

Effects of Anonymity on Comment Persuasiveness in Wikipedia Articles for Deletion Discussions

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Abstract

It has been shown that anonymity affects various aspects of online communications such as message credibility, the trust among communicators, and the participants' accountability and reputation. Anonymity influences social interactions in online communities in these many ways, which can lead to influences on opinion change and the persuasiveness of a message. Prior studies also suggest that the effect of anonymity can vary in different online communication contexts and online communities. In this study, we focus on Wikipedia Articles for Deletion (AfD) discussions as an example of online collaborative communities to study the relationship between anonymity and persuasiveness in this context. We find that in Wikipedia AfD discussions, more identifiable users tend to be more persuasive. The higher persuasiveness can be related to multiple aspects, including linguistic features of the comments, the user's motivation to participate, persuasive skills the user learns over time, and the user's identity and credibility established in the community through participation.

1 Introduction

In communication, people can be motivated to achieve anonymity or identifiability based on multiple reasons, and the desire for being anonymous or identified depends on the specific communication context (Marx, 1999). Anonymity is "the degree to which a communicator perceives the message source is unknown and unspecified" (Anonymous, 1998, p.387). It is a continuum from fully identifiable to fully unidentifiable (Marx, 1999). Anonymity can be constructed by the absence of identity information or by providing a fake identity through the use of pseudonyms

(Anonymous, 1998). The online space affords people with multiple ways to remain anonymous: visual anonymity by the lack of physical cues, disassociation of online identity from real-life identity, and the lack of identifiability that can link users to their real identity (Morio and Buchholz, 2009).

The anonymity that people construct can be categorized as physical anonymity where there is no visual or physical presence of the source and discursive anonymity where a message does not disclose personal information that can be traced to a certain source (Anonymous, 1998). In addition, it can be classified as self- and other-anonymity depending on whether the anonymity is perceived by the message source or the message receiver. A message receiver perceives different levels of source anonymity with different amount of identification knowledge available, interaction history with the message source, the receiver's perception of their own anonymity, and the communication context (Rains and Scott, 2007).

Previous studies suggest that in certain online communication contexts, anonymous messages can hurt trust and lower credibility, accountability, and social appreciation (e.g., Haines et al., 2006; Kang, 2017). These communication factors can in turn affect message persuasiveness (e.g., Burgoon et al., 1990; Xiao and Khazaei, 2019). However, prior studies have not directly established an empirical relationship between anonymity and perceived persuasiveness in online communication.

The effects of anonymity on communication and participation behaviors are found to vary in different communication contexts (Kang, 2017; Moore, 2018; Morio and Buchholz, 2009; Rains and Scott, 2007). One prior study shows that anonymity can motivate users to participate in online communication as it potentially opens up freedom for people to express unpopular or

undesired opinions, but the anonymous participants are less persuasive (Haines et al., 2006). However, the study was conducted in an experiment setting so that there was no sense of community among the participants. While some online communications are embedded in similar contexts (e.g., Reddit), others are not (e.g., Wikipedia). It is yet to be explored whether anonymity has a similar effect on participation and persuasiveness in these different communication contexts.

Addressing these literature gaps, we focus on Wikipedia Article for Deletion (AfD) discussions as an example of online collaborative communities. We analyze how anonymity of a participant is related to their communication behavior and persuasiveness in this particular type of communication context. The rest of the paper is organized as follows. Section 2 reviews previous work related to the effects anonymity has on communication behaviors in different communication contexts and online persuasion. Section 3 introduces this paper's methodology, data sources, and the data analysis processes. Section 4 details the data analysis results. We discuss the implications of the findings in section 5 and concludes in section 6.

2 Related work

2.1 Anonymity in online communications: its effects

Anonymity plays important roles in affecting interactions in online support groups (Kang, 2017), online group decision support systems (Tsikerdekis, 2013), electronic meeting systems (Rains, 2007), and other computer-mediated communication (Anonymous, 1998). In general, anonymity can be a way to boost participation (Haines et al., 2006), protect privacy (Morio and Buchholz, 2009), prevent people from getting harassed or lose reputation in their real life (Forte et al., 2017), and give people the freedom to speak what they truly want to say (Haines et al., 2006; Moore, 2018) and challenge existing power structures (Champion et al., 2019). Anonymous feedback can be more positively reacted to compared to those given by "a peer or an authority" (Nguyen et al., 2017, p.1024). However, the freedom of speech associated with anonymity can be abused as well (Choi et al., 2016; Singh et al., 2017). Thus, the anonymous condition may need to

be removed in certain online communications in order to reduce the number of unacceptable and antisocial comments (Kilner and Hoadley, 2005).

In online discussions and collective decision-making, anonymity helps to create opportunities for "strategic and deceptive communication" because the audience cannot decide the real intention and any bias of the speaker (Moore, 2018, p.182). Anonymity may also help to facilitate information flow, encourage information seeking and self-help (Anonymous, 1998), and give rise to more diverse opinions in the process (Haines et al., 2006). On the other hand, anonymous communication can hurt trust among the participants (Scott et al., 2011), reduce a message's credibility (Kang, 2017), and slightly reduce the possibility that an individual participant conforms to the group opinion (Tsikerdekis, 2013). Anonymous (1998) argues that identifiability, the opposite of anonymity, can help to build the source's accountability and reputation which are important factors of a message's persuasiveness (Burgoon et al., 1990; Gamson, 1966). In fact, in a series of experiments with scenarios of different anonymity, Haines et al. (2006) find that an anonymous communication setting gives rise to participation as users can freely express reticent opinions without being identified; but at the same time, anonymous comments can be less persuasive. The authors speculate that the lack of social status cues and the deindividualization of the users give the other participants the impression that the multiple anonymous messages were a repetitive argument made by a single person (Haines et al., 2006).

2.2 Anonymity in online communications: the effects of the contexts

The effects that anonymity has on communication behaviors can vary with the degrees and types of anonymity, the audience of the communication (Kang, 2017; Moore, 2018), and the culture of the community within which the communication is taking place (Morio and Buchholz, 2009). For example, in cultures where affiliation to the group is emphasized and rewards are given to the group not individuals (Haines et al., 2006), anonymous situations are preferred (Morio and Buchholz, 2009), whereas in cultures that emphasize autonomy and personal award, such tendency is reversed (Morio and Buchholz, 2009).

There has also been research on anonymity in specific online communities or communication contexts. In New York Times online comments, anonymous commentators receive less recommendations than the non-anonymous ones (Pierson, 2015). A Reddit study finds that the perceived anonymity by the user themselves can affect their use of “throwaway” accounts (Leavitt, 2015). These accounts establish a temporary identity. The choice of using “throwaway” accounts in the Reddit discussions also correlates with the user’s gender (Leavitt, 2015). In the context of Wikipedia, the level of a Wikipedia editor’s perceived anonymity and the actual anonymity state are found to decrease an individual’s likelihood of conforming to the group decision, though the influence is small and may be subject to factors other than anonymity in the communication (Tsikerdekis, 2013). A forensic qualitative analysis of Tor-based anonymous users on Wikipedia finds both positive behaviors and contributions that violate community policies (Champion et al., 2019).

Prior studies suggest that the contexts of online communication mediate the effects of anonymity (Paskuda and Lewkowicz, 2015). Paskuda (2016) conducts a comparative study to understand how anonymity affects user participation in YouTube, Hack News, and Quora. The researcher (2016) finds that the integration of the YouTube comment system with Google+ limits users to post anonymous comments, and there are more interactions, more polite comments, and more rude comments after this integration. In Quora, when users answer questions anonymously, the length of the answer correlates with the number of upvotes it receives (Paskuda, 2016). Hacker News site publishes technology related news articles and claims to have a strong community aspect (Paskuda, 2016). The researcher finds that anonymity on Hacker News site does not have a statistically significant influence on social appreciation and participation, but identity factors have positive influence on them. These identity factors are defined specifically in the context of Hacker News and include the use of pseudonym and disclosed information (e.g., mentioning an email address, a website, or a Twitter profile) in a user’s self-description. They are considered potential indicators of a real and stable identity on the site.

2.3 Online persuasion

There are three main directions in researching persuasion in the context of computer-mediated human-human interactions. One line focuses on developing annotated corpora for online persuasion studies, e.g., corpora that annotate the persuasive attempts and tactics in the participants’ comments (Anand et al., 2011; Young et al., 2011). Another line of research investigates factors that could affect persuasion, such as the participants’ gender (Guadagno and Cialdini, 2002) and prior experiences (Cooke et al., 2002; Gershoff et al., 2003; Lydon et al., 1988), and the group setting (Price et al., 2006). The third line focuses on the development of computational techniques to predict the online users’ persuasive power in various scenarios, e.g., in identifying influential people in online communities (e.g., Biran et al., 2012; Quercia et al., 2011), in detecting which online reviews are more helpful than the others (Li and Zhan, 2011), and in examining what made some fund requests in the crowdfund sites successful (Hsieh et al., 2013; Mitra and Gilbert, 2014).

The existing research body primarily focuses on the language and content analysis of the comments in the online discussions. These studies (e.g., Tan et al., 2016; Xiao, 2018; Xiao and Khazaei, 2019) suggest that there are linguistic indicators of an online comment’s persuasion power, such as the use of function words, the emotional tones, the use of words that reflect one’s thinking styles (e.g., logical/analytical thinking or informal reasoning), and the length of the comment. The use of persuasion strategies in online discussion content is also examined (Hidey et al., 2017). These studies make inconsistent findings in different discussion contexts, e.g., Wikipedia’s Article for Deletion (AfD) discussions and Reddit “Change My View” (CMV) discussions. For example, while the length of a CMV comment is a strong indicator of the comment’s persuasion power, it is not an indicator for AfD comments’ persuasion power. The contextual factors of a discussion are also explored limitedly, such as the interaction dynamics among participants (Jo et al., 2018), the commenter’s credibility (Xiao and Khazaei, 2019), and the susceptibility of users facing the persuasion attempts (Mensah et al., 2019).

3 Methodology

Our literature review suggests that anonymity affects various aspects of online communication. We also identify related findings to the focal interest of this study – the effects of a participant’s anonymity on the perceived persuasiveness of one’s messages in online discussions. For instance, as mentioned earlier, messages made in an anonymous setting are found to be less persuasive (Haines et al., 2006). Prior research also shows that the communication context mediates this influence (e.g., Paskuda, 2016). We speculate that in online discussions, anonymity’s influence on one’s perceived persuasiveness is also mediated by the discussion context. Yet, to our best knowledge, this has not been explored. Additionally, while prior research has shown that a message’s persuasiveness is reflected from the language use (Tan et al., 2016; Xiao and Khazaei, 2019), it is unknown to us whether and how one’s anonymity is related to the individual’s language use in online communications. Furthermore, the effects of anonymity on the message’s persuasiveness are explained by their influences on accountability and credibility (Burgoon et al., 1990; Gamson, 1966; Kang, 2017; Scott et al., 2011). It is however not clear to us whether anonymity motivates people to participate more in online discussions thus more motivated to make persuasion attempts towards others.

In this study, we examine anonymity in Wikipedia’s Article for Deletion (AfD) discussions. We operationalize anonymity as the amount of personal information a Wikipediaian discloses in the community. We aim to understand how the choice of being anonymous or identifiable in Wikipedia plays a role in how a user constructs their comments and in turn their persuasiveness perceived by others. In this section, we detail our study to explore these issues.

3.1 Data collection

Wikipedia is an online community in which members strive for offering an online encyclopedia through open online collaboration. Wikipedia advocates the creation of a user account to establish a stable identity, build up credibility and reputation, and protect user privacy to facilitate their collaborative work within the community (Wikipedia, n.d.). To ensure the quality of its articles, Wikipedia has established four

mechanisms to examine and delete articles that are not appropriate to be included: Speedy Deletion, Proposed Deletion, BLP Deletion, and Deletion Discussion. In this study, we examine the anonymity aspect in the Deletion Discussions. Such a discussion occurs if it is unclear to the community whether the focal article should be deleted. Named as the Article for Deletion (AfD), this discussion often lasts about a couple of weeks during which any user can offer their opinion (e.g., to keep the article) and provide the corresponding rationale, i.e., the justification of their opinion. Wikipedia’s AfD policy requires that the final decision about the article be made based on the rationales. In Wikipedia, these AfD discussions are organized according to the date the discussions were started. An example AfD discussion page can be found by following this link: https://en.wikipedia.org/wiki/Wikipedia:Articles_for_deletion/Log/2017_May_20.

We leverage the Wikipedia AfD dataset collected by Mayfield and Black (2019). The dataset includes 1,967,769 AfD comments in English and other related information, e.g., the AfD discussion a comment belongs to, the commenter information, etc. There are 179,864 AfD participants included in this dataset.

3.2 Measuring message’s persuasiveness of a certain user

With the AfD discussion data, we first label each comment as persuasive or non-persuasive adapting the annotation mechanism by Xiao (2018). Specifically, an AfD comment is a user’s suggestion about what to do with the focal article along with their justifications, e.g., to keep it in Wikipedia and why, to delete it from Wikipedia and why, etc. We only consider two opinions in the comment: keep and delete, as labeled in the original dataset (Mayfield and Black, 2019), and the same two possible outcomes of an AfD discussion: keep and delete. Then, comments that have the same opinions as the discussion outcome are considered persuasive, and the comments that have the opposing views as the discussion outcome are considered non-persuasive. Some discussions have more persuasive messages than non-persuasive ones. In such cases, it is possible that a labelled persuasive message contributes to the final decision not because of its persuasive rationale but because of persuasive power accumulated through multiple persuasive comments. We therefore

remove comments from these discussions to better identify individual persuasive comments. Our subset data accounts for 5% of the original dataset.

Following is an example persuasive comment and an example non-persuasive comment:

Persuasive “Delete for now. The fact that it's in a copyright database is meaningless: episodes change names in planning stages. Also bogus is the argument that it'll just be recreated - that's why we have a CSD for previously-deleted material. Salting the earth is also possible. Per Aldux, the article can be recreated when there's actually material. —”

Non-persuasive “let's be careful here. How do we know he's not notable? I'd like to hear some confirmation by someone familiar with the Malayalam language or at least someone very familiar with the literature of India. Here's a source that mentions him. Now of course I have absolutely no way of knowing whether that site is just rewriting from Wikipedia content so that does not say much. Still I think a bit of research is needed before we go ahead and throw this away.”

We measure an individual's persuasiveness using the subset data by the percentage of this person's persuasive comments within all the comments the individual made. This process results in data of 10,746 users with an average of 0.3776 persuasive score.

3.3 Measuring a user's level of anonymity

Marx (1999) measures identifiability through seven dimensions of identity knowledge including name, location, pseudonyms that can or cannot be linked to other identity knowledge, behavior patterns, social categorizations, and certain eligibility or non-eligibility symbols. A message source can achieve different levels of anonymity when some of their identity knowledge is absent (Anonymous, 1998), e.g. when people withhold their personal information (gender, name, email, location, etc.) in online communication (Qian and Scott, 2007). Inspired by these works, we use the amount of one's personal and identity information that is openly available in the Wikipedia environment to measure the individual's anonymity in this online community. We first use the presence of the individual's gender information to measure the user's anonymity level, as users can

easily disclose this information on their user page in structured and accessible ways (e.g., by listing themselves as a member of the Male Wikipedian group, stating that “I am a male”, or using ‘he’ to describe themselves). Previous studies have developed models to predict gender information based on usernames (e.g., Knowles et al., 2016). However, for a more accurate measurement of a user's choice to disclose their personal information, we rely on existing dataset to obtain user's gender information. The dataset from Mayfield and Black (2019) includes gender information of some participants. We verify and make that information more complete based on the publicly available “Female Wikipedians”¹ and “Male Wikipedians”² lists from Wikipedia (as of November 2019). Through this process, we identify 3,069 users with gender information and 7,677 users without.

To validate using the presence of gender information to measure one's level of anonymity in Wikipedia community, we compare the amount of personal information disclosed on the participants' user page between these two groups (i.e., provision of the gender information vs. not). As our analysis focuses on the degree to which a Wikipedian wishes to appear identifiable in the community, rather than how their anonymity is perceived by other community members, we consider it appropriate to leverage the information on the user page, which is provided by the user themselves, to measure anonymity. User page texts from Wikimedia Downloads³ (as of March 2020) are obtained. We pre-process the texts by removing stop words and other HTML formatting strings. Then, we calculate a Shannon Entropy score for each user page text using formulas (1) and (2), where i is the individual word in the text. This entropy score offers a way to measure the amount of information contained in a text content.

$$entropy = - \sum (p_i * \log_2 p_i) \quad (1)$$

$$p_i = \text{text.count}(i) / \text{len}(\text{text}) \quad (2)$$

Finally, using a Named Entity Recognition algorithm in SpaCy (Honnibal and Montani, 2017), we identify the words that are related to several identity categories including nationality, political or religious groups, organizations, locations, products, languages, and dates. We measure the amount of identity information in each category by

¹ https://en.wikipedia.org/wiki/Category:Female_Wikipedians

² https://en.wikipedia.org/wiki/Category:Male_Wikipedians

³ <https://dumps.wikimedia.org/backup-index.html>

calculating the normalized frequencies of the words in the category.

Our comparison of the amount of personal identity information in the user page texts is conducted through Mann-Whitney U tests. As shown by the average values in table 1 below, compared to those who do not reveal their gender, users who disclose their gender also disclose statistically more personal and identity information on their user pages. The statistical significance is based on a Bonferroni corrected α value 0.0015, because of the 33 comparisons made between the two groups in this study. The effect sizes of the Mann-Whitney U tests are all between 0.5 and 0.8, indicating a medium sized comparison between the two groups (Cohen, 1988). The only category that does not show statistically significant difference is the category of language, i.e., language names such as English, Japanese, and Chinese. The insignificance of this category is likely resulted by the fact that the majority of the texts (99% of a random sample of 1,000 users from our dataset) do not contain any language names, leaving the two groups of users being similar with each other.

Feature	Users with gender information	Users without gender information	Effect size
User Page text length	308.04	173.23	0.6537
Entropy	4.25	3.12	0.6402
Named entity - nationality, political, religious groups	0.11	0.06	0.5244
Named entity - organization	0.32	0.26	0.5847
Named entity - location	0.25	0.14	0.5514
Named entity - product	0.04	0.02	0.5098
Named entity - language	Not significant		
Named entity - date	0.27	0.14	0.5634

Table 1: Amount of personal information disclosed on user pages by users with and without gender information in Wikipedia

Based on the result, we group all 10,746 participants into two categories: the group of low

anonymity that includes those with gender information and more personal and identity information (3,069 users, 15,906 comments), and the group of high anonymity that consists of participants whose gender information is not available in Wikipedia and who have also provided less personal and identity information (7,677 users, 25,094 comments). Figure 1 and figure 2 are example profiles of users of low and high anonymity respectively.



Figure 1: Example profile of a user of low anonymity classified based on section 3.3



Figure 2: Example profile of a user of high anonymity classified based on section 3.3

3.4 Data analysis

With this data, we examine whether one's level of anonymity affects one's persuasiveness through a Mann-Whitney U test.

Additionally, we analyze whether one's level of anonymity affects one's language use in the discussions. We measure the use of linguistic attributes and the presence of various cognitive, social, and affective categories by the word choice using Linguistic Inquiry & Word Count (LIWC) 2015 (Pennebaker et al., 2015). We also measure the use of transitional phrase⁴ and hedging and boosting words and phrases⁵. We use Mann-Whitney U tests to compare the linguistic features of the two groups of users.

⁴ <http://www.studygs.net/wrtstr6.htm>

⁵ <https://github.com/jumayel06/Tension-Analysis>

Furthermore, we apply Spearman’s correlation test to examine whether one’s persuasiveness correlates with one’s participation behavior in AfD discussions, which is reflected from the number of comments they made in AfD, their total edit counts in Wikipedia, and the length of their membership in the Wikipedia community. We also apply Mann Whitney U tests to examine whether a user’s level of anonymity correlates with their participation behaviors in the AfD discussions. Wikipedia AfD discussions allow people to provide their opinions on what to do with the articles being discussed. The policy that requires the final decision about the article be made based on the participants’ rationales emphasizes the importance of the participants offering rationales to defend their opinions and to convince the others. We assume that people’s participation behavior in these discussions reflects how strongly they are motivated to help control the quality of Wikipedia. In other words, if one participates in these discussions more, the person is more motivated. We speculate that a stronger motivation may make one put more efforts in their reasonings, therefore their rationales may be perceived as more persuasive. We also expect that how anonymous a user wants to remain in the community influences how they participate in AfD discussions.

4 Results

4.1 Anonymity and persuasiveness

The results of the Mann-Whitney U test indicate that users of low anonymity (average = 0.42) have statistically higher persuasive scores than the other group (average = 0.36, effect size = 0.54, corrected $\alpha = 0.0015$). In other words, in Wikipedia AfD discussions the participants who are more identifiable tend to be more persuasive. This is consistent with a prior study that finds comments made in anonymous experiment settings are less persuasive because of the absence of a commenter’s status cues and the presence of more diverse comments (Haines et al., 2006).

4.2 Anonymity and linguistic features

We report the average of each language use aspect of the two groups of users and the effect size of Mann-Whitney U tests in table 2 (corrected α value 0.0015). The LIWC *clout* category measures language that reflects confidence, social status, or

leadership, and the *authentic* category refers to an honest or authentic way of speaking (LIWC, n.d.).

Feature	Group 1 - Low anonymity	Group 2 - High anonymity	Effect Size
LIWC - word count	47.9	47.5	0.521
LIWC - tone	Not significant		
LIWC - positive emotion	Not significant		
LIWC - negative emotion	1.40	1.20	0.544
LIWC - clout	40.9	43.1	0.467
LIWC - word per sentence	16.8	16.1	0.525
LIWC - authentic	26.8	26.5	0.518
LIWC - analytical	70.0	71.4	0.470
LIWC - cognitive process	12.9	12.23	0.525
Average booster word counts	.0088	.0082	0.529
Average hedging word counts	0.017	0.016	0.527
Average transitional phrase counts	.0053	.0050	0.532

Table 2: Linguistic feature comparison between users of low and high anonymity in Wikipedia AfD

From this analysis, we find that users of low anonymity tend to be more authentic in their communication, write longer comments and longer sentences, and convey more negative emotion. Their comments are also more likely to relate to their cognitive or thinking process, contain more booster words or phrases to strengthen their argument, and utilize more transitional phrases to organize their argument. These findings conform to previous studies on the linguistic features of a comment’s persuasiveness in online discussions (Tan et al., 2016; Xiao, 2018; Xiao and Khazaei, 2019). On the other hand, we also observe less clout, less analytical words, and more hedging words in their communication, though it has been found in a previous study that more persuasive Wikipedia AfD comments have more analytical words (Xiao,

2018). These findings suggest that in Wikipedia AfD discussions, anonymity affects one’s persuasiveness through several aspects including but not limited to linguistic features. Specifically, as one is more identifiable, one may invest more intellectual and cognitive effort in the discussions (e.g., longer comments and sentences) – this is expected because of our tendency in impression management (Goffman, 1978). Additionally, the fact that they are more identifiable makes their arguments perceived as being more credible when they are more open to show their negative emotions and uncertainty.

4.3 Anonymity, participation, and comment features

The results shown in table 3 confirm a positive correlation between all three participation behaviors and persuasiveness. This result conforms to our speculation that users who participate more tend to put more efforts to constructing persuasive messages.

Feature	Persuasiveness
Voting comment count in the dataset	$r = 0.251$, $p < 0.01$
Total edit count in Wikipedia	$r = 0.284$, $p < 0.01$
Length of Wikipedia membership	$r = 0.128$, $p < 0,01$

Table 3: Community participation behavior and message persuasiveness in Wikipedia

We also find that users of low anonymity have statistically more comments in our dataset and make more Wikipedia edits in general, though there is no significant difference in the length of their Wikipedia membership. The average of user’s participation statistics and the effect size of the Mann-Whitney U tests are given in table 4 below (adjusted α value after Bonferroni correction 0.0015). The result implies that users of low anonymity in Wikipedia are more motivated to actively participate in the collaborative work in the community.

In summary, our analysis on anonymity, participation, and comment features shows that more identifiable Wikipedia users participate more in the community. As longer and higher amount of contribution to the community is associated with higher persuasiveness, we speculate that this group of Wikipedians are more motivated to construct

persuasive messages. Alternatively, as found by Luu et al. (2019) that debaters improve their persuasive skills over time, these Wikipedians may have acquired the skills to be persuasive in the community through their long participation.

Feature	Group 1 – Low anonymity	Group 2 - High anonymity	Effect size
Comment count in the dataset	5.18	3.27	0.576
Total edit count in Wikipedia	29,885	12,110	0.703
Length of Wikipedia membership	Not significant		

Table 4: Community participation behavior comparison between users of high and low anonymity in Wikipedia

5 Discussion

Our results show that in Wikipedia discussions, persuasive comments, i.e., those express congruent views with the final decision, are made more often by identifiable users. These users also participate more actively in the discussions. This is inconsistent with the findings of Haines et al.’s (2006) experiments in which anonymous participants were found to be more actively participating in the online discussion but less persuasive.

In Wikipedia discussions, participants share a common identity as Wikipedians in the community and conduct collaborative work (Baytiyeh and Pfaffman, 2010). Motivated to be associated with the community, the members’ active participation helps them establish and maintain their identities with the community. In addition, Wikipedia encourages non-anonymous participation (Wikipedia, n.d.). Apart from the fact that more disclosed personal information makes one more identifiable in the community, one’s participation in various Wikipedia activities is connected to the collective goal of the community and reflects one’s identity in Wikipedia. The higher participation level makes an additional contribution to establishing their identity, credibility, and reputation within the community and decreases perceived anonymity of the message receiver. Wikipedians may also learn to be more

persuasiveness through their long-term participation in the community.

Our findings on the influences of anonymity on persuasiveness are potentially limited because our way of extracting personal information based on a Wikipedia's user page text features and named entity recognition may not reflect user anonymity accurately. The classification of high and low anonymity therefore needs to be validated more rigorously. Additionally, we are not able to measure how a user's identifiability is perceived by other communicators and how the perceived anonymity affects perceived persuasiveness. When measuring persuasiveness, we only consider data from discussions that have more non-persuasive comments than persuasive ones for higher accuracy. This choice leaves users and their anonymity choice and persuasiveness in the alternative situation unaccounted for, which is worth exploring in future work.

Nevertheless, our study provides empirical evidence that anonymity is related to a comment's persuasiveness through linguistic and behavioral features. Our finding in the Wikipedia context suggests that it is a successful practice in terms of establishing credibility and reputation in Wikipedia by requiring one to create and use their user accounts in Wikipedia activities. It would be interesting to examine whether this applies to other online communities where peer-to-peer collaborations are the norms, and how these communities contrast with those without extensive collaborative work.

Our future work includes establishing a more direct relationship between anonymity and user credibility and accountability to understand the mechanisms behind anonymity's influence on persuasiveness. For example, a prototype design of asynchronous online deliberation uses the feature of voting for participants to measure the constructiveness of a message and ensure the accountability of anonymous participation (Kaplan et al., 2013). A similar mechanism can be implemented to study whether or not accountability measured in this way differs between anonymous and identified messages. Similarly, the methods used by Wagenknecht et al. (2018) can also be used to understand the mechanisms through which anonymity affects persuasiveness. We would also like to explore in more details how being anonymous or having an established identity in online communities affects

a user's motivation to participate in the community. Lastly, in some online communities such as Quora, a user can switch between revealing their identities and showing as anonymous when asking questions and offering answers. It will help us gain a more comprehensive understanding of users' online behavior and their perspectives regarding online identities by exploring their motivations and communication strategies in choosing these communication situations and compare their language use in the two cases.

6 Conclusion

In this study, we analyze whether or not a user's anonymity level affects their comment persuasiveness in the Wikipedia Article for Deletion (AfD) discussions. We collect user and comment data of the discussions and annotate them for anonymity and persuasiveness. In this specific context, we measure anonymity by the amount of personal information disclosed in their user page using named entity recognition and other linguistic features. Message persuasiveness is measured by the degree to which a message can lead to an agreed group decision on the focal Wikipedia article. We also analyze the relationship between anonymity and the linguistic features of a user's comment and the user's participation in the community to understand how anonymity is related to persuasiveness.

Our findings conform to what has been suggested in previous research: a user's message persuasiveness is related to his or her anonymity status or level of identifiability in the community. In Wikipedia AfD discussions, users of lower anonymity are more persuasive and participate more in the community. Our finding suggests that the higher persuasiveness can be related to multiple aspects, including linguistic features of their comments, the user's motivation to participate, the persuasive skills acquired over time, and the user's identity and credibility established in the community through prolonged participation. The results shed light on how anonymity affects communication behavior and communication results in an online collaborative community. We also suggest multiple perspectives for further research including closer examinations of the relation between anonymity and accountability or credibility, anonymity and participation in online communities, and comparative studies on other types of online communities.

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