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Mobile Media – Mobile Creativity?

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Abstract

Today's society is characterized by a mobility shift in the usage of media, which influences the ways people communicate and express themselves. This paper explores the basic correlation between mobility and creative ways of mobile phone usage. The results of a study conducted among 597 students at the University of Paderborn show how mobile phone users adopt creative ways of communicating in their daily life. Furthermore, different special subgroups of mobile users and their creative actions could be identified. The analysis also reveals a correlation between creative mobile usage and mobile gaming. All in all, this paper aims at highlighting the creative ways in which young adults use mobile technologies.

Keywords

Mobile Media; Mobile Communication; Creativity; Mobile Gaming

1. Mobility turn – The Mobile Phone as Metaphor of Ubiquity and Symbol of Mobility

A number of authors have pointed out that we are on the move toward a mobile society in which growing mobility in all arrays implies a pre-condition for participation (e.g. Baumann, 2003; Bonß & Kesselring, 1999; Castells, 2000; Tully & Baier, 2006; Tully, 1999; Urry, 2010). It seems that being mobile constitutes a general principle of the 21st century: a 'mobile world' has been proclaimed (Hamill & Lasens, 2005) and Weibel (2003) maps out visions of a 'mobile society' discussing physical and virtual mobility. Steinbock (2005) addresses the question of how mobile devices and services transform life, work, and play. Urry states that, in consequence, these theorists and other empirical analysts "are mobilizing a 'mobility turn', a different way of thinking through the character of economic, social and political relationships" (Urry, 2010: 6).

Dominant theoretical approaches in the study of mobility in the context of modern society refer to traditional sociological categories such as differentiation, specialization and individualization. However, it may be more insightful to rethink sociological categories in the light of our mobile society. Mobility entails the dissolution of traditional structures, yet it also creates new arrays. Current approaches to new patterns of communitization have been developed by Baumann (2003) and Urry (2000) and in their concepts of 'scrapes' and 'flows' as well as by Castells *et al.* (2007).

The ubiquity of mobile media enables communication anywhere and anytime – according to Castells et al., 'a mobile network society' is emerging. Time and space are constitutive of a society and its social structures, as well as its changes (Castells *et al*., 2007: 171). In order to grasp the new tendency of mobilization, Castells et al. introduce the terms 'space of flow' and 'timeless time'. 'Space of flow' is defined as the "material organization

of simultaneous social interaction at a distance by networking communication" (2007: 171). It does not describe a space independent of location, even though the location of the person communicating is no longer considered as the location of communication as such (Castells *et al.*, 2007: 174). Instead, the points of communicative intersection lead to the construction of a geographic net. With the metaphor 'space of flow' Castells et al. illustrate the modified form of communication against the backdrop of 'anyplace'. According to Castells et al., the second central characteristic of the mobile network society is 'timeless time', which expresses the fact that interaction no longer depends on time and can be devised freely. Particularly "in-between times," i.e. periods of waiting and spare time, are phases that can be used for mobile communication and social interaction (Castells *et al.*, 2007: 174). As mobile communication moves the spatial frame of reference into the background, the flow of communication becomes more significant.

Mobile media such as iPads, handhelds or mp3-players shape today's everyday life and are embedded in complex media cultures. Yet mobile phones[1] in particular can be understood as the medium and metaphor of the current postmodern mobility. At the beginning of the 20th century, Georg Simmel observed that the pocket watch and its wide distribution was the symbol of modernity (Simmel, 1997: 177). Nowadays, mobile phones have a similar significance in shaping the daily life, as they are further developed into universal networking instruments. Mobile phones are "personal, portable, pedestrian" (Ito *et al.*, 2005), and they have been "quickly adopted – attached to the body like watches" (Castells *et al.*, 2007: 77). Moreover, the mobile phone is a pervasive technology, it "has moved from being the technology of a privileged few to an essentially mainstream technology" (Castells *et al.*, 2007: 7).

The significant influence of mobile phones is reflected in the enormously growing market. In 2011, 1.4 billion mobile phones were sold worldwide. In Germany, 29 million phones were sold, 10.1 million of them being smartphones (Bitkom, 2011a). Overall, 61 million Germans have a mobile phone today (Bitkom, 2011b) and even every fifth person owns a smartphone (Bitkom, 2010). Especially with the launch of Apple's iPhone in 2007, smartphones gained popularity and acceptance. The integration of mobile phones and smartphones in our everyday life influences media practices as well as the ways people communicate with each other. Mobile phone users are no longer just communicating one-to-one but, due to the ubiquitous connectivity and technological capabilities, also many-to-many (cf. Urry, 2010: 174f.). According to Urry's concept of a "mobile world" (2010: 3ff.) being online is important for the users of mobile phones. Every fifth internet user between 14-69 years of age in Germany is online via mobile communicative devices, such as smartphones or tablets (Langer, 2011: 9). When buying a mobile phone, 78% ensure that it is web-enabled (in 2010 it was 60%).

Due to the enhancement of its range of functions, different communication

1 In this article we use the term 'mobile phone' to denote the general concept of any mobile communicative device, cellphone or smartphone. The term 'cellphone' is used for mobile phones without internet access for which the installation of apps is generally not intended. In contrast, the latest innovation in the area of mobile media is referred to as 'smartphone.' It is characterized particularly by mobile internet usage, applications, and GPS. Hence media convergence emerges, as previously separate technologies are combined and can now interact with each other synergistically.

possibilities emerged and a series of "m"-neologisms have arisen, such as m-gaming, m-learning, m-commerce or m-entertainment (Castells *et al.*, 2007: 78). Through the use of a ubiquitous technology, communicative mobility advances to a global cultural technique.

2. Creative Mobile Communication

The described mobility turn has crucial influences on the ways people communicate. Smartphones have been turned into multi-purpose-devices and therefore mobile media convergence (e.g. Jenkins, 2006) is becoming more and more important. Moreover, simultaneously with the network shift and the development from web 1.0 to web 2.0, the user has taken an active part in the communication process. The (inter-)active users create content on their own and can distribute their ideas in diverse ways on multiple platforms, using various ways of expression. Therefore, the internet is also referred to as a participatory medium and user-generated content has a great significance (Rheingold, 2008). According to Rheingold, specific participatory media are, for instance, blogs, wikis, music-photo-video sharing, podcasts, virtual communities and social network services (2008: 100). As a consequence of the participatory factor, a creativity shift in (mobile) communication can be observed: sharing photos, creating individual online profiles, making and publishing videos are a significant part of (mobile) network communication. Users have the option of producing content and sharing it on the internet, which means that "co-creation" is a key-feature of interactive communication (Klimmt, Vorderer & Ritterfeld, 2007: 171). The creation of content and the possibility to provide content directly via mobile devices to others enables new temporal forms of expression. Could these be described as creative processes?

The scientific community has developed diverse definitions of creativity in the different disciplines which also vary among major thinkers within the field (e.g. Csikszentmihalyi, 1988; Gardener, 1993; Sternberg, 1988, 1999; Runco & Pritzker, 1999). Creativity is often described as a mental process which leads to new ideas or advances existing concepts (Jackson *et al.*, 2012: 370). It is therefore linked with creation, novelty and usefulness (e.g. Plucker & Zabelina, 2009: 6; Russ, 2003: 292). To emphasize the observability of the mental process Plucker et al. (2004: 90) define creativity as the "interaction among aptitude, process and environment by which an individual or group produces a perceptible product that is both novel and useful as defined within a social context."

There are two aspects of this definition which seem particularly interesting. On the one hand, creativity is considered as the output of a single person as well as that of a group. On the other hand, it supposes a correlation between a creative product and the social context. This means that for being creative it is important to foresee an integration of the product into a social environment. The influences of social and cultural aspects on creativity were, for instance, discussed by Csikszentmihalyi (1988, 1999). These two points are supported in particular by the technological capabilities of mobile communication. With wireless networks it is easier than ever to connect several devices. With social networks and other online platforms, temporal and spatial limits no longer restrict the collaborative work on creative outputs, as well as the presentation, visualization and

exchange of these outputs. The interrelationship between creativity and digital technology is increasingly discussed because it has been proven that interactivity, storage capacity, range and speed of the internet and further functions encourage creative thinking and actions effectively (c.f. Kaufman & Sternberg, 2007). The different technologies are understood as auxiliary tools for these creative practices. Digital technologies – in this case smartphones – support a playful and exploratory dealing with ideas, material and information. The flexibility in time and space – or, following Castells "timeless time" and "space of flow", could also improve creativity (cf. Loveless, 2007).

Moreover, in recent years the degree of creativity has been a subject of research. Three main categories can be distinguished. The highest degree includes eminent creative contributions of persons who are considered to be very talented or even geniuses in their fields of interest. This level of creativity is called "Big-C" creativity (cf. Kaufman & Sternberg, 2007: 57). This high-level creativity may be less detectable in mobile media usage and a wider understanding of creativity as for instance Richards et al. suggest with the term "everyday creativity" (Richards et al., 1988: 476) seems to be more suitable in this context. This second form of creativity is not reserved for special talents, but comprises more or less any person's creative output. This everyday creativity (also called "little-c" creativity) varies in quality and quantity and is not limited to special "fields of endeavor" (Beghetto & Kaufman, 2007: 73). According to the definition of creativity suggested by Plucker et al. (2004, see above), the results should be useful and original (c.f. Beghetto & Kaufman, 2007: 76). A third level suggested by Beghetto and Kaufman is called "mini-c" creativity and could be described as a first step towards creativity. It is defined as "the novel and personally meaningful interpretation of experiences, actions, and events" (Beghetto & Kaufman, 2007: 73). The difference between mini-c and little-c creativity is that the output of mini-c creativity needs to be useful and meaningful only for the creator himself (intrapersonal judgment), whereas little-c creativity requires an acknowledgement by others. The three described forms of creativity are seen as a chain of development, beginning with mini-c, which can become little-c, and, in extraordinary cases, can turn into Big-C.

The creative communication with mobile phones could be part of mini-c creativity processes because technological features foster creative thinking and actions, but the results are not necessarily published. However, due to the characteristics of the network society and ubiquitous connectivity (see section 1) the publishing of creative outputs is comparatively easy and quick. Thus, the possibility of everyday creativity (little-c) arises. Based on these definitions of little-c and mini-c creativity the following survey investigates how the use of mobile technology involves and promotes creative practices in the broadest sense.

The aspect of creative thinking, especially regarding the generation of ideas and problem solving, is not just essential for creativity, but also for playing (Russ, 2003: 291). Both creativity and playing, as well as their relationship, have been studied extensively (cf. Russ, 2003: 291f.). On a theoretical basis it could be assumed that the development of cognitions and affects during play is crucial for the creativity of a person (Russ, 2003: 291). Russ has conducted a review of literature focusing on empirical studies with the result that play and creativity not just correlate but that play in fact facilitates creativity

(Russ, 2003: 300). This close connection between playing and creativity is quite interesting regarding the creative usage of mobile phones because one significant part of the mobile phone use is playing mobile games. For example, over 60% of the German smartphone owners play at least several times a month on their mobile phone (Goldhammer & Lehr, 2011: 26). Are mobile gamers therefore more creative in dealing with mobile communication devices?

We have conducted a study which took an explanatory approach in order to examine the relationship between the crucial and complex concept of creativity and mobile communication. Because there is little knowledge of how the mobility turn influences creative thinking and the use of mobile devices, we were particularly interested in the patterns of social daily life usage. Against the backdrop of the close connection between playing and creativity we will examine whether mobile gamers (m-gamers) are more creative in their use of mobile devices than non-mobile gamers (non m-gamers).

The study addresses the following research questions: Is there any kind of creativity in today's mobile phone usage and are there specific user types? On the basis of these questions, we suggest the following hypotheses:

H1: Mobile phone users adopt creative ways of communication in their daily life (creativity shift).

H2: A correlation between creative mobile use and participatory possibilities may be revealed.

H3: There are different user types concerning the creative use of mobile phones.

H3a: Smartphone users are more creative in their using habits compared to cellphone users.

H3b: Especially iPhone users show a creative usage.

H3c: Mobile gamers are more creative in their mobile phone use compared to non-mobile gamers.

3. Methods

The standardized analysis that examines the patterns of mobile use is designed as a quantitative online study and the data for the main survey were collected in May 2011. The basic population of this survey is made up of students who were enrolled at the University of Paderborn while the study was conducted.

A total of 597 students participated in the online survey. They were invited via email, social networks such as 'Facebook' and 'twitter', official university websites and flyers. Since internet access is fully supplied, every student of the population had the opportunity of participating in the online survey. On average the students took ten minutes to fill out the online questionnaire. The data were analyzed with the statistical program 'SPSS Statistics 19'.

This paper aims at providing an overview and therefore focuses on bivariate analyses. Especially Cramer's V which is based on Pearson chi-square statistics as well as correlations will be discussed. The results will be presented in the following section.

4. Sample Description

All in all, the survey consisted of 49.6% of female and 50.4% of male students. Furthermore, the cellphone (50.3%) and the smartphone users (48.2%) were almost equally

distributed. Nine people answered that they do not possess any device. Compared to the general spread (in Germany every fifth; Bitkom, 2010), the smartphone possession is above average: every second student owns a smartphone.

Variable	Cellphone	Smart-phone	Total
Age			
19-21	28.8	28.4	28.6
22-24	35.6	33.3	34.7
25-27	23.7	24.6	24.1
28 and older	11.9	13.7	12.6
Total	100%	100%	100%
Field of study			
Cultural Studies	52.8	38.0	45.4
Economic Science	9.0	22.0	15.7
Natural Science	7.3	6.6	6.9
Engineering	10.6	10.1	10.2
Computer science	20.3	23.3	21.8
Total	100%	100%	100%
Gender			
Male	40.5	61.3	50.4
Female	59.5	38.7	49.6
Total	100%	100%	100%
	50.3	**48.2**	

Table 1: Sample Demographics (Basis: all respondents; n=597)

However, there is a gender gap between cellphone and smartphone users. Male students hold significantly more smartphones (61.3%) than female students (38.7%) ($p<.001$; Cramer's $V=.21$). This confirms the gender difference stated for all smartphone users (for further investigation and studies, see Bitkom, 2010; Castells *et al.*, 2007; Huyer *et al.*, 2005).

Table 1 illustrates that 45.4% are enrolled in a cultural studies course. 15.7% study economics, 6.9% natural sciences, 10.2% engineering and 21.8% computer science. There are significant differences concerning the students' ownership of smartphones in the individual courses of study analyzing the several subgroups ($p<.001$; Cramer's $V=.21$). It is striking that students of economics in particular tend to own a smartphone (67%), while 57.5% among the students in engineering do. Computer science rank third with just over half (51.5%) and natural science students are in fourth place with 46.3%. The cultural studies students are found to be owners of smartphones less frequently: only 40.2% of them own one.

With the help of the modal value, one may summarize that the average person interviewed in this study is male, 24 years old, a student of cultural studies, enrolled in a Bachelor's course of study, with possible monthly expenditures of 406.00 €.

5. Results

This section presents the results of the online-study and offers analyses how mobility, gaming and creativity are connected in the usage of mobile devices, especially smartphones. Diverse aspects will be examined, especially disparities in the creative use of the technology and particular user groups as well as differences between m-gamers compared to non m-gamers.

5.1 General Usage of Mobile Phones

The usage of the mobile phone includes many different functions due to the fact that mobile phones have turned into multi-purpose devices. Therefore the study considers both offline and online activities. A statistical-univariate analysis elucidates that the most frequently used function of mobile phones is the alarm clock. 73.7% of the students use this function on a daily basis and only 4.3% of mobile owners do not use it. This result is interesting in so far as it is not a communicative function but an opportunity to structure everyday life which ranks first. It underlines the multi-purpose dimensions of mobiles that lead to the phenomenon that other devices, which are only constructed for a single purpose, are becoming somewhat superfluous. However, the second main task is still using the mobile phone for communication: 64.8% of the sample send text messages, often on a daily basis. Due its asynchronous modus, texting is a comfortable way of communication. However, supported by applications like 'whatsapp', it may also be used in a somewhat synchronous way. In this form the use of text messages inherits the mobile idea of situational action. In addition, it should be noted that the use of text messages is also linked to creative language use. Texting opens up possibilities to playfully utilize communication. Creativity in text communication is used to differ from standardized statements and therefore to express individuality as well as intimacy (Schwitalla, 2002: 52). Furthermore, the use of ideograms, acronyms and pictorial representations of facial expressions (emoticons) can underline the aesthetic, creative and playful use of text messages. In order to examine the mini-c and little-c potentials of mobile phones, the next chapter focuses on auxiliary tools and their creative utilization.

5.2 Creative Usage of Mobile Phones

Typical creative functions of mobile phones are taking pictures and recording videos. Therefore it is not surprising that we can determine a significant correlation between these items ($p<.001$, $r=.65$). Both offer the user the possibility of expressing ideas and points of views, and lead to a perceptible product – to draw on Plucker's et al. (2004) definition. Recording videos even comprises creative handling in diverse ways because there are a visual and an auditory component. Furthermore, there is the creative aspect of using Multimedia Messaging Service (MMS). MMS is an improved version of Short Message Service (SMS) and EMS (Enhanced Message Service) and offers the possibility to send multimedia messages and content to other mobiles or to e-mail addresses. However, table 2 shows that this service is in fact not a communication option for the surveyed students. This may be due to the high costs. In contrast, the mobile creative functions of taking pictures and recording videos are frequently used, which is why we will focus on these creative mobile features.

	Often	Sometimes	Seldom	Never	Not possible with the device
Taking photos	10.8%	33.6%	41.6%	9.2%	4.8%
Recording videos	2.3%	13.9%	43.8%	31.2%	8.4%
MMS	0.4%	2.5%	25.9%	66.1%	5.1%

Table 2: Frequency of creative mobile usage (Basis: all respondents; n=577)

Most students say that they rarely use their mobile phones for taking photos (41.6%, see table 2). This may be due to the facts that taking photos is not directly linked to mobile communication and it is not a daily activity like phoning or texting. However, about 45% of the respondents take pictures with their mobile device at least sometimes. This may be due to two possible reasons. On the one hand, the quality of cameras built in in mobile phones, especially smartphones, is comparable to that of conventional digital cameras. More and more people use their mobile phone as a substitute for their camera. Here a key factor of media convergence becomes visible. On the other hand, more and more communication platforms and social networks like 'Facebook' or 'Pinterest' actively invite their users to communicate via pictures. These pictures are therefore artifacts of self-display and represent the way of life. 'Pinterest' – an online pin board – even uses the visual expression through pictures as the primary way of communication. People can pin photos which they find on the web on their pin boards and comment on other pins. In so doing, they create strong visual profiles which can be categorized in different topics.

The second creative function of mobile phones is recording videos – up to 16.2% of the students do this regularly. Making videos is not as common as taking photos. Even 31.2% of the participants never use the function, maybe because it requires a higher level of activity of the user.

These results are confirmed by other studies, especially about the use of smartphones in Germany. In 2011, 33.3% of the smartphone users took photos at least several times per week and 16% also recorded videos (Goldhammer & Lehr, 2011: 26). Younger people use this way of communication even more intensely, since 41% of the girls and 28% of the boys between 12 and 19 years of age take pictures or make videos on a weekly basis (MPFS, 2011: 60). The results of our study, however, do not confirm this gender gap, because no gender differences could be observed in the creative mobile phone use. This could be explained with the development of different stages in life: during infancy and young age, classical roles of girls and boys generate these differences, but they are neutralized in the later stages of development.

Next, we will take a closer look at the mobile device, the duration of ownership, the brand of smartphone as well as the opportunity of participation in networks in combination with the creative potential.

Taking photos and recording videos can be highly significant depending on the type of mobile device: smartphone users do so much more often than other mobile phone users (taking photos: $p<.001$, Cramer's $V=.45$, recording videos: $p<.001$, Cramer's $V=.36$). This is also the reason why the duration of ownership of mobile devices predicts the creative forms of communication, since new devices, such as smartphones, support this kind of usage in a more comfortable way (for example superior photographic equipment). 46.8% of those who have owned their mobile device for less than half a year often take pictures, whereas only 5.2% of the persons whose mobile is up to two years old use this function often ($p<.001$, Cramer's $V=.18$). Consequently, the use of mobile phones for creative aspects currently is related to the age and technical conditions.

Variable	iPhone users (30.3%)	Smartphones users (Non-iPhone) (69.7%)	Total
Taking photos			
often	27.6	16.0	19.5
sometimes	49.4	42.0	44.3
seldom	20.7	38.0	32.8
never	2.3	4.0	3.5
Total	100%	100%	100%
Recording Videos			
often	7.4	3.6	4.7
sometimes	25.9	16.8	19.5
seldom	48.1	55.1	53.1
never	18.5	25.5	22.7
Total	100%	100%	100%

Table 3: Creative use of iPhone and other Smartphone users (Basis: all respondents who own a smartphone; n=287)

It is particularly interesting that also the choice of the mobile brand leads to differences in the usage (see table 3). All in all, 19.5% of the smartphone users often take mobile photographs, however, especially iPhone users (27.6%) show this creative use compared to other smartphone users (16%; p<.005, Cramer's V=.20). The same applies to recording videos: iPhone users are much more creatively dedicated here, too (see table 3). One reason for this might be the high and intuitive usability as well as the quality of workable tools and features on the iPhone. In this regard, the data show relevant results with respect to the preferred smartphone brand: apple is favored (30.3%), followed by Samsung (22%). The fact that the iPhone ranks first illustrates that the students surveyed attach significance to special brands, for example because of its unique design or an intuitive usage. In our study the buying criterion 'usability' was very important for the iPhone users in their mobile purchase decision. While all in all 67.1% of the students who own a smartphone claim that usability is a crucial concern when choosing a mobile phone, the same holds true for 79.3% of the iPhone users and only for 61.8% of the users of other smartphones (p<.005, Cramer's V=.22). It may be noted that Apple's strategy regarding high usability aspects of mobile devices has paid off.

Another connection may become evident between taking pictures, making videos and mobile web consumption. For creative people, the social context is important for showing, sharing and communicating their products (in the sense of little-c creativity; see section 2). To ensure that this aim is achieved, users have to upload their pictures and videos, which is why taking photos and recording videos correlate with uploading them to the internet (p<.001, r=.33; p<.001, r=.22). In general, 12.7% of the students with smartphones often upload photos and videos, 21.3% sometimes, 22.8% seldom and the rest (43.1%) never use this function of their mobile device. In this context, the question arises of where to upload the creative products; here communication platforms and social networks like 'Pinterest' or 'Facebook' seem particularly suitable, as stated above. Using the smartphone for social networking is one of the main activities of the students: 60.8% often communicate in this way with their friends on the internet. So it is not surprising that mobile social networking and uploading pictures and videos show a high correlation (p<.001, r=.53). In the sense of a network society our hypothesis (H2) of a correlation between creative mobile use and participatory possibilities is confirmed.

It needs to be discussed if this reveals a basic form of creativity. According to the definition of mini-c creativity, these findings indicate a first step in a creative process. To what extend this could also be seen as little-c creativity cannot be answered here, as it depends on the judgment of other social network users, more precisely the aspect of valuing the creative product as useful and novel. However, due to the feedback functions of social networks and other online platforms it seems highly likely that they facilitate the transformation of mini-c into little-c creativity.

Furthermore, the first hypothesis (H1; creativity shift) is thus also confirmed: mobile phone users adopt creative ways of communication in their daily life. Moreover, the study reveals different creative user types. Firstly, smartphone users tend to be more creative than classical cellphone owners (Hypothesis 3a), which is due to the technical capacities of the products and their possibilities for web consumption. Smartphone users can fully utilize the mobile creative potentials more easily. Secondly, the data demonstrate significant differences in the creative practices of iPhone users compared to users of other brands. Apparently, iPhones and the respective Apple products particularly invite people to use their mobiles creatively (Hypothesis 3b). Subsequent to these results we will take a look at the m-gamers. Are m-gamers also more creative than non m-gamers?

5.3 Mobile Gamers as Creative Communicators

As the theoretical reflections about play and creativity (see chapter 2) suggest, the group of the m-gamers is likely to be inventive in their usage of and the communication with their mobile devices. This suggests the hypothesis (H2a) that m-gamers are more creative in their mobile phone use compared to non m-gamers.

Two thirds (67.8%) of all respondents in the study play mobile games on their mobile phones. 33.1% of them even play regularly. For every third student, mobile games are not crucial; these students rank among the mobile game abstainers.

Yet, it is not surprising that there is a significant difference in gaming behavior between cellphone and smartphone users. Of the cellphone users 40.7% play mobile games, whereas smartphone users play at a rate of 59.3% ($p<.001$; Cramer's $V= .29$). In this context, it is again insightful to differentiate between the brands of mobile phones, too. Amongst the iPhone owners, 93.1% play mobile games, while only 76.8% of the users with other smartphones do so ($p<.005$; Cramer's $V=.19$). A logistic regression analysis proves that iPhone users are four times as likely to belong to the group of m-gamers than users of other smartphones. This emphasizes the relevance of mobile gaming: particularly iPhones are not just perceived as communication devices, but rather used as multi-purpose devices that serve as entertainment tools. It is interesting to see that there is one special user group – the iPhone users – which are both: more likely to be mobile gamers and, as shown in section 5.2, more engaged in creative mobile communication, represented by taking pictures and making videos. Apart from this highly versatile and creative user group, the universal creative communication of m-gamers independent of the brands needs to be investigated further.

Finally, the analysis of the potential of m-gamers in contrast to non m-gamers is also essential (for differences in learning behavior see Ganguin & Hoblitz, 2012). The group of the m-gamers is constituted by participants who play at least 'seldom' (off- or online). These two groups were compared regarding 30 different mobile usage items. Figure 1 shows the eight most significant differences in a comparison between m-gamers and abstainers with respect to mobile activities. For the visualization, the categories 'frequently' and 'sometimes' were combined.

As figure 1 shows, there is a significant difference in downloading apps between m-gamers and non m-gamers ($p<.001$; Cramer's $V=.35$). This is not surprising, as current mobile games have to be downloaded as applications in the app- or other stores. Downloading apps is therefore a prerequisite for gaming. Moreover, it could be assumed that downloading game apps awakens the users' interest for other apps and generally raises the affinity for using applications on a mobile phone.

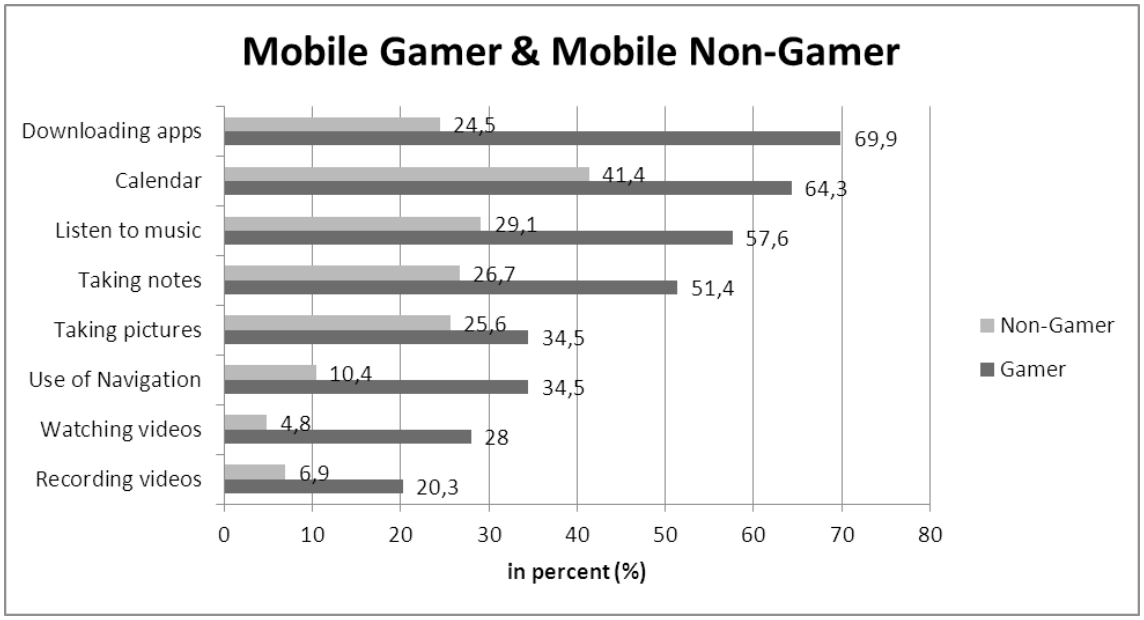

Figure 1: Comparison of mobile gamers and mobile game-abstainers (Basis: all respondents; n=577)

Secondly, there is a significant difference between m-gamers and non m-gamers when it comes to features that support the organization of everyday life like the calendar function ($p<.001$; Cramer's $V=.27$), taking notes ($p<.001$; Cramer's $V=.27$) as well as using the navigation system ($p<.001$; Cramer's $V=.35$). The calendar serves as a reminder of birthdays and private as well as business appointments and the navigation system assists in physical mobility. M-gamers are more skilled in technology matters and they use these tools to simplify their lives and to save scheduled events on one device. They have a high acceptance of the mobile phone as a permanent companion – an aspect which Simmel (1997) observed regarding pocket watch owners at the beginning of the 20th century as well. This significant difference is not directly linked to communication itself or to being creative, but it reveals an interesting aspect of the m-gamers' characteristics.

Thirdly, a significant difference concerns the items 'listen to music' ($p<.001$; Cramer's $V=.33$) and 'watching videos' ($p<.001$; Cramer's $V=.36$). Entertainment in general is important for m-gamers and both functions also occur during gaming. Watching videos represents the visual orientation of m-gamers. Entertainment like listening to music and watching videos are not creative processes in themselves, much like using the calendar. Digital games support problem-solving oriented thinking and virtual worlds allow for trial and error acting without any real life consequences (cf. Ganguin, 2010: 191ff.). M-gamers seem to apply this experimental behavior to their entire mobile media usage. Apparently, they have an open mind regarding experimentation with new technologies and are prepared to integrate those technologies into their everyday lives as well as to benefit from entertainment features.

Finally, the most interesting functions concerning creativity are taking pictures ($p<.001$; Cramer's $V=.3$) and recording videos ($p<.001$; Cramer's $V=.25$), as they reveal the creative dimension of usage. It is remarkable that m-gamers are more likely to use these functions because they are not directly linked to the process of gaming itself like downloading apps. Therefore, mobile gamers are not just creative related to the game, but more creative in other areas as well. Taking photos and recording videos are key factors in mobile gamers' creative communication.

In addition – according to the distinction between mini-c and little-c creativity – it is important to find out if the results of the creative process are shared with others. This aspect is particularly relevant for smartphone users because in most cases they possess almost ubiquitous connectivity to the internet. 64.7% of the m-gamers with smartphones upload videos or pictures to the internet at least seldom. By comparison, only 38.6% of the non m-gamers with smartphones do so ($p<.05$; Cramer's $V=.21$). These results support the assumption that m-gamers are indeed more creative because they are more likely to reach the stage of little-c creativity. For further research it would be interesting to analyze how, to what extend and on which channels m-gamers share their photos and videos, and if they continue to work on them, for instance by discussing them online and by modifying them.

The analysis indicates some essential and promising correlations between being a mobile gamer and creative forms of mobile communication. Firstly, the iPhone users are again the most active user group concerning mobile gaming as they are in general creative users of mobile phones, too. However, regardless of the brand, m-gamers exhibit a more creative usage of their mobile phones compared to non m-gamers regarding the functions 'taking pictures' and 'making videos.' Hence, hypothesis 3c is confirmed.

Furthermore, the findings demonstrate that the m-gamers use a greater variety of functions more intensely. These types of applications often do not result in the creation of output and hence would not be understood as being acts of expressing creativity. Here an in-depth analysis of the mini-c creativity with microgenetic methods, as suggested by Beghetto and Kaufman (2007), would help to reveal if these are first processes of creative thinking.

M-gamers are able to shape their communication in various forms and are capable of utilizing their mobile phones as multi-purpose devices in such a way that they exploit

the advantages of ubiquitous connectivity and mobility to their full extend. On a theoretical base it may be assumed that they are able to do so because playing (respective gaming) promotes creativity processes (Russ, 2003). With this approach to mobile phone usage, the mobile gamer turns into a creative communicator.

6. Conclusion and Discussion

This study aimed at evaluating today's mobile communication with respect to a possible creativity shift and determining user types. Our study allows for the conclusion that m-gamers are capable of a broader and more sophisticated range of activities regarding their mobile phone usage. Significant differences could be observed regarding the organization of everyday life and the creative as well as the entertaining applications. M-gamers utilize the opportunities offered by mobile technology in an all-encompassing way and therefore can be labeled as 'mobile all-rounders'. This leads to the conclusion that m-gamers are generally more capable of using mobile technologies for their own benefit. The results for the m-gamers are in line with the results of a recent study among 12-year-old children in the US, which indicates a correlation between playing videogames and being creative (Jackson *et al*., 2012).

Even though a versatile use of mobile communication technology is not a creative process per se, in communication via mobile phones the users express ideas, make connections, share knowledge, create and re-create media content and develop feedback systems, all of which could encourage mini-c and little-c creative processes. Mobile communication in particular is an expression of the network society and the mobility turn with its 'timeless time' and 'space of flow' (Castells *et al*., 2007: 174) and therefore supports new ways of creative expressions. Multi-purpose devices enable permanent access to visual and audio-visual ways of expressing ideas quasi on the move. Situational contexts in combination with the technical features of mobile devices shift communication towards more expressive and creative modes. Due to ubiquitous connectivity and social communities it is also easier to make creative products visible for friends or larger groups. Here again the social aspect of creativity plays an important role (cf. Plucker *et al*., 2004).

There are several limitations to the current study which should be addressed in future research. Firstly, as the early adopters of new technology who tend to have a more intense and diversified kind of usage, we focused on younger people, especially only on students. Other age groups need to be investigated because the stated creativity shift in mobile phone usage is likely to be directly linked with people's age (as mentioned in section 3, our own decision to study students resulted from this insight). Secondly, other forms of creative expression should be surveyed, for instance by using questionnaires designed for creativity research like the Torrance Test of Creative Thinking (TTCT). We have conducted a study that measures creativity only indirectly by generally requesting the usage of mobile phones. The reason for this design was that we aimed at examining whether there are any forms of creative usage in the first place. As we could in fact prove this, research may go one step further and for instance question the conditions and reasons why people like to utilize their mobile phones in a creative way. Additional research

may also address the correlations between the technological features of mobile devices and creativity, for example by especially focusing on iPhone users, who seem to be rather open-minded and creative in their use of mobile phones.

Due to the fact that only little research has been done on the connection between mobile communication, mobile phone usage and creativity, this basic study aims to highlight first indications of how new and mobile forms of communication in the mobile network society are influenced by a creativity shift.

7. References

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