Operant Subjectivity

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Digging into the Subjectivity of Mobile Apps "Non-Users" – A Single Case Study Approach

Claire Gauzente
University of Nantes

Abstract: Information and communication technology (ICT) use is a matter of societal importance. These technologies are developing at a rapid pace and require significant investments on the part of governments, companies and even individuals. Their adoption in everyday life constitutes a challenge as the potentialities of ICT are plentiful: education, business, health and culture are a few of the many sectors impacted by IT. This is even truer with mobile technologies. The reasons why people accept and adopt these technologies remain a vast domain for research. In this project, instead of focusing on the reasons for accepting and using ICT, a reverse viewpoint was taken, trying to investigate the subjectivity of one "non-user". Building upon the avenue suggested by Stephenson that a single case study might be as rich as studies with several individuals, an investigation was conducted using nine conditions of instruction with the same participant (Q sample=29; P sample=1). The research findings revealed four distinctive viewpoints and that "non-use" was far from being a homogeneous concept.

Introduction

Information and communication technologies are now acknowledged as pervasive technologies. They characterise our everyday life and yet a certain number of people still avoid, resist and even refuse to use these technologies as much as possible. While a lot of studies have been dedicated to the digital divide that tends to explain IT non-use as the result of economic, cognitive or socio-cultural deficiencies, researchers have begun to refine the study of IT non-use by progressively integrating issues relating to attitudes, technophobia and ideology (Selwyn, 2006). In professional contexts, the use of technologies has been studied with quantitative models as a process of acceptance (Davies, Bagozzi & Warshaw, 1989). These reference models, although becoming more and more sophisticated, fail to explain 100% of use/non-use and more fundamentally lack qualitative nuances. Trying to bridge the two literatures and research traditions, the one directed at non-use and the digital divide and the one dedicated to technology acceptance and use, it is proposed that Q single case studies can document effectively the viewpoint of "non-users" and unveil to what extent non-use is actual, partial, arbitrary, paradoxical, and far from a binary characteristic.

   A literature review of the different studies dealing with IT use/non-use is briefly provided before the single case approach and design is described The findings are discussed and show the richness of in-depth investigation of one "non-user". Non-use appears to be a coarse category of understanding that should be unpacked more deeply.

Contact author: claire.gauzente@univ-nantes.fr

Literature Related to Technology Use and Non-Use

Trying to map the theoretical and empirical contributions to the understanding of the use or non-use of technologies leads to the discovery of a fragmented, although very rich, literature. Different disciplines have been looking at technology use/adoption/acceptance or non-use and include economic and management sciences, education, psychology, sociology, ergonomics and human-machine (or human-computer) interaction.

Bringing these contributions together, it should be noticed that although literature dedicated to usage and literature dedicated to non-usage should have mirror-like logic, the underlying perspectives are indeed different. The stance of non-usage studies follows more or less from the digital divide research tradition while the usage-centred studies can be split into two sub-categories identified by Brangier, Hammes-Adelé and Bastien (2010): operational acceptance on one hand and social acceptance on the other.

Operational acceptance of technology derives from ergonomics where the usability, ergonomic criteria and model of interaction are at the heart of technological acceptance. However, beyond operational acceptance which is important from a design standpoint, Orlikowski and Baroudi (1991, p. 7) pointed out that researchers need to understand the social processes that underlie the introduction, creation, use, mis-use and abandonment of ICT. For this reason, several theoretical attempts were made in order to conceptualise technology use. One of the most prominent models is the Technology Acceptance Model (TAM), proposed by Davis and colleagues (Davis, 1986; Davis, Bagozzi & Warshaw, 1989) and refined in subsequent publications. This model explains intention to use and actual use by attitude toward technology, perceived usefulness and perceived ease of use. This model is very popular and has been tested in many settings. Critiques and refinements have also emerged with time (Legris, Ingham & Collerette, 2003; Turner, Kitchenham, Brereton, Charters & Budgen, 2010; Brangier, Hammes-Adelé & Bastien, 2010). Alternative conceptualisations have also been proposed. Among the most fruitful, can be cited the Expectation-Confirmation Theory (ECT) (Bhattacherjee, 2001; Bhattacherjee & Premhumar, 2004) derived from the Satisfaction Approach (Oliver, 1980), the Task-Techno Fit Model (TTF) (Goodhue & Thompson, 1995), the Structurationist approach (DeSanctis & Poole, 1994; Orlikowski, 1992), and the Coping Model of User Adaptation (Beaudry & Pinsonneau, 2005, 2010). These approaches address different stages and aspects of ICT acceptance and use. The ECT model suggests that expectations toward the technology at one point in time and the satisfaction derived from its first use condition future use. Continued ICT use is then related to expectations and their confirmation via satisfaction. The TTF model holds that utilization depends on the task to be accomplished and the technological characteristics. When task requirements and technology characteristics fit, utilization and satisfaction are more liable. Fit assessment depends on the use context. In the long run, the individuals' performance in ICT use is also more likely. The Structurationist approach points out that IT use, mainly in organizations, challenges theory and organizations as it induces changes. A dynamic and interactionist view is proposed emphasizing social interactions emerging from IT adoption and use. The Coping Model of User Adaptation suggests that emotions constitute a significant part of ICT acceptation, first use and continued use. Different emotions have been studied: enjoyment, pleasure, anxiety and playfulness.

All in all, these different approaches hold a common view that technology acceptance and use is socially constructed, influenced by utilization context, and by individuals'

emotions and attitudes. In line with this, IT use or non-use does not merely appear as a matter of meeting ergonomic or technical requirements. The social stance in accepting and using technology is also prevalent in the non-usage literature.

Non-usage approaches include many digital divide studies such as Rice and Katz (2003) and represent a dynamic stream of research (Brandtzæg, Heim & Karahasanovic, 2011; Cruz-Jesus, Oliveira & Bacao, 2012). The most classical predictors of digital inequalities are income or socio-economic status as well as gender, age, education, and family structure. Beyond these traditional variables, Verdegem and Verhoest (2009) suggest that integrating usage-centred literature, and particularly the utility concept, opens alternative interpretations of non-use. They develop the ASA model, comprising Access, Skills and Attitude, in order to explain technology appropriation and thus e-inclusion or exclusion. Their investigation distinguishes five different profiles of non-users.

This echoes the work by Selwyn (2003, 2006) who had already underlined that the patterns of non-engagement in technology vary between technologies and that there are different types of non-users. Typically, Selwyn distinguishes three reasons for non-usage: non-access (lack of economic, cultural or cognitive resources); technophobia; and ideological refusal. Other refinements exist: for instance, Jauréguiberry (2012) focuses more precisely on voluntary non-usage where non-use is not necessarily absolute, but is rather partial (certain usages are simply paused) and segmented (limited to certain periods of the day for instance). All this research suggests that the non-use of technology is multi-faceted and that investigation of non-use should find appropriate methods to uncover the complexities of the phenomenon.

Turning now to mobile technology use, Wiredu (2007) stresses that the individual appropriation of portable devices tends to be almost taken for granted in areas such as Information Systems Research. More precisely, most of the studies investigating mobile internet use draw on Technology Acceptance Model (TAM)/Theory of Planned Behavior (TPB)/Theory of Reasoned Action (TRA) frameworks. Innovation Diffusion Theory (Rogers, 1995) is also used as a basis for exploring mobile internet (MI) use as MI can be conceptualised as an innovation (i.e., Verkasalo, Lopez-Nicolas, Molina-Castillo & Bouwman, 2010). Such studies suffer however from a very stepwise view of the logic guiding individuals; the complexity and intertwined dimensions of users' *psyches* remain unexplored.

Sociological and qualitative studies on the other hand develop in-depth investigations of mobile devices uses (i.e., Ling & Haddon, 2003; Selwyn 2006) and often focus on specific populations (i.e., young people in Humphreys, von Pape & Karnowski, 2013; or older people in Gilly, Celsi & Schau, 2012). They provide rich observations but not necessarily synthetic views of non-use.

A recent meta-analysis of MI usage underlines the scattered and fragmented nature of academic research dedicated to the use and non-use of mobile technologies and services (Gerpott & Thomas, 2014). Their results indicate that inter-individual variance in MI usage is quite large and that the most influential variables are enjoyment, educational level, subscription at a flat rate and ease of use. While this meta-analysis is interesting it restricts the view of use/non-use to a small number of factors. In their conclusion, Gerpott and Thomas call for the exploration of "unchartered territories" that entails measurement issues, independent variables identification and study design. In particular, they spotlight biases associated with mono-method designs. This substantiates other researchers' current preoccupations as demonstrated by the recent formation of a new working group within the Association for Computing Machinery

(ACM) which calls for more research in both conceptualising and investigating non-use (Baumer, Ames, Brubacker, Burrell & Dourish, 2014). This research group also points out the methodological challenge associated with the study of non-use. In this context, we advocate that Q-method offers a timely methodological option.

A Single Case Study Approach

Stephenson (1974, 1987) has suggested that a single case study is a promising methodological possibility in order to develop in-depth knowledge of subjective issues and to unveil an individual's inner world. As he puts it, "*the non statistical strategy leads to immediate results*" (1974, p. 3). This methodological orientation has been discussed and illustrated in studies by Brown (1978, 1981), Stephenson (1979), Baas (1997) and also more recently by Allgood and Svennungsen (2008) mainly within the psychological field.

In the field of ICT use, Q studies have not been engaged although the potential of Q method has been underlined (Kendall & Kendall, 1993; Thomas & Watson, 2002; Gauzente, 2013). Furthermore, single-case investigation is a methodological option that is rarely exploited despite its richness as pointed out by Wolf (2010, p. 63). Brown also speaks of the vividness provided by intensive analyses (1981, p. 629).

In the present project, an individual in-depth case study is employed in order to explore the perceptions and representations of mobile services offered by wireless technologies, especially on smart-phones and tablets or any wireless devices. It is also developed in order to demonstrate the richness and potential contribution of Q-method in ICT use/non-use studies.

Method

The constitution of the Q sample, and choices pertaining to the conditions of instruction and the identification of the P sample are now described.

The statements are based upon a concourse gathered through several preliminary studies focusing on different mobile services. Qualitative material concerning perceptions of m-commerce and m-advertising (studies in 2009 and 2013 respectively), perceptions of mobile augmented reality (an on-going cross-national Q-study[1]) and perceptions of QR-codes[2] (a 2013 study). The following table indicates the source of statements and the method used to generate them.

Topic	Method for data generation	Date
Mobile advertising	Nominal group technique and board writing (23 statements)	2009
Mobile commerce	Nominal group technique and individual writing (83 statements)	2013

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[1] In this cross-national Q-study, several augmented reality applications were used (google glass, and pre-visualization of products) in order to gather participants' perceptions and opinions.

[2] QR-code: Quick-Response code, also known as 2D-code or Flashcode, when scanned via the smartphone camera, it links up with online content (information, applications, etc.)

Mobile augmented-reality (google glass, product visualisation)	Focus group (24 statements)	On-going
QR-code	Focus group and individual writing (11 statements)	2013
Total number of statements	141 statements	

Table 1

A choice was made not to discuss the "mobile internet" as a generic concept but rather to do so through currently available, concrete, technologies and services that people can experience or understand (in the case of mobile augmented reality). The qualitative material gathered from these previous studies was based on nominal group technique, focus groups and individual writing about the technology.

Out of this initial material, 29 statements were selected to cover different viewpoints (see statements in Appendix). Interestingly, the emerging statements cover the different theoretical dimensions identified in both research traditions (the Information Systems Research and the Digital Divide/Non Usage tradition)[3]. The choice to restrict the Q sample to 29 statements was dictated by the consideration that Q sorting is demanding and there is a need to achieve a balance between redundancy and parsimony in order to keep a participant's cooperation. This is all the more important in a single-case study as the respondent will have to do the task several times. The quality of gathered data relies heavily on the participant's benevolence.

Nine conditions of instruction were used. The choice of the conditions of instruction is important for a single case study as they represent the problem at hand. Stephenson (1974, p.7) emphasized that "*the sampling of problems and situations may be in the long run more important than the sampling of individuals*", which is echoed in Brown's observation that "*we are all representatives of the social order*" (1981, p. 630). The nine conditions cover the participant's *a-priori* view of mobile technologies and services and his *a-posteriori* view once the different technologies and services have been presented and judged. The different technologies and services were chosen to cover several aspects of the research domain:

- the current state of technologies and services (m-ticket, QR code)
- popularity: "in-progress" technologies that benefited from buzz and that most people are aware of (like google glass, augmented reality)
- the functionality of technologies/services (m-ticket, m-payment)
- the fact that preliminary investigation has been conducted
- the fact that technologies are clearly documented online so that the participant can understand how it works.

In order to reveal more social dimensions we also included the view of what future generations or parents might think. Finally, nine conditions of instructions were

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[3] Except the structurationist approach, which is quite logical as this approach pertains to organizational contexts.

retained keeping in mind that the participant's collaboration had to be maintained until the end of the study.[4] The conditions of instructions were as follows:

1) What is your general viewpoint about available mobile services and technologies?
2) About m-ticket[5] for public transportation?
3) About QR code advertising?
4) About augmented-reality product pre-visualization[6]?
5) About Google glass?
6) About m-payments[7]?
7) Now that we have seen several possibilities, please reassess your view of mobile services and technologies
8) In your opinion, what would be the view of your parents?
9) In your opinion, what would be the view of future generations?

For each Q sort questionnaire, an example of the technology/service was first given either through pictures or video demonstrations in order to make sure that the participant adequately understood the technology/service characteristics. Additional methodological refinements consisted in listing the statement order differently from one data collection to another and collecting the data over a 10-day period with one Q sort/per day. This precaution is important as Q sorting is a rather demanding task. In order to preserve data quality, a step-by-step administration is advisable. Together with the first Q sort, a brief questionnaire was included in order to gather complementary descriptive information pertaining to the participant. The Q sort questionnaires were e-mailed each day and the participant had to make an initial broad three-category ranking before proper Q ranking. The data were entered and factor-analyzed using PQ-method.

The selected person for the single case study was a 36-year-old female non-user called Marnie. She was a well-educated person (having a Master's degree in management science) and qualifies as a technology-aware person as she has been using a computer and the internet for years, for both professional and private purposes. In terms of MI experience, she has long possessed a cell phone and has had a smart phone for 4 months. She does not use mobile services (except SMS) because she did not subscribe to any internet access. She would agree to purchase products and services using her mobile with any type of mobile merchant and would feel comfortable with spending up to 150 euros. For her, a mobile phone was a mere functional object.

The collaboration of the participant was initially obtained via a telephone interview. During this initial interview the study was presented as well as its specific modalities, the constraints and the importance of following the instructions carefully was pointed out (e.g. viewing video demonstrations, reading carefully the statements and ranking them in a two-step process).

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[4] Even with an administration of the 9 sorts over a period of 10 days, the feedback was that the study was "*a bit repetitive*".

[5] M-ticket is a mobile application for public transportation and replaces paper-tickets.

[6] Augmented reality applications help to visualize a virtual layer of information together with reality: for example, viewing virtual glasses on your face. Google glass also exploits augmented reality technology.

[7] M-payment makes it possible to pay with mobile phones.

Results

Centroid analysis was used and judgmental rotation applied to selected factors. Following Stephenson's warnings concerning interpretation (1983a and b) and operantcy (Stephenson, 1977; Brown, 1978), a constant back and forth procedure between hypothetical meaning and analytical choices was employed. In the case of this in-depth investigation of the perceptions of mobile services and technologies, the results suggested a two-factor structure if the eigenvalue criterion was adhered to. Looking more closely at the results, one Q sort was rather poorly represented (less than 50% of explained variance). Accordingly, the decision was made to keep two factors while removing the poorly represented Q sort (see the factor array in the Appendix) and to examine Q sort #6 separately [8].

In the present study, thanks to the two-factor structure, we can actually identify four visions including one specific case (Q sort #6) because factor 2 is bipolar. Factor 1 (31% of variance) is defined by four Q sorts: general opinion *ex-ante* and *ex-post*, QR-codes and Google glass. Factor 2 (33%) opposes (a) the vision for future generations, together with the vision of m-tickets and AR-pre-visualization versus (b) the vision for parents. The fourth vision corresponds to Q sort #6 which pertains to m-payment.

Vision#1 corresponds to Marnie's general vision of mobile technologies services. This general vision is stable over time as the ex-post evaluation is in line with this. QR Codes applications seem to be very typical of her general vision which is one of defiance toward these technologies: "*I am not fond of these technologies*" (22: +3), "*data protection is important*" (21: +2). Marnie does not "*feel curious*" at all about mobile technologies (28: -3). This defiance and potential rejection is nurtured by critical considerations: "*we are dependent upon our mobiles*" (16: +3), "*I don't really need it*" (10: +2). This vision of mobile technologies and services is conducted by rational and critical thinking leading to distanciation: the possibilities are not seen as "*playful*" (6: -2), "*exciting*" (26: -3) or "*pleasant*" (25: -1). While she recognizes that these technologies/services might "*represent future*" (23: +2), she would only "*use them as an exception*" (4: +1).

Vision#2 (a & b) is more complex. Marnie considers that her parents and future generations would hold opposite attitudes toward mobile technologies. Both hedonic and functional dimensions of mobile services appear in relation to future generations. A hedonic instance is given with mobile Augmented Reality Apps helping to interactively visualize the effect of wearing glasses on people's faces. A functional instance is given through mobile ticketing for public transportation. Marnie considers that mobile services may "*make life easier*" (17: +3) and can even be "*exciting!*" (26: +3), "*pleasant*" (25: +2) and "*playful*" (6: +2). A certain level of "*curiosity to try these technologies*" (28: +2) arises. Some issues appear without relevancy such as "*data protection*" (21: 0).

On the contrary, older generations, such as her parents, would consider mobile services and technologies to be potentially "*dangerous*" (14: -3) and would consider them to make us "*more and more dependent upon technology*" (16: -1). It also can be observed that "*distrust concerning security*" (12: -2) also arises.

All in all, while future generations might use mobile technologies that offer both functional and hedonic characteristics – which Marnie recognizes – older generations will be reluctant to use them despite potential benefits. This factor suggests that Marnie positively appraises certain mobile services in spite of her general defiance depicted in

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[8] I thank Steven Brown for this analytical suggestion.

Factor 1 and also that she thinks these services to be more appropriate for younger generations. This nuanced view of technology is in line with non-use studies that point out inconstant acceptance and use of technologies rather than absolute rejection or non-use of technologies. It also suggests that individuals develop some sort of "bricolage"[9], that is subjective in essence, and that can be dynamically adapted to circumstances and an individual's mood.

Lastly, Vision#3 (corresponding to Q sort #6) pertains to mobile payment. Marnie appears highly concerned with this and considers this technology to involve a "*danger*" (14: +3) and to generate distrust 12: +3) which probably derives from perceived financial risks. She also feels more comfortable with "*conventional*" payment methods (7: +2). While recognizing that this technology will be more and more present "*in the future*" (23: +2), she does not consider it as "*exciting*" (26: -3) or "*playful and fun*" (6: -2) at all. This view echoes Vision#1 where Marnie's core vision is expressed. This Q sort exemplifies, however, a more extreme standpoint than Vision 1. While Factor 1 is guided by critical thinking, the fourth vision is more guided by fear and technophobia deriving from technology and financial risks. This last case also exhibits a paradoxical position as Marnie also declares in the questionnaire data that she would be fine with shopping using her mobile. Again, this showcases a kind of "bricolage" logic in the use/non-use dichotomy.

Looking at consensus statements is also instructive. Marnie considers that she understands the technologies that underpin mobile services (1: -2 and -1) and that it is not an issue for her. She also does not necessarily feel that human contact is lost through the use of mobile technologies (8: -1 and 0). Possible real-time interaction with merchants through mobile devices is not of importance to her (9: -1 and 0) although these technologies might be considered to be rather useful (20: -2 and -3) and represent a logical future evolution (23: 2 and 1). Lastly, no specific irritation arises when she considers these services (29: 0 and 0).

To summarize, this single case study shows that with only one individual a rich portrait of mobile technology appraisal can be drawn. In particular, although a "non-user", we see that Marnie is not an ideological rejecter and that, depending on circumstances and future evolution, her view of certain mobile services might evolve. More importantly, the study also suggests that even if a negative attitude has been formed, the benefits may be recognized and the technology may be partially adopted. A sense of "bricolage", also including paradox, emerges from this study. Thanks to Q methodology, the multi-faceted nature of technology acceptation, adoption and appropriation can be documented and brought to light. "Non-use" can be pictured as a changeable geometry between different aspects. A hexagon sums up the different significant dimensions as they appear from the single case. Depending on circumstances, this hexagon varies across dimensions leading to different use-behaviour patterns (such as use, non-use, and partial use) as pictured in the following figure. Keeping in mind such variability when studying individuals' use and non-use of mobile technologies may be of interest for future research.

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[9] Bricolage can be referred to as a piecing together of technology use strategy, with a do-it-yourself spirit.

Figure 1
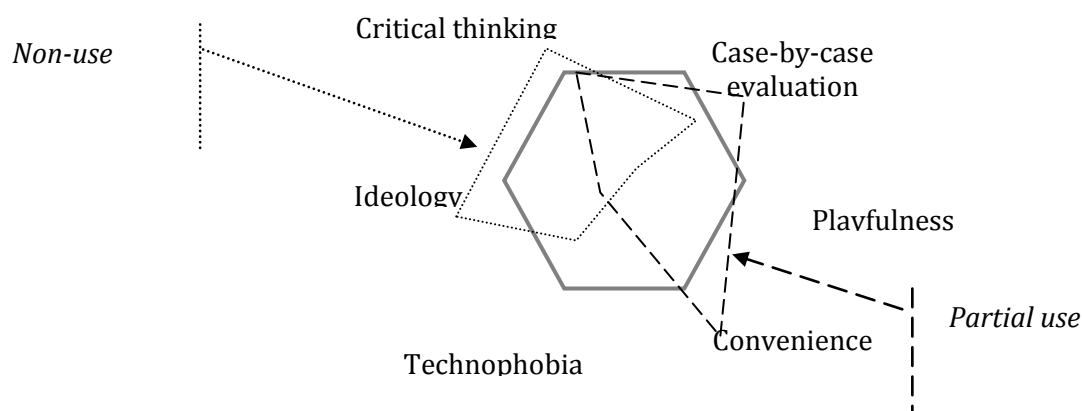
Conclusion

The usefulness of ICT in our societies is undeniable and examples of its benefits can be found in many domains such as education, health services, culture, citizenship and business. The pervasiveness of it can, however, be disconcerting for a certain number of potential users that prefer not to use the technologies. A substantial amount of research has been dedicated to technology use and non-use, adoption and non-adoption, ranging from digital divide studies to technological acceptance models via technical ergonomic approaches or more socially oriented ones. Some researchers have emphasized that "non-use" varies along time, technology and situations. In order to grasp the subtlety of the phenomenon, we suggest that Q-methodology is a highly relevant approach and more specifically that the Q single case approach is of particular significance.

Using a Q sample of 29 statements and 9 conditions of instruction with one "non-user", Marnie, two important ideas were exemplified. First, that with one individual it is possible to observe the different nuances of non- and partial-use. And second, that it is possible to understand the underlying logic of technology defiance instead of staying at the surface of social and individual phenomena. Future research using Q methodology and dedicated to technology use and non-use should be encouraged employing different designs. We see at least three methodological avenues for expanding the present study. First, the statements can be varied: within the population of statements that were generated, alternative Q samples can be selected and used. Second, conditions of instruction can be varied in order to broaden the present findings. Lastly, multiple Q sorts can also be gathered with a larger P sample. To sum up, we believe that the juxtaposing of different Q designs dealing with the same topic deserves further development in the future.

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Appendix 1: Statements

Les technologies mobiles permettent d'utiliser Internet en mobilité et d'accéder à toutes sortes de services (paiement, géolocalisation, prévisualisation, achat, applications, jeux, musique, messagerie, informations…). Elles sont disponibles sur les téléphones mobiles, les smartphones, les tablettes… **Voici une série d'affirmations à propos de ces possibilités techniques. Lisez-les attentivement car vous allez devoir les classer.**	Mobile technologies allow the use Internet while moving and accessing all sorts of services (payment, geo-localising, pre-visualisation, purchase, apps, games, music, mail, information…). They are available on smart phones, mobile phones, tablets etc. Below are a series of statements about these technologies and their possibilities. Please read them carefully as you will have to rank them.
1. **Je ne comprends pas comment ça marche, c'est trop compliqué pour moi.** 2. **Je n'ai pas envie d'essayer.** 3. **C'est mieux d'être en face à face plutôt que de vivre derrière son écran.** 4. **Je pourrais utiliser ces technologies si je n'avais pas une seconde et ce serait une exception.** 5. **C'est bien seulement pour attirer l'attention.** 6. **C'est ludique et marrant.** 7. **Il faut pouvoir toucher un produit.** 8. **On n'a plus de contact humain.** 9. **C'est bien seulement si l'on peut vraiment interagir…** 10. **C'est pas indispensable, j'en n'ai pas vraiment besoin.** 11. **Cela permet aux entreprises/marques de se rapprocher géographiquement de sa clientèle.** 12. **Je trouve que cela suscite la méfiance quant à la sécurité des paiements.** 13. **Cela pose la question des forfaits et frais de téléphone.** 14. **Ces technologies représentent un danger.**	1. I do not understand how it works; it's too complicated for me. 2. I do not feel like trying this. 3. It's better to be in face-to-face relationships rather than behind screens. 4. I could use it only if I did not have a minute for me and it would be an exception. 5. It's good only for attracting attention. 6. It's fun and playful. 7. We need to be able to touch the product. 8. We do not have human contact any more. 9. It's good only if we can genuinely interact with each other. 10. It is not vital; I don't need it. 11. It allows firms and brands to be closer to their customers geographically. 12. I feel it raises distrust about payment security. 13. It raises the question of cell phone fees. 14. These technologies are dangerous.

15. C'est synonyme de publicités.	15. It's synonymous with advertising.
16. Cela me fait penser que nous sommes dépendants de notre portable et d'internet.	16. It makes me think that we are techno- and cell-phone dependent.
17. Cela simplifie la vie !	17. It makes life easier!
18. Cela permet de faire de bonnes affaires.	18. It helps getting good deals.
19. Ces technologies rendent plus facile d'accès les informations nécessaires.	19. Such technologies make it easier to access information we need.
20. Ce n'est pas pratique.	20. It is not practical.
21. La protection des données est très importante.	21. Data protection is essential.
22. Je ne suis a priori pas adepte de ces technologies.	22. I am not fond of this technology.
23. C'est probablement l'avenir.	23. It's probably the future.
24. C'est l'achat rapide, n'importe où, n'importe quand.	24. It allows rapid purchase in any place, at any time.
25. Je trouve plaisant, agréable de pouvoir utiliser ces technologies.	25. I find it pleasant to be able to use these technologies.
26. Ces technologies sont excitantes !	26. These technologies are exciting!
27. C'est moderne, en adéquation avec notre vie de + en + mobile.	27. It's modern and coherent with our more and more mobile way of life.
28. Je suis curieux(se) d'essayer ces technologies.	28. I feel curious about trying it.
29. Ces possibilités technologiques m'énervent.	29. Such technology upsets me.

Appendix 2: Factor Loadings and Explained Variance

QSORT	Factor 1	Factor 2
1 q1-gener	0.7220X	0.0521
2 q2-mtick	0.5257	0.6952X
3 q3-qrcod	0.7579X	0.2714
4 q4-previ	0.4276	0.6685X
5 q5-googl	0.6634X	-0.3792
6 q7-xpost	0.5491X	-0.1536
7 q8-paren	0.3649	-0.9311X
8 q9-futu	-0.2022	0.7704X

% expl. var.	31	33

X   Defining sort

Appendix 3: Factor Scores

No.	Statement	A	B
1	Je ne comprends pas comment ça marche, c'est trop compliqué.	-2	-1
2	Je n'ai pas envie d'essayer.	0	-2
3	C'est mieux d'être en face à face plutôt que derrière son écran.	0	-1
4	Je pourrais utiliser ces technologies si je n'avais pas une exception.	+1	-1
5	C'est bien seulement pour attirer l'attention.	0	+1
6	C'est ludique et marrant.	-2	+2
7	Il faut pouvoir toucher un produit.	-1	-2
8	On n'a plus de contact humain.	-1	0
9	C'est bien seulement si l'on peut vraiment interagir avec ...	-1	0
10	C'est pas indispensable, j'en n'ai pas vraiment besoin.	+2	0
11	Cela permet aux entreprises/marques de se rapprocher géographiquement de sa clientèle.	-2	0
12	Je trouve que cela suscite la méfiance quant à la sécurité des paiements.	+1	-2
13	Cela pose la question des forfaits et frais de téléphone	+1	0
14	Ces technologies représentent un danger.	-1	-3
15	C'est synonyme de publicités.	+2	-1
16	Cela me fait penser que nous sommes dépendants de notre portable et d'internet.	+3	-1
17	Cela simplifie la vie!	0	+3
18	Cela permet de faire de bonnes affaires.	0	+1
19	Ces technologies rendent plus facile d'accès les information.	+1	+1
20	Ce n'est pas pratique.	-2	-3
21	La protection des données est très importante.	+2	0
22	Je ne suis a priori pas adepte de ces technologies.	+3	-2
23	C'est probablement l'avenir.	+2	+1
24	C'est l'achat rapide, n'importe où, n'importe quand.	+1	+2
25	Je trouve plaisant, agréable de pouvoir utiliser ces technologies	-1	+2
26	Ces technologies sont excitantes!	-3	+3
27	C'est moderne, en adéquation avec notre vie de + en + mobile.	0	+1
28	Je suis curieux(se) d'essayer ces technologies.	-3	+2
29	Ces possibilités technologiques m'énervent.	0	0

Appendix 4: Statement Ranks for Q sort #6

No.	Statement	Rank
1	Je ne comprends pas comment ça marche, c'est trop compliqué.	0
2	Je n'ai pas envie d'essayer.	0
3	C'est mieux d'être en face à face plutôt que derrière son écran.	-2

No.	Statement	Rank
4	Je pourrais utiliser ces technologies si je n'avais pas une exception.	-1
5	C'est bien seulement pour attirer l'attention.	-2
6	C'est ludique et marrant.	-3
7	Il faut pouvoir toucher un produit.	+2
8	On n'a plus de contact humain.	0
9	C'est bien seulement si l'on peut vraiment interagir avec …	0
10	C'est pas indispensable, j'en n'ai pas vraiment besoin.	+1
11	Cela permet aux entreprises/marques de se rapprocher géographiquement de sa clientèle.	-2
12	Je trouve que cela suscite la méfiance quant à la sécurité des paiements.	+3
13	Cela pose la question des forfaits et frais de téléphone	-2
14	Ces technologies représentent un danger.	+3
15	C'est synonyme de publicités.	+1
16	Cela me fait penser que nous sommes dépendants de notre portable et d'internet.	+2
17	Cela simplifie la vie!	+1
18	Cela permet de faire de bonnes affaires.	0
19	Ces technologies rendent plus facile d'accès les information.	+1
20	Ce n'est pas pratique.	-1
21	La protection des données est très importante.	-1
22	Je ne suis a priori pas adepte de ces technologies.	+1
23	C'est probablement l'avenir.	+2
24	C'est l'achat rapide, n'importe où, n'importe quand.	+2
25	Je trouve plaisant, agréable de pouvoir utiliser ces technologies	0
26	Ces technologies sont excitantes!	-3
27	C'est moderne, en adéquation avec notre vie de + en + mobile.	0
28	Je suis curieux(se) d'essayer ces technologies.	-1
29	Ces possibilités technologiques m'énervent.	-1