# Tweeting Badges:
# User Motivations for Displaying Achievement
# in Publicly Networked Environments

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## Abstract

Badge systems, a common mechanism for gamification on social media platforms, provide a way for users to present their knowledge or experience to others. This study aims to contribute to the understanding of why social media users publicize their achievements in the form of online badges. Five motivational factors for badge display in public networked environments are distinguished—self-efficacy, social incentives, networked support, passing time, and inattentive sharing—and it is suggested that different badge types are associated with different motivations. System developers are advised to consider these components in their designs, applying the elements most appropriate to the communities they serve. Comparing user motivations associated with badges shared across boundaries provides a better understanding of how online badges relate to the larger social media ecosystem.

## Introduction

**T**HE SUCCESS OF SOCIAL COMPUTING applications,[1] or simply social media, relies on their social engagement: the extent to which users interact with one another in creating, sharing, and promoting content. User interaction often bridges various participatory platforms through a range of mechanisms, including rich site summary (RSS), social plugins, and mashups, as well as manual reposting and linking, resulting in a fluid social media environment. Developers recognize that the success of a social media platform rests largely in its integration into the wider ecosystem, and provide functionality that encourages users to engage in such integration. Among the attempts to encourage user interaction are a subset often referred to as gamification: the application of game elements to nongame systems to increase user engagement, loyalty, and enjoyment.[2]

One way of implementing gaming mechanisms is a badge system, used to signal various forms of participation. Online badges are digital representations of knowledge or experience by which user achievements are encouraged, recognized, and communicated across digital platforms.[3] Various online platforms encourage users to earn badges for different purposes, including wellness promotion, information sharing, skill and knowledge exchange, and education, as well as a range of entertainment experiences. Many of these badges not only appeal to users' internal desires for playfulness but also serve as a marker of reputation that signals an individual's status (via experiences, tenure, level of skills, etc.) within various communities and publics. In turn, a badge may also influence other users' behaviors, encouraging them to earn similar badges.[3]

While the majority of existing research on online badges tends to focus on infrastructure[4,5] or badge-earning patterns within a particular community of interest,[6] relatively little research has explored user motivations for sharing online badges, particularly beyond the badge issuer Web site. The purpose of this study is to contribute to the understanding of why social media users publicize their earning of different types of badges. The focus is on badge displaying, rather than earning patterns, given that networked sharing and social visualization of user activities are core elements of engaging in social media experiences. Moreover, the act of display is closely intertwined with the process of goal attainment. After discussing why users would share and display online badges, this study maps the relationship between display-related motivations and different types of online badges offered from various types of social media sites.

### Online badges and gamification

Badges have traditionally been used by various institutions to recognize and incentivize performance, providing a marker of accomplishment visible to the community and to the wider public. Examples range from shield emblems in the Roman imperial armies to indicate unit membership to merit

badges in modern scouting.[7] More recently, there has been a growing interest in using open digital badges to accredit learning in online communities. Some open badge experimentation has been a natural outgrowth of gamification in networked environments and intended mainly to motivate continued participation. Some scholars have suggested that online badges can challenge existing forms of assessment[8] or existing credentials,[9] among other uses.

The application of gaming mechanisms to nongame contexts is also not new. As early as 1982, Malone[10] presented three heuristics for developing games with instructional ends: multilevel goal achievement, emotional appeals, and a well-defined knowledge structure. The technological components that Malone describes, which enhance users' intrinsic motives of challenge, fantasy, and curiosity, are also referred to as ''motivational affordances.''[11,12]

While early discussions of gamification mainly focused on the effects on an individual user, the social web environment requires developers to ponder not just intra-individual needs but also the ways in which game mechanics help to shape community dynamics. For example, a study of an online movie rating community found that designing with the object of self-interested action actually decreased the user's participatory intentions.[13] When a user's contribution was valued and recognized to be altruistic, however, the participation rate increased.[14] The results suggested that while appeals to self-interest found an audience among rather passive users, overemphasis on self-interest could result in already willing contributors losing interest.[15] The users with high willingness to engage need to be retained for a system to succeed.[15] Highly dedicated creative users contribute disproportionately to online communities. For example, a study of Wikipedia showed that a small number of dedicated contributors made more than half of all content changes.[16] Another study demonstrated that, unlike passive users, the dedicated contributors had a low boredom threshold but expected to receive recognition or authority commensurate with their efforts.[17]

To summarize, previous literature showed that both self-interest and social incentives were important motivating factors for successful gamification of social computing applications. Intra-individual motivations such as goal achievement, curiosity, and entertainment might help enhance participation from a larger body of active and passive users. A well-designed social incentive mechanism, on the other hand, might help encourage a small number of heavily dedicated users to return loyally and contribute to the community.

### Motivations for badge displaying

A badge system is one popular gaming element adopted by many nongaming online communities.[7] Badge earning and displaying can occur as separate stages and in potentially different spaces. First, a user participates in particular activities in order to achieve a specified goal. A badge is awarded as a result of completing the recommended task. The user is then able to determine whether to display the earned badge to other users or keep it hidden. Once deciding to display, the user posts the badge on her profile embedded in the Web site or application, or broadcasts the achievement via third-party platforms.

In practice, however, earning and displaying a badge are not always clearly distinguished from each other and are often experienced seamlessly. In many cases, a badge sharing option is automated and does not require additional actions. Aside from the functional advantages of making badges visible (e.g., more networking opportunities, greater recognition, upgrades in profile appearance), displaying a badge itself becomes an important source of playfulness and a considerable motivation for future badge earning.

Given that earning and displaying practices are intertwined, exhibiting a badge to a broader network is understood to enhance psychological gratifications produced from the process of earning a badge. Research across various disciplines has explored how and why the use of interactive online technologies fulfills users' psychological needs. Notably, self-determination theory,[18,19] which emphasizes intrinsic motivations such as autonomy, competence, and relatedness as core factors underlying participation in sports or games, has been adapted to online systems.[18–22]

Many media scholars drew on uses and gratification (U&G) theory to understand social media motivations,[23] attempting to enumerate the essential functions of social media.[24–28] Among various U&G-based studies, one study[29] distinguished *process* gratification (i.e., the enjoyment generated from the ''actual use of the medium itself,'' p. 267), from *content* gratification, a secondary result of engaging in the content found via the medium. They additionally defined a third dimension,[29] called *social* gratification, which concerns social networking. The process and social gratifications, as opposed to the traditionally well-studied content gratification, are particularly relevant to understanding the motivations for badge display because badge mechanisms are generally implemented in order to enhance the user experience of the platform (process), as well as social interactions with other users (social), and not particularly to serve the content or informational functions of a site.

Some studies considered proactive self-image maintenance as an additional user motivation,[1,30] specifically in terms of monitoring self-efficacy.[31] A visible marker of reputation and recognition allows users to monitor their own standing in comparison with others and encourages users to accumulate more badges in order to compete and excel among peers.[1,3] Moreover, the process of reputation and recognition building also contributes to the strengthening of a positive self-concept and self-identity. For example, digital badges displayed in one's own profile may signal the authority of the earner in a certain area, which can then be an important part of the user's self-concept. Stated differently, badge earning and displaying can not only gratify users' intrinsic needs but also offer intangible social incentives produced through the process of monitoring and comparing within social environments.[16] The current study attempts to understand better why users engage in badge displays and whether different types of badge displays reflect different user motivations. Based on the findings, the study intends to provide some recommendations as to how to improve badge-based gamification, particularly across platforms.

## Methods

### Gathering badge announcement tweets

Given the focus of this study on the cross-platform display of badges, data were collected via a third-party platform instead of specific badge-issuing Web sites. A search of the Twitter microblogging site provided a sample of tweets that

indicated badge earning. While badges may be presented on a number of social networking sites, including personal blogs, Tumblr, or Facebook, Twitter provides an excellent platform for an initial study for several reasons. First, while accounts can be made private, Twitter is generally public in nature, and represents a space in which presented badges are expected to be widely seen. Second, it provides a widely used application programming interface (API) that allows for articulation with badge-issuing sites. Third, because it requires abbreviated posts in text alone, it provides a more searchable space for detecting badge sharing.

Before beginning recruitment, a list of keywords was constructed specifically to identify badge-displaying posts in Twitter (e.g., just earned a badge). This process was necessary because a search based on only the word ''badge'' resulted in overwhelming numbers of irrelevant tweets. The keyword sets were heuristically determined by investigating the terminology of Twitter postings referencing badge earning on a specific set of popular sites. The keyword searches represented 10 different badge-issuing Web sites (Table 1), which were topically categorized into five types: fitness, leisure, programming, education, and community giving.

*Ambush survey*

Because Twitter's privacy policy limits the ability to send messages to unrelated users, alternative contact details were instead extrapolated via Twitter profile pages (e.g., e-mails, personal/professional Web sites, other social media profiles). If no further contact information was found, the user was excluded. Apparently non-English speaking users were also excluded. Participants were given a chance to win one of several $50 gift cards. The survey was administered at the end of 2013.

It should be noted that badge sharing is usually done in a brief moment within the context of other activities, and the event or decision is rarely particularly memorable. Therefore, the recruitment strategy was to ambush recently active users, attempting to contact the most recent badge sharers as quickly as possible. While some badges were so popular they appeared on a daily basis, other badges were less commonly posted. To balance the sample across different types of badges, the searches were conducted regularly once every 3 or 4 days, giving enough time for less popular badges to be newly posted. Users were contacted no later than 2 days after being identified. Most of users were contacted on the day they posted a badge.

*Measures*

A 25-item scale was constructed by adapting the previous literature. First, online game motivation research highlighted intrinsic needs such as a sense of efficacy, competence, and novelty.[18,19,21,22] Similarly, self-efficacy, mastery, and novel

TABLE 1. DESCRIPTIONS OF WEB SITE ISSUING BADGES

| Category | Web sites and descriptions |
| --- | --- |
| Programming | **Coderbits:** A computer programmer community, which builds user portfolios to showcase skills in computer science. These portfolios provide links to the user's social networking and professional sites. Badges awarded based on a user activity, e.g. ''Teamwork.'' |
| | **Stackoverflow:** A Q&A site, mainly for computer programmers. Users are able to vote on the quality of questions and answers, thereby affecting the reputation of fellow users. Badges awarded based on user activity, such as asking and answering questions, leaving comments and earning reputation points, e.g. ''Guru.'' |
| Education | **Khan Academy:** A learning Web site that offers free tutorials on many educational subjects. It offers courses at all levels, and is used worldwide. Badges awarded for achievements and community activity, e.g. ''Great Answer.'' |
| Fitness | **Fitbit** and **NikePlus:** Fitness sites allowing users to track physical activity, weight, nutrition, etc. Using the activity tracker devices such as a wristband or smartphone, the user's physical activity is uploaded directly. The site also offers users the ability to set health-related goals. Badges awarded for accomplishments, e.g. ''Lifetime Distance 3,000 Miles'' (Fitbit) and ''Three Weeks in a Row'' (NikePlus). |
| Leisure | **Untappd:** A social beer drinking community. Allows users to ''check-in'' to a beer instead of a location. Users are offered suggestions for new beers and given the opportunity to share ''check-ins'' via social network. Badges awarded for drinking specific types of beer, e.g. ''New Brew Thursday.'' |
| | **Foursquare:** A locative SNS. Users ''check-in'' at different locations from their mobile device. The ''check-in'' is then shared with the user's network. Badges are earned for the user's first ''check-in,'' patronizing a business multiple times, or attending a particular event, e.g. ''Newbie.'' |
| | **Yelp:** An urban guide to local places. Users are able to review and rate businesses they have patronized. Yelp also offers discussion forums and encourages activity with badges. Badges awarded based on ''check-ins,'' influencing your social network, and writing reviews, e.g. ''Gym Junkie.'' |
| Community giving | **World Community Grid:** A project aiming to create the collective computing power, which is then used to analyze large-scale humanitarian projects such as the human genome, clean energy, and HIV. Badges awarded based on the amount of donated CPU time, e.g. ''Ruby Badge.'' |
| | **Ezine:** A site dedicated to providing free informative, educational, or entertaining articles. Badges earned by community activity, e.g. ''Expert Author.'' |

outcomes were found as new gratification items for Internet uses.[20,30] Considering that badges are gamification components, a number of items represented these motivations: for example, a question asked a respondent's agreement to the statement ''sharing this badge provides me a sense of achievement.'' Second, given that badge sharing is one kind of social media experience, recent studies of social media use motivations were adapted. In particular, recognition, emotional support, networking, entertainment, social comparison, and social identity have been consistently found to be prominent motives for social media uses in multiple studies.[24–27] Thus, related items from previous literature were

adapted: for example, one item asked respondents whether they agreed with the statement ''I enhance my sense of belonging by sharing this badge.'' Last, badge sharing is a momentary experience, and may also be automated. A sharing activity could be understood as a habitual social media use rather than driven by a proactive motivation. Accordingly, a couple of media habit items were modified and used[30]: for example, ''I did not realize I shared the badge.''

To confirm whether the predefined motivation items properly represents online badge users, researchers presented open-ended questions, which helped obtain more detailed

TABLE 2. MOTIVATION ITEMS AND FACTOR ANALYSIS

| | | | Rotated component matrix | | | | |
|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 |
| Items | M | SD | Self-efficacy | Social incentive | Networked support | Passing time | Inattentive sharing |
| I am more self-motivated by sharing badges. | 3.64 | 2.01 | **0.83** | 0.19 | 0.25 | 0.15 | −0.10 |
| Sharing this badge helps me define who I am. | 3.63 | 2.00 | **0.77** | 0.23 | 0.31 | −0.01 | −0.12 |
| Sharing this badge provides me a sense of achievement. | 3.60 | 2.04 | **0.77** | 0.22 | 0.15 | −0.06 | −0.20 |
| Sharing this badge will be helpful for self-development. | 2.07 | 1.56 | **0.76** | 0.18 | 0.37 | 0.15 | −0.08 |
| Sharing this badge helps me present my personal identity online. | 3.26 | 1.99 | **0.69** | 0.32 | 0.22 | −0.08 | −0.19 |
| By sharing badges, I can compare the level of my activities with others. | 3.97 | 2.16 | **0.64** | 0.46 | −0.02 | 0.10 | 0.19 |
| I enhance my sense of belonging by sharing this badge. | 4.43 | 2.12 | **0.62** | 0.35 | 0.25 | 0.26 | −0.22 |
| I can express my interest, opinion, or personal values by sharing badges. | 4.64 | 2.06 | **0.47** | 0.26 | 0.31 | 0.03 | −0.38 |
| I make new like-minded friends by sharing this badge. | 4.05 | 2.02 | 0.35 | **0.72** | 0.25 | 0.00 | 0.03 |
| By sharing this badge, other users will perceive me as more knowledgeable in the area to which this badge is related. | 4.28 | 2.05 | 0.38 | **0.64** | 0.20 | −0.09 | 0.08 |
| I build on reputation in online community by sharing the badge. | 3.08 | 2.06 | 0.46 | **0.63** | 0.12 | 0.00 | 0.08 |
| By sharing this badge, I become more capable or knowledgeable about the area to which the badge is related. | 4.04 | 2.22 | 0.06 | **0.60** | 0.47 | 0.28 | 0.00 |
| I am recognized as trendy by sharing this badge. | 4.03 | 2.13 | 0.37 | **0.59** | −0.01 | 0.30 | −0.05 |
| Badge sharing is part of my usual routine. | 4.33 | 2.11 | 0.14 | **0.58** | 0.37 | 0.15 | −0.18 |
| By sharing this badge, I can be better connected with my friends online. | 2.50 | 1.74 | 0.18 | **0.47** | 0.30 | 0.31 | −0.29 |
| Sharing this badge helps encourage or collaborate with one another for a certain goal. | 4.84 | 2.08 | 0.37 | 0.14 | **0.73** | 0.02 | −0.09 |
| Sharing this badge helps exchange information and knowledge more efficiently. | 4.88 | 1.96 | 0.33 | 0.30 | **0.72** | 0.01 | 0.03 |
| Sharing this badge is effective for learning new knowledge. | 3.25 | 2.05 | 0.31 | 0.29 | **0.64** | 0.18 | 0.16 |
| I share the badge just to pass time. | 2.03 | 1.59 | −0.04 | 0.12 | −0.04 | **0.87** | 0.06 |
| I share the badge to relieve boredom. | 2.05 | 1.56 | 0.02 | 0.01 | 0.03 | **0.87** | 0.16 |
| Actually, I did not realize that I had shared the badge. | 2.13 | 1.99 | −0.09 | −0.03 | 0.04 | 0.14 | **0.82** |
| The badge was shared automatically with no purpose. | 3.02 | 2.42 | −0.20 | 0.07 | 0.02 | 0.15 | **0.81** |
| Reliability | | | 0.92 | 0.85 | 0.78 | 0.82 | 0.70 |
| Eigenvalues | | | 4.91 | 3.51 | 2.72 | 1.99 | 1.88 |
| % of variance | | | 22.36 | 15.94 | 12.35 | 9.06 | 8.52 |
| Cumulative % | | | 22.36 | 38.30 | 50.66 | 59.72 | 68.24 |

Extraction method = principal component analysis; eigenvalues and variances based on rotation sum of squared loadings.
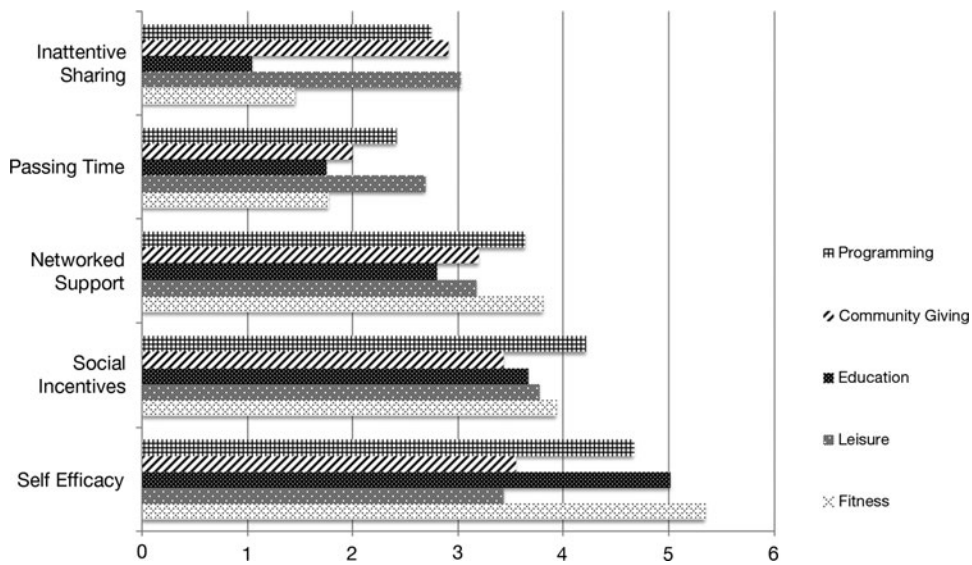Items in bold are loaded in the same factor.

**FIG. 1.** Composite mean values of motivation factors, compared by badge types.

and textured explanations of motivations described in the scale items. Based on the open-ended responses, three items adapted from social media motivations were decided as irrelevant to the badge-sharing context, and were thus removed. Each item was measured based on 7-point scale. The final 22 items are described in Table 2.

### Results

In total, 837 messages were sent with some users being contacted twice. Of these, 142 users successfully completed the survey, with a response rate of 16.96%. While lower than ideal, given the nature of the survey, which involved tracking public utterances and in some sense surprising users with a

response, the response rate was satisfactory. The majority of respondents were male ($n = 105$; 77.8%) and had at least some college education ($M_{mode} = $ college graduate [$=3$]; $M_{avg} = 2.93$). The average age was 34.96 years.

A factor analysis with a varimax rotation solution was conducted based on the 22-item scale. The analysis yielded five distinguishable motivations with an eigenvalue $>1.0$, representing 68.24% of the variance. These were labeled accordingly: "self-efficacy," "social incentives," "networked support," "passing time," and "inattentive sharing" (Table 2).

Composite mean values and factor scores of these five motivation factors are presented in Figures 1 and 2, with comparisons across badge types. To test whether the intensity of each motivation is different across badge types, a
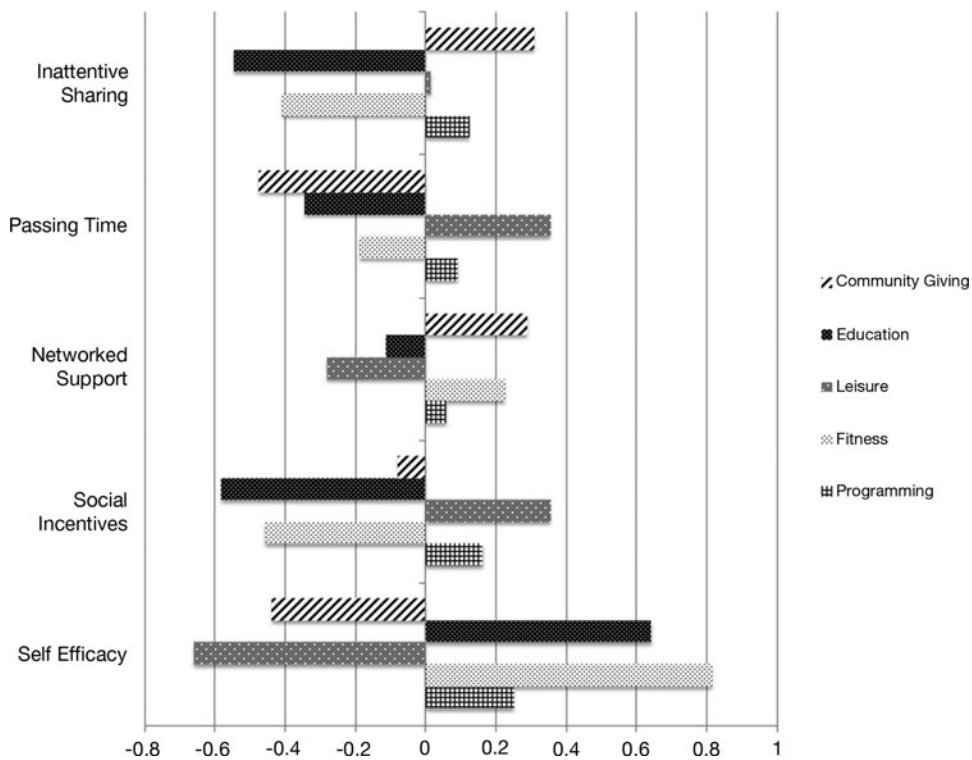


**FIG. 2.** Mean motivation factor scores, compared by badge types.

TABLE 3. BOOTSTRAPPED POST HOC TEST OF PAIR COMPARISONS

| Pair comparisons | | Self-efficacy | CI | | Social incentives | CI | | Pass time | CI | | Inattentiveness | CI | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $M_{Diff}$ | L | U | $M_{Diff}$ | L | U | $M_{Diff}$ | L | U | $M_{Diff}$ | L | U |
| Programing | Fitness | **−0.56** | −0.93 | −0.18 | **0.62** | 0.14 | 1.16 | 0.28 | −0.16 | 0.77 | **0.53** | 0.08 | 1 |
| Programing | Leisure | **0.91** | 0.53 | 1.32 | −0.19 | −0.63 | 0.26 | −0.26 | −0.75 | 0.24 | 0.11 | −0.35 | 0.62 |
| Programing | Education | −0.39 | −0.94 | 0.23 | 0.74 | −0.18 | 1.49 | 0.43 | −0.18 | 1 | **0.67** | 0.14 | 1.23 |
| Programing | Community | **0.69** | 0.08 | 1.32 | 0.24 | −0.27 | 0.73 | **0.56** | 0.08 | 1.09 | −0.18 | −0.83 | 0.57 |
| Fitness | Leisure | **1.48** | 1.13 | 1.82 | **−0.81** | −1.43 | −0.2 | **−0.54** | −1.05 | −0.03 | −0.42 | −0.83 | 0.03 |
| Fitness | Education | 0.17 | −0.39 | 0.79 | 0.13 | −0.84 | 0.92 | 0.16 | −0.43 | 0.76 | 0.14 | −0.34 | 0.61 |
| Fitness | Community | **1.25** | 0.7 | 1.84 | −0.38 | −1.06 | 0.26 | 0.29 | −0.2 | 0.74 | **−0.72** | −1.35 | −0.07 |
| Leisure | Education | **−1.3** | −1.85 | −0.69 | **0.94** | 0.04 | 1.72 | **0.7** | 0.04 | 1.27 | **0.56** | 0.04 | 1.07 |
| Leisure | Community | −0.22 | −0.78 | 0.37 | 0.43 | −0.16 | 0.98 | **0.83** | 0.33 | 1.36 | −0.29 | −0.96 | 0.35 |
| Education | Community | **1.08** | 0.32 | 1.89 | −0.5 | −1.37 | 0.42 | 0.13 | −0.44 | 0.69 | **−0.86** | −1.52 | −0.18 |

Scheffe Test. $M_{Diff}$=factor score mean difference. Items in bold are significant based on 95% confidence interval. ''Instrumental support'' is excluded from the table because none of the comparisons was significant.

series of one-way analyses of variance (ANOVA) with the motivation factor scores were performed. Although there were multiple dependent variables, an ANOVA was conducted instead of multivariate analysis of variance because the dependent variables (factor scores) were uncorrelated. Given an unbalanced and relatively small sample size, as well as the violation of homogeneity of variance, bias-corrected bootstrapping was conducted for each test.

The tests of between-subjects effects were not based on bootstrapped resampling. The results suggested three factors significantly differed across badge types: for ''self-efficacy,'' $F(4, 119) = 15.005$, $p < 0.001$, $\eta^2 = 0.335$; ''social incentives,'' $F(4, 119) = 3.807$, $p < 0.01$, $\eta^2 = 0.113$; and for passing time, $F(4, 119) = 2.725$, $p < 0.01$, $\eta^2 = 0.084$. However, Scheffe post hoc tests based on the bootstrapping revealed pairwise differences in ''inattentive sharing,'' in addition to the three factors resulted as significantly different from the between-subjects tests. In particular, fitness badges showed significantly higher self-efficacy motivation scores when compared with all other badges apart from education. Also, education and programming badges showed higher self-efficacy motivation scores than leisure and community-giving badges. On the other side, leisure badges had significantly higher scores for ''social incentives'' and ''passing time,'' particularly when compared to fitness and education badges. Community-giving badges showed a relatively higher score for ''inattentive sharing,'' especially when compared with fitness and education badges. Computer programming badges also showed significantly higher scores in ''inattentive sharing'' and ''passing time'' when compared to fitness or education badges (Table 3).

## Discussion and Conclusion

The current study attempted to understand why online users publicly display their achievements. Badge systems are a popular element that facilitates public display of achievement and performance. This study focused on badge displaying rather than earning patterns, based on the premise that enhanced visibility of user activities throughout a user's online social network is essential to the participatory web.

To explore the relationship between user motivations and badge types, the study conducted an ambush survey in Twitter. The data collection process was not free from limitations, including relatively a small sample size, a 2 day response time window that is longer than the ideal for an ambush survey design, and sampling from a single social media platform. Limited sampling was inevitable given much stricter access to users' profiles in other badge-displayable social media sites. Even in Twitter, the current privacy policy allowed the recruitment information to be sent out only to the users who publicly provided alternative methods of contact. Interpreted differently, however, the contacted users were the ones who demonstrated a convergent use of Twitter along with other online platforms. They could be defined as the active online public and likely to be more frequent adopters and users of badges. Understanding of the active user group may provide scholars and social media developers with unique insights that might not be captured when studying a more general online population.

The study identified five motivational factors of online badge sharing. Although the boundaries across these motivations cannot not be clearly defined and the identified motivations did not provide an exhaustive list of human desires and needs, the resulting factors placed the motivations of badge sharing firmly within a well-established literature of human motives with regard to media drawn from self-determination theory,[18,19] online gaming literature,[22] the Internet U&G,[24–30] and social cognitive theory.[30,31] The motivation factor loadings suggest that the largest variances were accounted for by self-efficacy and social incentives, both of which have been addressed as important motives for online games. One interesting finding is that the first factor, labeled as ''self-efficacy,'' contained the items related with a personal identity expression, a sense of achievement, and social identity promotion. While these items could be treated separately in a general media use context, these motivations were integrated into one factor and contributed to enhance positive experiences of sharing of online badges. Second, the factor loading in ''social incentive'' showed that, in contrast to previous literature that treated recognition and networking separately,[25] the motivations for social networking and for building up reputation and recognition were found to be

inseparable from each other in this study. In general, the factor analyses results suggest the needs for nongaming Web site developers to delve into the lessons from game research for effective implementation of achievement displaying tools.

The main problem addressed by this study was understanding how different badges were associated with different motivations. The between-subjects tests suggest that ''networked support'' and ''inattentive sharing'' were *not* distinguishable motivations across badge types. Instead, they might be taken-for-granted components in social media badge uses, seen as essential affordances of all achievement displaying systems. In particular, ''inattentive sharing'' did not occur due to complete negligence. Rather, the open-ended comments suggested that users intentionally continued to allow the automatic display of badges, as it made the sharing process more convenient. Although users might not be aware of every badge posted in their Twitter account, they were still cognizant that their achievements were being broadcast to their networked publics.

The post hoc tests suggested that while users of fitness- and education-related badges showed stronger self-efficacy motivations, those who shared leisure-related badges showed greater social incentive motivations. If fitness and education badge users were understood as mainly seeking self-mastery and goal achievement, leisure community users might be described as seeking stronger reputations and use these services for enjoyment (passing time). In fact, such findings are not very surprising because of the intuitive relatedness between topical areas of the badges and motivations. On the other hand, it is an interesting finding that computer programming badges were shared based on multilayered motivations, including most of the motivation factors presented here. In contrast, community-giving badges seemed not to be engaging users' motivations effectively and these badges showed higher scores only for ''inattentive sharing.''

As a whole, the findings of this study help compare user motivations across different types of badge systems and may assist system developers in designing badge components within related types of online communities. For instance, if self-efficacy is not the main goal of the badge earning practice in a leisure-oriented community such as Foursquare, the enjoyment driving components such as sound effects or unusual badge names might help attract more users. Also, consistent with the previous literature,[13,14] the emphasis on social incentives may be an important design consideration for user profile presentation. If, instead, earning and sharing badges is directly associated with hard work and spending considerable time and effort, as in the case for the fitness or education communities, more consideration should be put into maximizing a sense of fulfillment in self-interested objective, for example by facilitating the recognition of achievement by like-minded users or incorporating positive feedback options that can more easily boost a feeling of accomplishment and positive self-concept.

As digital representation of expertise and knowledge, online badge systems are an emerging component in human–computer interactive platforms. The convergent social media environment facilitates cross-platform displays of online badges, which may enrich user experiences and enjoyment online. The empirical model developed in this study provides future gamification research with a tool to address user motivations for adopting online badge systems or similar modes of accomplishment displaying systems.

## Author Disclosure Statement

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