Signaling the Intent to Change Online Communities: A Case From a Reddit Gaming Community

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Abstract
This study builds on existing research about churn and community movement, examining if language use on Reddit can be used to determine if people signal their intent to relocate to a new community before they actually do so. Using a computational and semantic approach, we studied the subreddits for the game series Fallout at the time Fallout 76 (FO76) was released to see if the users of the Fallout 4 (FO4) subreddit signaled how they would react to the new subreddit. The main difference we found was that those who stay in the FO4 subreddit or use both subreddits on average post more often and create longer posts than those who move to the FO76 subreddit or leave. This adds further evidence to support theories about community as communication, and we suggest this finding can help online community managers identify which users may be about to leave the community, aiding retention and the overall health of the community.

Keywords
Reddit, online communities, Fallout, gaming, churn

Churn, the rate at which a system’s users come and go, has long interested researchers in both academia and industry. However, determining whether people are about to leave an online community is no easy task. User retention is needed not just to ensure the financial survival of subscription-based media, but also to ensure the longevity and survival of online communities (Bruckman & Jensen, 2002; Kraut & Resnick, 2011; McEwan, 2016). Although the answer to retaining users differs from system to system, determining whether someone is about to leave is an important step. Quite simply, if one cannot identify those who are about to leave, then one cannot preemptively intervene and encourage them to stay. In this article, we seek to identify those who are about to leave an online community by looking at their communication during a time of transition when they may be motivated to leave.

For online communities, user retention is vital to their survival. If too many people leave an online community, it may collapse (Bruckman & Jensen, 2002; Poor & Skoric, 2014), and community members will lose the social and informational support that such communities provide (Ellison et al., 2007; Preece, 2000; Rheingold, 1993; Standage, 2013). Online community research has long been a purview of communication scholars. In this work, we seek to extend our understanding of communication among members of an online community by examining a time of potential transition for a community that congregated on the website Reddit.com, developing around a popular video game franchise.

Literature Review
Reddit, launched in 2005, is an online space where users congregate and post text, audio-visual media, and links about a huge range of topics across thousands of subreddits, the topic-focused sections of Reddit (Bergstrom, 2011; Massanari, 2015). Researchers have noted how Reddit groups function as communities (Bergstrom, 2011; Panek et al., 2018), but they may not necessarily be stable. If members of one subreddit have a reason to move to another subreddit and leave the first subreddit altogether, the first subreddit and its community may collapse due to inactivity.

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As our research focuses on fans of the *Fallout* video game series who use Reddit, we begin with a brief introduction to the existing literature about online communities and Reddit. This is followed by an exploration of fandom and its relation to commercialism. We conclude with an explanation of the game series that we focus on, the *Fallout* franchise, to provide context to help situate the community’s transition from *Fallout 4* (FO4) to *Fallout 76* (FO76) in November 2018.

Humans evolved as community-based creatures: we need communities to survive, and so we build and maintain them via communication and coordinated action (Gamble et al., 2014; Geertz, 1973). When members leave a community, it can be challenging for both those who leave and those who remain (Chen, 2012; Gamble et al., 2014; Geertz, 1973; Pearce, 2009; Poor & Skoric, 2014). Although online communities are easier to leave than geographical communities—one merely needs to stop logging in to disengage—the emotional toll from leaving is similar no matter if the community is online or offline.

Typically, when leaving is discussed in the game studies literature, it is referred to as churn, as it is in studies of other subscription-based media (Bergstrom, 2019). Churn research is motivated by the desire to predict whether players are about to leave a game, allowing the developer to engage players before they cancel their subscriptions (Debeauvais et al., 2014; Runge et al., 2014). Unlike much of the existing games-focused churn research, our concerns are more in line with Banks and Martey (2018), who found that changes within an online game (*World of Warcraft*) and its community could be socially stressful for players. Their work encourages us to examine what happens socially in times of change, using Reddit’s *Fallout* community as our site of inquiry.

### Using Reddit to Study Online Communities

Community creation on Reddit is user-driven, rather than imposed via top-down organizational structures. Any user can make a new subreddit at any time, such as when a new game in a series (e.g., *Fallout*) is announced. Users have made subreddits for hundreds of games, and no standard approach governs how subreddits for game franchises are handled. Sometimes a general subreddit covers all games in a franchise, at other times specific subreddits exist for each game, and some are fractured even further to create individual subreddits to discuss different elements of the same game (e.g., lore, trading items, etc.). From our observations to date, we found that once the arrangement has been set for a game franchise, it tends to stay in place: if previous users have made subreddits for each individual game in the franchise, future users will continue organizing in the same fashion, making a new subreddit for a subsequent game in that franchise. This disaggregation provides an advantage to our research as it makes analysis easier, as communities are to some extent preidentified by occupying their own spaces.

Subreddits often function as communities for their users (Bergstrom, 2011; Panek et al., 2018), based on topics such as games (including the *Fallout* series) and other activities stereotypically associated with the young men assumed to predominantly populate Reddit (Pew Research Center, 2019)—but counter publics also exist on Reddit, such as pockets of feminist humor that run counter to the dominant ideology of the site (Massanari, 2019). When starting a new subreddit, creators often specify guidelines for rules and behavior, with each subreddit having its own approach to moderation, posting requirements, or even who is allowed to post. With *people, purpose, and policy*, subreddits fit Preece’s (2000) definition of an online community. Some members may feel more strongly attached to any one subreddit, and others may have little attachment to it at all; but the same is true for offline communities (Granovetter, 1973).

Buntain and Golbeck (2014) studied community members on Reddit and found that people belong to one community, posting to one subreddit only. This mirrors findings in our previous work examining periods of transition in three different game franchises, including *The Elder Scrolls* (Bergstrom & Poor, 2021). Buntain and Golbeck’s study took place during times of relative stability for those online communities, and it provided the groundwork for our examination of relative instability for Reddit communities: studying user behavior around the time of a new release in a game series. A new addition to a series gives the fans of that series a reason to buy the new game, and researchers have noted the clear relationship between fandom and consumerism (Cavicchi, 1998; Hills, 2003), explored below. If Buntain and Golbeck’s findings are applicable to game-specific subreddits during times of transition and potential instability, a new addition to a franchise may lead to a dilemma for fans of the game about to be usurped by that new addition, such as when *FO76* was released. That is, if *FO4* fans buy *FO76*, do they move to the subreddit for *FO76* and abandon their community on the *FO4* subreddit?

Newell et al. (2016) studied Reddit user behavior during a moment of user protest against Reddit—a brief period of instability when thousands of subreddits temporarily shut down. They found a small number of “migrants, tourists, and dual-citizens” (p. 281) in their sample of Reddit users: that is, migrants who moved to a different platform, tourists who only briefly used another platform, and dual-citizens who continued to use Reddit but also used an alternative site. Of their three groups, only migrants sustained usage on the non-Reddit site over time, although this is in part true because of how the groups are defined. Tourists and dual-citizens, however, actually saw a slight increase in their activity on Reddit, which Newell et al. felt may have been due to social capital and social ties to the subreddits. Their work suggests we should consider the different possibilities that *FO4* fans on Reddit faced upon the release of *FO76*, as well as the presence of different strengths of social ties. What action would they take with regard to their subreddit use?
Research has shown that the cohesion of a Reddit community—directly related to the actions of its members (e.g., do they leave or stay?)—can be measured by the language that the community members use in Reddit (McEwan, 2016). Specifically, McEwan found that a Reddit community’s cohesion relates in part to level of activity (number of posts) in the subreddit, the emotional tone expressed by users in those posts, and references to the community’s past which is shared by the community members. Note that McEwan measured these items at the level of the subreddit as a whole. She focused on cohesiveness as found via the use of first-person plural pronouns, if the community saw itself as cohesive via the use of past and future tense verbs (they have been together in the past, they will continue to be together in the future), and sociability via the expression of positive and negative emotions and also friend and family words.

These studies of Reddit are possible because an archive of all existing posts is available (Baumgartner et al., 2020). Each post is time-stamped and attributed to the unique username of the poster, allowing researchers to use Reddit as a site of longitudinal text-based data. (In this paper we are using the term “post” in a generic way, for any posting to the site, whereas Reddit delineates between “submissions” which are new, top-level posts, and “comments” which are replies to both submissions and other comments.) It also allows us to examine spaces where fans of particular cultural products communicate with other fans (Gunderman, 2020), providing an opportunity to observe how conversations and communities shift and change over time. Subreddits related to older games remain active, sometimes over a decade after a game’s initial release. Reddit also acts as a proxy for ephemeral discussions about games that happen in-game, for example, in-game text chat, or via other text- or voice-based platforms used in conjunction with gaming, such as Discord and Twitch (Ruberg et al., 2019).

Because many people take part in community activities online, understanding the challenges online communities and their members face, as well as the actions of individual community members when they face a reason to leave one of their communities, can benefit online community leaders and those who design online community spaces (Kraut & Resnick, 2011). Online communities take place in different ways in different spaces via different technologies with different affordances (this has especially been true over time, see Fiesler and Dym [2020]). An online community in Reddit will have different affordances available when compared to an online community in a massively multiplayer online game (MMO). However, people’s community-based behavior is, at its root, the same, and is merely embodied through the affordances at the time. And, communities with an online component often take place in multiple locations (e.g., subreddits for MMOs) as researchers have noted (e.g., Baym, 1999).

**Fandom and Commercialism**

In their study of online fan communities from multiple decades and across platforms, including Reddit, Fiesler and Dym (2020) found that when individuals leave such a community, there are costs for both the individuals and the community. Specifically for Reddit and other user-oriented platforms, they noted that “when new communities emerge they bring with them membership from prior communities” (p. 4). They note “migration” from and “leaving” previous spaces (p. 4), that is, a full abandonment of the old space, but also that some users may for a time use both the new and old online spaces. They also observe that, “people are also often part of multiple communities across a single shared technology platform” (p. 4). These findings again suggest that we should see movement from the FO4 subreddit to the FO76 subreddit upon the release of FO76, and, if that movement is a migration, there will be accompanying negative costs for the FO4 subreddit’s community of fans.

A fan’s interaction with a game is not limited to the game alone. Fans create and consume paratexts for games and/or franchises (Carter, 2014; Consalvo, 2017). Here, we are interested in understanding more about the fan interactions and communities that develop around *franchises* of video games, as franchises present a scenario where fans can communicate about games and create fan-based online communities across multiple related games. Fans of one game in a franchise might play and become a fan of a new release in that franchise, or they might not. Although fans utilize different online spaces (and those spaces have changed over time—see Fiesler et al. [2016]), many fans currently use Reddit to be part of fan-based communities and to discuss the objects of their fandom with fellow fans (Gunderman, 2020).

Discussing game fandom specifically, Wirman (2009) looks at how game fandom goes beyond the productivity or co-production often discussed in other work focused on fandom. Wirman details several types of productivity, some of which have not typically been considered productive (such as gameplay itself), including expressive productivity which includes discussions in forums like Reddit. Wirman argues that computer game fandom may be different from other fandoms in the different types of productivity that fans work on, and that productivity and game fandom are interwoven. Here, in this work, we focus on the textual production in forums which she explicitly discusses as communities.

Cavicchi (1998) explored how some fans are perfect consumers for cultural items, always buying the newest works in a series. When applied to games, this suggests that when a new game is released in a franchise (e.g., *FO76*) fans of the series will buy it. However, Cavicchi’s work suggests that some of those series fans who buy (and play) *FO76* will have previously purchased and played *FO4*. As such, fans who have taken part in the subreddit for *FO4* should then move to the subreddit for *FO76*. However, the relationship between an old game and a newer one from a franchise is not straightforward. The general assumption has been that older games will be abandoned when new games are released. Like a novel in a series, fans are ready for new content. Nothing is
particularly wrong with an older game in a series in any way, but it may have blockier graphics, a less time-tested interface, fewer features, and a smaller player base compared to a newer game just after launch. Finally, there is a commercial impetus to release a new game to drive sales. There are also commercial attempts to reignite interest in older games through new expansions, remastered editions, and re-releasing a game previously released as a physical disk via low-cost digital distribution.

Similar to Cavicchi (1998), Hills (2003) detailed the strong relationship between fandom and consumerism; buying fan-related cultural items is a large part of fandom for many. This finding again suggests that many fans will buy and play the new game in a franchise upon its release. In her work, Taylor (2006) noted that entire groups of players move together, as a coordinated whole, from one game to another—often newly released—game. This finding further suggests that the same mass migration was not just possible but was likely to have happened when FO76 was released. If this finding applies to players’ social interactions surrounding a game, it would follow that they also moved from the subreddit for the old game to that for the new game, especially if the findings of Buntain and Golbeck (2014), that Reddit users only use one subreddit, apply to video game-related subreddits. If this finding were true for all players, it would end the community for the old game—in this research, the subreddit for FO4.

Fallout

The first game in the Fallout series, Fallout: A Post Nuclear Role-Playing Game, was released in 1997 and transported players to a retro-futuristic post-apocalyptic world; its success spurred a franchise of sequels. New fans continue to discover the franchise each time a Fallout game is released. FO4 has a particularly successful history and continues to be an entry point into the Fallout universe for thousands of fans, even years after its release in 2015. To date, it has sold over 13.5 million copies (Gough, 2020).

FO4 is a first-person-shooter, single-player game. Set in a stylized 1950s radioactive wasteland after a nuclear war, players encounter hundreds of nonplayer characters, many of who need the player’s help and who offer missions to be completed. If players want to discuss where to find items or need help finishing quests, players must be able to interact with fellow Fallout players. This in turn requires having a common congregation point. For FO4 players, Reddit serves as one such point, even 7 years after the game’s release, guiding our decision to use Reddit as our investigation site.

FO76 is a subsequent addition to the series, released in 2018. It breaks from the single-player environment of previous Fallout games; it is a multiplayer game that shares some characteristics with MMOs. Players can access the FO76 gameworld with a free account or purchase a subscription, and the multiplayer environment provides new adventures even after one completes the main storyline. Like with FO4, a dedicated subreddit was made to discuss the game.

Both games can be played somewhat endlessly, and so their subreddits live on. In FO4, players can replay the game, create new characters, take different actions during gameplay, or can otherwise approach the game differently each time. FO76 is somewhat different in that it was designed to have longevity in terms of play, with other player characters adding to the challenges every time a player logs in.

Literature Summary

Some research suggests that Reddit users primarily take part in one subreddit (Buntain & Golbeck, 2014), although other work suggests this may not be so. Fans of a cultural product are expected to buy new items related to their fandom (Cavicchi, 1998; Hills, 2003). When placing these findings in conversation, it suggests that with Reddit, fans would move to a new game’s subreddit upon its release, possibly ending the community in the older subreddit and leading to the loss of support it provided (Bruckman & Jensen, 2002; Chen, 2012; Poor & Skoric, 2014). If enough people move to the new space, support can be maintained (Fiesler & Dym, 2020; Pearce, 2009), but for those who stay, it may be lost, especially if enough people migrate (Fiesler & Dym, 2020).

But Reddit users have more options than solely leaving the platform or leaving a single subreddit (Newell et al., 2016). Identifying this tension in the literature, this article examines if players move between Fallout-related communities, and if so, can we predict when they are about to do so? The archival nature of Reddit allows us to go back to the genesis point of a community, including FO76 to investigate this question.

In applying these findings to the potential actions of FO4 subreddit users at the time FO76 was released, loosely based on Newell et al. (2016), we find four potential actions that subreddit users could choose upon the release of FO76: move, leave, stay, or add. That is, they could move from the FO4 subreddit to the FO76 subreddit, abandoning the FO4 subreddit and its community. They could just leave the Fallout subreddit space altogether. Move and leave are similar in that users no longer use the FO4 subreddit after FO76 is released. Or, as a third option, they could stay in the FO4 subreddit, despite the arrival of FO76. All of these options are in line with Buntain and Golbeck’s (2014) findings that users stick with one subreddit, at least during times of relative stability. Yet, the findings from Newell et al. suggest a fourth option, due to instability and uncertainty stemming from the release of FO76 and how fans tend to buy new releases (Cavicchi, 1998; Hills, 2003). Newell et al. call this fourth option becoming “dual-citizens,” or what we refer to as the option to add a subreddit (specifically the FO76 subreddit). Just as the first two options, move and leave, are similar, the last two options of stay and add are similar in that users continue to post to the FO4 subreddit after the release of FO76.
Hypotheses

Banks and Martey (2018) found that upcoming changes can dominate a multiplayer game’s in-game discussions, but what about upcoming changes to a single-player game? In the case of the single-player game *FO4*, Reddit serves as an important gathering point for such discussions. Community belonging is a deeply rooted and highly emotional issue for humans (Gamble et al., 2014; Geertz, 1973; Rheingold, 1993), and subreddit users in a community where there will soon be a reason to move to a new subreddit may express different levels of emotional content in their posts, reflecting on their upcoming move. Even the expression of negative emotions can indicate online community cohesiveness in Reddit (McEwan, 2016). This finding leads to our first hypothesis regarding groups who take one of the four actions—move, leave, stay, and add:

H1: There will be differences in the emotional tone and expression as measured by word usage between those in the four groups.

Community belonging is, by definition, a social issue (Kendall, 2011; Preece, 2000). We have different levels of attachment to others in a community (Dunbar, 2005; Gamble et al., 2014; Granovetter, 1973), and subreddit users who must soon choose which subreddit they primarily use may express different amounts of socially oriented words (such as community-based words about family, friends, and affiliation). Those who are about to leave may use fewer of these words, while those who are about to move may use more as they reflect on their community involvement, leading to our second hypothesis:

H2: There will be differences in the number of socially oriented words used between those in the four groups.

Those who look forward to the new game and anticipate moving to its subreddit may show that they are valid community members within the larger community despite their (possibly anticipated) move from one subcommunity to another, either by discussing their past or current connections or by discussing the future in some respect (a future where they are no longer members of the older game’s community but are still members of the overall *Fallout* Reddit community). Researchers have hypothesized that Reddit users may discuss a shared past or shared future, which can indicate the stability of their community (McEwan, 2016). This finding is expressed as our third and final hypothesis:

H3: There will be differences in how much those in the four groups mention items relating to the past, present, and future.

As interaction and communication between people form and reinforce bonds (Carey, 1989; Dewey, 1927; Gamble et al., 2014; Granovetter, 1973; Kendall, 2011), differences may emerge in how many posts users create, or the length of those posts (on average), as some users are leaving (i.e., weaker ties) and some are staying (i.e., stronger ties). Those in the leave category may feel less attachment to the subreddit and so may post less. But those who move might post less than those who stay because they are leaving (and their ties are weakening), or they could post the same amount as before because their attachment to the greater *Fallout* community is still strong.

RQ1: Are there differences in the average number of posts, and average length (measured in words) of posts, among the four groups?

Method

Reddit, as an internet forum, is mostly text-based. Typical data for a user’s post includes the username, text of the post, when it was posted, and to which subreddit it was posted. An archive of Reddit has been created by Jason Baumgartner at the site Pushshift.io (Baumgartner et al., 2020); using Python 3.7, we scraped the posts and metadata for the users of Interest via the Pushshift API. We used two different quantitative approaches to analyze users’ posts. The first approach was LIWC, the Linguistic Inquiry and Word Count analysis software, to analyze the data on the number of words in posts (Tausczik & Pennebaker, 2010) to evaluate our hypotheses. The second approach used basic statistical descriptors for posts by category, used for RQ1.

LIWC uses a dictionary-based approach to categorize words in a piece of text, and it reports the percentage of words in each of its categories for each text. Thus, with the LIWC results, we knew we could only ask questions about categories that LIWC has. This is not a limitation, as LIWC has over 80 categories of words (Tausczik & Pennebaker, 2010), and several categories are of theoretical interest based on the literature around community and communication with which we were familiar and wanted to build on. In the LIWC dictionary, words are mapped to psychological constructs (Tausczik & Pennebaker, 2010). Words in a text under analysis are looked up in the LIWC dictionary, and each text is given a count of how many words are present for each construct. This count is converted to a percentage for each construct, based on how many words are in the text. This is straightforward (although building the dictionary was not). So for family, friends, and affiliation measures (H2), as well as past, present, and future words (H3), we used LIWC to compare the words in our Reddit corpus (per post) to the words in the LIWC dictionary, and counted how many words from each post were identified as a word in one of those categories.

To assess emotional tone (H1), LIWC has measures for both positive and negative emotion words. These are
combined into one overall tone measure, which differs from how categories are usually reported: 50 is an equal balance of both positive and negative emotion words, below 50 is more negative, and above 50 is more positive. LIWC also measures the impact in its standard way, specifically, by identifying words expressing the emotion of some sort, be they positive or negative.

For the LIWC analysis, we used LIWC 2015 (1.6). Some numbers were run using R 3.6.1 in RStudio 1.2 (such as the ANOVA comparisons between groups, using Tukey’s HSD). All analyses were done in macOS 10.14.6 (Mojave). Data were cleaned using Python 3.7, removing posts that had been deleted by the user as well as posts that had no textual content. Before this cleaning, 36,015 posts spanned the four categories; the cleaning removed 1,491 posts (4.1%), leaving 34,524 posts for analysis (Table 1).

To identify which users (and their posts) were relevant to this research, we scraped all the metadata for the FO4 subreddit and the FO76 subreddit for the 6-month period at the time of the FO76 release, November 2018—specifically, the 3 months before and 3 months after the release—as part of a larger project. Scraping occurred in early 2019, and the resulting data are explained in Table 1 and as follows. Users in the move category were ones who used the FO4 subreddit before the release of FO76 but then moved their activity to the FO76 subreddit upon its release (n=622). Users in the leave category posted in the FO4 subreddit prior to the release of FO76, but then posted to neither subreddit after FO76 came out (n=4,824). Users in the stay category posted in the FO4 subreddit during the 3 months before and also the 3 months after FO76’s release, but not in the FO76 subreddit (n=1,766). Finally, users in the add category posted in the FO4 subreddit both before and after the release of FO76, and upon the release of FO76 they started posting to that subreddit as well (n=337). We scraped the content of these users’ posts from the FO4 subreddit for the 3 months prior to the release of FO76 and, examining their relevant posting behavior during the 3 months after the release of FO76, labeled them as move, leave, stay, or add.

**Limitations and Considerations for Future Research**

Although all of the data were public when the posts initially appeared on Reddit, and continue to be available via both Reddit and Pushshift unless a user goes back and deletes posts, we do not reveal any usernames; our work remains on the aggregate level. Despite Reddit’s design, where content is open and public unless a community is set to private or members-only, we acknowledge that just because digital data are public as well as the existence of widespread advertising analytics for the site it does not mean that the users who generated those data intended for others to analyze their data; they may not have considered the possibility of such use (Fiesler et al., 2015, 2020). We also recognize that when posts are indexed by search engines, even what appears at first glance to be inconsequential—such as the date a post was made or a direct quote (however small)—can still be traced back to the original post via a quick web search (Beyer, 2011). In this article, therefore, we do not reveal any user data that might single out a specific user or their posting behavior, although for clarity and to allow for future reproducibility we specify the subreddits and time frame we used for analysis.

An additional caveat about the data is that, by using Reddit and focusing on the *Fallout* series, the sample is somewhat constrained in its representativeness—it comprises English speakers, probably skews male, has an average age that is probably lower than the general population’s age, and consists of those who have the time and financial resources to own and play games as well as access the internet and post on Reddit. It is most likely a “WEIRD” sample, where the majority of respondents are from societies that are Western, educated, industrialized, rich, and democratic (Henrich et al., 2010). Therefore, we make no claims about our findings being representative of the *Fallout* community as a whole, or of every online community; instead, these results should be taken only as evidence for community behavior among *Fallout* fans who use Reddit as a site for a conversation about the game, although we do hope the findings are more broadly applicable.

Last, we initially thought that the topics that the four different groups discussed might be slightly different, even though they were all posting to the FO4 subreddit, and we thought that the posts would be different enough that they could be distinguished by a machine-learning approach. We used a support vector machine method for this linguistic data analysis, using Python 3.7, the NLTK 3.5, and scikit-learn 0.23.1 packages. However, this approach was not at all able
to distinguish among the groups, indicating that they generally posted the same type of material; due to spatial constraints, we do not discuss this analysis further.

### Results

Starting with RQ1—whether differences exist in basic posting descriptives among the groups—analyses of variance among the four groups using average words per post show that the move and leave groups are similar (no statistically significant difference at the \( p < .10 \) level), as are the stay and add groups. However, each group differs from the others in the other cluster. More simply, move and leave groups averaged about 34.5 words per post, while stay and add groups averaged about 41.5 words per post (see Tables 2 and 3). For the average number of posts per account, move and leave groups were similar at around 2.7, while the stay group’s average was around 8.5, and the add group’s average was just over 14—all of which are statistically significant differences and are notable on the level of lived experience.

Moving on to the LIWC analyses (also Tables 2 and 3), most results are reported as averages of percentages of total words across posts for a group. For H1—that there will be differences in the amount of emotional expression between groups—in terms of LIWC’s emotional tone measure (an aggregate from 1 to 100, where below-50 indicates more negative than positive), the move and leave groups were statistically similar, and the stay and add groups were also statistically similar. However, all four measures were fairly similar, and it is not clear whether this similarity would be noticeable on the human level. For affect, positive emotion, and negative emotion, many of the groups differed statistically, but the numbers were very small; it is not clear that these differences would be noticeable. H1 is partially supported, but only statistically.

For H2, regarding differences in social connection categories, although some statistically significant differences were found, the measures were too small to be meaningful on the human level. Social words, on average, constituted roughly 8% of words in posts for all groups. Family words, friend-related words, and affiliation words were used very little overall. H2 is not supported.

For H3 (regarding past, present, and future), the situation is similar to the results for H2: that is, there were some statistically significant differences, but they were not noticeable on the human level. Past and future words were rarely used. H3 is not supported.

### Discussion

The only real differences among the four groups lie in the number of posts per account and the length of those posts. Those in the move and leave groups posted noticeably fewer, and noticeably shorter, posts than did either the stay or add groups. Although the stay group posted more than either the move group or the leave group, those in the add group posted,

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### Table 2. Means and ANOVA Significance for Descriptives and LIWC Variables.

| Variables          | Move | Leave | Stay  | Add  | \( p \) Value \(< .10 \) |
|--------------------|------|-------|-------|------|--------------------------|
| N posts            | 1,697| 12,867| 15,163| 4,797| bcde                     |
| \( M \) words/post | 34.35| 34.68 | 41.75 | 41.5 | bcd                      |
| SD words/post      | 90.18| 55.70 | 66.69 | 71.97|                          |
| N accounts         | 622  | 4,824 | 1,766 | 337  |                          |
| \( M \) posts/account | 2.73 | 2.67  | 8.59  | 14.23| bcde                     |
| SD posts/account   | 4.33 | 5.58  | 25.64 | 46.46|                          |

**LIWC variables**

**H1 variables**

- Emotional tone: 47.90, 46.36, 43.09, 41.8, bcde
- Affect: 9.18, 8.33, 7.35, 7.87, abcd
- Positive emotion: 6.62, 5.76, 4.77, 4.98, abcde
- Negative emotion: 2.52, 2.53, 2.55, 2.85, ef

**H2 variables**

- Social: 8.24, 7.66, 7.89, 8.14, ae
- Family: 0.41, 0.25, 0.25, 0.25, abc
- Friend: 0.33, 0.36, 0.31, 0.30, –
- Affiliation: 1.36, 1.46, 1.36, 1.42, –

**H3 variables**

- Focus past: 3.28, 3.18, 2.92, 2.82, bcde
- Focus present: 12.72, 12.21, 11.74, 12.02, bcd
- Focus future: 1.08, 1.08, 1.10, 1.07, –

*Note. Move-Leave: a; Move-Stay: b; Move-Add: c; Leave-Stay: d; Leave-Add: e; Stay-Add: f. One take on a theorized result is bcde, where Move and Leave are similar, and Stay and Add are similar, but nothing else. For specific \( p \) values, see Table 3. ANOVA: analysis of variance.*
on average, even more than those in the stay group. For those in the move and leave groups, their attachment to the subreddit might have been lower or waning as they were on the verge of leaving the FO4 subreddit and perhaps moving to the newer FO76 subreddit. Not only were the differences statistically significant but also the amounts of those differences are noticeable on the human scale (Table 2).

This result makes some sense, as those who fell into the leave category might just have been part of general Reddit churn and might have had little attachment to the specific subreddit. Those who were about to move might have been anticipating their move, and so their imagined ties to the FO4 subreddit might have been weakening. We know that communication creates community (Carey, 1989; Dewey, 1927; Gamble et al., 2014; Kendall, 2011), and that time spent together increases tie strength (Granovetter, 1973). So, flipping these ideas, we might argue that community creates communication and that stronger ties will result in more time spent together. Hence, those who were about to move or leave might have felt feel less of a sense of community in the FO4 subreddit and so communicated less, and they might have felt weaker ties and so spent less time in the subreddit.

It is not clear why those in the add group posted more, on average, than everyone else, including especially the stay group. Perhaps, they were excited by the upcoming release of FO76, and this energy carried over into their posting behavior on the FO4 subreddit. Although some statistically significant differences emerged among the groups for some of the word types found in LIWC, the overall differences in usage of these words were so small as to be unnoticeable in terms of lived experience; only a computer can measure such fine differences. Topics within the subreddit and how they were discussed were the same across groups, at least as far as this analysis reveals.

One possible shortcoming of this research is that we did not drill down into the content of the posts that had words of interest. With the type of analysis we did, we do not know whether, when Redditors who post to a particular subreddit are discussing social items, for instance, they are discussing them in the way we hypothesize—about their community and subreddit belonging. Another issue is that we cannot tell which Reddit users are actively playing either game, although we assume most are, and this may influence the content of their posts.

**Conclusion**

The main differences between those who stayed in the FO4 subreddit (stay and add) and those who moved to the subreddit for FO76 or who just left outright (move and leave) were mainly their amount of posting to the FO4 subreddit and the lengths of those posts. The community is brought together by a shared interest in FO4, not unlike the affinity spaces discussed by Gee (2005) and communities of interest (Garton et al., 1997; Kendall, 2011). The authors of frequent and lengthy posts had clearly invested time in this community, and it should not be surprising that they were less inclined to move to the FO76 subreddit or to leave the FO4 subreddit altogether. Those who posted less were ones whose engagement community managers could have encouraged (Kraut & Resnick, 2011).

What about the potential collapse of the FO4 subreddit? Ultimately, the subreddit was fine. In the months following the release of FO76, the FO4 subreddit did see a decrease in

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**Table 3. p Values for ANOVA Comparisons From Table 2 Using Tukey’s HSD.**

| Variables          | Move-Leave (a) | Move-Stay (b) | Move-Add (c) | Leave-Stay (d) | Leave-Add (e) | Stay-Add (f) |
|--------------------|----------------|---------------|--------------|----------------|---------------|--------------|
| M words/post       | .999           | .000          | .001         | .000           | .000          | .994         |
| M posts/acct       | .999           | .000          | .000         | .000           | .000          | .000         |
| LIWC variables     |                |               |              |                |               |              |
| H1 variables       |                |               |              |                |               |              |
| Emo tone           | .368           | .000          | .000         | .000           | .000          | .179         |
| Affect             | .047           | .000          | .002         | .000           | .148          | .065         |
| Positive emotion   | .024           | .000          | .000         | .000           | .001          | .683         |
| Negative emotion   | .999           | .998          | .177         | .995           | .005          | .008         |
| H2 variables       |                |               |              |                |               |              |
| Social             | .067           | .429          | .983         | .168           | .009          | .313         |
| Family             | .021           | .017          | .049         | .999           | .999          | .999         |
| Friend             | .926           | .973          | .981         | .109           | .390          | .999         |
| Affiliation        | .725           | .999          | .946         | .135           | .909          | .816         |
| H3 variables       |                |               |              |                |               |              |
| Focus past         | .846           | .024          | .006         | .000           | .000          | .621         |
| Focus present      | .206           | .001          | .070         | .001           | .695          | .338         |
| Focus future       | .999           | .996          | .999         | .954           | .999          | .967         |

*Note. ANOVA: analysis of variance.*
the average number of accounts posted to it, going from an average of just over 4,000 accounts per month before the release to just under 4,000 after the release. This general decrease was not unique to the FO4 subreddit; it was true for all eight of the Fallout-related subreddits from which we originally collected data.

To be clear, the release of FO76 did not cause a collapse of the FO4 community in the subreddit. Putting this finding in conversation with the literature discussed earlier in this article, we theorize that anyone consistently using the FO4 subreddit at this time, about 3 years after the game’s release, had fairly strong bonds to the game and the subreddit. This is corroborated by previous research on Fallout fans in other contexts that finds Fallout fans behave like fans of other long-running franchises, and are devoted to the game (Milner, 2009). What we have in these data is dedication to either FO4, its subreddit community, or the people in that community—but most likely this dedication falls within a greater and more general fandom of the Fallout series. Yet that more general fandom did not, for many, pull them to the FO76 subreddit from the FO4 subreddit.

Community, then, maybe more straightforward and somewhat simpler than we initially proposed through our analyses. Communication forms community, and here, we see that those who stay in an online community when given ample reason to leave, at least according to theories about fans and consumption, do indeed communicate more, measured by a greater number of posts, than those who do not stay, and their posts are on average longer. A greater amount of communication occurs among those who stay, while those who are soon to leave communicate less. Community managers should try to engage with those in the community who do not interact much, or whose engagement decreases. With the importance of community and online community in our daily lives, maintaining and sustaining those communities is of vital importance, and identifying those who may be about to leave an online community can aid retention and the vitality of our online communities.

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