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An App for Every Step: A psychological perspective on interoperability of Mobile Messenger Apps

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An App for Every Step

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A psychological perspective on interoperability of Mobile Messenger Apps

René Arnold¹ and Anna Schneider²

Abstract

Mobile Messaging Apps (MMAs) such as WhatsApp, Facebook Messenger, LINE, Signal or Snapchat are used by many consumers next to the traditional electronic communication services (ECS) SMS texting and phone calls. While with ECS the idea of full end-to-end interoperability is one of the key features, initial research (28 qualitative interviews) conducted by us indicate that consumers use different MMAs to negotiate their social ties. In this paper, we extend this research with an analysis of the functionalities of 139 MMAs and 20 in-depth interviews focusing on how consumers use individual services to manage stages of intimacy in relationships, communicate a message's urgency, or craft social messages. We find that the technological seams between various MMAs indeed fulfil important functions as they enable consumers to mediate competence, relatedness and autonomy as defined in Deci and Ryan's Self-Determination Theory (SDT). Furthermore, the paper shows how the choice of MMA reflects different stages of relationship development. Finally, we show that consumers also rely on technological seams between MMAs to feel autonomous and competent in their social interactions as the choice of MMA and functionality according to the specificities of the situation adheres to a finely grained social code. For policy makers and regulators, our results indicate that imposing interoperability obligations on MMAs is likely to reduce consumers' well-being given the importance of technological seams to enact self-determination.

1 Introduction

Mobile Messaging Applications (MMAs) such as WhatsApp, Facebook Messenger, LINE, Signal or Snapchat have become very popular recently (Arnold & Schneider 2016). Commonly, consumers use these applications complementary to traditional electronic communication services (ECS) consisting of voice telephony and short message service (SMS) texting (Arnold, Hildebrandt, & Waldburger 2016) among others. In light of their immense success, it is surprising that so far only few authors have explored why consumers use MMAs. Our paper pursues two explanations for MMAs' success rooted in consumers' basic psychological needs fulfillment and aims to negate two typical assertions of the public debate around MMAs.

First, reasons for using MMAs are often linked to Fishbein and Ajzen's (1975) Theory of Reasoned Action (TRA) implying a rational consumer that seeks to reduce costs as most

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MMA's are offered at (almost) no monetary cost. So far, only two studies (O'Hara et al. 2014, Church & de Oliveira 2013) overcome these simplistic notions by exploring consumers' underlying motives in qualitative case studies. Our paper draws on these studies and our own semi-structured interviews to build a more systematic understanding of MMA's success framed in Self-Determination Theory's (SDT) (Ryan & Deci 2000) concepts of basic psychological needs fulfillment and its positive link to satisfaction (Sheldon et al. 2001) and enjoyment (Reinecke, Vorderer, & Knop 2014).

Second, based on the alleged like-for-like substitution of MMA's for ECS, the notion of applying similar or the same regulatory obligations on MMA's as are on ECS has gained some traction in the public debate recently (BEREC 2016). End-to-end interoperability being one of the core concepts of ECS (regulation) is among the obligations discussed to be transposed on MMA's. Arnold et al.'s (2016) results indicate that this would not be in the interest of consumers, who use the technological seams between MMA's (and between MMA's and ECS) proactively to manage their social ties. Our paper extends these findings with 20 additional in-depth interviews revolving around consumers' use of MMA's. Specifically, we explore how different MMA's serve different purposes, are used for distinct groups of ties, and function as gatekeepers. Our results are framed in the concept of seamfulness of technology (Chalmers & Galani 2004, Barkhuus & Polichar 2011) and stage models of relationship development (Knapp 1978, Altman & Taylor 1973).

The remainder of this short paper is structured as follows. First, a brief literature review presents the background to the present study and develops its research objectives. Second, we present and briefly discuss our methodology. Hence, the paper presents our findings based on two sets of semi-structured interviews (n=28 and n=20) conducted during Spring and Autumn 2016. The paper culminates in a conclusion identifying key success factors of MMA's and the implications of multi-homing for managing social ties. Based on this discussion, the paper continues to make recommendations for policy makers and regulators on how they can fulfil their ultimate goals of consumer welfare and well-being in potential actions relating to MMA's.

2 Literature Review

"Humans are profoundly social animals"(p.3) (Scholl 2013, 3). We require social interaction and interpersonal communication across all areas of our lives. Thus, it is not surprising that Rubin et al. (1988) show a link between basic psychological needs and motives for interpersonal communication. While they provide an extensive overview of various needs that appear to be linked to interpersonal communication, research on basic psychological needs has been converging towards three major needs as reflected in SDT (Ryan & Deci 2000):

1. *Competence*: Feeling that you are very capable and effective in your actions rather than feeling incompetent or ineffective.
2. *Relatedness*: Feeling that you have regular intimate contact with people who care about you rather than feeling lonely and uncared for.

3. *Autonomy*: Feeling like you are the cause of your own actions rather than feeling that external forces or pressures are the cause of your actions.³

These three needs are confirmed and reflected in various studies. They also constitute the frame for our paper. Sheldon et al. (2001) and Reinecke et al. (2014) show that fulfillment of these psychological needs is positively linked to satisfaction and enjoyment respectively. In line with these empirical results, Quinn and Dutton (2005) posit that speech acts interpreted as enforcing one's competence, relatedness, and autonomy increase one's energy, while interpretations decreasing one's need fulfillment will also decrease one's energy. In sum, these findings point to interpersonal communication being instrumental in need fulfillment.

Today, MMAs and other online applications e.g. social network sites (SNS) shape a significant part of our interpersonal communication. Karapanos et al. (2016) investigate the link between psychological needs and consumers' use of WhatsApp and Facebook. They use a sample of 494 participants and follow a methodology similar to Sheldon et al. (2001) to identify differences in the two services as regards the needs they fulfill. Although Karapanos et al. (2016) tested 10 psychological needs, only relatedness proved to be a significant predictor of intensity of use for WhatsApp. For Facebook, it was self-esteem.

Other accounts of consumers' motives to use MMAs do not make a direct link to basic psychological needs. They highlight in particular the additional functionalities that these services offer as the main drivers of their success. Three of these functionalities are salient in the literature. Notably, group chats enable consumers to enact groups and social behavior e.g. clustered around an event such as "John and Jane's wedding" (König 2015, O'Hara et al. 2014). Awareness and notification features of MMAs have been shown to offer both pragmatic benefits such as reception notification as well as an "additional set of concerns relating to accountabilities, moral implicatives and temporal meanings bound up in what can be perceived, interpreted and revealed through" (p. 8) the two blue ticks in the case of WhatsApp (O'Hara et al. 2014). Profile pictures and timelines featured by various MMAs offer a new opportunity for consumers to perform presentation of self (Dunne, Lawlor, & Rowley 2010, Arnold, Schneider, & Hildebrandt 2016).

Although the above studies do not make a direct link to competence, relatedness, and autonomy, these three basic psychologic needs transpire from their results. Group chats may be interpreted as enactments of relatedness, but may also be linked to autonomy as they can be perceived as burdensome given that one feels a need to keep up with conversations even though they are not inherently interesting (O'Hara et al. 2014). Awareness and notification features may be linked to competence as they enable subtle negotiation of relationships, thus also having an impact on relatedness. For instance, the visibility of typing and the time taken to type may be used as an indication of how much effort goes into crafting a message (O'Hara et al. 2014). Finally, presentation of self-strategies have been shown to depend on autonomy (Lewis & Neighbors 2005).

On this backdrop, the first research objective of this paper is to explore how consumers use MMAs and the functionalities they offer to mediate competence, relatedness, and autonomy in their conversations. As it has been shown that fulfillment of these basic psychological

³ The three definitions are quoted from Sheldon et al. (2001) [Appendix].

needs drives satisfaction and enjoyment also with a view to interpersonal communication, we further intend to interpret our findings to understand why MMAs are so popular.

When considering interpersonal communication and applications enabling it, relatedness merits more attention as concepts such as pleasant social interaction, creating a feeling of being understood and appreciated underpin this basic psychological need (Reis et al. 2000, Reis et al. 2010). Beyond mediating this need through their functionalities as discussed in the above, MMAs may play an even more important role in negotiating one's sphere of social interactions.

Two components of social interactions appear to be relevant to understand the potential impact of MMAs. First, stage models of relationship development (Knapp 1978) as well as social penetration theory (Altman & Taylor 1973) posit that relationships follow a staircase pattern, in which two people based on reciprocity climb the stairs until they arrive at a stage of relationship comfortable to both of them. The second component of social interactions refers to the relative strength of the social tie that is the prevalent outcome of the staircase process. Commonly, researchers distinguish weak and strong ties.

Graham et al. (1993) show that (1) communication with weak and strong ties fulfils different psychological needs and (2) triggers substantially different communication styles, breadth and depth. If need fulfillment and differences in functionalities of MMAs are indeed linked, then one may also expect that different MMAs lend themselves more naturally to weak or strong ties.

Arnold et al. (2016) find some indications for this drawing on the concept of seamfulness of technology (Chalmers & Galani 2004). Indeed, various studies support the idea that consumers proactively use the seams between MMAs (and ECS) to stratify their social contacts according to the strength of the individual tie (Reynolds et al. 2011, Church & de Oliveira 2013, Barkhuus & Polichar 2011) and to add meaning to messages or communicate urgency (2015).

If and how consumers' choice of MMAs differs across the typical stages of relationship development as well as weak and strong ties when relationships have stabilized is however still unclear. Consequently, to explore such potential differences is the second research objective of the present paper.

3 Methods

Unlike the majority of studies discussed in the literature review, this paper uses only qualitative methods – specifically semi-structured individual interviews – to arrive at its results. Within that, the paper broadly follows the key principles of Grounded Theory (Corbin & Strauss 1990, Corbin & Strauss 2008). The interviews for this study were conducted in two rounds. The first round consisted of 28 interviews. It was conducted during Spring 2016. It covered a broad set of topics revolving around consumers' use of Over-The-Top (OTT) services, of which MMAs formed a major part. It revealed indications of marked differences in usage patterns, need fulfillment, and ability to negotiate social ties relating to MMAs.

Based on these results, and in line with Grounded Theory's concept of constantly interweaving results, we conducted a second round of interviews with a new set of participants focusing only on MMAs and ECS usage. For this second round, only participants who used at least three MMAs were accepted. Since we expected to find these respondents mostly in the younger age groups (Arnold & Schneider 2016), their age was restricted to range between 18 and 25 years. This restriction furthermore enabled a more diversified observation of relationship development and negotiation of social ties as relationships at this age are typically not as stable as with more mature people. This set of 20 semi-structured interviews constitutes the main source for the following results.

For the analysis, the results from the initial round of interviews were intertwined with the results of an accompanying research project that analyzes the functionalities of 139 MMAs (Arnold et al. 2017) to build an initial set of codes. These were extended by analyzing the transcripts of the second round of interviews and continuously revised in light of additional findings from the literature review performed for this study.

4 Results

This section presents the results of the two rounds of semi-structured interviews. The section commences with a brief overview of the results of the first round of interviews and hence presents our findings from the second round of interviews as regards consumers' mediation of competence, relatedness, and autonomy through MMAs as well as their proactive use of technological seams between MMAs in detail.

4.1 Results of the first round of interviews

The first round of interviews already points to a link between specific functionalities and the need for relatedness. For instance, audiovisual chat features register with participants as eliciting increased levels of feeling understood and sharing the moment even across long distances.

"I use it a lot with my boyfriend, when we can't see each other otherwise or with my mum. She gets a FaceTime call for her birthday if I can't be there in person. [...] It is simply much more personal. In the beginning, the first FaceTime or Skype calls were quite awkward, almost like going out for a coffee with somebody for the first time." (Emma, 19)

"My daughter, she studies in Turin. She put that [Skype] on my computer, so we can chat from time to time. We can see each other then. That's pretty great!" (Stefanie, 52)

Participants describe most vividly how awareness and notification functionalities can decrease one's autonomy, but bear important meaning for the enactment of relatedness.

"Some really keep an eye on this [notifications]. There is this aspect of surveillance. I think you have to be careful what you make of it. [...] Sometimes it drives me crazy to see somebody has received and read the message, but does not reply." (Sabine, 23)

"Of course, I would like to know when the other one has read this. So that I can get mad because the other one has read it, but has not bothered to reply in days. [...] But that always depends on the relationship you have or may have." (Shanti, 20)

Instances that point to consumers' proactive use of technological seams between various communication channels refer mainly to the difference between MMAs and ECS.

"I would never ever send a WhatsApp to my landlord. He sent me one and I really couldn't have cared less. [laughs] For acquaintances, it is always SMS with me." [Only with friends WhatsApp messages are exchanged.] (Emma, 19)

"I make phone calls only to good friends or my girlfriend, or if it is necessary for work." (Lars, 23)

We employed these findings to guide the development of the participant selection process as well as the discussion guide for the interviews conducted in the second round. The following sections describe these results in detail. We begin by presenting the results referring to the first research objective of this paper.

4.2 MMAs and need fulfillment

The second round of interviews generally confirms our notion of MMAs enabling better need fulfillment than ECS that transpires from both the literature and the initial interviews. However, more subtle effects emerge that also point to issues similar to the negative effect of awareness and notification functionalities on autonomy noted before. The following paragraphs present our findings as regards the two most salient functionalities emerging from our interviews.

Beyond mere practicalities of being able to correspond with several people at the same time, group chats enable a much more realistic enactment of group behavior than ECS. This fulfills the need for relatedness, but also mirrors enactment of competence and autonomy very much like in actual social groups. One can choose to partake in conversations or just listen (autonomy). Even if one chooses only to listen, one has the full picture of the conversation that is going on. Hence, it is more likely that one feels enabled to make competent decisions about if and when to speak and whom to address depending on the topic. Indeed, the transcripts imply a feeling of missing out when only using individual contacts such as featured in SMS to organize group activities.

“We have got a family group [...] this somehow makes me feel as if we all were sitting in a large room and we all can share our experiences, feelings and so on. This is nice. [laughs]” (Helena, 20)

„If you weren't part of this group, then you wouldn't go on holiday with them, because you wouldn't know nothing. Unless someone tells you about it, but then you would have to rely on others always. So, and then, the others will agree on something and you can't take part.” (Katharina, 21)

Group chats may however also become burdensome for consumers. This effect registers with participants in our study in particular when the members of the group chat consist of somewhat distant friends or acquaintances. If such groups execute some degree of peer pressure to respond this may just as in real life thwart one's autonomy need fulfillment. To regain their autonomy, some participants explain how they deliberately withdraw from conversations by not opening messages received or muting group chats altogether. Notably, this behavior is only relevant with weaker ties or when participants' need for relatedness is otherwise low as regards the social group in question.

“Sometimes it's really annoying [...] I really only use them [group chats] when we are planning something.” (Luca, 20)

“Well, if I were to not use them [group chats] anymore, this would backfire at me. It would make my life harder, so it's about maintaining your social network and that's why it's almost impossible not to use them. So, it's really somewhat like peer pressure, but it makes things just so much easier, so it's not like anyone would go 'I feel pushed to use WhatsApp', I think it's more about the advantages.” (Daniele, 20)

Awareness and notification functionalities allow MMA users to see when another user was last online, when their message has been received and hence read unless the other user has switched off these functionalities. Although these functionalities may somewhat constrain one's autonomy as one's actions become transparent to others, it is interesting to see that the majority of participants in our study leave awareness and notification functionalities switched on. We find that the fulfillment of relatedness and competence needs appears to trump thwarting one's need for autonomy.

As regards relatedness, notification functionalities are actively used to collect evidence regarding the amount of reciprocity within the specific conversation. Essentially, they act as yardstick for assessing the quality of the relationship. Replies given immediately after a message has been received signal appreciation, care and closeness. Hence, this function aids relatedness need fulfillment. On the other hand, enacting this social code can fulfill the need of competence as one can feel capable in managing relationships with others effectively.

“[It depends on] the importance of what I just sent and also on whom I sent it to whether I care about if it has actually been read; the blue tick you know. But what

I find even more annoying is when the other one has been online and did not bother to respond [...] I feel ignored then.” (Daniele, 20)

“[...] and when she does not respond right away I think like well that’s not OK, that’s not nice.” (Nils, 25)

“The more important the person is to me the quicker I reply. But sometimes you can see that someone has sent you a message in like the preview [push message] and then I decide not to click on it because then the other one would see that I have read it. With some people I deliberately hold back, sometimes is just the situation though, you know. Like if I don’t know like when you had a fight or something, then you take your time to reply. Or if somebody wants to complain about something and you are just not in the mood to listen to this stuff right now.” (Svenja, 24)

4.3 Seams between MMAs and social sphere

The transcripts from the second round of interviews support that consumers proactively use the seams between MMAs to negotiate their social ties. We structure this section broadly along the idea of stages of relationships development posited in the approaches mentioned in the literature review (Knapp 1978, Altman & Taylor 1973): (1) Orientation Stage; (2) Exploratory Affective Stage; (3) Affective Stage; and (4) Stable Stage.

Overall, the interviews show that participants’ choice of MMA changes with the stage of relationship development. Notably, some ties remain at the orientation or explorative affective stage. Continuing distance reflects in a stable choice of MMA or in fact keeping people away from one’s MMA contacts altogether. Very close and intimate ties on the other hand gain access to all communication channels available. With them the choice of a specific MMA, SMS or phone call may however signal other codes such as the level of urgency of a message.

During the *Orientation Stage*, people are keen to impress others. Information sharing during this stage shies away from intimate topics. Interpersonal communication commonly adheres closely to social norms. Interactions that break these social norms are not only disturbing, but may lead to an abrupt breakup of the relationship. Premature progression to another MMA and thus the next stage of relationships development features among such actions.

MMAs used to make contacts (Instagram, Tinder, Lovoo) revolve around idealized presentations of self and learning about the idealized selves of others. On the other hand, SMS and email are used commonly with ties that are likely to remain distant to one. All services used during this early stage strike a balance between allowing a controlled approach and a potentially abrupt avoidance of social contacts.

“Instagram is interesting, to me it’s all about checking out posts by others.” (Anna, 23)

“Instagram is so intuitive, but it’s not really personal. I think, because you always have to think about what you upload, so you always take care that you look as good as possible, like, you choose your photo angles well.” (Marie, 19)

“I choose to text with people who I don’t know on Lovoo and Tinder, but not on WhatsApp.” (Marius, 19)

“On Lovoo and Tinder, that’s not even friends! Acquaintances maybe. I really don’t have any personal contact to them.” (Marius, 19)

“Email is only for business contacts. It’s not really about communicating with friends.” (Anna, 23)

“[...] or everything that I have to talk about with my boss and so on, that’s all on email.” (Elisa, 20)

In the *Exploratory Affective Stage*, people commence to reveal more details to others. While truly intimate information is still withheld, views on politics or sports may be shared freely and honestly. In fact, most relationships remain at this level, which is commonly associated with casual friendship.

Given this description of the *Exploratory Affective Stage*, it is not surprising that participants associate Facebook and Facebook Messenger with it. Notably, participants hardly ever differentiate between the social network and the corresponding MMA. In line with the stages of social penetration theory, it may be exactly the mix of a strong presentation of self on the social network and extended communication functionalities that make Facebook so well suited for this stage.

As a communication tool, Facebook captures both ties that one seeks more contact to i.e. the ones that have moved up from the first stage and weak ties that are likely to remain at this level for the foreseeable future. Such ties can include classmates and other casual contacts e.g. from gym class or holidays. Participants described their behavior on this application as somewhat passive and seemed to care little for engagement with their contacts here.

“When I have got to know someone a little bit better then I also add him on Facebook. [...], but I would not add anyone whom I know for only like five minutes or less.” (Simon, 21)

“There are still Facebook messages that I have not even replied to.” (Danielle, 20)

“When something reaches me on [Facebook] Messenger I often don’t even bother to look at it.” (Lea, 21)

At the *Affective Stage* disclosure of personal and private matters starts. Emotional engagement and a truly personal touch to conversations are expected at this stage. If social contacts’ levels of disclosure and engagement do not match, irritations will develop. The

transcripts indicate that Snapchat and WhatsApp are the MMAs used once relationships grow closer. Indeed, their functionalities allow very personal ways of crafting social messages and expressing feelings with inter alia emojis, stickers or private (even intimate) pictures.

“But when the other does not use any smileys that’s when I stop using them as well. So, I think smileys really express the mood of the conversation.” (Daniele, 20)

“Facebook is about less important people, WhatsApp is for the important ones.” (Daniele, 20)

“Snapchat is like you somehow share more intimate things [...] because you know it’s gone after 24 hours.” (Helena, 20)

“[...] especially with WhatsApp there are many misunderstandings [...] because people there don’t really know you.” (Elisa, 20)

Once the *Stable Stage* is reached, consumers disclose themselves openly and feel comfortable with it. Not only are they able to predict how the other person will react to certain types of information, they are also interested in registering and understanding the feelings of their partners fully especially when it comes up to personally relevant topics. Consequently services such as Skype are used that allow a near natural experience of communication as they introduce nonverbal cues into the conversation.

“When a friend [good friend / bff] calls me and she’s crying her eyes out, really upset, then I will know immediately. On WhatsApp that’s not the same. When I text ‘How are u’ and she goes ‘not too bad’, right? And really she’s crying.” (Lea, 21)

“It’s different because you can see the other one, you see how they feel and you hear it in their voice. I mean on the phone, yes, you can hear it in their voice, but you still don’t know what’s really going on. But when you [...] skype or facetime and you can see the other one [...] their body language, gestures and so on. That’s a real difference to reading a few lines of text with smileys.” (Imke, 24)

4.4 Seams support self-determination

The results presented so far underscore that consumers use MMAs to mediate interpersonal communication. Within that they attend to a finely tuned set of codes enabled by additional functionalities of MMAs, but also by the mere choice for contacting the other via one application or another. Arguably, the technological seams between the various MMAs fulfill an important function as regards protecting one’s autonomy and competence in negotiating various levels of relationships. Thus, our suggestion towards the end of each interview to abolish these seams resonated strongly and negatively with consumers. Faced with the idea that technological seams between MMAs could cease to exist, participants described

feelings of being deprived of their privacy, but mainly their autonomy and competence to negotiate social ties. Specifically, they fear that even looser ties would be able to enter areas restricted for closer ties.

“Wow. Totally blindsided. Because like everyone could reach out to me everywhere. The problem would be that you cannot [break] that you don’t have any possibility for retreat. [break] because everyone could get in touch with me and I don’t want that.” (Luca, 20)

“By choosing the application you can like decide whom to communicate with on which level.” (Yannik, 23)

“I think like even though we post and share so much stuff, it’s still important that you can decide you can see what.” (Nils, 25)

5 Conclusion

This paper aimed to shed light on two assertions about MMAs commonly reflected in public debates around imposing similar obligations as apply to ECS on them. First, our results show that MMAs’ additional functionalities can provide better fulfillment of basic psychological needs than consumers can achieve by using only SMS. This finding can also explain MMAs’ significant success, which is most likely not solely due to offering texting at (almost) no monetary cost. Second, our results support Arnold et al.’s (2016) initial finding that consumers proactively use the technological seams between MMAs to negotiate social ties. In fact, suggesting to consumers that these seams could cease to exist registered very negatively with participants, who felt deprived of their privacy if everyone would be able to contact them on any communication channel.

While SDT (Ryan & Deci 2000) and stage model concepts (Knapp 1978, Altman & Taylor 1973) individually can offer convincing explanations of MMAs’ success and consumers’ preferences for multi-homing, an overarching perspective may offer a complementary explanation. Various social norms and practices which exert subtle pressures on usage emerge from the transcripts. For instance, participants concur in their descriptions of how different MMAs correspond to the various stages of relationships. They also seem to have a learned understanding of when which kind of message (text, voice, video) is appropriate, if and how emojis are used, and other subtle codes, which users themselves may not be so conscious of or readily articulate.

Independent from the perspective on the results, our paper is one of very few that puts forward an interpretivist approach on psychological concepts that are commonly tested only in fundamentally positivistic research. Our paper adds substance to studies by Sheldon et al. (2001) or Karapanos et al. (2016) as it explores how consumers fulfill their psychological needs through functionalities and technological seams.

For policy makers and regulators, our results highlight that full interoperability is by no means always positive for consumers. In the case of MMAs imposing full interoperability obligations

may in fact harm consumers' well-being as a significant part of their need fulfillment in interpersonal communication builds on technological seams between MMAs as well as a clear distinction between MMAs and ECS.

Future research should focus on disentangling interpretations enabled by psychological concepts and explanations following the idea of social norms dictating MMAs use in interpersonal communication and navigation of social interaction. Specifically, researchers may address the question of whether MMAs are indeed a kind of 'neutral' tool that individual consumers wield of their own independent volition to satisfy their different and changing needs or if learned social norms mediate feelings of competence, relatedness and autonomy fulfillment.

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