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100 million strong: A case study of group identification and deindividuation on Imgur.com

Jude P Mikal
The University of Utah, USA

Ronald E Rice
University of California, USA

Robert G Kent and Bert N Uchino
The University of Utah, USA

Abstract

Online groups can become communities, developing group identification and fostering deindividuation. But is this possible for very large, anonymous groups with low barriers to entry, highly constrained formats, and great diversity of content? Applying social identity theory and social identification and deindividuation effects theory, this study assesses influences on group identification and deindividuation in the case of Imgur.com. Respondents reported slightly positive levels of the three forms of group identification, but mixed levels of two forms of deindividuation. As argued by proponents of computer-mediated communication, demographics play only a minor role on these outcomes. More involved usage, such as direct access and commenting on images, is more associated with these outcomes, while more basic usage, such as total hours and reading comments, has little influence. Deindividuation is positively associated with group identification.

Keywords

Deindividuation, group identification, Imgur.com, online community, site usage, social identification and deindividuation effects theory

Corresponding author:
Jude P Mikal, Psychology Department, The University of Utah, 380 S. 1530 E. BEHS 502, Salt Lake City, UT 84112, USA.
Email: mikal@csbs.utah.edu

Due to the widespread adoption and development of the Internet and social networking, individuals can now find others across the world who share common interests. Like offline groups, online groups may develop a sense of community and have members who identify with the group. As Howard and Magee (2013) note, "Individuals connect through the Internet to interact with similar others, and over time they categorize, identify, and compare themselves as part of these online groups" (p. 2058). Yet our understanding of the influences on members' sense of community (here, group identification) remains incomplete.

Some researchers conceive of community in general as a moral entity that transforms the individual through group pressure (Poplin, 1979). According to social identification and deindividuation effects (SIDE) theory, this normative pressure and group identification can also exist in online communities (Postmes et al., 1998). Members' identification may be influenced by the site's resources and purpose, ways in which members use the site, and design features such as group size, anonymity, and barriers to entry and exit (Ren et al., 2007). However, previous SIDE studies using random group assignments in experimental settings do not typically allow researchers to account for ongoing or more involved usage of an online site, an over-time shared interest, or design features that may affect group identification.

Thus, we apply SIDE theory to study one very popular, large website with a mix of features possibly both constraining and supporting a sense of community. We first provide background on the concept of group identification. Then, we discuss how social relations and group identification may emerge in the particular context of online interaction, highlighting the roles of demographics, boundaries and norms, usage and involvement, and site design. These discussions provide the basis for hypotheses about the existence of and relationship between online group identification and deindividuation and differential influence of usage versus involvement on those.

Theoretical framework

Group identification

Research has evolved from conceptualizing groups as primarily deindividuating forces to contexts for group identification and social norms. Based on the notion of "submergence" by LeBon (1895), early deindividuation theory proposed a basic opposition between the personal and social self. From this perspective, group mentality reduces concern for social evaluation or comparison, and self-restraint, making individuals capable of basic, destructive, and mob-like behavior. Early Deindividuation research found that deindividuation correlated positively with heightened hostility and antisocial behavior (Cannavale et al., 1970; Festinger et al., 1952; Watson, 1973).

Two critiques in particular have been levied against deindividuation theory. First, deindividuation theory holds that only two states of being are possible—one characterized by individual control and rationality and the other characterized by the individual becoming submerged in the group, thereby losing the ability to self-regulate (Reicher et al., 1995). Social identity theory (SIT) rejected this dichotomy. SIT does agree that individual identity is constructed of a personal and a social self (Tajfel et al., 1971). Yet,

SIT also assumes that group participation can affirm personal identity and that an individual can identify with one or more groups. This identification can then encourage individuals to modify their behavior in such a way as to confirm group membership and benefit fellow group members (Ashforth and Mael, 1989; Brewer, 1979). Moreover, through the process of self-anchoring, an individual's own positive self-image may become projected onto the group at large—creating a social attraction toward prototypical or stereotypical members of the group, based on group membership (Cadinu and Rothbart, 1996).

The second critique of deindividuation theory comes from studies showing that submersion within a group does not always result in anti-normative behavior. As a person shifts from the personal to the social self, internal controls can be replaced by external, social controls. In some situations under conditions of anonymity, deindividuation can actually promote group-normative behavior (Diener, 1976; Zabrick and Miller, 1972). Thus, Deindividuation emphasizes the social over the personal identity *and* a salient group identity (Douglas and McGarty, 2001).

SIDE was also inspired by these criticisms of strict deindividuation theory (Postmes et al., 1998). Fundamentally, SIDE argues that (especially anonymous) computer-mediated communication (CMC) minimizes the interpersonal/relational grounds for social comparison and self-awareness, generalizing others as representations of the group, thus fostering group identification. Anonymity reduces individuating information (deindividuation), thus increasing awareness of salient norms of a social category or group, via depersonalized perceptions of one's self and others (Turner, 1987). Postmes and Spears' (1998) meta-analysis concluded that across many SIDE studies, behavioral effects of group participation were moderated by the group's situational norm.

Online group identity

Research provides more contextual insights into the influences on and nature of online group identity, such as demographics and social boundaries, social norms and behavior, types of usage, and site design.

Social norms and behavior in online groups. Early CMC research claimed that Internet use competed with and thus reduced offline social interaction, and characterized Internet users as socially reclusive and anxious, with greater risk of depression and isolation (Kraut et al., 1998), and some still do (e.g. Turkle, 2012). Other early studies of online group interactions continued with the assumption that, because of the lack of nonverbal and other cues in CMC, increased anonymity would lead to disinhibited and antisocial behavior, such as "flaming" (Culnan and Markus, 1987; Kiesler et al., 1984). Yet, what most later research works found was quite different (Hiltz and Turoff, 1978, 1993; Walther et al., 1994). For example, Shaw and Gant (2002) reported that Internet use was linked with increased social support and elevated self-esteem; and CMC content can contain considerable positive socio-emotional content (Rice and Love, 1987). Katz and Rice's (2002) analysis of several nationally representative surveys showed that there was a small but significant positive correlation of Internet use with social interaction and community involvement.

Studies using SIDE theory in online contexts found that, rather than increasing *anti-social* behavior, Internet users under conditions of anonymity were more likely to exhibit behavior *in conformity with group norms, when* they were primed with behavioral expectations congruent with the group's *salient social identity* (Postmes et al., 2001). As users become more deindividuated and more likely to conform to the norms and comments of other members, they identify more strongly with their online group (Lee, 2006; Postmes and Spears, 1998; Turner and Oakes, 1986) (although the reverse causal relation could also be argued). With greater group identification also comes increased attractiveness of the group's online content, members, and resources (Lea and Spears, 1992). Indeed, self-categorization theory presumes that group member attraction is grounded in prototypical similarity (Hogg, Hardie and Reynolds, 1995). Group prototypicality has been applied to the role of leaders, whereby prototypical leaders gain status, charisma, and influence to the extent that others identify them as representative of the group, as members conform to this prototype, and thus become more depersonalized (Hogg, 2001).

Thus, social interaction, group identification, deindividuation, and social influence can in theory develop in even anonymous online groups (Postmes et al., 2001). One question is whether these relationships apply to very large, anonymous online groups with no membership requirements and minimal textual expression as well:

H1a. Online site users will report more than neutral *group identification*.

H1b. Online site users will report more than neutral *deindividuation*.

H2. Deindividuation will be positively associated with *group identification* on an online site.

Demographics and social boundaries. Early CMC literature raised a variety of conceptualizations of online community and questioned the potential for the development and support of online communities (Calhoun, 1986; Hiltz and Turoff, 1978, 1993; Katz et al., 2004; Rheingold, 2000). Compared to physical communities, online or virtual communities are characterized by intimate secondary relationships, specialized relationships, weaker ties, and homogeneity of interest (Wellman and Gulia, 1999).

However, CMC proponents and SIDE theory argue that CMC can increase participation and social interaction by decreasing inequality and discrimination and overcoming time, space, demographic, and social boundaries and markers (Postmes et al., 1998; Rice, 1987b). More generally, online media (especially Web 2.0 and social media) support more diverse public expression, including sharing common interests and user-produced content with their digital communities (Ellison et al., 2007; Shirky, 2009).

This is not to say, though, that online communities do not also impose their group norms and engage in out-group discrimination as a way of fostering group identity (Albrecht, 2006; Mikal et al., 2014; Postmes and Spears, 2002; Tepper, 1997) or that demographics play no role in adoption and use, as emphasized in digital divide research (Albrecht, 2006; Hargittai and Walejko, 2008; Katz and Rice, 2002; Schradie, 2013). However, in anonymous online settings, primarily in sites not organized around socio-demographic interests (such as those relating to particular age, gender, ethnicity issues), socio-demographic factors would likely not play much of a role in group identification or deindividuation.

RQ1. How are socio-demographics associated with *group identification* and *deindividuation* in an online site?

Online site use. Beyond facilitating social interaction and group development, greater CMC use and familiarity can also foster online impression management and relational success equivalent to, or even greater than, face-to-face communication (Walther, 1996; Walther et al., 1994). Quan-Haase et al. (2002) noted that frequent email and chat users, and those who communicate online more frequently with friends, have a greater sense of online community.

However, simple time online is not a complete measure of CMC system acceptance and involvement (Hiltz and Johnson, 1989). For example, in the context of email, "Time online does not distinguish between 'active' use (composing and sending) and 'passive' use (receiving and reading)" (Hiltz and Johnson, 1989: 390). Such distinctions are even more salient with the current diversity of new media and features, with "use" including a wide variety of adoption forms and user engagement in activities varying in interactivity and potential social capital (Pearce and Rice, 2013). Greater activity in an online group site both requires and signals more commitment to the group and represents more exposure to the norms and rules of conduct for the site. For example, Burke et al. (2011) found that while directed communication in Facebook (comments, Wall posts, "likes," messages, and tags received by a participant) was associated with increased social capital, broadcasting communication (passive consumption of information through the News Feed, broadcasting information through public posts) on the site was not. Activities such as commenting on a Friend's post, which Tong and Walther (2011) identify as relationship maintenance signals, represent an investment in a given relationship and thus help to develop social capital. Features in an experimental site designed to increase online community identity-based attachment (e.g. information about group activities, group-level communication) and bond-based attachment (individual activities, interpersonal communication) both increased site use and self-reported attachment, but the identity-oriented features had a greater effect (Ren et al., 2012). Thus, differences in online site use, from simple individual and one-way *usage* to more interactive and group-oriented *involvement*, could differentially affect group identification and deindividuation:

H3a. Online site use, particularly more involved use, will be positively associated with *group identification*.

H3b. Online site use, particularly more involved use, will be positively associated with *deindividuation*.

Methods

Case website

Imgur.com is an appropriate site to investigate the existence of and influences on online group identification and deindividuation because it is (a) an extremely popular and frequently used site (and thus represents a reasonable exemplar), yet (b) extremely large with minimal features (and thus presents challenges to developing a sense of an online community and group identification).

Background and usage. Begun in 2009, Imgur.com (pronounced *imager*) is a way of sharing photos, images, and/or *gif*s ("graphical interchange format" which allows static or animated images, often captioned, sometimes with sound) online. Imgur began as a way of allowing users to upload images and share images online quickly by simply providing a web link. Site creator Alan Schaaf (2013, personal communication) has likened Imgur to a YouTube for images. All images are uploaded to a "user submitted" gallery. Nonmembers are able to lurk and view, general members are able to "like" content and post original images up to a certain size and to comment on others' images, and "pro" members may post original content (OC) with no size restrictions. Imgur thus provides all three types of online message types described by Walther and Jang (2012): *proprietor content* (such as the original image and comment), *user-generated content* (comments on others' content), and *aggregate user representations* (ratings). Imgur content is primarily what Blank (2013) categorized as "social and entertainment content," compared to skilled content or political content.

In February 2009, Imgur received a modest 45,995 visits per month, with an average of only 49 seconds per visit. Now it is the 49th most commonly visited site on the Internet, receiving nearly 1.4 billion page views daily, with an average of 47.6 million unique visitors per month with 11 minutes per visit (QuantCast.com). Imgur users are overwhelmingly male (83%) and under 35 years old (71%).

Imgur features potentially fostering or constraining community and group identity

Site design and features can influence online group identification and a sense of community (Preece, 2000). Community-centered design involves fostering critical mass in both users and content (Bieber et al., 2007; Markus, 1987) and encouraging trust and accountability. Restricting group size and content diversity helps so that the site does not become fragmented or difficult to use. Identification with the online community also improves by attracting new and return visits through the generation of sufficient, timely, and relevant content (Howard, 2010; Preece, 2000; Ren et al., 2007).

Imgur has several pro-community and noncommunity features that help shape online interaction and thus development of group identification. Concerning *pro-community design features*, Imgur has vastly exceeded a critical mass of users required to generate sufficient, even massive, content. Furthermore, users must register in order to post OC, to comment, or to respond to a comment, which encourages user accountability and fosters trust. The 140-character limit constrains extent of commenting, but allows users to browse multiple responses from multiple users quickly—thus not privileging otherwise lengthy responders. Bloggers have suggested that the addition of micro-comments and comment responses to Imgur.com in November 2010 contributed to the formation of a virtual community of Imgur users, with site content references to "Imgur community" members, an "Imgur family," and "Imgurians" (Broderick, 2013; Gannes, 2012). Beyond uploading and sharing *gif*s, users can *like* (up vote) or *dislike* (down vote) an image. Images are assigned *points* based on the number of up votes minus the number of down votes. Once images receive over 300 points, they are moved from the "user submitted" gallery to an Imgur "most popular" page. Users can make comments about images and other users' comments, and those comments are listed below the image itself. Comments

can also receive up and down votes and a total score. Most popular comments appear directly below the image, while comments with a negative total score are *censored* (moved to the bottom, and requiring clicking a link to "show bad comments"). Such features make explicit the group's norms about content value.

Imgur does, however, exhibit some *noncommunity design features*. First, as noted, the site began in 2009 simply to host images, and comments were not added until November 2010 (Schaaf, 2013, personal communication). Thus, the notion of an Imgur community was not possible until nearly 18 months following the site's launch. Second, the concept of a critical mass implies both a sufficient and a manageable number of participants. While sites like Facebook, Twitter, and Reddit respond to ever-increasing numbers by encouraging the formation of smaller, more intimate, interest driven groups, Imgur has not divided visitors into smaller sub-Imgur communities. Thus, its wide diversity of topics and extraordinary number of users may make the site content seem amorphous, overwhelming, confusing, and inconsistent. Third, signing up to Imgur is very simple, and users can have multiple accounts under different names, so users may feel free to disappear, close their account, sign up for a new account, or simply troll under a different account name, which can weaken a sense of community (Rice, 1987a). Fourth, over 60% of Imgur traffic comes from links posted to outside websites, such as Reddit, Facebook, Twitter, and other websites. So, due to Imgur's size and multiple access points, unlike many online discussion boards, site content here is not dominated by a few core members, and users of this site are unlikely to get to know each other in personal terms, making it difficult to generate a sense of community. Fifth, users do not "follow" other users as with Twitter; all posts are public because they can be viewed by people with no accounts. Sixth, Imgur has very few restrictions on posting content. As such, what constitutes an on- versus an off-topic post is subjective and amorphous—and often a source of contention and confusion among users, although potentially adjudicated by up or down votes as noted above. Seventh, unlike Facebook, where users are identified by name, users on this site are known exclusively by their avatars or pseudonyms and their site content.

Procedure

The survey was posted to the user submitted gallery, once at the start of business day on 9 July 2013 and again in the evening on 11 July 2013 in order to read those who browse primarily either during the day or at night. Neither post reached the 300 up votes required for view on the Imgur "most popular" gallery. To increase the potential response pool, the survey link was also posted to two "closed" Facebook groups set up by and for Imgur users and to Reddit.com. To increase the sample size, we reposted the survey to Imgur and to the two Facebook groups in the evening on 15 April 2015.

Sample

A total of 1006 Imgur users began the survey. In compliance with human subjects guidelines, 67 respondents under the age of 18 years were prevented from completing the survey, based on a filter question, resulting in 939 respondents. However, as some

respondents did not respond to some questions, the actual sample size varies by analysis.

Measures

Demographics. The survey began with standard demographic questions: s*ex, education, age, ethnicity*, and *income*.

Use. The survey then asked about respondents' use of Imgur.com. These included usage (hours using Imgur per day and five categories of reading others' comments, using the "all/most" category with 0 = no and 1 = yes) and *involvement* (access, 0 = indirect via Facebook or Reddit, or 1 = direct; frequency of commenting on others' posts; and frequency of posting OC). Different access methods may affect perceived *group identification* and *deindividuation* (e.g. due to different levels of intentionality in arriving at Imgur).

Group identification and social attraction. *Group identification* was measured using modified versions of Identification with a Psychological Group (IDPG) and social attraction scales. The IDPG scale is based on Mael and Tetrick's (1992) two-dimensional scale: *shared characteristics* and *shared experience*. Given that their shared characteristics factor measured very little by way of specific characteristics, we supplemented the shared characteristics items with additional measures based on Buckner's (1988) Neighborhood Cohesion Instrument, which measured perceived cohesion, comfort, and similarity within a group. We also changed the language to reflect situations likely to be encountered on Imgur. Principal component analysis verified the subdimensions (Mael and Tetrick, 1992): *IDPG—Shared characteristics* (six items related to users' sense of commonality with group members) and *IDPG—Shared experiences* (four items related to an individual's feeling of pride from the group's accomplishments) (see Table 1).

The *social attraction* scale was constructed from the social attraction subscale in McCroskey et al.'s (2006) interpersonal attraction scale. The scale items were prompted by the question, "Imagine a 'typical' Imgurian. Please answer the following questions with that person in mind." While the original *social attraction* subscale items loaded onto a single component, our principal component analysis indicated two. Given that the 10 positively worded items loaded onto component 1 (see Table 2) and the two negatively worded items were a separate, weak component, we used only the first component.

Deindividuation. The *deindividuation* items were based on Kim and Park's (2011) subscales of *perceived deindividuation* and *conformity intention*. We supplemented these with original items, such as a user's willingness to censor his or her opinions for the sake of community cohesion, and modified the language to make it relevant to Imgur users. After removing low-loading items, the final principal component analysis identified a first component of *perceived deindividuation* (two items indicating a sense of being part of the Imgur community) and a second component of c*onformity intention* (three items measuring willingness to avoid disagreeing with Imgur group members) (see Table 3).

Table 1. Wording, factor loadings, descriptives, and alpha reliabilities for group identification subscales.

Items	IDPG—Shared characteristics	IDPG—Shared experiences
It bothers me when I see Redditors or users of other sites make fun of Imgur users	.02	**.76**
When I talk about Imgur/Imgurians, I usually say "we" rather than "they"	.41	**.63**
When lies on the Internet are exposed on Imgur (when a post is proven false by an Imgurian), I think that is a success for all Imgurians	.28	**.68**
When I see a meme somewhere online that I've already seen on Imgur, I feel proud to be an Imgurian	.41	**.72**
I have a number of qualities typical of an Imgur user	**.70**	.30
On Imgur, I feel like I belong	**.76**	.38
If the users on Imgur were planning on doing something (e.g. a meet up or other social activity), I'd feel comfortable joining in	**.67**	.14
I think I agree with most Imgurians about what is important in life	**.78**	.19
I have a lot in common with other Imgur users	**.85**	.20
I find it easy to identify with other Imgur users	**.82**	.33
Eigenvalue	3.9	2.4
Variance explained	39.2%	24.1%
Mean (*SD*)	3.13 (1.04)	3.06 (1.14)
Alpha	.87	.75
N	791	795

IDPG: Identification with a Psychological Group; *SD*: standard deviation.
Response range: (1) strongly agree to (6) strongly disagree. Principal component analysis used with varimax extraction and orthogonal rotation.

Note on group identification and deindividuation response values and scales. Constituent items for the *group identification* and *deindividuation* scales were presented in Likert format, with response choices from (1) strongly agree to (6) strongly disagree. Thus, *higher* values indicate *lower* levels of each of the subscales of *group identification* or *deindividuation*. Scales were the mean of high-loading items. See Table 1, which, along with Tables 2 and 3, includes scale descriptives and Cronbach alpha reliabilities.

Results

Table 4 provides descriptive statistics on the demographic and use variables.

Table 2. Wording, factor loadings, descriptives, and alpha reliability for social attraction scale.

Items … relating to a "typical" Imgurian …	Social attraction
I think she or he could be a friend of mine	**.84**
I would like to have a friendly chat with him or her	**.83**
It would be easy to meet and talk with him or her	**.77**
We could probably establish a personal friendship with each other	**.87**
She or he would probably fit into my circle of friends	**.72**
She or he would be pleasant to be with	**.87**
She or he would be sociable with me	**.77**
I would like to spend time socializing with this person	**.89**
I could become friends with him or her	**.85**
She or he would be easy to get along with	**.82**
Eigenvalue	68.2
Variance	68.2%
Mean (*SD*)	2.74 (0.87)
Alpha	.95
N	750

SD: standard deviation.
Response range: (1) strongly agree to (6) strongly disagree. Principal component analysis used (as only one component, no rotation).

Demographics

The respondents were predominantly female (63.7%), White (84.9%), young (18–24, 50.7%), college students (33.0%) or higher (48.7%), and low income (<US$15,000, 41.2%; but also 26.0% with more than US$45,000). Due to a low incidence of non-White respondents (Asian/Pacific Islander = 6.1%; Black = 1.7%; Hispanic/Latino = 7.1%), these ethnicities were grouped into a single "other" category.

Use

Access. Respondents primarily (89.2%) accessed Imgur directly instead of through other social media.

Usage. Users spent an average of 2.15 hours per day (median = 2.0) on the site (standard deviation [*SD*] = 2.68), and 16.8% read all/most of the comments.

Involvement. Frequency of commenting on OC uploaded by others ranged from 17.9% never commenting to 38.0% doing so once per month, with 7.7% commenting multiple times per day. Nearly two-fifths (37.3%) of respondents never posted OC (memes, images, *gif*s, or stories), with 54.9% doing so once per month or less and very few doing so more frequently. Thus, we recoded this into never (0; 37.3%) and ever (1; 62.7%).

Table 3. Wording, factor loadings, descriptives, and alpha reliabilities for deindividuation scales.

Deindividuation		
Items	Perceived deindividuation	Conformity intention
I am willing to adjust my own opinion—or to state my opinion less strongly—in order to maintain group harmony on Imgur	.13	**.77**
I am willing to keep my opinions to myself if they conflict with the group on Imgur	−.14	**.77**
I try to agree with the group on Imgur	.16	**.76**
When people ask Imgurians for advice, support, or help, I consider myself part of the group being addressed	**.88**	.06
I think other users consider me part of the Imgur community	**.88**	.05
Eigenvalues	1.77	1.61
Variance	35.5%	32.3%
Mean (*SD*)	3.29 (1.28)	4.01 (1.05)
Alpha	.73	.64
N	707	709

SD: standard deviation.
Response range: (1) strongly agree to (6) strongly disagree. Principal component analysis used with orthogonal rotation.

Correlations among use measures. Table 5 shows that, not unreasonably, all forms of use were at least weakly but significantly positively intercorrelated (from $r=.09$, $p<.01$ to $r=.30$, $p<.001$) except that the high-involvement indicator of posting OC was not significantly associated with any of the other usage measures.

Hypothesis tests

Existence of group identification and deindividuation

H1a: Supported. The means of the *shared characteristics* ($M=3.13$, $SD=1.04$) and the *shared experiences* subscales ($M=3.06$, $SD=1.14$) are both slightly but significantly lower than 3.5 (meaning *more* agreement with the group identification survey items), the midpoint of the question response choices ($t=-10.1$, $df=794$; $t=-11.0$, $df=790$, respectively; both $p<.001$). Respondents also indicated between moderate and mild agreement with the *social attraction* scale ($M=2.74$, $SD=0.87$; $t=-23.9$, $df=749$, $p<.001$).

H1b: Partially supported. The means of *perceived deindividuation* ($M=3.29$, $SD=1.28$) and *conformity intention* ($M=4.09$, $SD=1.05$) were both significantly different from the 3.5 midpoint ($t=-4.4$, $df=706$; $t=14.9$, $df=708$, respectively; both

Table 4. Descriptive statistics for demographics, access, use, and involvement.

Sex	
Male	36.3%
Female	63.7%
Ethnicity	
Non-White	15.1%
White	84.9%
Age (years)	
18–24	50.7%
25–34	39.9%
>35	9.4%
Education	
High school graduate	19.4%
College student	32.0%
College graduate	29.1%
Graduate/professional school student or graduate	19.6%
Income	
<US$15,000	36.6%
US$15,000–US$25,000	12.9%
US$25,000–US$35,000	13.0%
US$35,000–US$45,000	11.4%
>US$45,000 (US$55,000, US$65,000, US$75,000+)	26.0%
Access method	
Another site	10.8%
Direct	89.2%
Usage	
Mean	2.12
Mode	1.0
Median	2.0
SD	2.68
Extent read comments	
No	7.0%
Newest comments	3.6%
Only top comments	72.6%
All/most comments	16.8%
Frequency comment on images	
Never	17.9%
Once/month	38.0%
Multiple times/month	21.7%
Multiple times/week	14.6%
Multiple times/day	7.7%
Frequency upload original content	
Never	37.1%
Once/month	54.9%
Multiple times/month	6.7%
Multiple times/week	0.7%
Multiple times/day	0.4%

SD: standard deviation.
N = 859–937.

Table 5. Correlations among access, use, and involvement.

	Access method	Usage (hours/day)	Read all/most comments	Frequency comment on images
Usage (hours/day)	.30**	–	–	–
Read all/most comments	.09*	.11**	–	–
Frequency comment on images	.28**	.28**	.18**	–
Frequency post original content	.00	−.04	−.01	.03

$N = 735–859$.
*$p < .01$; **$p < .001$; Spearman's nonparametric correlations, two-tailed significance tests.

$p < .001$). Here, however, respondents slightly *disagreed* with the conformity intention items.

Regressions explaining group identification and deindividuation. Table 6 provides the results from two sets of hierarchical regression models, one (A) for the three aspects of *group identification* and one (B) for the two aspects of *deindividuation*. Explanatory variables in the first blocks were demographics, with the second blocks including site use, and for group identification, a third block including deindividuation. Total variance explained for the three *group identification* regressions was 43% for *shared characteristics*, 41% for *shared experiences*, and 30% for *social attraction*. Without the deindividuation measures, the variances were 10%, 15%, and 7%, respectively. Variance explained by demographics and usage was 15% for *perceived deindividuation* and 3% for *conformity intention*.

Association of deindividuation with group identification

H2: Supported. Both perceived deindividuation (much more strongly) and conformity intention were significantly positively associated with shared characteristics, shared experiences, and social attraction.

Demographics

RQ1. Younger users identified more with the *social attraction dimension* of group identification. Females identified more with the *shared experiences* aspect of group identification and with the *conformity intention* component of deindividuation. No other demographics were significant regression influences.

Use, group identification, and deindividuation

H3a: Mixed support. At least one use measure was associated with each of the three *group identification* components.

H3b: Mixed support. At least one use measure was associated with each of the two *deindividuation* aspects.

Table 6. Regressions: Set A—group identification on demographics, Imgur use, and deindividuation; Set B—deindividuation on demographics and Imgur use.

(A) Group identification				(B) Deindividuation	
Explanatory variables, by block	IDPG—Shared characteristics (typical Imgur user)	IDPG—Shared experiences (group pride)	Social attraction (prototypical user)	Perceived deindividuation	Conformity intention
1. *Demographics*					
Age	−.02	.03	.11**	.03	.02
Sex (F = 1)	−.03	−.15***	.06	−.08*	−.16***
Ethnicity (White = 1)	−.00	.03	.01	−.03	.04
Income	.04	−.02	.04	−.04	.03
Education	−.01	.04	.01	−.01	.06
F	(5, 582) = 1.36	(5, 583) = 6.3***	(5, 583) = 2.7*	(5, 584) = 0.34	(5, 585) = 4.3***
Adj. R^2	.00	.04	.01	.00	.03
2. *Use*					
Direct access (yes = 1)	−.16***	−.15***	−.13***	−.08*	−.07
Hours using Imgur	−.08**	−.02	−.02	−.02	−.08*
Read all/most comments[a]	−.00	−.00	−.04	−.01	.04
Frequency comment on images	.07*	−.02	.10**	−.38***	.00
Frequency post original content	.01	−.04	−.03	−.04	−.02

Table 6. (Continued)

(A) Group identification				(B) Deindividuation	
Explanatory variables, by block	IDPG—Shared characteristics (typical Imgur user)	IDPG—Shared experiences (group pride)	Social attraction (prototypical user)	Perceived deindividuation	Conformity intention
F change	(5, 577) = 13.2***	(5, 578) = 15.2***	(5, 578) = 7.2***	(5, 579) = 22.6***	(5, 580) = 1.8
R^2 change	.10	.11	.06	.16	.01
F	(10, 577) = 7.4***	(10, 578) = 11.1***	(10, 578) = 5.06***	(10, 579) = 11.5***	(10, 580) = 3.1***
Adj. R^2	.10	.15	.07	.15	.03
3. *Deindividuation*					
Perceived deindividuation	.58***	.49***	.50***	–	–
Conformity intention	.14***	.20***	.12***	–	–
F change	(2, 575) = 166.0***	(2, 576) = 128.5***	(2, 576) = 97.7***	–	–
R^2 change	.33	.26	.23	–	–
F	(12, 575) = 37.3***	(12, 576) = 34.8***	(12, 576) = 21.9***	–	–
Adj. R^2	.43	.41	.30	–	–

IDPG: Identification with a Psychological Group.
Response range for dependent variables: (1) strongly agree to (6) strongly disagree; thus, lower values mean *more* group identification or deindividuation.
Hierarchical linear regression with forced entry. Values are standardized beta coefficients. Table provides *F* and R^2 of the change between each blocks, but beta coefficients are from the final regression model. Complete tables are available from the authors.
[a]Dummy code, compared to all other comment reading, including none.
*$p < .05$; **$p < .01$; ***$p < .001$.

RQ2. The basic usage measure of hours/day was slightly associated with greater shared characteristics and greater conformity intention. Reading all/most comments (relative to the other categories) was unrelated to any of the measures. Considering more involved use, directly accessing Imgur.com was related to more of all the group identification and more perceived deindividuation components. More frequent commenting on images was associated with lower shared characteristics and less social attraction, but strongly with more perceived deindividuation. However, the frequency of posting OC was unrelated to any of the measures.

Discussion

Online sites and group identification

Experiencing group identification and deindividuation. At least among this exploratory and nonrepresentative sample, members of a very large and anonymous site with low barriers to entry and very short text constraints, features that would seem to mitigate against developing a sense of community, can experience at least slight *group identification* (*shared characteristics, shared experiences*, and *social attraction*) with the site and its members, and at least some *perceived deindividuation*. However, respondents slightly disagree that they experience *conformity intention* (censoring one's comments to conform with the group norms). At least in this site, participants feel some sense of identification and even deindividuation, but not to the point of self-censoring their communication. This may be due to some of Imgur's features discussed above (large size, anonymity, low barriers to entry and exit), creating a balance between the individual and the community, as SIT allows.

Deindividuation and group identification. As expected from SIDE theory, but not much tested in natural online settings, both forms of deindividuation were associated with all three forms of group identification. Perceived deindividuation may be a much stronger influence than conformity intention because it emphasizes group membership more. Self-censorship or conformity intention seems less of a submergence into the group than a submission to it.

Demographics, group identification, and deindividuation. As industry reports show, most users are male and young, creating an Imgur "fratmosphere," with male-oriented sexual humor and imagery (echoed in a statement by Sarah Schaaf, 2012, founding member of the Imgur site and Director of Community, personal communication). Thus, it seems reasonable that they identified more strongly (younger through *social attraction* and males through *shared experiences, perceived deindividuation*, and *conformity intention*) with Imgur. No other demographics were associated with any of the dependent subscales. These results mirror claims (going back to Hiltz and Turoff, 1978, 1993; Rheingold, 2000; Rice, 1987a) that online communities can remove many of the socio-demographic biases or obstacles to participation and communication, but still show how specific demographics may be relevant for particular online communities.

Imgur use, group identification, and deindividuation. Prior research and this study's measures identify potentially important distinctions in conceptualizations of online community "usage," from simple amount (hours per day, reading comments) through involvement (direct access, commenting on images, and posting OC). However, relationships with use in general, and these distinctions in particular, were inconsistent across the group identification and deindividuation subscales.

Simply spending more *hours using the site* exposes one to more other users, their experiences, and group norms surrounding comments, thus increasing shared characteristics and conformity intention. *Reading others' comments* (even most or all) apparently is sort of a passive, individual form of use, with no relationship to group identification or deindividuation.

Direct access, or going directly to the site, represents more intentional involvement, presumably because of the explicit choice and the nature of the resulting page, which displays Imgur and top images and comments, with the heading (currently) of "The most viral images of today, sorted by popularity." Perhaps the intentional act of direct access is caused by, represents, and reinforces one's sense of identity with the group (Imgur.com) and, to a lesser extent, deindividuation.

Commenting on others' images requires and represents more involvement, here fostering perceived deindividuation, or membership in the group. Interestingly, however, it is also associated with less a sense of shared characteristics or social attraction. So commenting, while more involving in terms of action, can also distance one from the group, perhaps to the extent that such comments are critiques, challenges, or disagreements.

Curiously, more frequent *posting of one's OC*, although an active and intentional involvement form of use, is unassociated with either group identification or deindividuation. Perhaps this is due here to generally low frequency of doing so (54.9% once a month or less). Or it may be that developing and posting one's own content is an explicitly individual creation and act, independent of a sense of group belongingness, although, in the aggregate, more contributions create a deeper and more valuable online community (Heinz and Rice, 2009; Markus, 1990).

Limitations

Clearly, the sample is nonrepresentative (given the immense size of the user population, the nature of posting survey requests on Imgur, and online response representativeness problems in general, it would seem impossible to achieve a representative one). This is most noticeable in the high percentage of female respondents. However, considering the good sample size, it is useful for beginning to understand the development of a sense of an Imgur online community.

Most prior SIDE-type research is experimental, providing clear control against other explanations, and grounds for causality. This study measures only a few of many relevant concepts, cannot control through randomization, and cannot make any causal claims. For example, the positive relationship between *hours using the site* and *shared characteristics* might function in either direction: those who use the site more often may come to develop greater identification with typical group members, or those who feel a greater sense of identification with the group may be more willing to use the site based on an

assumed similarity with, and commitment to, the typical user. Also, because of the reported average usage of 2.12 hours per day and 16.8% reading all/most comments and because postings that are not in the "most popular" or "top" space require more intentional searching, our sample is likely mostly heavy Imgur users, so group identification might be systematically higher.

A more differentiating measure of (in)group identification, such as the five-component measure validated by Leach et al. (2008), might allow for a more detailed understanding of the aspects of group identification fostered through online communities. More fundamentally, because the group identification literature shows that at least minimal identification is possible even with groups assigned to participants at random, or with small group manipulations, it would increase the validity of our results to compare these reported levels of identification with those of other online groups to which these respondents (a) do not belong and (b) do belong. Furthermore, a textual analysis of Imgur postings could help demonstrate identification and deindividualization beyond this study's survey responses (see Mikal et al., 2014, for an example).

Conclusion

Can group identification and deindividuation emerge even in very large anonymous online groups with few entry requirements? In the case of Imgur.com, they can, but not in strong or simple ways. Different aspects of group identification and deindividuation are related slightly to a few relevant demographics and differentially to varying kinds of use and involvement.

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Author biographies

Jude P Mikal (PhD, University of California, Santa Barbara) is an Assistant Research Professor in the Department of Psychology at the University of Utah. His research focuses on transitional stress, cross-cultural adjustment, family support structures, behavioral modification in online social environments, and the mental health effects associated with Internet communication.

Ronald E Rice (PhD, Stanford University, 1982) is the Arthur N. Rupe Chair in the Social Effects of Mass Communication in the Department of Communication and Co-Director of the Carsey-Wolf Center at the University of California, Santa Barbara. Dr Rice has conducted research and published widely in communication science, public communication campaigns, computer-mediated communication systems, methodology, organizational and management theory, information systems, information science and bibliometrics, social uses and effects of the Internet, and social networks.

Robert G Kent (MS, University of Utah) is a doctoral student in social and health psychology at the University of Utah. His work focuses on relationships and health, especially social support and cardiovascular functioning. He also conducts research in the Cancer Control & Population Sciences Program at the Huntsman Cancer Institute.

Bert N Uchino (PhD, Ohio State University) is a Professor of Psychology in the Social Psychology and Health Programs at the University of Utah. Dr Uchino has conducted research on the health consequences of social relationships and social interactions.