a submission, and that the system be designed to assist in ascertaining whether this has been adequately achieved.

Enhancing interactions between reviewers could facilitate learning from other reviewers' points of view or experience. Some respondents mentioned a desire to see comments made by other reviewers for learning purposes and for assessing their own reviews in comparison. If this were done, reviewers might better understand how their opinions have affected the decision process, even if the final decision does not match theirs, especially if the process explicitly represented how other reviewers responded to their reviews. Several respondents highlighted this in their comments; we suspect that peer review support systems would benefit from supporting higher levels of collaboration and interaction during the peer review process, whether or not they use teams of reviewers.

We also recommend creating a hierarchy of excellence in reviewing that is distinct from the function of the role played by an individual. This stands in contrast to the current hierarchy in reviewing where editorship or serving on a program committee is considered to be more prestigious than simply reviewing. In the current system, reviewers who provide quality reviews for several years will be offered a spot on a program committee; but, for those who are primarily motivated by enjoyment of critical reading, being promoted instead to "Expert reviewer" status that carries with it more flexibility in choosing what to review and a stronger say in reviewing decisions could be more desirable as long as it is seen to be as prestigious as serving on or chairing a program committee or becoming an editor of a journal.

Reviewer-assignment by bidding. A feeling of having appropriate expertise and relevance of the article to the current work of the reviewer were both rated highly and contributed to the two factors: ***CONVENIENCE*** of reviewing and ***CONTENT BENEFIT***. Two participants emphasized the importance of an article being relevant to their current or future work rather than to their previous work.

Peer review support systems can help when they capture the research interests of reviewers by asking them to choose

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relevant keywords or categories from a predefined set, or to provide their relevant articles to be used for modeling their expertise or interests (Charlin & Zemel, 2013). Based on this information, peer review support systems can recommend reviewer assignments to ACs or automatically assign articles to reviewers without their direct intervention (Charlin & Zemel, 2013; Conry, Koren, & Ramakrishnan, 2009; Goldsmith & Sloan, 2007). Whereas bidding is often used for eliciting the preferences of review committees or ACs for articles (e.g., AAAI, ICSE, WikiSym, CSCW, ICWSM, and so on), conferences and journals that rely on external reviewers often do not offer the same opportunity to the reviewers. An opportunity to bid on articles can encourage potential reviewers to register as volunteers for reviewing to be able to see the summaries and bid, which can increase the likelihood of accepting reviewing requests when a request is made, the so-called foot-in-the-door technique (Beaman, Cole, Preston, Klentz, & Steblay, 1983).

We recommend inviting volunteer external reviewers to bid on articles that they are interested in reviewing, while still using algorithms for satisfying constraints (minimum number of reviewers, conflict of interest, load-balancing, and so on), and then involving ACs (or editors) in making the final assignment to ensure the integrity of the process and to maintain important social dynamics that, as our findings suggest, may be necessary to motivate reviewer participation.

Making reviewing behavior visible to promote behavior desired by the community. Giving back to the community was among the top three general reviewing motivations. We recommend providing reviewers with a dashboard of interactions with the community, including the number of reviews received, and the number of reviews provided over the years to raise awareness of how much one is benefiting from the community, and how much one gives to the community. This type of information dashboard could include aggregate information from other reviewers for comparison. We propose further investigation, when practical and ethically feasible, of the use of explicit representations of behavior in the peer review process, such as accepting and declining reviews, response time, and quality of reviews, as a mechanism for motivating desired reviewing behavior. What we recommend is raising self-awareness by presenting the information privately, only to the reviewers.

Strengthening the sense of community around journals. A sense of belonging with a venue was one of the top reviewing motivations in our study. This supports existing research studying online community contributions (Budhathoki & Haythornthwaite, 2012; Ren et al., 2012). Whereas conferences provide a place for scholarly communities to gather and strengthen researchers' ties to one another, journals play a less-visible role in community building, which, we conjecture, might contribute to challenges that HCI journals face in recruiting reviewers (according to observations we made at editorial board meetings for two HCI journals). We suggest that journals might benefit from nurturing a sense of community among potential reviewers.

With the prevalence of digital publishing, the connection between articles that people read and the venues that the articles are published in has become less tangible. Instead of finding an article in a physical journal, in the digital era researchers find it in a digital library or through a search engine that might not even be associated with the journal. Indeed, researchers commonly use keyword search to find articles in generic academic search engines, such as Google Scholar, and download the articles from authors' homepages, without having to go through the publishers' or the journals' websites. When citing articles using citation managers, such as Zotero and Mendeley, authors might not have to write, or even notice, the venue in which the articles they are citing are published. All of the technological support tools for distribution, discovery, and generation of scholarly work contribute to the disconnection of the scientific community from journals.

One possible way to alleviate this problem is with strong "branding" practices, such as including logos or clear identifiers of publication venues in the document templates that authors use, to ensure that readers easily notice the publication venue. Creating an online forum around a journal and having physical gatherings of researchers involved with a journal (perhaps during conferences) are other possible strategies. Finally, the trend toward conference-journal hybrids could solve this problem by effectively bringing the best conferences and journals together (Grudin et al., 2013).

Supporting accumulation of reputation and rewarding reviewers. Maintaining and establishing reputation was a popular reviewing motivation and emerged as a factor that included the desire for Influencing my field and gaining experience and Preparing for higher roles in reviewing hierarchy. Online peer review support systems facilitate keeping track of reviewers' activities over time, which can be used to recognize reviewers' contributions, a prevalent concern of reviewers (Lu, 2013). Moreover, recognition and presentation of contributions of the best reviewers (based on both quality and quantity) in their online public profiles (with appropriate consent mechanisms in place) could help accumulation of reputation on top of the organic process that relies on social networks of researchers. We also recommend providing criteria for advancement in the peer review hierarchy or providing explanations of why people were selected for various reviewing roles. Such transparency might motivate reviewers who value higher positions by helping them understand the process that they need to go through and the efforts they need to put in for advancement in the hierarchy.

Although most of our suggestions have been in the form of providing reviewers with what matters to them, we need to also ensure that motivations of reviewers will lead to high quality and fair reviews. Clark (2012) discusses some of the undesirable motives that reviewers could potentially have, such as soliciting citations, blocking

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competitors, or enhancing one's CV with minimal effort. For example, if establishing or maintaining reputation is the main reason for reviewing for some reviewers, we need to ensure that the system enables accumulation of reputation only through provision of high-quality reviews, rather than by submitting just any review at all. Publishing a list of reviewers, perhaps with quantitative information, may encourage reviewers to participate more than they would otherwise, but it does not encourage timeliness or quality of reviews. Whereas an open peer review system can reveal the quality of reviewers' participation by publishing the reviews, it may be challenging in a closed peer review system to provide the details that reveal the quality of participation.

This suggests that an open peer review process might have long-term benefits in terms of the quality of reviews, over and above the short-term benefits that are often claimed for it. Computer-supported peer review systems could further enhance this by providing links between the ratings assigned to articles by reviewers and the citation counts (or other relevant measures of impact) for those articles, which would indicate their ability to identify impactful articles. This could, in fact, be done, even in a closed reviewing process, for publications within the systems if only statistical summaries, not individual articles and ratings, were provided.

Further implications for design, as well as more discussion of recommendations, can be found in the first author's dissertation (Nobarany, 2015).

Limitations of Our Study

The results from our survey might have been affected by volunteer bias, the possibility that participants who are willing to participate may have different characteristics than the general population under investigation (Heiman, 2002). It is possible that our participants cared more about peer review research and their research community than those who did not choose to participate, and it is possible that the level of busyness at the time of the distribution of the survey affected participation decisions from some important segment of the HCI community. However, the high diversity of the participants' backgrounds suggests that we were able to recruit a fairly heterogeneous, and perhaps representative, sample.

Another limitation of our work is the use of a questionnaire. People do not necessarily "do as they say" when asked about their practices or beliefs, and they may not be accurate in observing or predicting their own behavior. Fully assessing the influence of each of the potential reviewing motivations requires more in-depth behavioral studies. The questionnaire approach we pursued offers a much broader, but admittedly less reliable, view of the community than what could be achieved through a behavioral study unless significantly more resources were available.

We attempted to balance completeness of the questionnaire and its length. When asked to think of other reviewing motivations, participants mentioned a number of motivations that were not in our questionnaire. We recommend that future research combine those possibilities with our current questionnaire to validate or revise the factorial structure of motivations that we identified. Our questionnaire only looked at the effects of a few background variables. Numerous other demographic and background variables, such as age, nationality, country of employment, and language proficiency, could potentially influence reviewing motivations.

Conclusion

Our study has provided a broad understanding of reviewing motivations, particularly the differences between reviewers, how those motivations are related, and the relative importance of the motivations in an interdisciplinary, conference-oriented research community, such as the HCI community on which we focused. We showed the diversity of factors that can motivate various groups of reviewers. We think research communities could benefit from providing venues that use peer review processes that match the diverse reviewing motivations of the specific community. Our findings and suggestions that arise from the findings provide a first step in providing this type of support in the next generation of computer-mediated peer review systems.

Acknowledgment

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Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

Appendix S1. Questionnaire design considerations.
Appendix S2. Regression analyses.
Appendix S3. Factors underlying motivations for reviewing.
Appendix S4. Extended review of the literature.