Motivations and habits of micro-news consumption on mobile social media

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ARTICLE INFO

ABSTRACT

Micro-news are abbreviated summaries or teasers of news content that are often accompanied with links to longer articles. We investigated motivations and habits of micro-news consumption through mobile social media platforms and how these variables relate to continuation intention. We surveyed 250 U.S. adults and identified six motivations using a uses and gratifications approach: social utility, pass time, entertainment, local information-seeking, salient information-seeking, and financial information-seeking. We found that habits add significant explanatory power on top of motivation in explaining users' continuance intention. Context stability of time and situation, but not location, was correlated with habit.

1. Introduction

Social media is reshaping how people, especially younger generations, consume news (Anderson and Caumont, 2014). In 2016, the majority of U.S. adults—62%–reported that they get news on social media, up from 49% in 2012 (Gottfried and Sheraer, 2016), with 45% of U.S. adults relying on Facebook for news (Grieco, 2017). Not only is social media increasing becoming the primary information source for many people (Oeldorf-Hirsch et al., 2018), it also becomes an agora where individuals are easily able to share news and discuss them with other users (Almoqbel et al., 2019; Holcomb, et al., 2013; Oeldorf-Hirsch and Sundar, 2015; Wohn and Bowe, 2016). News consumption through social media has become even more prevalent as readers can access content through mobile devices. These platforms are able to provide a novel format of news content: *micro-news*. We define micro-news as brief text updates containing news content that are short summaries or teasers of news content, and are accompanied with a link to a complete article. It enables users to see news headlines and updates from various sources in a timely manner through a wide range of social media.

In understanding why people read news, much of the communication literature has focused on motivation (e.g., Diddi and LaRose, 2006; Shim et al., 2015; Vincent and Basil, 1997; You et al., 2013). Motivations are a form of conscious cognitive processing. Less attention, however, has been given to the role of habits, which are non-conscious (LaRose, 2010; Verplanken and Wood, 2006). Habits are mental and behavioral sequences that occur automatically in presence of a trigger; they develop when people repeat behavior in a stable context (LaRose, 2010; Verplanken and Aarts, 1999). It is important to consider habits in tandem with motivations because habits account for more than 40% of everyday behaviors (Neal et al., 2006) and are also associated with long-term use of technology (Wohn et al., 2012; Wohn, 2013).

While we know that habit is related with news consumption (Diddi and LaRose, 2006; Mitchelstein and Boczkowski, 2010), micro-news on mobile social media platforms has different affordances. It is more spontaneous than traditional news, as it is constantly available and updated throughout the day. This contrasts from traditional news such as paper newspapers, which are

delivered at a specific time of the day, or television news, which is broadcast at fixed time slots. This not only creates unpredictable times of day, but also varies the location that the individual will be situated in when receiving these updates, since the mobile platform enables people to view micro-news even when they are on the go. As habitual use normally requires a stable context (LaRose, 2010; Verplanken and Wood, 2006), the spontaneity of micro-news as received via the mobile platform may or may not provide stable circumstances required for the formation of users' habits in reading micro-news. A second characteristic of micro-news that makes it different from traditional news is that it is only a small snippet of information that contains a link to the fuller story. Thus micro-news are only able to provide limited information and are not in-depth, but because of the abbreviated nature of the content, reading them requires very low cognitive effort, and could thus more likely be subject to habitual behavior (Wood and Neal, 2007).

We aim to investigate how habit is related to the intention of continuing to read micro-news and to understand how habit is related to usage patterns and context stability. This study provides a better understanding on the motivations and habits of mobile micro-news consumption and how communication theories related to traditional media consumption apply in this mobile new media context.

2. Mobile micro-news on social media

Reading news is a large part of what individuals do on their mobile devices (Mitchell et al., 2012). These devices have provided users with alternative ways of reading news and also sharing news with others (Goggin et al., 2014). The use of mobile devices has enabled users to follow news more frequently from multiple news sources and platforms (Purcell et al., 2010). As a result, news organizations are increasingly focusing on news delivery through mobile devices (Chyi and Chadha, 2012) and utilizing notifications to alert users of breaking news or major headlines through mobile phones (Lu and Matsa, 2016).

In addition to mobile devices, social media platforms have moved news consumption to a new digital era (Anderson and Caumont, 2014; Wohn and Bowe, 2016). Social media refer to Internet-based channels enabling users to selectively self-present and opportunistically interact, in either asynchronous or real time, with both narrow and broad audiences who derive value from the perception of interaction with others and also user-generated content (Carr and Hayes, 2015). Social media contain short text feed services like Twitter and social network sites such as Facebook. Individuals nowadays use various social media platforms in order to participate in the online public sphere, integrating online news sites and social media platforms into their news consumption and sharing repertoires (Semaan et al., 2015; Grieco, 2017). In the United States, 62% of adults get news from some social media platform (Gottfried and Sheraer, 2016) and 26% get news from two or more social media sites (Grieco, 2017).

The combination of mobile devices and social media has formed mobile social media—which refer to applications, software, or services accessed through mobile devices that allow users to connect with other people and share information, news, and content (Humphreys, 2013). Mobile social media platforms provide an opportunity to reach more people with news than ever before. Similar to the distribution of Web micro-news using Rich Site Summary (RSS) (Liu et al., 2005; Ramasubramanian et al., 2006; Sandler et al., 2005), mobile micro-news can be distributed and brought to users on mobile social media platforms.

Micro-news can be posted by individuals or be automatically generated by news organizations and publishers. While the content itself is short, it provides a link to an article that has more detailed content, enabling users to see short summaries before deciding which stories they want to take a closer look at. When users generate micro-news on various mobile social media platforms, other users can get this news content on these platforms. Therefore users are exposed both content that they actively subscribe to—for example, through news media or news providers they "follow" on Twitter—or in a more spontaneous or serendipitous fashion through micro-news that is posted by people in their social media network.

3. Why do people continue to read mobile micro-news?

In this research, we aim to be able to explain people's future news-reading intentions using a model that incorporates both conscious and non-conscious aspects of media use. Continuance intention, or behavioral intention, is a cognitive representation of a decision in order to perform a given behavior (Ajzen, 2002) and has proven to be a strong predictor of actual behavior in numerous studies (Holcomb et al., 2013; Limayem et al., 2007). In this context, we define continuance intention as a cognitive representation of a decision to continue reading mobile micro-news.

To investigate mobile micro-news consumption motivations, we used the uses and gratifications (U&G) framework (Ruggiero, 2000). It is a theoretical lens which answers the questions of how and why individuals actively use specific media in order to meet specific needs. In the context of news consumption, scholars have used U&G to identify motivations behind users selecting specific content or platform for reading local, national, and international news (Rubin and Perse, 1987; Ruggiero, 2000), as well as how people consume news across different platforms, such as TV (Henke, 1985; Rubin and Perse, 1987), print media (McDonald, 1990; Vincent and Basil, 1997), and online media (Eveland et al., 2004; Kaye & Johnson, 2002). The U&G framework, however, does not take into consideration habits as conceptualized as a form of automaticity (LaRose and Eastin, 2004). Rather, U&G researchers have used the term "habit" to refer to ritualistic gratifications, such as passing time (e.g., Rubin, 1983). While the term "habit" was used by early U&G researchers, this was conceptually different from how habit is defined today because it was considered to be part of an active selection process. We know from prior research that habits add significant explanatory power on top of conscious motivations in explaining intention (Larose et al., 2001; Wohn et al., 2012). Thus it is important to examine both habits and motivations together. First, we will discuss motivations, then, we will explain the concept of habit and which factors are related to habit. Finally we will examine how habit and motivation are related to intention.

3.1. Conscious motivations of news consumption

In traditional media such as television and newspapers, scholars found that people's motivations for news consumption included surveillance (McDonald, 1990; Vincent and Basil, 1997), communication needs (McDonald, 1990), escapism (Vincent and Basil, 1997), and relief from boredom (Vincent and Basil, 1997). Online news consumption motivations showed that need for relaxation (You et al., 2013), social utility (Henke, 1985; Parker and Plank, 2000; Shim et al., 2015; You et al., 2013), information-seeking (Shim et al., 2015; You et al., 2013), and entertainment (Shim et al., 2015; You et al., 2013) are primary motivations. These studies show that there are a wide range of motivations related to news consumption and that while there are some common motivations such as information-seeking and social utility (Shim et al., 2015; You et al., 2013), there is some variance depending on the type of news medium. Moreover, these studies were all focused on motivations behind news consumption—not micro-news consumption. While the two may be correlated, reading micro-news (i.e., reading short summaries or headings of news stories) may have different consumption patterns. Thus we aim to develop a baseline understanding of motivations behind why people read micro-news:

RQ1: What are the motivations of reading mobile micro-news?

3.2. Habits

Motivations represent conscious factors. However, there are also factors associated with the reading of micro-news which may have a non-conscious nature. Habits are one of those factors. They are a form of automaticity in response to a particular trigger, which develop as people repeat actions in stable circumstances (Verplanken and Aarts, 1999). LaRose (2015) found that habits of new and interactive media use are even stronger due to the frequency of chances to use interactive media leading to a great number of trigger stimuli for users and more easily accessible chances for repeated behavior.

Despite the increase in adopting the concept of habits in media research, there still remains the problem of parsimony in conceptual definitions. In fact, while LaRose's (2010) definition of media habit focuses on automaticity, scholars who use the term "media habits" most often do not have a clear conceptual definition. Even among the empirical studies that cited LaRose (2010), there was a wide range of different conceptualizations of habit, including frequency of past behavior (e.g., Hartmann et al., 2012; Vitak et al., 2011) and sets of behavior sequences (Taneja et al., 2012), which was a similar concept to what Abelson (1981) argued as being habits when he distinguished scripts from habits.

Even LaRose (2010) himself re-conceptualized habits in his 2010 article from his earlier work on deficient self-regulation (LaRose et al., 2003) and deficient self-observation (LaRose and Eastin, 2004). Deficient self-regulation was defined as a state in which the individual loses self-control over media usage, referring more to the "lack of control" aspect of the four components of automaticity. This construct, while it correlated strongly with the self-report habit index (SRHI), did not include behavioral frequency. Deficient self-observation, on the other hand, reflected lack of awareness and cognitive deficiency, and aligned much closer with the current definition of automaticity. Thus, earlier work by LaRose was based on the social cognitive theory perspective of deficient self-regulation and deficient self-observation conceptualized habit as a multidimensional construct instead of a unidimensional structure of automaticity.

The problem with the varied conceptual definitions of habit is not unique to media scholarship; it resides within the greater body of literature on habits in general, as critiqued by LaRose (2010). Even among scholars who acknowledge habits as a form of automaticity, there is disagreement between those who argued that habits are associated with goals (Aarts and Dijksterhuis, 2000; Verplanken et al., 2000) and those who argued habits can persist without goals (Neal et al., 2011; Wood and Neal, 2007). In addition, some scholars argued habits are behaviors that are frequently performed (Aarts et al., 1998; Verplanken and Orbell, 2003) while others maintain that habits can be independent of frequency of behavior: Gardner (2012) pointed out that saying "amen" after a prayer can be habit because it is an automatic response that is associated with the end of a prayer, even if one only attends church once a year.

It is important to understand that frequency of past behavior and habit have been used interchangeably (e.g., Hartmann et al., 2012; Neal, Wood, & Quinn, 2006; Vitak et al., 2011) despite ongoing arguments that the two are not equal (e.g., Ajzen, 2002; Gardner et al., 2010; Verplanken, 2006) because while there has been limited evidence of habit predicting future intention, there has been ample evidence of past behavior predicting future intention and subsequent behavior. Moreover, there are limited examples about the role of habits in the context of reading news in traditional and online media, most likely because activities such as reading are effortful and less likely to be correlated with automaticity. Nonetheless, Lee and Carpini (2010) found that habits must be taken into account as one of the predominant factors which can affect offline news consumption behaviors. Diddi and LaRose (2006) investigated predictors of news consumption patterns and found that habit strength plays the most significant role among all the factors in predicting the number of days spent reading news in a week from a variety of news sources. Wohn et al. (2012) also found that habit is significantly correlated with reading other people's posts in an online community. This provides further justification for the investigation of habits in the context of mobile micro-news, because micro-news are short and constantly updated throughout the day, providing reason for the reader to continuously check for new information.

3.3. Habits and frequency of past behavior

The repetition of a behavior plays an important role in the formation of habits. If a behavior occurs more frequently, it is more likely that the related cognitive processes start to form automaticity (Ronis et al., 1989). Aarts and Dijksterhuis (2000) found that the frequent performance of actions forms associations between actions and goals which lead to the development of habits. In other

words, when individuals engage in specific goal-directed behaviors performed in similar conditions, the brain association between the action and the goals becomes stronger.

The frequency of a behavior, however, should not be equated with habit (Ajzen, 2002). Verplanken (2006) conducted several studies on habits and found that habits are mental constructs that must be distinguished from frequency of occurrence. Wohn (2013) also distinguished frequency from habits, conceptualizing the latter as a form of automaticity. Thus while the two constructs are correlated, they are conceptually different. Limayem et al. (2007) found that the strength of habit depends on the degree of frequency of prior behavior. They indicated the frequency of past behavior as one of the factors behind the formation of habits in using information systems. Wood et al. (2002) found that habits accounted for over half of all media usage frequency such as watching TV, using the Internet, and reading the newspaper. Several other studies have also found correlations between habit strength and frequency of past behavior (Wohn et al., 2015; Wohn, 2012). Accordingly in this study, we investigate whether the frequency of reading micro-news relates to habit strength:

H1: The frequency of reading mobile micro-news will be positively related to habit strength.

3.4. Habits and time spent reading micro-news

Another factor which may explain mobile micro-news habits is the amount of time which is spent during this activity. On the one hand, habit is an automatic construct that has no significant theoretical linkage to time—most of the examples of automaticity in behaviors have mainly been behaviors that require very little time, such as flossing, saying "Amen" after a prayer, or drinking a glass of water in the morning (Gardner, 2012; Lally et al., 2010; Neal et al., 2006). However, there has been evidence in certain media usage contexts of a correlation between time and habit that may be unique to media habits as a domain in comparison to other types of behaviors. For example, Lee and LaRose (2007) found that habit strength was a strong predictor of the amount of time spent playing entertainment games. Also Wohn et al. (2012) found a strong correlation between time spent in an online community and habit strength. Therefore our second hypothesis investigates the relationship between the amount of time dedicated to reading micro-news and habit strength.

H2: The amount of time spent reading mobile micro-news will be positively related to habit strength.

3.5. Habits and context stability

Another important factor associated with habits is the stability of context in which a behavior is performed (Shiffrin and Schneider, 1977; Verplanken and Wood, 2006; Wood et al., 2002). In the present study, context refers to the environment in which the behavior of reading mobile micro-news has been performed within the past (Danner et al., 2008). Accordingly, context stability refers to consistency of executing this behavior with regard to the environment.

Shiffrin and Schneider (1977) found when individuals face an identical behavioral choice repeatedly within an identical situation and repeat their previous response, associations are made between their response and the cues defining the context. Therefore if the context remains stable and the individuals are satisfied with the response, the associations which are made will lead to automaticity. Wood et al. (2002) found that the defining quality of habit is the efficiency and automaticity of behavior which occurs within stable contexts. Verplanken and Wood (2006) also found that interventions which are aimed at habit change must include disrupting the environmental factors which cue habit performance in an automatic manner.

With media habits, however, there is still uncertainty as to what the stable context actually is and conflicting evidence with regard to its relationship with habit strength. For television and newspaper viewing habits, change in the context led to the disruption of these habits (Wood et al., 2005), suggesting a strong contextual effect. Schnauber and Wolf (2016) found a correlation between contextual stability of time and radio usage habits. However, there has also been evidence of habit activation that has not been context dependent, especially in the context of mobile devices (e.g., Bayer et al., 2016; Naab and Schnauber, 2016; Schnauber and Wolf, 2016). These results are not easily comparable given that the contexts measured in these studies were all different. Moreover, the literature itself is somewhat ambiguous as to what context actually means—for example, LaRose (2010) suggested that for mobile habits, the phone itself may serve as the stable context, but there remains a lack of empirical data examining different types of contexts.

According to Danner et al. (2008) there are three types of context in which a behavior is executed; time such a the time of day, space (i.e., physical location), and situation—which refers to the circumstances such as other people, weather, etc. Thus we will be looking at these three types of context stability and examining how different environmental contexts are associated with mobile micro-news reading habits:

RQ1: What type of context stability is related to the habit strength in reading mobile micro-news?

3.6. Continuation intention

Much of the early theoretical frameworks and empirical research on media usage focuses on adoption of new technologies (e.g., Technology Acceptance Model; Davis, 1989; Diffusion of Innovations; Rogers, 1995) and media choice (e.g., Social Cognitive Theory; Bandura, 2002; Theory of Planned Behavior; Ajzen, 1991; Uses &Gratifications; Katz et al., 1974). These theories have an underlying assumption that people make conscious decisions about media selection and usage. What happens, however, with behavior that is not the result of a conscious thought process? How do conscious and non-conscious processes contribute to continued media use?

A behavioral intention is a "cognitive representation of a decision to perform a given behavior" (Ajzen, 2002, p. 109). Intention is

one of key variables in reasoned action theories such as the Theory of Planned Behavior (TPB; Ajzen, 1991; 2002). This theory is a very prominent theory in terms of explaining behavior with conscious decisions. The model in TPB indicates that the perceptual variables of attitude, subjective norm, and perceived behavioral control are predictors of intention, which in turn predicts behavior.

Habit scholars have repeatedly tried to update the TPB model. Early habit work conceptualized frequency of past behavior as habit, which has since been critiqued by a number of scholars including Ajzen (2002). Researchers have found that past behavior overwhelmed the effects of all other psychological variables in explaining behavioral intention, as well as subsequent behavior. This is referred to as the residual variance effect (Ajzen, 2002). Ajzen (2002) noted that it is an "undisputed fact that the frequency with which a behavior has been performed in the past can be a good predictor of later action" (p. 108). More interesting than past behavior predicting future behavior were findings that past behavior directly predicted intention, since the correlations would not be based simply on measurement similarities.

The large effect of past behavior on behavioral intentions has led habit scholars to wonder if past behaviors were in fact reflecting the effect of habits. A meta-analysis examining intentions, past behavior, and later behavior found that the two significant predictors of future behavior were past behavior and intentions (Ouellette and Wood, 1998). When behaviors were not frequent, intention was the strongest predictor of future behavior, but when behaviors were frequent, past behavior was the main predictor.

Much of the research in the past ten years has therefore focused on the moderating effect of habit between intention and future behavior in the context of information systems (Limayem et al., 2007), transportation choice (De Bruijn et al., 2009), and health contexts (Gardner et al., 2012) among others. However, many of these studies used frequency of past behavior rather than automaticity as a measure of habit.

In addition to the interaction between intention and habit on future behavior, there is also research on the direct correlation between habit and intention (e.g, Amoroso and Lim, 2017; Wohn et al., 2012; LaRose and Eastin, 2004; Trafimow, 2000). For example, in a study about reading and writing behavior in an online community, Wohn et al. (2012) found that habit was significantly associated with intent to read others' content. Mouakket (2015) found that habit was directly correlated with intention to continue using Facebook. While habit, a non-conscious construct, is certainly not an antecedent of intention, a conscious construct, a cross-sectional will enable us to see how much of the intention can be explained by the non-conscious element of habit.

In this study, we thus build on this prior research by conceptualizing habit as a separate yet complementary element that explains intention in addition to motivation while controlling for frequency of past behavior. While we can hypothesize that habit will indeed have a direct effect on intention, our research question aims to look at how much added variance habit can explain while distinguishing automaticity from frequency of past behavior. This will enable us to potentially untangle the confounds surrounding

RQ2: Does habit strength adds significant explanatory power on top of motivation in explaining continuance intention of mobile micro-news consumption?

4. Methods

4.1. Data collection

To statistically test our research questions and hypotheses, we ran an online survey. Participants (N = 250) who lived in the United States were recruited through Mechanical Turk (MTurk), which is a service by Amazon enabling people to recruit its users to do different types of tasks without requiring any close interactions with the users. It is important to note that within demographic surveys, data which is obtained through conventional online subject pools is very similar to data obtained through MTurk users in many research (Shapiro et al., 2013). In addition, while not a nationally representative sample, MTurk workers tend to be of a significantly wider diversity compared to a typical American college sample and of a slightly wider diversity compared to the standard Internet sample demographic (Buhrmester et al., 2011). The MTurk users who participated in this study were paid $1.50 for their participation. Among the 250 participants who completed the self-reported survey, 52% were male. The participants had the median age of 32 (SD = 10.26) and were 79.6% Caucasian.

4.2. Survey measures

At the beginning of the survey, participants were given a description about micro-news. We wrote "micro-news refers brief text updates containing news content on social media platforms such as Twitter, Facebook, Reddit, Instagram, etc." We asked participants if they received micro-news on mobile social media platforms. If they answered "yes" to this question, we asked them which mobile social media platforms they used and gave them a list of eight options, plus an open-ended "other" that they could write in. (If they answered "no" they did not participate in the rest of the survey.) We also asked participants which was the *primary* mobile social media platform they used, and what topics they read. We then asked them a series of questions related to their news consumption behavior.

For motivations, we adopted items from uses and gratifications scales within previous studies (Vincent and Basil, 1997) and added original items related to information-seeking and social utility motivations based on pilot interviews (see Table 1). For habit strength we used the automaticity-related items from the Self-Report Habit Index (SRHI) (Verplanken and Orbell, 2003) and items from studies previously conducted on Internet use habits (LaRose et al., 2003). Our 7-point Likert scale habit strength scale (M = 5.09, SD = 1.18. Cronbach's α = 0.87) included the items:

"Reading micro-news through mobile social media platforms is …"

Table 1

Motivations for reading mobile micro-news: principal component analysis using varimax rotation (*N = 250*).

Motivations	Factor Loadings					
"I read micro-news on mobile social media platforms …" Info-Seeking: Local (*M* = 3.09, *SD* = 0.96, α = 0.86)						
To seek information about my city	**0.82**	0.08	0.06	−0.02	−0.02	0.02
To keep up with information about my hometown	**0.84**	0.09	0.06	0.02	0.01	0.05
To seek information on local weather	**0.77**	−0.01	0.04	0.06	0.04	0.05
To get local traffic information	**0.72**	−0.11	−0.03	0.21	−0.09	0.14
To know better about nearby locations	**0.79**	−0.05	0.15	0.12	−0.02	0.05
To get information on social events	**0.63**	0.20	0.20	0.13	0.10	0.08
Pass-time (*M* = 3.85, *SD* = 0.65, α = 0.82)						
When I have nothing better to do	−0.04	**0.79**	0.00	0.09	0.01	−0.13
Just because it's available on my mobile device	0.17	**0.59**	0.01	−0.17	0.18	0.12
Because it passes the time	−0.06	**0.82**	0.04	−0.06	0.19	−0.06
Especially when I'm bored	−0.04	**0.81**	0.09	−0.05	0.06	−0.03
When there's no one else to talk to	0.12	**0.75**	0.10	0.06	−0.10	0.15
Because it's a good thing to turn to when I am alone	0.09	**0.55**	0.28	0.07	0.07	0.32
Social Utility (*M* = 3.47, *SD* = 0.88, α = 0.85)						
To have something to talk about	0.06	0.15	**0.85**	0.06	0.11	0.16
To be knowledgeable in conversations	0.12	0.10	**0.85**	0.09	0.17	0.04
To find subject matter to discuss with other people	0.07	0.05	**0.86**	0.10	0.14	0.16
To make new connections with people	0.33	0.03	**0.59**	0.18	−0.13	0.23
Info-Seeking: Finance (*M* = 2.22, *SD* = 0.99, α = 0.85)						
To find business finance information	0.08	0.02	0.15	**0.85**	0.13	0.08
To get international market data	0.17	0.01	0.11	**0.87**	−0.09	0.11
To look for stock prices	0.16	−0.08	0.05	**0.85**	−0.05	0.13
Info- Seeking: Salient (*M* = 4.23, *SD* = 0.62, α = 0.74)						
To seek information about topics of interest	0.02	0.10	0.09	0.06	**0.77**	−0.04
To seek information on news headlines	0.04	0.05	0.11	−0.10	**0.81**	0.11
To search for interesting news content	−0.05	0.11	0.10	0.03	**0.80**	0.15
Entertainment (*M* = 3.12, *SD* = 0.85, α = 0.76)						
Because it's exciting	0.20	0.00	0.16	0.15	0.07	**0.86**
Because it is thrilling	0.13	0.01	0.18	0.21	0.05	**0.87**
Because it sometimes gives me a good laugh or cry	−0.03	0.17	0.38	−0.03	0.22	**0.48**

Note: Factor loadings over 0.40 appear in bold.

- Part of my usual routine
- A habit that I have gotten into
- Something I do without really thinking about it
- Something I start doing before I realize I'm doing it
- Something I have no need to think about doing
- Something I do without having to consciously remember

Time spent reading micro-news was examined through three separate items; the total number of perceived minutes spent reading micro-news on a typical day (*M* = 48.08, *SD* = 63.45), the day previous to the survey (*M* = 35.08, *SD* = 52.49), and per session (*M* = 15.54, *SD* = 28.55). Frequency was examined using three items asking participants to indicate the frequency of reading micro-news (*M* = 5.96, *SD* = 1.21), clicking on links to related news material (*M* = 5.36, *SD* = 1.41), and updating news sources (*M* = 3.55, *SD* = 1.62) on seven-point Likert-type scales from "never" to "several times a day." These measures were all perceived time and frequency from the perspective of the participants, thus do not represent objective time.

For context stability, we used items from Danner et al. (2008) asking about context stability in places (*M* = 2.70, *SD* = 0.68), time of day (*M* = 2.43, *SD* = 0.69), and situations (*M* = 2.61, *SD* = 0.72) of reading mobile micro-news, which the participants answered with a four-point Likert-type scale ranging from "never" to "always."

In order to examine general intention of continuing to read mobile micro-news, we adopted items over different time spans, namely, next week (*M* = 6.41, *SD* = 0.91), next month (*M* = 6.40, *SD* = 0.93), and next three months (*M* = 6.35, *SD* = 0.93) on a seven-point Likert-type scale ranging from "strongly disagree" to "strongly agree" (Bhattacherjee, 2001; Limayem et al., 2007).

5. Results

5.1. Descriptive results

When asked about the various mobile social media platforms they used for reading micro-news, participants said that Facebook was the mobile social media platform used most (80%), followed by Twitter (55%), Reddit (42%), Google + (21%), Instagram (16%),

Tumblr (10%), and Pinterest (8%). On average, participants were reading micro-news across 2.38 mobile social media platforms. We also asked the participants to choose the *primary* mobile social media platform they used for reading micro-news. Facebook was the most popular (46%), followed by Twitter (26%), Reddit (22%), and Google+ (3%). Since these platforms were different in affordances, we focused on the use of *primary* mobile social media platforms by the participants and the questions were with regard to these specific platforms. Participants also used a range of mobile devices: indicating the primary mobile device they used to read micro-news, the most popular devices were smart phones (93%), of which 63% were iPhones, followed by tablets that ranged from 7 to 10.1 in. screens.

In our sample, 43.2% of the participants said they received micro-news on these platforms several times a day and 46.8% of the participants said that they updated the list of news sources they followed on theses platforms every few weeks. Also 27.2% and 25.2% of the participants said they clicked on links to related news materials on these platforms several times a day and about once a day respectively. World (83.2%), national (80.4%), and technology (61.2%) news formed the main types of news for the participants.

We also studied the locations in which participants read micro-news on mobile social media platforms. 78.8% of the participants in this study said they got micro-news when they were at home in a personal place. The participants also said that they got micro-news at communal spaces at home (68.4%), at work (52.4%), and when traveling or commuting on public transport (29.6%).

5.2. Identifying motivations

RQ1 investigated conscious motivations behind reading mobile micro-news. We identified several motivations in our interviews and through prior literature, which we used to compose new survey items in addition to items used in prior research. We performed all the analyses using SPSS 22.

In order to statistically assess the motivations identified in the interviews, we ran a principal component factor analysis using Varimax rotation which explained 65% of the available variance. The result of the analysis and exact items are depicted in Table 1. Six different factors emerged in the analysis: social utility, pass time, entertainment, local information-seeking, salient information-seeking, financial information-seeking. These factors showed different dimensions of conscious motivations in reading mobile micro-news.

Social utility motivation is about individuals obtaining useful information and news through mobile micro-news which aids their social interaction with other individuals. The pass-time motivation focuses on when individuals have nothing better to do and tend to relieve boredom and occupy their idle time by reading mobile micro-news. The entertainment motivation explains when individuals seek enjoyment and amusement through micro-news. Consistent with previous research, we found that information-seeking was a major motivation. However, we found that information-seeking motivations were multidimensional and that they needed to be unpacked. The first information-seeking dimension focused on seeking local information such as traffic, weather, and local events. The second dimension was salient information seeking, which is about seeking information on the salient aspects of news, namely, breaking news, events, and specialized content. The third information-seeking dimension was financial information. This information-seeking dimension was about wanting to know stock prices, market data, and other money-related information.

5.3. Habits and frequency

H1 investigated the relationship between frequency and habit strength. As depicted in Table 2, a Pearson product-moment correlation coefficient was calculated for the relationship between the frequency of reading mobile micro-news platforms and habit strength. A strong positive correlation was found which indicated a significant linear relationship between these two variables.

Another correlation examined the relationship between the frequency of clicking on links to related news material on these platforms and habit strength. We found a strong positive correlation. We also examined the relationship between the frequency of updating the list of news sources on these platforms and habit strength and found a weak, but significant positive correlation. Thus H1 was supported.

5.4. Habits and time spent reading micro-news

H2 examined the relationship between time spent reading micro-news and habit strength. As shown in Table 3, a Pearson correlation coefficient was calculated for the relationship between the total time spent reading mobile micro-news "yesterday" and habit strength. A weak but significant positive correlation was found between these two variables.

Table 2
Correlations between frequency and habit strength.

	1	2	3
1. Habit strength	–		
2. Freq: reading news	0.44***	–	
3. Freq: updating sources	0.17**	0.23***	–
4. Freq: clicking on links	0.42**	0.71***	0.38***

Note. $*p < .05$, $**p < .01$, $*** p < .001$.

Table 3
Correlations between time spent and habit strength.

	1	2	3
1. Habit strength	–		
2. Time: previous day	**0.20**[**]	–	
3. Time: typical weekday	**0.28**[***]	0.67[***]	–
4. Time: per session	**0.02**	0.46[***]	0.48[***]

Note. *$p < .05$, **$p < .01$, *** $p < .001$.

We also examined the relationship between the total time spent reading mobile micro-news "on a typical day" and habit strength. We found a moderate positive correlation between these two variables which showed a significant linear relationship between the variables, but we found no significant relationship between time spent per session and habit strength. H2 was partially supported.

5.5. Context stability and habit

H3 examined the relationship between context stability and habit strength. As depicted in Table 4, Pearson product-moment correlation coefficients were calculated to examine the relationship between different types of context stability and habit strength. We examined three different aspects of environment: time, location, and situation.

We found significant but weak relationships between spatial context stability and habit strength and also situational context stability and habit strength. However the relationship between temporal context stability and habit strength was not statistically significant. Therefore H3 was partially supported.

5.6. Understanding intention

RQ2 inquired into the relationship between habit strength and continuance intention of reading mobile micro-news and whether habit strength adds significant explanatory power on top of motivation in explaining continuance intention. Therefore multiple models were calculated to predict the continuance intention of users based on their habit strength, motivations and demographics, age and gender, as we had three intention variables: intention for next week, intention next month, and intention in three months.

The model explaining intention for the following week was statistically significant, $F(9,249) = 15.58$, $p < .001$. Adding habit strength to the model with just motivation caused significant changes in adjusted R^2 (F change = 25.59, $p < .001$), adding to the overall variance explained. The final model indicated that habit and salient information seeking were the two variables significantly explaining intention.

The model explaining intention in the next month was significant, $F(9,249) = 14.79$, $p < .001$. Habit also added significant explanatory value to the model on top of motivation, F change = 19.88, $p < .001$. Salient information-seeking and habit were the only two predictors.

The model explaining intention for the next three months was significant, $F(9,249) = 11.27$, $p < .001$. Habit added significant variance in addition to motivation (F change = 16.91, $p < .001$). Again, salient information-seeking and habit were the only variables that were significantly related with the dependent variable (see Table 5).

6. Discussion

In this study, we found three factors linked with habits in reading mobile micro-news. Two of these factors were indicators of past behavior. Firstly, we found that the more frequent users read micro-news on these platforms, the stronger their habit was to do so. Habits were also strongly related to the frequency of clicking on links to related news material.

Second, the total amount of time which was spent reading micro-news was associated with their non-conscious habits. However, the amount of time that the users spent per session was not related to habit strength. This was consistent with prior research on micro-blog consumption patterns: although an average user takes into account 41% of micro-blog posts worth reading (André et al., 2012), the amount of time which users dedicate to reading a micro-blog post and attending to content that it involves is only around three seconds (Counts and Fisher, 2011).

Table 4
Correlations between context stability and habit strength.

	1	2	3
1. Habit strength	–		
2. Same place	**0.16**[**]	–	
3. Same time	**0.12**	0.50[***]	–
4. Same situation	**0.15**[**]	0.54[***]	0.55[***]

Note. *$p < .05$, **$p < .01$, *** $p < .001$.

Table 5

Regression model explaining continuance intention with habit strength and motivations.

Demographics	Next Week		Next Month		Next 3 Months	
Gender	− 0.06	− 0.06	− 0.10	− 0.01	− 0.08	− 0.07
Age	0.06	0.02	0.03	0.00	0.04	0.02
Motivations						
Info-seeking: Location	− 0.01	− 0.02	0.00	− 0.01	0.01	0.00
Info-seeking: Salient	**0.51*****	**0.46*****	**0.50*****	**0.45*****	**0.44*****	**0.39*****
Info-seeking: Finance	− 0.07	− 0.05	− 0.08	− 0.06	− 0.09	− 0.07
Pass-time	0.06	− 0.04	0.06	− 0.03	0.04	− 0.05
Social utility	0.05	0.03	0.09	0.07	0.13	0.11
Entertainment	− 0.02	− 0.06	− 0.03	− 0.07	− 0.03	− 0.06
Habit Strength		**0.30*****		**0.27*****		**0.26*****
R	0.55	0.61	0.55	0.60	0.50	0.55
AdjustedR²	0.28	0.35	0.28	0.33	0.22	0.27

Note. *$p < .01$, **$p < .01$, ***$p < .001$, values are standardized beta coefficients.

The correlation between environmental context stability and habits in reading micro-news was statistically significant, but very small. This was consistent with the theory that emphasizes context stability as one of the main factors facilitating the activation of habits (Verplanken, 1999) but its small effect size may signal a unique affordance of micro-news, which is its spontaneity. It could also be that context stability is important in habit formation but not once the habit is formed. Since our study was cross-sectional, we could not tease out this difference; future studies should employ longitudinal habit tracking to see changes over time.

We identified six categories of motivations of reading mobile micro-news. Similar to previous studies on news motivations, we found pass-time, entertainment, and utility as motivations behind the reading of mobile micro-news. We also found that there were three dimensions within information seeking motivations, namely, local location, salient, and finance. The dimensions indicate the existence of different information seeking motivations. In other words, users on mobile social media platforms get micro-news on these platforms in order to fulfill more diverse information seeking needs. This suggests that understanding how people consume micro-news on mobile devices may be more information-oriented than other types of news consumption; however further research is needed to see if this "unpacking" of information seeking motivations applies to other types of news reading that are not in a mobile micro-news context.

Lastly, we examined the intention of users on mobile social media platforms to continue reading micro-news on these platforms. Conscious motivations played a strong role in explaining continuance intention. However we found that adding habits to the model significantly improved the explanatory power of the model. This indicates that understanding habits is critical in trying to understand future usage.

At the same time, we also found a notable difference between the explanation of continuance intention between the different projected timeframes. The strength of the habit coefficient declined gradually as people projected into the far future, while the effect of salient information seeking motivations declined at a steeper level. This may indicate that habit has a more persistent effect than motivation; actual tests of this effect would be to track people's actual behavior, rather than their intention, over time. Since intentions are only perception variables, this study cannot determine whether or not habit influences actual behavior. A panel survey design administered over multiple time points may be able to better assess the longitudinal effects of habit.

6.1. Implications for system design

This study presents several design implications for mobile news services which use the idea of distributing their content in the format of mobile micro-news.

6.1.1. Importance of salient information-seeking

Similar to studies that showed headlines are valuable for predicting the popularity of news (Reis et al., 2015), the current study found that salient information seeking was the only motivation related to continuance intention of reading mobile micro-news on these platforms. What these findings suggest is that designing a mobile micro-news system should have different content display algorithms than those that news systems that are not on mobile platforms or take a more "rich" magazine-type design, such as Flipboard or ePaper (Shapira, Shoval, Tractinsky, & Meyer, 2009). It could also mean that even for the same service, such as Facebook, content delivery algorithms differ based on the device being used, which could be determined through detection of the operating system or other device specifications.

Given that there are studies that found that local news is limited on social media (Mitchell et al., 2015), it could be that developers have the opportunity to use the mobile phone's location to facilitate more local information (Oppegaard and Rabby, 2015; Xu et al., 2012) and collecting location-specific content from location-specific apps and other social media like Foursquare, Yelp, and Yik Yak. Schmitz Weiss (2013) pointed out that news organizations are only using location features for traffic and weather. While there have been many prototypes presented in the research community (Nyre et al., 2012; Väätäjä et al., 2012; Yeung et al., 2010) most of these are ambiguous about what the local news sources would be. This suggests an opportunity to involve users in generating that content

by creating location-sensitive news uploading features (Väätäjä et al., 2011) and further fostering the concept of spatial journalism (Schmitz Weiss, 2015).

While tailoring/customization of news content delivery is a major trend (Constantinides et al., 2015), requiring the user to frequently change their news source settings may interrupt with habitual usage because our results suggest that active engagement, such as adjusting news sources are not strongly related to habit. This may be because changing one's news sources is a less spontaneous behavior that requires much conscious thinking.

6.1.2. Importance of habit strength

Habit strength was correlated with the frequency and amount of time of reading micro-news but weakly correlated with situational and spatial context stabilities. The weak correlation with context stability gives more opportunity to designers because context is something that is difficult to control. Frequency, on the other hand, can be induced through things like notification systems or constant updating of new content. There is a fine line, however, between annoying and useful; more granular usability tests will have to prove optimal thresholds for reminding the user of new content; they may also vary between users.

While spatial and situational context stabilities were weakly related to habits, temporal context stability (i.e., time of day) was not related to habit. This was interesting because in our interviews, several participants discussed about reading mobile micro-news the first thing in the morning or the last thing at night.

On the one hand, this may imply that time of day is not important in developing habits. This could mean that there is a missed opportunity for designers. The platforms that our participants talked about (e.g., Facebook, Twitter, Reddit) all deliver content randomly throughout the day; it could be that the lack of correlation in our data is because despite people's desire for temporal context stability, these platforms do not deliver that. Combining current random content delivery with more structured content delivery associated with specific times, may help facilitate habitual usage. This strategy is used in certain news apps that are not social media (e.g., Yahoo News Digest, Circa), but is not present in social media.

It is important to note that increasing the time that users spend reading micro-news per session was not related to habit strength. However, the strong correlation between frequency and habit means that people check micro-news frequently in short bursts throughout the day. Having the interface distinguish between read content and new content may be one way of helping users who are constantly checking their social media. Also enabling users to see the content without having to actually touch their phone may be useful. At the same time, if users are constantly reading micro-news through the brief updates but not necessarily opening the app, it is difficult for system designers to accurately know how much of the app is being used, since reading updates is not logged on the back end. It is thus important to conduct surveys because engagement with the app may be much higher than what the servers record.

This also has implications for the business model that designers employ for news apps. If much of the engagement with the app is passively done through reading notifications, relying on advertisements that require active engagement with the app may not be the most lucrative solution. More research is needed to examine how different forms of presentation in the notifications are related to clicking the notifications to open the app.

6.2. Limitations and future research

One limitation of this study is that our sample of users is a not representative sample of all users on mobile social media platforms. Mechanical Turk users are more likely to be more technologically savvy than the average American. We also did not account for cultural differences.

In the present study, we studied reading micro-news based on participants' primary mobile social media platform. Future studies should investigate if there are platform differences in habits of reading micro-news; are the platform differences persistent across users or can we identify micro-news consumption habits that transcend platforms? In addition, there may be differences between people who use a single platform versus those that use multiple platforms.

We also looked at different forms of context stabilities and how they correlate to habit strength in reading mobile micro-news. The categories that we took into account were spatial, temporal, and situational context stabilities which all concentrated on environmental contexts. However we did not consider other types of context stability. Our future agenda includes investigating the relationship between habits and various kinds of context stabilities in reading micro-news.

Another limitation is that our measures of reading micro-news were based on self-report. Although self-report is commonly used as measures of media usage such as television, Internet, etc (e.g., LaRose et al., 2001; Rubin and Perse, 1987). It unlikely that individuals are accurately able to identify how much time they spend doing something. Thus when interpreting the results it is important to understand that time is not an objective measure but rather the individual's *perception* of how much time they spend.

Finally, while our study was about micro-news consumption, as mobile devices play an important role in transforming journalism work (Väätäjä and Egglestone, 2012) and also citizen reports (Starbird and Stamberger, 2010) practices, future studies may also look into factors related to micro-news production, such as when and how people share links. We also examined micro-news consumption in isolation; studying this in tandem with other modalities of news article consumption would be the natural next step.

7. Conclusion

In the present study, we used qualitative and quantitative methodologies to understand the intention of continuing mobile micro-news consumption. We studied the motivations and habits related to consumption of mobile micro-news. We identified six categories of conscious motivations including three categories of information-seeking motivations. Salient information-seeking was the only

motivation statistically associated with intention.

We found that habits add significant explanatory power on top of motivations in explaining continuance intention. Frequency of past behavior and time were strongly correlated to habit strength but spatial and situational context stabilities were weakly related.

Declaration of Competing Interest

The authors note no conflict of interest
There is no funding body to report for this research.

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