
Hedonic Quality Identification
integrating
tacky
unpresentable
isolating
alienating
cheap
stylish
connective
professional
Hedonic Quality Stimulation
challenging
creative
dull
bold
inventive
conservative
ordinary
novel
conventional
innovative
cautious
captivating
Attractiveness
attractive
ugly
good
Pragmatic Quality
clearly structured
practical
complicated
technical
cumbersome
human
unruly
simple
straightforward
AT&T
3 March 16:00 PM
TechCrunch
LogoQuiz
The Verge
SongQuiz
Attractiveness of smartphone applications:
First impression vs. Anticipated use
vs. Actual use
Based on pragmatic and hedonic qualities
Master Thesis
by Rishna Achaibersing

Running head: Attractiveness of smartphone applications

Attractiveness of smartphone applications:
First impression vs. Anticipated use vs. Actual use

Based on pragmatic and hedonic qualities

Name:	Rishna A. D. Achaiber Sing
Student number:	S1238833
Corresponding address:	r.achaibersing@gmail.com
Faculty:	Faculty of Behavioural Sciences, University of Twente
Thesis:	Master Thesis Communication Studies
Thesis supervisor 1:	Dr. Thea van der Geest
Thesis supervisor 2:	Dr. Sabrina Hegner
Date:	3rd of march 2014

UNIVERSITY OF TWENTE.

Table of contents

Abstract

Purpose ~ With the emergence of smartphone applications and the continuous growth of the number of applications, it is important to gain knowledge about the encountered user experience of smartphone applications. According the ISO standard 9241-210 a user experience is a user's perception that is an effect from the anticipated use or use of a product (ISO/DIS, 2009). The present study investigated to what extent the user experience, measured as the attractiveness (e.g. pleasant and good), of a smartphone app is influenced by pragmatic qualities (e.g. usability and functionality), hedonic qualities identification and stimulation (e.g. creative and inventive) and personal factors of the user (e.g. behavioural intention, subjective norm and self efficacy) during a first impression, anticipated use and the actual use. It is further assumed that the effects are moderated by the type of app (entertainment and information). To research the influence on the attractiveness of smartphone apps, the instrument of Hassenzahl (2003) has been used for this study.

Design ~ A three-staged experiment (n=101) was conducted with the help of a face to face questionnaire showing screenshots of the two entertainment apps (Logo quiz and Song quiz) and the two information apps (TechCrunch and The Verge), in the first impression stage. In this stage the users could name five words that described their first impression of the shown apps and 82 participants were not familiar with the apps. In the anticipated use stage, the instrument of Hassenzahl (2003) was used to measure the attractiveness of the app (n=97) along with the personal factor, behavioural intention to download the app. In the actual use stage (n=97), the instrument of Hassenzahl (2003) was used again, this time to measure the attractiveness of the app based on the actual use. The personal factors, behavioural intention to keep using the app, smartphone self-efficacy, subjective norm and the expertise from the respondents with smartphone apps was measured as well.

Findings ~ The study showed that entertainment apps are perceived as more attractive compared to the information apps in the first impression stage. The exploratory factor analyses showed that the instrument of Hassenzahl (2003) should be a three factor instrument for smartphone studies instead of a four factor instrument, because 93% of the items loaded on three factors instead of four. The factor hedonic quality identification loaded in the same factor as attractiveness in the actual use stage. The factor analyses also showed that even though user experience of a product is a result from the use or anticipated use of the product, the instrument of Hassenzahl (2003) only measures the actual use of a smartphone app and the anticipated use. This is because of the complex and incoherent loadings in the anticipated use stage.
Paired sample t-tests were used to compare the difference between the perceived anticipated use and perceived actual use of the apps. The results showed that pragmatic qualities became more positive in the actual use stage compared to the anticipated use stage, as well as hedonic quality identification and attractiveness. Hedonic quality stimulation became less positive in the actual use stage compared to the anticipated use stage, meaning that participants were stimulated less to use the app compared to the anticipated use stage.
A stepwise multiple linear regression was used to find out the significant effect the variables pragmatic and hedonic qualities and personal factors had on the attractiveness of the apps, moderated by the type of app. The results showed that the moderator had no causal effect

on the linear relation between the variables and the attractiveness. In the anticipated use stage 53% of the variance is explained by the variables of the attractiveness. And in the actual use stage 83%, which is remarkable high, of the variance is explained by the variables of the attractiveness. This result shows that the actual use of the app amplifies the perceived user experience of the respondent. It can therefore be said again that the instrument of Hassenzahl (2003) measures the user experience when actual usage of a product occurs. Another result of this study is that none of the personal factors, behavioural intention, smartphone self-efficacy and subjective norm had significant influences on the perceived attractiveness of the app.
Hedonic quality stimulation, hedonic quality identification and attractiveness did not always have a significant effect on the attractiveness of an individual app in the actual use stage compared to the anticipated use stage. A reason for this could be, because of the small sample size of each of the individual apps (n=22-24).

Originality/value ~ There are only a few studies about the user experience of smartphone apps available and this study is among the first to scientifically assess to what extent hedonic and pragmatic qualities influence the user experience of smartphone apps. From a theoretical standpoint, this study extends knowledge on the user experience of smartphone apps.

Keywords ~ User experience, attractiveness, pragmatic and hedonic qualities, first impressions, anticipated use, actual use, smartphone apps

Acknowledgments

My deepest gratitude goes out to a number of people, who made my master thesis possible. First of all I would like to thank my supervisor Thea van der Geest a lot. She helped me with finding a suitable and interesting topic and guided me profoundly with structure, theories needed and helped me in the right direction when I felt stuck and lost. I would also like to thank Sabrina Hegner for her insights and feedback on my thesis. Having them as my supervisors was a major component for the successful completion of this thesis. Next, I would like to thank is Mark Hassenzahl, who has provided me with the instruments and theoretical knowledge needed for this study.

I would like to thank Marloes Jansen for helping me code my data and reading my thesis, giving me feedback when structure was missing and doing the final check. Thank you as well for making my two years as a master student at the University of Twente much more fun. On this note I would like to thank Laura Ruijter as well.

Furthermore I would really like to thank my mom for her patience, support and understanding when I was working on my thesis. Thank you for putting up with me on stressful days. In the same light I would like to thank my family and friends who have stood by me. Iris van der Schoor for helping me design my front page and thank you uncle Sam for printing my questionnaires.

Last but not least, I would like to express my gratitude to my boyfriend who has helped me with the data input of this thesis, but also for his patience and understanding and silently keeping me company on my late nights working on this thesis.

1. Introduction

In the ever evolving world of mobile technologies, the advent of smartphones has caused an explosion of smartphone applications- which will be referred to as 'apps' in the rest of this study. Smartphones are phones with features such as wireless connectivity, multimedia presentation and capture, web browser that is built-in, a file management system, storage of several gigabytes, movement sensors and navigation software, high-resolution displays (HD-quality) application installation, full programmability like computers and much more. Smartphones can be used for regular activities such as texting and calling, but also to access the internet, making use of wireless technologies such as Bluetooth and access to applications such as games and multimedia (Oulasvirta, Wahlström, & Ericsson, 2010).

Mobile applications are software applications working on mobile devices such as smartphones, PDA's and other mobile devices. These applications can be downloaded through various platforms such as Google play store and Android market for smartphones running on Android, iTunes for smartphones running on iOS (Apple), Windows phone store and Windows store for smartphones running on Windows (e.g. Nokia), Blackberry app world for smartphones running on Blackberry device software and other software available platforms in the market. These platforms provide numerous free and paid apps simultaneously with reviews and user-rating features.

There is a very competitive market currently for organizations or any other institution for that matter, because almost everyone nowadays can create a software application (app). According to a press release from Gartner Inc. worldwide mobile app store downloads will surpass 81.4 billion apps downloaded in 2013, with 90% of this totality being free downloads (Pettey & van der Meulen, 2012). Telecompaper (2012) claims that 61% of the Dutch population aged between 15 and 65 years owns a smartphone (measured in quartile three of 2012). Furthermore demand for smartphones has increased and will keep increasing, because of their popularity, numerous functions, instant messaging (messaging each other on the go) and the ability of downloading specific apps (especially apps that are "needed"). Initially apps such as calendar, e-mail and contact apps were available. Due to public demand and different platforms offering various apps in different categories, such as games, weather, news, banking and other apps, the availability of diverse applications has grown.

The interest of this study lies in getting to know about the user experience a mobile user encounters when interacting with a smartphone application. Studies in the field of Human Computer Interaction (HCI) have contributed to the knowledge about user experience in

different areas (such as websites). First, HCI especially focused on doing research on the instrumental aspects of the quality of a product, such as functionality, ease of use and usability. In the past two decades, researchers found that there was a human need to address that would go beyond the instrumental aspects. For instance, the quality of a products' instrumental aspects together with its non-instrumental aspects, such as beauty, was to be seen as an important factor by Alben (1996). Other authors also supported the non-instrumental aspects such as beauty as an important factor of the quality of a product and this is researched more often these days (Hassenzahl, 2004; Hassenzahl & Tractinsky, 2006; Lavie & Tractinsky, 2004).

A field that considers both instrumental and non-instrumental aspects of the quality of a product is the field of user experience. There are many definitions of user experience. For now the following definition will be used, that is derived from ISO standard 9241-210 "A person's perceptions and responses that result from the use or anticipated use of a product, system or service"(ISO/DIS, 2009).

1.1 Goal

With the emergence of smartphone applications and the continuous growth of the number of applications, it is important to gain knowledge about the encountered user experience of smartphone applications.

The aim of this study is to provide knowledge about the experience users encounter during the usage of a specific app, by collecting quantitative and qualitative data. To be precise, the user experience that will be looked into will specifically focus on the relation between the non-instrumental, hedonic qualities (e.g. beauty, creativeness) and the instrumental, pragmatic qualities (usability) of an app.

With this aim, a general research question is formulated as follows:

What is the influence of pragmatic and hedonic qualities when the user experience of a smartphone app is shaped?

1.1.1 Practical relevance

Evidence for mobile software app developers will be provided to determine which role pragmatic (instrumental) and especially hedonic (non-instrumental) qualities play in the user experience of a smartphone app. As the authors Tractinsky, Katz, and Ikar (2000) say: "what is beautiful is usable". For software app developers insights about the user experience of smartphone apps, influenced by pragmatic and hedonic qualities are key. It also gives an

understanding of human behaviour in the ever evolving world of mobile technology (HCI). In addition, this study aims to provide insights on the user experience when using a specific app, for software developers to be directly implemented in practice. Moreover, outcomes of this study can be used for future developments in HCI technology to explore the user experience of future smartphone apps in development.

Originality/value – In a rapidly moving area of mobile technologies, this study will try to provide insights on the relation between the user experience and pragmatic as well as hedonic qualities of smartphone apps. It is of importance to acknowledge that the use of mobile apps on smartphones is increasing rapidly and with that the knowledge about the user experience from the web design domain into the smartphone app domain can be extended.

1.1.2 Academic relevance

Besides the practical implications, this study intends to build on previous research findings on the user experience of interactive products. Various authors have shown that hedonic (non-instrumental) qualities are an important part of the perception of usability of a product (Hassenzahl & Tractinsky, 2006; Phillips & Chapparo, 2009; Tractinsky et al., 2000). These studies primarily focussed on the perceived consequences caused by hedonic attributes and usability of web-designs – which will further be referred to as desktop versions in this study. These studies will be used as a foundation and comparison to why smartphone applications need to be researched on their pragmatic (instrumental) and hedonic (non-instrumental) qualities causing a certain user experience.

Web applications designed for desktop usage display a lot of options on the home page, simultaneously also a lot of text. Even though it is quite natural to consider a smartphone app to be the small version of a desktop version, the difference in usage patterns asks for a different approach when smartphone interfaces are designed and operationalized. A practical app must assist the user to focus on a specific task, rather than all the options available such as on a desktop version that can cause distraction (Salmre, 2005). Moreover, smartphone devices have a distinguished characteristic of having a small format, which results in requiring a special user interface. Because of the limited screen solution, a smart user interface design has to be used, which should be different from the desktop version. Choi and Lee (2012) mention for example, that due to the limited screen size, multiple windows in the same screen should be limited, and full menu items should be left out.

According to Emmanouilidis, Koutsiamanis, and Tasidou (2013) a user interface of a smartphone app must be clear, insightful, flexible for the user to decide what amount of information to take in and it should be consistent. Not all available functions should be presented within a single screen, in contrast to a desktop version. The most common functions should be directly visible and through navigation and clicking other secondary functions should become available. This in comparison to a desktop version. Here, the user should directly see the various options, without having to click too much (Emmanouilidis et al., 2013).

Choi and Lee (2012) also mention that because smartphones ask for fingertips usage to interact with the smartphone compared to the mouse for browsing on a pc or the web, it becomes priority for smartphone developers to prevent errors for correct navigation on the interface of the design of the smartphone. For instance, the buttons on a smartphone should have enough space to correctly touch them with a fingertip.

Smartphones have the benefit of being carried around 24/7 most of the time. Desktop versions on the other hand cannot match the benefits of being carried around all the time. Because of this, the key advantage that smartphone apps offer is that they can be used in different contexts for various functionalities. This means that apps can offer tailored information and services in different contexts. (Spaccapietra, Al-Jadir, & Yu, 2005). Choi and Lee (2012) also mention this on-the-go principle in different context of use such as privacy, personal needs, space and time.
Other factors that might influence the smartphone users are the disruptions that occur when going outside, such as sunlight interruptions that can cause an unclear display. Full concentration on a small screen for a long time is also limited and therefore the user will expect an app to work as efficient as possible when using a smartphone. Visual richness or diverse windows may not be preferred by smartphone users, due to the screen size (Choi & Lee, 2012).

1.3 Thesis structure

In this section the structure of this study will be discussed. Chapter 1 has already been introduced, giving insights about the practical and academic relevance of this study. Chapter 2 will give an overview of the theoretical framework for this study finalized with a research model and research questions. Chapter 3 will present the reader with the method how this study will be performed, followed by chapter 4 where gathered data will be analysed. The final chapter, chapter 5, will present the reader with final conclusions, discussions and recommendations for future studies.

2. Theoretical framework

This theoretical framework is based on factors that can influence the user experience of smartphone apps. Section 2.1 defines smartphone apps and the types available. Section 2.2 presents a definition of user experience. Section 2.3 provides factors influencing the user experience such as pragmatic qualities, hedonic qualities and the attractiveness, followed by section 2.4 providing additional factors such as personal factors, namely behavioural intention, self-efficacy and subjective norm that can possibly affect the user experience.

2.1 Smartphone apps

In this section a detailed description will be given on what a smartphone app is. Smartphone apps are applications that can easily be downloaded to add specific functions to a smartphone . Where mobile phones were initially designed to call and text, mobile phones can now be expanded to multifunctional communication technologies by downloading applications, which makes a mobile into a smartphone (Zheng & Ni, 2010). Smartphone apps make it possible to send messages (free) always and everywhere and are the strongest of its kind in infotainment. Infotainment for smartphones means that the public is easily up-to-date of the latest information such as news, social media updates (e.g. status updates of friends and family), the weather, traffic and sports (Jebril, Albæk, & de Vreese, 2013).

2.1.1 Types of smartphone apps

There are different types of smartphone apps. According to Brenner (2012) the most popular smartphone apps are those that provide regular updates (news, sports, weather) and those apps that people use to communicate (iMessage, WhatsApp, Skype). The most common areas of smartphone apps are information apps, networking apps and entertainment apps (Brenner, 2012; Google, 2012).

Networking apps are applications that are often called social media apps (WhatsApp, Facebook, Twitter, Hi5 and E-mailing) that include updating your current status, state of mind, looking at messages from friends and family or visiting their pages.

Entertainment apps can be applications that are mostly used during leisure time (e.g. playing games, internet surfing, watching music and movies on Youtube, Spotify, Dumpert.nl or Facebook)(Google, 2012).

According to a study from the source Google (2012) on the insights of the mobile consumer in the Netherlands, 86% of their participants (N=1000) used smartphone apps for entertainment (such as games, surfing on the internet and music); 82% used their smartphone apps to communicate (such as WhatsApp, Facebook and E-mail) and 56% used an app to stay informed (such as news-apps, weather-apps and blogs). The same study

showed that participants have installed approximately 25 apps on their smartphone, nine of which they have used in the past 30 days and five of these apps were paid apps.

For this study, information apps and entertainment apps will be used as moderators to research the user experience of smartphone apps. It is assumed that the type of app has an influence on the relation between hedonic and pragmatic qualities and the user experience. Minimal scientific data can be found to support this assumption, however it is a good starting point to find out whether the type of app has an influence on the relationship between pragmatic and hedonic qualities and the user experience of smartphone apps.

2.2 User experience

According to the ISO standard which is, ISO standard 9241-210, User experience (UX) is defined as *"A person's perceptions and responses that result from the use or anticipated use of a product, system or service"* (ISO/DIS, 2009). In this definition it is implied that a person's perception is shaped from the anticipated use or use of a product, which means that the time span in which a user experience is shaped is of utter importance. Therefore different time spans that can shape the user experience will be discussed.

2.2.1 Different time spans shaping the user experience

Time spans have an influence on the user experience of the user (Karaponas, Hassenzahl, & Martens, 2008). An individual will have a different perception on the user experience when using the product for a longer period in time, compared to their perceived user experience when using a product for the first time (Karapanos, Zimmerman, Forlizzi, & Martens, 2009; Karaponas et al., 2008; von Wilamowitz-Moellendorff, Hassenzahl, & Platz, 2006).

According to Karaponas et al. (2008) time and the time spent using a product has an influence on the user experience. For example when using the product for a longer period of time, the user friendliness of the product might seem different (Karapanos et al., 2009; Karaponas et al., 2008). According to these authors, time is also of influence on the perceived quality of the product itself, for instance the user first focuses on the easiness and user friendliness of a product and the stimulation to use the product. After a while the user friendliness is not as important anymore, but the updates provided that can enhance the product to make it more interesting and viable could be more important.

Even though the core of user experience is the actual usage experience, it does not cover all user experience concerns. An indirect experience of a product can be formulated beforehand when seeing the product for the first time. These indirect experiences continue and expand

when the potential user starts anticipating the experience with the product and even after using the product for example through changes in the appraisal of the product use.

ISO (2009) also states that the anticipated use or actual use of a system or service results in a user experience when a person's perceptions and responses are shaped.

Roto, Law, Vermeeren, and Hoonhout (2011) mention that time spans can cause different user experiences and distinguish four time spans, the anticipated user experience that may relate to the period before using the product, momentary user experience that can change a feeling during interaction, episodic user experience which is an appraisal of the product right after usage or cumulative user experience which is an appraisal of a product as a whole after using it for a while (Roto et al., 2011).

For this study, three time frames will be used for the user experience when performing the questionnaire. The first time frame that will be used is the first impression user experience, because research of Lindgaard, Fernandes, Dudek, and Brown (2006) shows that it takes 50 milliseconds to leave the user with a visually appealing first impression.
The second time frame will be the anticipated user experience, where the user will be able to evaluate what to expect from the smartphone app.
And the third time frame will be the actual use stage, were the user is able to form both momentary and episodic user experiences about the smartphone app.

There are two separate research approaches in the field of user experience, therefore the definitions of these approaches will be explained in the following section. The first approach is from Mahlke and Thüring (2007) and the second approach is from Hassenzahl and Tractinsky (2006).

2.2.2 Definition of user experience by Mahlke and Thüring (2007)

The first approach which is from Mahlke and Thüring (2007) outlines the major components of user experience in a model called "The CUE-Model: Components of User Experience". See Figure 1 for this model.

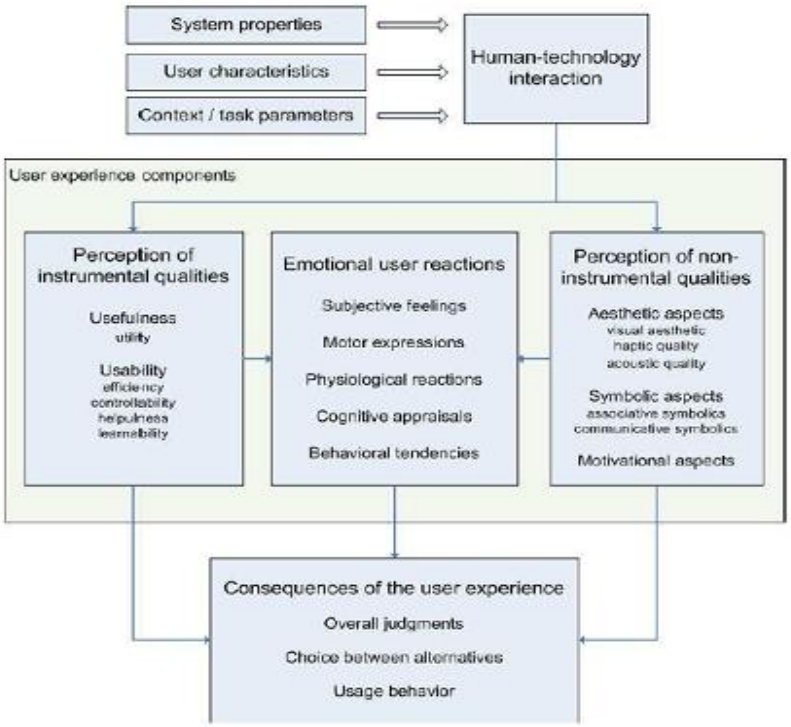


Figure 1. The CUE Model: Components of user experience by Mahlke en Thüring (2007, p. 916)

The reason why these authors have called the model the CUE-Model, is because according to them, user experience is a description of diverse components that interact in particular manners (Mahlke & Thüring, 2007).

According to Mahlke and Thüring (2007) *"User experience is gained through the user's interaction with the system"* (p. 916). This interaction depends on whether the task is accomplished, the context in which the task has been performed and the limited period of time available for the task. The interaction is affected by skills and knowledge of the user and the functionality and interface design of the system that can determine the major characteristics of the user experience (Mahlke & Thüring, 2007).

According to Mahlke and Thüring (2007) there are two components that influence the user experience. The first component is the perception of instrumental qualities and the second component is the perception of non-instrumental qualities. Instrumental qualities mainly include features concerning the usability and usefulness of a system, while non-instrumental qualties have features that concern the looks (aesthetics) and feel of the system and are a result from the appeal and attractiveness. Mahlke and Thüring (2007) also mention that these two types of components are likely to influence the third component of user experience, emotions, which is also a component that directly influences the user experience. It can be concluded that the three components of the user experience are of utter importance when

appraisal of the whole system takes place and can therefore influence upcoming reactions, descions and performance. See Figure 1 for an overview of the model of Mahlke and Thüring (2007).

2.2.3 Definition of user experience by Hassenzahl and Tractinsky (2006)

The second approach is of the researchers Hassenzahl and Tractinsky (2006). These authors explain several concepts that define user experience:

"User Experience is about technology that fulfils more than just instrumental needs in a way that acknowledges its use as a subjective, situated, complex and dynamic encounter. UX is a consequence of a user's internal state (predispositions, expectations, needs, motivation, mood, etc.), the characteristics of the designed system (e.g. complexity, purpose, usability, functionality, etc.) and the context (or the environment) within which the interaction occurs (e.g. organizational/social setting, meaningfulness of the activity, voluntariness of use, etc.)" (Hassenzahl and Tractinsky, 2006, p. 95).

In the user experience model of Hassenzahl (Hassenzahl, 2003, 2004) product features are combined with individual expectations and principles that can cause a user experience. Product attributes consist of various aspects such as the substance, appearance, functionality and interactivity of a system or product. These aspects influence the users' perception on a product its attributes (Schaik & Ling, 2008). See Figure 2 for the user experience model of Hassenzahl (2003).

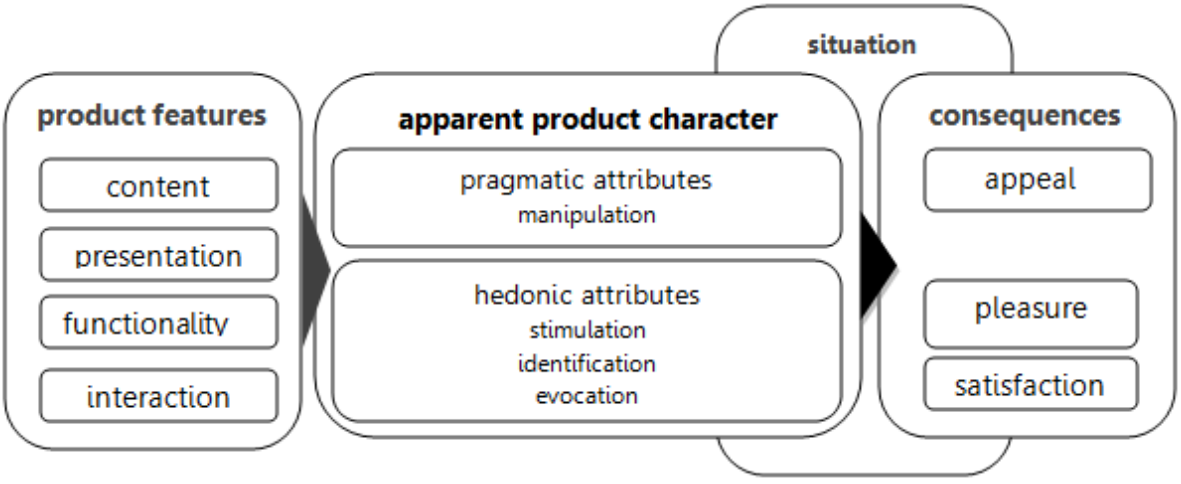


Figure 2. Key elements of the model of user experience from a user perspective Hassenzahl (2003, p. 32)

The user experience model as displayed in Figure 2 is from a users' perspective. This means that it is not about how a product reacts to the user's affective state, but how the user experiences the interaction with a product affectively. In the instrument of Hassenzahl (2003)

user experience is measured as attractiveness (Hassenzahl, 2003; Hassenzahl & Tractinsky, 2006).

2.2.4 Definition of user experience used for this study

The user experience model that will be used for this study is the model of Hassenzahl and Tractinsky (2006). One of the reasons for this is that the model of Mahlke and Thüring (2007) focuses more on the appraisal of a system based on the components of the model, while the model by Hassenzahl (2003) describes user experience from a users' perspective of a product. This means that the model of Hassenzahl (2003) can be used for various products and not only systems as implied by Mahlke and Thüring (2007) to gain insights into the user experience. The model of Hassenzahl (2003) has been used previously for different products such as a computer display (Hassenzahl, 2001), website design (Hassenzahl, Kekez, & Burmester, 2002), MP3 player software (Hassenzahl, Platz, Burmester, & Lehner, 2000), Embodied Conversational Agents (ECA) an app for smartphones (Vlot, 2012) and to measure the influence of brand-experience on user experience in websites (Klomp, 2011). This diversity of implementation of the UX model by Hassenzahl (2003) implies that it is a good model to use to research the user experience of smartphone apps.

Another reason why the model of Hassenzahl and Tractinsky (2006) will be used, is because emotions are differentiated as consequences of product use and affective reaction (Hassenzahl & Tractinsky, 2006). This in comparison to the model of Mahlke and Thüring (2007) initiating that emotion is a component that can have an influence on the consequences of the user experience but cannot be the user experience it self (Mahlke & Thüring, 2007). The CUE model of Mahlke and Thüring (2007) visualises that a consequence of the user experience can be an overall judgment, choice between alternatives and use behavior (Figure 1) while the model of Hassenzahl and Tractinsky (2006) visualises emotions as a consequence such as satisfaction about the inteactive product (Figure 2).

Section 2.4 will give a detailed overview on the user experience model of Hassenzahl (2003) and its predictors.

2.4 User experience from a user's perspective by Hassenzahl(2003)

In this section the model as displayed in Figure 2 and the model components will be discussed in detail, following the line of reasoning of Hassenzahl (2003).

A process is set in motion when an individual makes a connection with a certain product. Looking at the UX model (Figure 2), it can be seen that an individual will first start to notice the product features. Based on these product features, expectations and personal values, an

individual will develop a personalised view on the product features, namely the apparent product character. An apparent product character can be influenced by the designer to communicate a certain image of a product (called the intended product character). This apparent product character is an abstract view of the product features expressed in terms such as interesting, conventional and innovative. After the apparent product character has developed, it will lead to various consequences. These consequences can be on the appeal of the product (is it good or bad?), emotional consequences (such as pleasure and satisfaction) and behavioural consequences (the increased time that is spent with the product) (Hassenzahl, 2003, p. 32).

2.4.1 Hassenzahls view on the apparent product character

Hassenzahl (2003) describes the apparent product character as *"the user's personal reconstruction of the designers' intended product character"* (p. 33). When an apparent product character occurs in a specific situation, this will lead to different consequences. The construction of an apparent product character is based on the features of the product itself, but also on the standards and expectations of the individual. This apparent product character can change over time within an individual. This change happens because the individual gets more experienced with the interactive product. For example, when downloading a multimedia app (such as a music app) that has continuous pop-ups on the screen on what the meaning of certain icons are, can be really useful when using the app for the first time and a positive apparent product character is shaped. However in time, this positive apparent product character can change into a negative one, because the pop-ups might create irritation and frustration when the user is already skilled with the app and might find the pop-ups unnecessary.

In Hassenzahl's work (2003; 2004) two main groups of product attributes are described as representatives structuring the apparent product character. These two dimensions, namely pragmatic and hedonic qualities, are formulated by Hassenzahl based on human needs. As can be seen in the model in Figure 2, Hassenzahl makes a distinction of four different human needs, namely: manipulation, stimulation, identification and evocation.

2.4.2 Pragmatic attributes – Manipulation

Manipulation as described by Hassenzahl is *"manipulation of the environment requires relevant functionality (i.e. utility) and ways to access this functionality (i.e. usability)"* (2003, p. 34). Manipulation of the environment requires relevant functionality and a user interface to make use of this functionality (user friendliness). Hassenzahl (2003) describes the attributes that are in line with this requirement as pragmatic attributes. Various pragmatic attributes

result in a pragmatic quality of a product. Pragmatic quality of a product relates to the extent in which an interactive product helps in completing tasks, so called 'to–do' goals. Some examples of to do goals are "turning on a computer", "downloading a smartphone app" and other task-oriented goals to "do"(Hassenzahl, 2008).

2.4.3 Hedonic attributes

Hedonic qualities are qualities of a product perceived to be enjoyable and or pleasant and are not directly related to the task a user wants to achieve, but rather the originality and beauty of the product. Hedonic qualities go 'beyond the instrumental aspects of an interactive product, the so called ' to – be' oriented goals (Hassenzahl & Tractinsky, 2006). Examples of 'to-be' goals can be "being extraordinary", and "being capable" (Hassenzahl, 2008). Hedonic qualities go beyond the pragmatic/instrumental qualities where human beings will have a need for newness, originality, change, personal development, self-expression and other human related needs.

The three human needs, stimulation, identification and evocation describe the hedonic qualities of a product according to Hassenzahl (2003).

2.4.3.1 Hedonic quality - Stimulation

According to Hassenzahl (2003), individuals seek personal development by increasing their knowledge and developing skills overtime. To do so, products should be stimulating, which is necessary for personal growth (Hassenzahl, 2004). To fulfil the need of self-growth and self-development, products must stimulate new insights and chances. Hassenzahl (2003) mentions that even when the full capacity of a product is not used, these non-used functions are seen as chances for future self-development.

2.4.3.2 Hedonic quality - Identification

The attribute of identification refers to the ability of individuals to express themselves. Individuals have an urge to be seen in a certain way by relevant others, whether it is to be socially accepted, to exert power on people or the will to differentiate themselves from others. To fulfil this human need, it is important that the product itself portrays a certain kind of image/identity. By using this product, individuals can identify and express their selves. According to Hassenzahl (2003), individuals like products that communicate a certain positive identity in the eyes of relevant others.

2.4.4 Evocation

Evocation is a product attribute that fulfils the human need when the product recalls certain memories. An example of evocation-attributes are the attributes that users link to goods that

they do not actually use anymore, but are preserved because these goods evoke some great old memories. According to Roto and Rautava (2008) "*Evocation aspect is promoted by designing personal products that I keep close to me most of the time*" (p. 2). This attribute will not be used for the research of smartphone apps, because only unfamiliar apps will be used for this study and evocation can therefore not be measured.

2.4.5 Consequences: Satisfaction, pleasure and appealingness

"Experiencing a product with a certain character will have emotional consequences, such as satisfaction or pleasure" (Hassenzahl, 2003, p. 38). Consequences like these (satisfaction, pleasure and appeal) occur when technology is experienced. Satisfaction requires a certain expectation. For example, one is expecting an app to perform the task of the user. If the task can be completed with minimal errors, than the user is satisfied and pleased with the app. However, joy or pleasure do not call for any expectations. It could be that pleasure is derived from the unexpected performance of the product and that therefore the more unexpected the product is, the stronger the pleasure. A product is appealing when it triggers positive emotional reactions. Appealing means that a product can be visually appealing, attractive, motivating, desirable and other positive product attributes. When a consequence is positive, the behavioural intention to use the product is more likely to occur (Hassenzahl, 2003). The term behavioural intention will be explained further in this section.

2.5 Situation

The situational context when a product will be used is not always the same. The context depends on the task. Therefore, the situation influences the value of a product perceived by the user. The task always consists of *"behavioural goals and actions to fulfil these goals"* according to Hazzenzahl (2003, p. 39). The author (2003) therefore describes a goal-mode and an action-mode. A goal-mode is something that has to be done, within a specific period and an action-mode is something that can be performed at any time the user feels like. According to Korhonen, Arrasvuori, and Väänänen-Vaino-Mattila (2010) there are several different contexts that can be important– the triggering context – in affecting the UX in a certain situation. Various context from research of Korhonen et al. (2010) that apply for this study are the personal context, the task context and access network context. A fourth contextual situation that applies for this study is app support context (Chen & Zhu, 2011).

2.5.1 The personal context

There are two types of personal context. The first type is the physical condition of the user e.g. blood pressure. The second type is the mental state a user is in. This mental state can be best described as e.g. the user's mood, expertise, stress (Korhonen et al., 2010). For this study,

only the expertise of the participant will be measured due to practical considerations. The expertise will be measured by asking the participant about the frequency of use of smartphone apps.

2.5.2 The task context

The task that the user is engaged in at a certain time, is called the task context. For example, the user is engaged in a task, event, activity or happening. There are two types of task-contexts. First one is the primary task. The user is engaging with the product, but is being interrupted by other contextual factors. The second one is the secondary task. Here, the user is performing another task, while at the same time engaging in using the product. For example, a secondary task could be that a user is reading a book, while at the same time tries to message a friend. This is also called multitasking (Korhonen et al., 2010). For this study, only a primary task will be given, which is the same for entertainments apps and the same for information apps. The participants will have to perform a task on their smartphone by making use of a smartphone app.

2.5.3 Access network context

Access network context explains the communication between different products with one another, through Bluetooth, network (e.g. GSM, UMTS, GPRS, LTS) or WLAN. This context describes the characteristics such as speed of the network, the availability of it, the network coverage, costs etc. In this study, the access network context will be kept constant by making sure that the participant has either a WLAN (Wi-Fi) connection or network (UMTS, GPRS) connection to download and use the smartphone app.

2.5.4 App support

Chen and Zhu (2011) mention that the operating system on the device affects the user experience. This study will focus on Android operating systems working on Android Ice Cream Sandwich 4.0 and more advanced Android together with iOS 6 and more advanced iOS. Furthermore, this study will use similar looking apps from each of these different platforms, meaning that each app will look alike on both operating systems.

2.6 Personal factors influencing the UX

There are other factors, beside the factors mentioned by Hassenzahl (2003), that can have an influence on the user experience. These factors are called personal factors in this study and the factors that have been chosen are behavioural intention, subjective norm and self-efficacy.

2.6.1 Behavioural intention

Ajzen (1991) states *"intentions are assumed to capture the motivational factors that influence a behaviour; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behaviour"* (p. 181). Behavioural intention is the intention on predicting and planning to download and use a system (Fishbein & Ajzen, 1975) for this study a smartphone app. It is also assumed that when the behavioural intention to download and use the smartphone app is positive, the user experience will be more positive. Previous studies have shown that behavioural intention has an influence on the actual use behaviour (Venkatesh & Bala, 2008; Venkatesh, Morris, Davis, & Davis, 2003) and it is therefore assumed that behavioural intention has a direct influence on user experience. Behavioural intention will be measured using three items from Venkatesh et al. (2003) adapting it to the purpose of this study.

2.6.2 Computer Self - Efficacy

Computer self-efficacy (CSE) means that a user believes he or she has the ability to perform a specific task on a computer with or without technological support (Compeau & Higgins, 1995a; Compeau & Higgins, 1995b; Venkatesh & Bala, 2008; Venkatesh et al., 2003). CSE has been derived from the social psychological concept of Bandura (1994), self-efficacy, which proposes that an individuals' judgment about his or her ability affects their actual performance. CSE can influence an individuals' motivation to use a system, but also an individuals' affect and persistency (Deng, Doll, & Truong, 2004). Creativity can also be enhanced by CSE (Ayeni, 2006). CSE has further been identified as a main determinant for computer usage (Hasan, 2003) and as a key factor for adopting technology in a work environment (Thatcher, Gundlach, McKnight, & Srite, 2007). Venkatesh and Bala (2008) mention that when a system has characteristics such as reliability, flexibility and user friendliness it will be more likely that the user experience with the system is more enjoyable and less system-related anxiety will occur. These system related characteristics will enhance an efficient usability of the system, because tasks can be performed quickly. Venkatesh and Bala (2008) also mention that when a system appears to be user friendly, the user may feel that they have an even better control over the system and therefore self-efficacy towards using the system can be enhanced. Concluding, these previous studies the diversity of CSE postulate that it is an important factor to consider to research whether it has an influence on the user experience. CSE has been adapted to smartphone self-efficacy (SSE) for this study. SSE will be measured using four items from CSE of Compeau and Higgins (1995a) adapting these items to the purpose of this study.

2.6.3 Subjective norm

Subjective norm (SN) is when an individual is influenced by his surrounding peers on what is important or not and whether these important others believe the individual should use the system or not (Fishbein & Ajzen, 1975; Venkatesh & Davis, 2000). SN will be researched in this study to find out whether SN has an influence on the UX of smartphone apps. It is assumed that when surrounding peers are favourable toward a new smartphone app, it will be more likely that the individual forms more favourable perceptions toward the smartphone app before using it (anticipated user experience) and even after using the smartphone app through the process of social influence. Venkatesh and Davis (2000) also mention that through the social influence processes, individuals are more likely to be favourable in accepting a system when their surrounding peers (in the study of these authors the surrounding peers were co-workers) are positive about the system as well. For this study participants will be asked about the influence of their surrounding peers in general, not for the smartphone app specific. The reason for this is because it is important that the individual is not familiar with the app yet, otherwise a first impression cannot be measured. SN will be measured using four items from Venkatesh et al. (2003) and adapting them to the purpose of this study.

2.7 Research question and research model

Based on the theoretical framework a research question can now be formulated.
The general research question formulated in the introduction (§1.2) of this study was "*What is the influence of pragmatic and hedonic qualities when the user experience of a smartphone app is shaped?*

As can be seen from the theoretical framework, the factors hedonic quality identification (HQI) and stimulation (HQS), pragmatic quality (PQ), behavioural intention (BI), subjective norm (SN) and smartphone self-efficacy (SSN) will be used to measure the attractiveness. As mentioned in § 2.2.2, UX is measured as attractiveness in the instrument of Hassenzahl (2003). Demographics (gender and education) of the participant can also be of influence on the attractiveness and will therefore also be considered as a factor.

Based on these factors a final research questions can now be formulated:

Main question:

1. *"To what extent is the attractiveness of smartphone apps influenced by pragmatic and hedonic qualities and personal factors of the user , during a first impression, the anticipated use and the actual use?"*

Sub question:

2. *"To what extent is the attractiveness of each individual app influenced by pragmatic and hedonic qualities and the personal factors of the user during a first impression, the anticipated use and the actual use?*

Figure 3 displays the research model that will be used for this study.

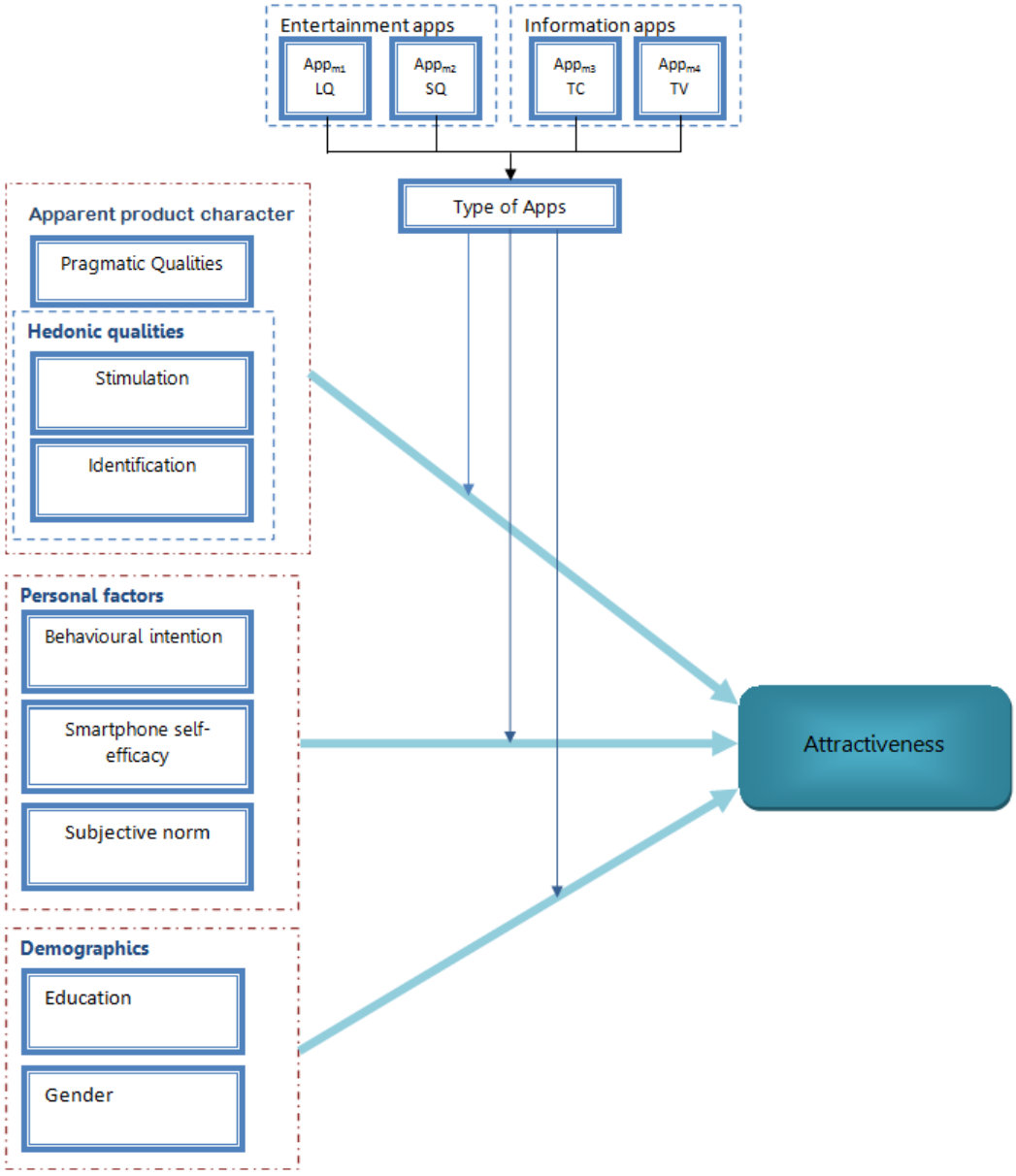


Figure 3. Research model
Note. [a]= smartphone self-efficacy, which is only measured in the actual use stage.

3. Method

To answer the main question '*to what extent is the attractiveness influenced by pragmatic and hedonic qualities of smartphone apps and personal factors of the user during a first impression, the anticipated use and the actual use?*' as well as the sub question, the method on how the research questions will be answered will be explained. In section 3.1, a description of the potential participants will be given and where they are recruited. In Section 3.2, the instrument for this study will be discussed. Section 3.3 will give an overview on the procedure of conducting this study and section 3.4 and 3.5 will discuss how qualitative and quantitative data gathered will be analysed.

3.1. Participants

People that will be participating in this study will belong to a homogeneous sample of young people under 30 years who will be approached in random areas, such as the library and the university cafeteria. The questionnaire will be performed face to face. Participants need to meet several criteria. The participants should own a smartphone running on either android 4.0 or up or iOS 6 or up (apple) and must be willing to download an app on their smartphone.

According to a report of central bureau of statistics (Leenen & Sleijpen, 2013) approximately 60 percent of people between the age of 12 and 25 use their smartphone on a daily basis, making this the largest group in the Netherlands. This group should be familiar with downloading apps. A minimum of a 100 participants is set for this research to get meaningful results.

3.2 Instrument

In this section, the selection on the criteria for smartphone apps used for this study will be discussed along with an explanation of the instruments by Hassenzahl (2003) and the other factors mentioned in the theoretical framework, that have been used in the questionnaire.

3.2.1 App selection

To make a first impression and perceived anticipated use, the app should not be known by the respondent. During the time of collecting data, the chosen apps will be visited continuously in order to see whether the app has changed.

Two information apps and two entertainment apps will be used for this study. The names of the apps differ for both platforms, but the apps look similar to each other. Table 1 gives an overview of the four chosen apps.

Table 1

Overview of chosen apps

Entertainment App	Information App
App 1 :	App 3:
Logo quiz – National Flags (android)	Tech Crunch(android and apple)
National flags quiz ultimate (apple)	
App 2:	App 4:
Song quiz: Guess Radio Music (android)	The Verge (android and apple)
Song quiz: Guess Radio Music Games (apple)	

3.2.2 Reliability of the instrument from previous studies

To measure the user experience, a Dutch translation by Klomp (2011) of the instrument Attrakdiff2 of Hassenzahl, Burmeister, and Koller (2003) has been used (Appendix H). This instrument consists of four components, namely pragmatic qualities (7 items); hedonic qualities identification (7 items); hedonic qualities stimulation (7 items) and attractiveness (7 items). Table 2 gives an overview on the Cronbach's Alpha from various studies.

See appendix A-D for the questionnaires.

Table 2

An overview of the Cronbach's alpha from various studies

Study	Hedonic quality Identification *α*	Hedonic quality Stimulation *α*	Pragmatic Quality *α*	Attractiveness *α*
Hassenzahl (2001)	.93	.90	.83	-
Hassenzahl (2004)	.85	.95	.90	-
Schaik and Ling (2008)	.86	.90	.93	
Klomp (2011)	.82	.87	.88	.92

Note. Instruments are measured using a 7 point semantic differential scale

To measure the personal factors behavioural intention (3 items), subjective norm (5 items) and smartphone -self efficacy (4 items), items of Unified Theory of Acceptance and Use of Technology Model (UTAUT) by Venkatesh et al. (2003) have been used and adjusted to the purposes of this study. The items have an average reliability of α=80 from previous researches. The items were originally designed for information technology purposes, but past studies have proven these items to be very adaptable for various products and technologies (Cheong, Park, & Hwang, 2004; Massini, 2004; Welmers, 2005).

3.3 Research procedure

For an overview of the research procedure see Figure 4. This procedure will be explained stepwise.

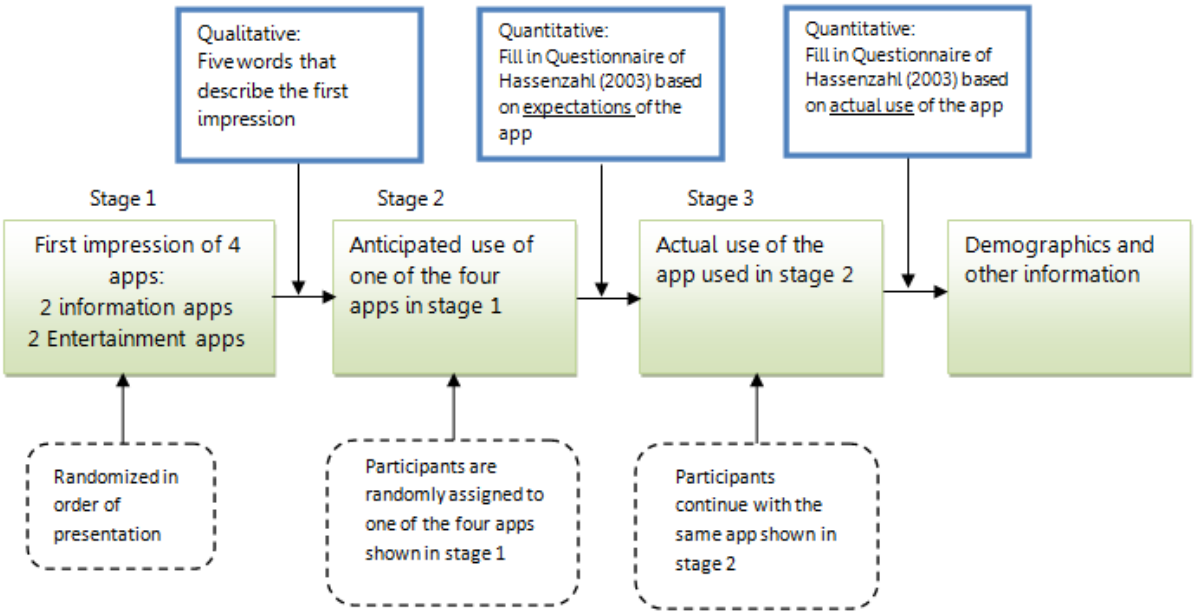


Figure 4. Research procedure

3.3.1 Stage 1: First impression

Four different screenshots will be shown for two seconds in the first impression stage and after each screenshot the participant can write down five words describing their first impression of the app on the questionnaire. To make sure that the participant reported a first impression, a control question has been asked whether the participant is already familiar with the app. See appendix G for the screenshots of the apps.

3.3.2 Stage 2: Anticipated use

Participants were randomly assigned to one of the four apps from the first impression stage in the anticipated use stage. The participant is allowed to look at the app for one minute and will be asked to fill out their questionnaire based on their anticipated expectations of the app. In this stage the semantic differential scales designed by Hassenzahl (2003) are introduced. At the end of this stage, the participant will be asked whether he or she is willing to download the app (behavioural intention).

3.3.2 Stage 3: Actual use

In the third stage "actual use", the participant will be asked to download the app (if necessary with the help of the researcher) that was displayed in the anticipated use stage. Downloading the apps is not part of the study only the task given in the questionnaire. After downloading the app, the respondent is asked to perform a task on his or her own. If the respondent has

been assigned an entertainment app, the respondent will be asked to play a game. If the respondent has been assigned an information app, the respondent will be asked to select an article in the social or entertainment section and send it to his or her email.

After performing the tasks, participants will be asked about the difficulty of the task (difficult or not difficult) or whether certain errors occurred when trying to perform the task. The researcher has been present at all times to see whether the task has been completed and whether technical errors have occurred. After completion or non-completion of the task, the participant will be asked whether the anticipated use was different from the actual use of the smartphone app. After that, the respondent will continue filling out the questionnaire. The semantic differential scales designed by Hassenzahl(2003) will need to be filled in again, this time for the experience encountered when using the app. At the end of this stage, the participant will be asked whether he or she is willing to keep using the app (behavioural intention) and whether he or she will delete it.

3.3.4 Personal factors and demographics

In the final part of the questionnaire, the participants are asked about their demographics, the influences of their peer surroundings (subjective norm) and whether the participant had the ability to complete the given task without any technological support (self-efficacy). See Appendix A-D for the final questionnaires. The questionnaires will need to be filled in following a specific procedure. This procedure is described in a protocol. See Appendix F for the protocol applied for this study.

3.4 Analysing qualitative first impression data

In the first impression stage, qualitative data will be collected. As described in §3.3 the participants can name five words that describe their first impression for each app. In total 2020 (4^{apps}*5^{words}*$101^{participants}$) first impressions can be formulated. The first impression data will be coded with a codebook that is both data and theory-driven. The codebook is based on the Dutch translation of Klomp (2011) on the items used by Hassenzahl (2003) as described in the theoretical framework. The codebook has a total of 9 codes (code 1 – 9). The component, hedonic quality identification has a total of seven differential semantic scales, coded as 1 and 2 for the positive and negative side of these differential semantic scales. The component, hedonic quality stimulation has a total of seven differential semantic scales, coded as 3 (positive) and 4 (negative). Component pragmatic quality has a total of seven differential semantic scales, coded as 5 (positive) and 6 (negative). The last component, Attractiveness has a total of seven differential semantic scales, coded as 7 (positive) and 8

(negative). Code 9 has been used as descriptive words, meaning what the participant think he or she has seen. See Appendix E for an overview of the codes.

For example, one of the five impressions of participant X about the logo quiz is attractive. This will be coded as a 7, the positive side of the category attractiveness. Another example from participant X about the The Verge app, describing it as complicated (ingewikkeld) which is coded as 6, the negative side of pragmatic qualities.

Another example, participants may not describe a feeling as their first impression, but what the participant thinks he or she has seen. For example, participant Y about the logo quiz names three different first impressions namely green, game and flags. Words like these have been recoded as a descriptive and will not be used for further analyses.

Participants may encounter difficulties with naming five words for each smartphone app that describes their first impression. These non-filled in words are recoded as missing and will not be used for further analyses.

Using this codebook, two coders started coding the first 400 impressions of the first 20 questionnaires independently to obtain a high inter-rater reliability. 96% of the first impressions was coded similar, the remaining differing codes were given a final code after consultation among both coders.

Table 3 displays the total number of descriptives mentioned and missing words from each of the four apps.

Table 3
Total number of descriptives and missing words

	Logo Quiz	Song Quiz	Tech Crunch	The Verge
Descriptive	220	219	169	149
Missing (filled in nothing)	61	59	83	117

Table 4 displays the total number of the final first impressions used for this study

Table 4
Number of final first impressions used for further analyses

	Logo Quiz	Song Quiz	Tech Crunch	The Verge
First impressions used	149	213	253	219

3.5 Analysing quantitative data anticipated use and actual use

Before starting with the actual data collection of this study, the questionnaire has been pre-tested by five participants. During the pre-test of the questionnaire, the respondents were asked to think aloud when giving an answer to the translated semantic differential scales from the instrument of Hassenzahl and Tractinsky (2006). The participants experienced difficulties in relating some of these scales to the entertainment apps or information apps. The semantic scales that seemed difficult or inappropriate for the entertainment apps were: likable – disagreeable (symphatiek – onsympathiek), cheap – valuable (minderwaardig-waardevol) and alienating – integrating (afgezonderd – betrokken). The word-pairs that seemed difficult or inappropriate for the information apps were: likable – disagreeable (symphatiek – onsympathiek) and unpredictable – predictable (voorspelbaar – onvoorspelbaar). From this face-validity test it can be concluded that there might be a validity issue with the instrument of Hassenzahl.

The actual data collected (questionnaires performed after the pre-test) will be processed into SPSS 20.0. Before starting with analysing the data, a reliability (Cronbach's Alpha) and validity (factor analyses) analysis will be done for the collected data. To answer the research question and sub question, means are compared between the anticipated use stage and actual use stage by performing paired sample t-tests. A stepwise multiple linear regression will be performed to find out the variance explained for attractiveness in the anticipated use stage and actual use stage.

4. Results

This chapter will work towards answering the main question "*To what extent is the attractiveness influenced by pragmatic and hedonic qualities of smartphone apps and personal factors of the user , during a first impression, the anticipated use and the actual use?"* . Section 4.1 will give an overview of the recruited participants. Section 4.2 provides a detailed overview on the qualitative data of the first impression stage. Section 4.3 will continue with the quality of the questionnaire by researching the reliability and validity of the instrument. Section 4.5 till 4.8 will provide an answer to the main and sub question using t-tests and multiple linear regressions.

4.1 Gathered participants

Participants have mainly been recruited at the university library of Nijmegen. All participants (n=101) used their own smartphone, running either on android or iOS (Apple).

The following tables 5-8 give an overview on information about the participants in this study.

Table 5

Gender overview

	Nr. of participants	Percentage
Male	42	41.6%
Female	59	58.4%

Table 6

Education level

	Percentage %
Higher education	74.2
Middle schooled	21.6
Different	4

Table 7

Type of software

	Number
Android	58
iOS	43

Table 8

Average age and number of apps

	Average	Min.	Max
Average age	24.3	17	30
Average number of apps incl. pre installed	61	3	250
Average number of self downloaded apps	28	0	100

Data from participants who did not fulfil the criteria have been left out. That means that, participants who knew the app already in the first impression stage have been left out, because previous experience with the app can have an influence on the evaluation of the app. Furthermore, the data from the anticipated stage and the actual use stage of the participants that already knew the app in the first impression stage have been deleted as well, because previous experience with the app can have an influence on the evaluation of the app. All participants were able to complete the task.

To give a better view on the data that has been used for this study see Figure 5.

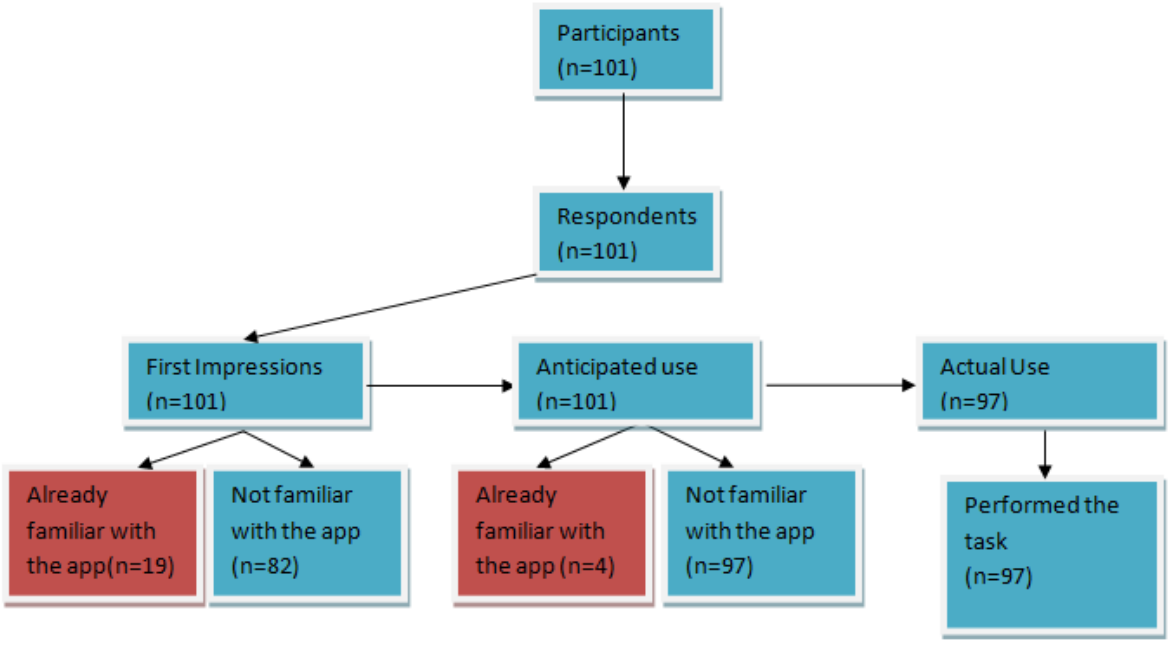


Figure 5. Respondents used for analyses.

From the 101 participants, 82 participants were not familiar with the apps shown in the first impression stage, which means that 19 participants knew one or two apps already. In the anticipated use stage, stage 2 (n=101), four participants were familiar with the app, leaving

the sample size to a total of 97 participants. This sample size (n=97) was used in stage 3, actual use.

Table 9 displays the types of apps the respondents own and how often they use these apps. As can be seen, social media apps are used the most (multiple times a day). The categories displayed are taken from the app store and have been downsized to a few categories only, as can be seen in table 9. See Appendix A-D question nr.14 for examples of each of these categories.

Table 9
Types of apps

Types of apps	Nr. of respondents with the app	Multiple times a day	Daily	Weekly	Infrequent
Media Apps	93	29	40	15	9
Social Media Apps	91	74	10	4	3
Amusement apps	90	43	25	13	9
Information apps	81	33	27	11	10
Travelling Apps	73	5	17	30	21
Finance Apps	70	10	23	30	7
Productivity Apps	59	4	9	18	28
Health and Fitness apps	44	0	2	17	25
Education Apps	26	2	7	8	9

The results from table 9 suggest that the desired respondents have been found for this study, considering the large number of respondents with information apps (n=81) and amusement apps (n=90). Furthermore, the number of respondents with infrequent usage of these apps (n=10 for information and n=9 for amusement) is too small to make a systematic comparison with frequent users.

4.2 First impression data

In this section an answer will be given to the main question "*To what extent is the attractiveness influenced by pragmatic and hedonic qualities of smartphone apps when making a first impression'*.

As explained in §3.4 the first impression data has been recoded using the items of Hassenzahl (2003). In total 19 participants knew one or two apps that were shown in the first impression stage, meaning that a 110 first impressions are deleted from the data, because a first impression cannot be measured if the participant already knows the app.

Table 10 shows an overview of the total number of first impressions for each of the four apps.

Table 10
Number of first impressions for each app

	Entertainment		**Information**	
	Logo Quiz	Song Quiz	Tech Crunch	The Verge
Hedonic Qualities Identification positive	3	6	30	46
Hedonic Qualities Identification negative	2	25	7	3
Hedonic Qualities Stimulation positive	26	7	20	12
Hedonic Qualities Stimulation negative	5	10	28	36
Pragmatic Qualities positive	28	21	34	31
Pragmatic Qualities negative	19	8	93	49
Attractiveness positive	53	125	14	11
Attractiveness Negative	13	11	27	31
Total first impression data	149	213	253	219

As can be seen from table 10, the two entertainment apps (logo quiz and song quiz) are judged the highest on the attractiveness positive (for logo quiz 53 and song quiz 125), meaning that from these results, entertainment apps are first judged on how attractive the app looks rather than the functionality of it. After the attractiveness of the entertainment apps, the functionality (pragmatic quality) is judged positively.

Looking at the information apps (TechCrunch and The Verge) it can be said that these apps are first judged on how functional they are (pragmatic qualities) rather than the attractiveness. The attractiveness is judged negative for these apps, however the participants encounter a positive identification of hedonic qualities for these apps, meaning that the participants feel that they can identify with the app. Even though the participants feel they can identify with the information app, it should also be said that some of the first impressions are judged high on the hedonic quality stimulation negative, which means the participants do not feel the need to use this app.

Section 4.5 will give a more in-depth analysis of the first impression data and what it means compared to the anticipated use and actual use.

4.3 The quality of the instruments for anticipated and actual use stage

The instruments used in the questionnaire for this study are tested on their reliability. In Table 11, the Cronbach's Alpha's (α) of the instruments are displayed. As a rule of thumb the

Cronbach's Alpha above 0.70 and higher is acceptable (Landis & Koch, 1977). All instruments meet this requirement, which means that the instruments are reliable to be used for analyses in this study.

Table 11

Reliability of the instrument

Construct	Cronbach's Alpha anticipated use condition	Cronbach's Alpha actual use condition
Pragmatic Quality	.74	.82
Hedonic Quality Identification	.73	.81
Hedonic Quality Stimulation	.77	.93
Attractiveness	.92	.87
Behavioural intention	.87	.91
Smartphone self-efficacy [a]		.70
Subjective norm [a]		.82

Note. [a] only measured in actual use stage

4.3.1 Factor analyses

Prior to the factor analyses, the factorability of the 28 items from Hassenzahl (2003) was examined. Various standard assumptions for the factorability of a correlation were used. The first assumption is the criteria to test whether the factorability is reasonable. All 28 items correlated with at least one other item with .3, suggesting the factorability as reasonable. Second criteria, the Kaiser-Meyer-Olkin measure of sampling adequacy was in the anticipated use stage .86 and in the actual use stage .90, which is above the commonly recommended value of .6. Furthermore, in the anticipated use stage Bartlett's test of sphericity was significant ($\chi 2$ (378) = 1740.64, $p < .0001$) as well as in the actual use stage ($\chi 2$ (378) = 1802.76, $p < .0001$). Finally, the communalities (h^2), which are above .3 (see table 12 and 13), are further confirming that each item shares some common variance with other items. Given these standard assumptions, it is deemed that all 28 items are suitable for an exploratory factor analysis.

A principal component analyses was performed to see whether the semantic differential scales designed by Hassenzahl (2003) fit between the four distinguished categories, pragmatic qualities, hedonic qualities identification and stimulation and attractiveness. Initial eigen values indicated that the first four factors in the anticipated use stage explained 36%, 13%, 7% and 5% of the variance respectively. The fifth and the sixth factors had eigen values just over one, and each explained 3% of the variance. Solutions for four, five and six factors were each examined using the promax rotation (kappa =4), which is an non-orthogonal

(oblique) rotation method, because the distinguished categories by Hassenzahl (2003), pragmatic qualities, hedonic qualities identification and stimulation and attractiveness correlate with each other. The four factor solution, which explained 61% of the variance, was preferred because of: (a) previous theoretical support (Hassenzahl, 2003; Hassenzahl & Tractinsky, 2006); (b) the eigen values on the scree plot after four factors sufficiently above 1; and (c) the difficulty of interpreting the fifth and subsequent factors. The same was done for the actual use stage were four factors explained 40%, 12%, 6%, and 5% of the variance respectively. The fifth factor had an eigen value just over one, and explained 3% of the variance. A promax rortation was used to examine the solution for the four and five factors and again the four factor solution was preferred, explaining 63% of the variance.

No items were deleted because of a primary factor loading of .4 or above and because a fixed data set was used from Hassenzahl (2003). Several items had cross loadings above .4, but it is troubling that six of the28 items are complex in a way that they have loadings above .40 on two or three factors (see table 12 and 13). These indicate that, while the loadings have a strong overall pattern, there is some complexity.

For example, pragmatic qualities loads high in the same factor as attractiveness in the anticipated use stage, while in the actual use stage hedonic quality identification loadings are in the same factor as attractiveness. This could mean that in the anticipated use stage PQ has something to do with ATT and in the actual use stage HQI is related to ATT. It could also be that for researching the user experience of smartphone apps the pragmatic quality items measure the same as the attractiveness of smartphone apps for the user when anticipating the use of the given app. This can change when the actual use of the app occurs and hedonic quality identification is rated in the same way as the attractiveness of the smartphone apps.

Only three items have cross loadings in the anticipated use stage (PQ3, HQI4 and HQS2), however these items have higher loadings in their primary factor. In the actual use stage only one factor (HQS2) has a cross loading and the primary loading of this item is higher in its primary factor.

As can be seen from table 13, there are four primary factors in the actual use stage and the loadings are better visible within the four factors, compared to the anticipated use stage in table 12. The items human-technical (menselijk – technisch) and the item professional – unprofessional (professioneel – amateuristisch) can probably not be related to the apps used in this study and are therefore the only items that load in a fourth factor. It can be said that in the actual use stage there are only three main factors. All in all, when actually using the app,

users relate to hedonic identification qualities in the same way as the attractiveness of the app. There could be three main factors instead of the original four factors when researching the user experience of smartphone apps. For this study the four factors will be treated as four factors, because the goal for this study was to find out whether the instrument from Hassenzahl (2003) can be used for researching the user experience of smartphone apps. For this reason it has been decided to use the fixed items from Hassenzahl (2003) and therefore the items and constructs will not be adjusted or reformulated. Furthermore the reliability of the items are α= .70 or higher (table 11), which is an indication that the items can be used for further analyses. See discussion, chapter 5, for a broader explanation and recommendations for future studies.

Table 12
Factor loadings and communalities based on a principal component analyses with promax rotation (kappa=4) pattern matrix for 28 items by Hassenzahl (2003) measuring the user experience of smartphone apps (n=97) in the anticipated use stage. Fixed number of factors = 4.

	Item	Factor 1	Factor 2	Factor 3	Factor 4	*h2*
PQ 1	Menselijk – Technisch				.68	.72
PQ 2	Eenvoudig – Ingewikkeld	-.80				.75
PQ 3	Praktisch – Onpraktisch	-.49			.41	.56
PQ 4	Duidelijk – Omslachtig	-.87				.77
PQ 5	Voorspelbaar – Onvoorspelbaar	-.63				.57
PQ 6	Overzichtelijk – Verwarrend	-.85				.75
PQ 7	Handelbaar – Onhandelbaar	.78				.66
HQI 1	Verbonden – Isolerend			.58		.45
HQI 2	Professioneel – Amateuristisch				.81	.68
HQI 3	Stijlvol – Stijlloos		.55			.62
HQI 4	Waardevol – Minderwaardig			.51	-.56	.63
HQI 5	Betrokken – Afgezonderd			-.75		.63
HQI 6	Brengt mij dichter bij mensen – Scheidt mij van mensen			-.80		.68
HQI 7	Toonbaar – Niet toonbaar	-.54				.50
HQS 1	Origineel – Conventioneel		.66			.48
HQS 2	Creatief – Fantasieloos	-.49	-.51			.55
HQS 3	Gedurfd – Voorzichtig		-.69			.52
HQS 4	Innovatief – Conservatief		-.72			.56
HQS 5	Fascinerend – Saai			.52		.52
HQS 6	Uitdagend – Eenvoudig		-.51			.35
HQS 7	Nieuw - Gebruikt		-.73			.61
ATT 1	Mooi – Lelijk	.51				.55
ATT 2	Goed – Slecht	.63				.76
ATT 3	Aangenaam – Onaangenaam	-.64				.58
ATT 4	Sympathiek – Onsympathiek	.62				.62
ATT 5	Uitnodigend – Afkeurend	.58				.73
ATT 6	Aantrekkelijk – Afstotelijk	.64				.77
ATT 7	Motiverend – Ontmoedigend	.55				.70

Note. Factor loadings <.4 are suppressed. Rotation converged in 6 iterations.

Table 13
Factor loadings and communalities based on a principal component analyses with promax rotation (kappa=4) pattern matrix for 28 items by Hassenzahl (2003) measuring the user experience of smartphone apps (n=97) in the actual use stage. Fixed number of factors = 4.

	Item	Factor 1	Factor 2	Factor 3	Factor 4	*h2*
PQ 1	Menselijk – Technisch				-.69	.66
PQ 2	Eenvoudig – Ingewikkeld			.83		.75
PQ 3	Praktisch – Onpraktisch			.61		.58
PQ 4	Duidelijk – Omslachtig			.83		.75
PQ 5	Voorspelbaar – Onvoorspelbaar			.49		.52
PQ 6	Overzichtelijk – Verwarrend			.84		.74
PQ 7	Handelbaar – Onhandelbaar			.66		.57
HQI 1	Verbonden – Isolerend	.69				.54
HQI 2	Professioneel – Amateuristisch				.69	.62
HQI 3	Stijlvol – Stijlloos	.65				.60
HQI 4	Waardevol – Minderwaardig	.58				.52
HQI 5	Betrokken – Afgezonderd	.78				.63
HQI 6	Brengt mij dichter bij mensen – Scheidt mij van mensen	.71				.56
HQI 7	Toonbaar – Niet toonbaar	.52				.44
HQS 1	Origineel – Conventioneel		.65			.54
HQS 2	Creatief – Fantasieloos	.42	.59			.73
HQS 3	Gedurfd – Voorzichtig		.77			.62
HQS 4	Innovatief – Conservatief		.77			.66
HQS 5	Fascinerend – Saai		.62			.71
HQS 6	Uitdagend – Eenvoudig		.67			.50
HQS 7	Nieuw - Gebruikt		.69			.54
ATT 1	Mooi – Lelijk	.64				.61
ATT 2	Goed – Slecht	.59				.78
ATT 3	Aangenaam – Onaangenaam	.69				.70
ATT 4	Sympathiek – Onsympathiek	.67				.65
ATT 5	Uitnodigend – Afkeurend	.79				.77
ATT 6	Aantrekkelijk – Afstotelijk	.75				.78
ATT 7	Motiverend – Ontmoedigend	.57				.65

Note. Factor loadings <.4 are suppressed. Rotation converged in 5 iterations.

4.4 Task performance

Before analysing how the apparent product character, personal factors and demographics influence the user experience, moderated by the type of app, an overview will be given on the results of the task that the respondents had to perform in the actual use stage. After the performance of the task, the respondent was asked whether he or she was able to complete the task, whether technical problems occurred and about the difficulty of the task. The respondent was also asked to what degree the anticipated use is different from the actual use of the app. All participants were able to complete the task. 95% of the respondents judged the difficulty of the task, the other 5% did not give an answer to this question. See table 10 for an overview on the difficulty of the task for each app.

Table 14

Difficulty task performance

APP		Technical Error		Difficulty of the task in the actual use stage	
		yes	no	*M*	*SD*
Logo quiz app	N=23	1	22	5.65	1.34
Song quiz app	N=24	3	21	6.12	1.48
TechCrunch app	N=25[a]	1	24	5.91	1.66
The Verge app	N=24[b]	2	22	5.87	1.49

Note. Average degree of difficulty with a minimum of 1 being very difficult and a maximum of 7 not difficult at all (n=97). [a] three respondents did not answer the difficulty question of the task for the TechCrunch app

[b] One respondent did not answer the difficulty question of the task for the The Verge app.

As can be seen from table 14, the song quiz app task was the easiest (M=6.12) and the logo quiz app task the most difficult (M=5.62). It can therefore be considered that none of the apps were difficult to use.

4.5 Perception of the overall User experience

In this study the user experience of smartphone apps is researched. Related to the user experience, the apparent product-character, consisting of hedonic an pragmatic qualities, and the attractiveness of an app is being looked into. In this section the answer to the main question is presented "To what extent is the attractiveness of smartphone apps influenced by pragmatic and hedonic qualities and personal factors of the user during the first impression, anticipated use and the actual use?". Table 15 shows the overall perception of the UX in all three stages, table 16-19 show the perception of the UX in all three stages for the individual apps and table 20 shows a summary of table 15-19.

4.5.1 Perception of the overall UX in first impression, anticipated and actual use stage

Table 15 shows the overall perception of the UX in all three stages. In the first impression stage the differences between the negative and positive sides of the semantic differential scales from Hassenzahl (2003) are counted. For example, 114 positive judgements of the overall pragmatic qualities were named and 169 negative judgments of overall pragmatic qualities. The difference is -55, meaning that the apps in general have been related to the negative side of pragmatic qualities. As can be seen from table 15, the overall attractiveness and the overall hedonic quality identification are judged higher compared to the overall pragmatic and hedonic quality stimulation in the first impression stage.

Table 15
Significant overall user experience in 3 stages: first impression, anticipated use and actual use

Variable	First impression		Anticipated use		Actual use			
			M	*SD*	*M*	*SD*	*t*	*p*
[a] Overall PQ	Pos= 114 Neg=169	-55	3.53	0.79	5.04	1.01	t(96)= -9.88	<.0001***
[a] Overall HQI	Pos= 85 Neg=37	+48	3.90	0.74	4.55	.98	t(96)= -6.74	<.0001***
[a] Overall HQS	Pos= 65 Neg=79	-14	4.04	0.62	3.68	1.10	t(95)= 2.32	<.02*
[a] Overall ATT	Pos= 203 Neg=82	+121	4.41	0.86	4.64	1.23	t(96)= -2.73	<.01**
[b] Overall BI	-----	------	3.80	1.13	3.66	1.19	t(95)= -1.30	.20
[b+c] Overall SSE	-----	------	-----	------	2.24	0.97	-----	------

Note. [a] measured on a 7-point semantic differential scale ranging from the negative side of the variables to the positive side of the variables. [b] measured on a 5 – point likert scale ranging from 1=Completely probable to 5=Not at all probable. [c] only measured in the actual use stage. Pos= positive impressions and Neg=negative impressions. The overall BI has not been measured in the first impression stage, therefore no data can be provided. The overall SSE has not been measured in the first impression stage and anticipated use stage, therefore no data can be provided and no paired t-test can be performed*p < .05, ** p < .01, *** p < .001.

A paired-samples t-test was conducted to compare the means in the anticipated use stage with the actual use stage for pragmatic qualities(PQ), hedonic qualities identification (HQI), hedonic qualities stimulation (HQS), Attractiveness (ATT) and Behavioural Intention (BI).

4.5.1.1 Overall pragmatic qualities

As can be seen from table 15, the overall pragmatic quality has been judged negatively (-55) in the first impression stage. Comparing it to the anticipated use stage and actual use stage, it can be said that a positive shift has occurred. There was a significant difference between the scores for the pragmatic qualities in the anticipated use stage (M=3.32, SD=0.79) and the pragmatic qualities in the actual use stage (M=5.04, SD=1.01) conditions; t(96)=-9.88, p<0,001. These results suggest that the actual use of the apps has a positive influence on the judgement of the overall pragmatic qualities compared to the judgment of the overall pragmatic qualities in the anticipated use stage of the apps.

4.5.1.2 Overall Hedonic qualities identification

As can be seen from table15, the overall HQI has been judged positively (+48) in the first impression stage. Comparing this to the anticipated use stage and actual use stage, it can be said that an even better positive shift occurred. There was a significant difference between the scores for the hedonic qualities identification in the anticipated use stage (M=3.90,

SD=0.74) and the hedonic qualities identification in the actual use stage (M=4.55, SD=0.98) conditions; t(96)=-6.74, p<0.001. These results suggest that the actual use of the apps has a positive influence on the overall judgement of the hedonic qualities identification compared to the overall judgement of the hedonic qualities identification in the anticipated use stage of the apps.

4.5.1.3 Overall Hedonic qualities stimulation

As can be seen from table 15, the overall HQS has been judgement negatively(-14) in the first impression stage. There was a significant difference between the scores for the hedonic qualities stimulation in the anticipated use stage (M=4.04, SD=0.62) and the hedonic qualities stimulation in the actual use stage (M=3.68, SD=1.10) conditions; t(95)=2.32, p<0.02. These results suggest that when using the app in the actual use stage, it has a negative influence on the overall judgement of hedonic qualities stimulation of the apps compared to the overall judgement of hedonic qualities stimulation in the anticipated use stage of the apps.

4.5.1.4 Overall Attractiveness

As can be seen from table 15, the overall ATT has been judgement positively (+121) in the first impression stage. Comparing it to the anticipated use stage and actual use stage, it can be said that an even better positive shift occurred. There was a significant difference between the scores for the attractiveness in the anticipated use stage (M=4.41, SD=0.86) and the attractiveness in the actual use stage (M=4.64, SD=1.23) conditions; t(96)=-2.73, p<0.01. These results suggest that when actual usage of the app occurs, it positively influences the overall judgement of the attractiveness of the apps compared to the overall judgement of the attractiveness in the anticipated use stage of the apps.

4.5.1.5 Overall behavioural intention paired sample t-test

As displayed in table 15, there was no significant difference between the scores for the behavioural intention to download the app in the anticipated use stage (M=3.80, SD=1.13) and behavioural intention to keep using the app in the actual use stage (M=3.66, SD=1.19) conditions; t(95)=-1.30, p=0.20. These results suggest that the intention to download the app and the intention to keep using the app after the actual use stage is low and it stays low.

4.6 User experience measured for individual apps

This section will give an answer to the sub question "To what extent is the attractiveness influenced by pragmatic and hedonic qualities from each individual app (two entertainment and two information apps) and the personal factors of the user during a first impression, the anticipated use and the actual use?". This section will therefore devote its attention to the individual smartphone apps and the means and standard deviations of each of these apps. The means will be for both anticipated use stage and actual use stage user experience for pragmatic qualities, hedonic qualities identification and stimulation, the attractiveness and the behavioural intention.

4.6.1 User experience of the Logo quiz app

As can be seen from table 16, the overall pragmatic quality has been judged positively (+9) in the first impression stage. Comparing it to the anticipated use stage and actual use stage, it can be said that a positive shift has occurred. There was a significant difference between the scores for the logo quiz app in the PQ anticipated use stage (M=3.32, SD=0.65) and the logo quiz app in the PQ actual use stage (M=5.23, SD=0.78) conditions; t(22)=-8.96, p<0.001. These results suggest that the actual use of the logo quiz has a positive influence on the judgement of pragmatic qualities of the logo quiz app compared to the anticipated use of the logo quiz app.

Table 16
Significant user experience for the Logo quiz app in 3 stages: first impression, anticipated use and actual use

Variable	First impression		Anticipated use		Actual use			
			M	*SD*	*M*	*SD*	*t*(22)	*p*
[a] PQ	Pos= 28 Neg=19	+9	3.32	0.65	5.23	0.78	-8.96	<.001***
[a] HQI	Pos= 3 Neg=2	+1	3.98	0.41	4.22	1.06	-1.17	.25
[a] HQS	Pos= 26 Neg= 5	+21	4.13	0.51	3.34	1.00	3.04	<.01**
[a] ATT	Pos= 53 Neg=13	+40	4.63	0.80	4.52	1.34	0.62	.54
[b] BI	-----	------	3.58	0.99	3.53	1.17	0.10	.92

Note. [a] measured on a 7-point semantic differential scale ranging from the negative side of the variables to the positive side of the variables. [b] measured on a 5 – point likert scale ranging from 1=Completely probable to 5=Not at all probable. The overall BI has not been measured in the first impression stage, therefore no data can be provided. Pos= positive impressions and Neg=negative impressions. ** p < .01, *** p < .001.

For HQI, the logo quiz has been judged positively (+1). However, there was no significant difference between the scores for the logo quiz app in the anticipated use stage (M=3.98,

SD=0.41) and the actual use stage (M=4.22, SD=1,06) conditions; t(22)=-1.17, p=0.25. These results suggest that the actual use of the logo quiz has no significant influence on the judgement of HQI of the logo quiz app compared to the anticipated use of the logo quiz app.

The logo quiz has been judged positively on HQS (+21) in the first impression stage, however HQS turned out to be less positive in the actual use stage. There was a significant difference for the HQS in the anticipated use stage (M=4.13, SD=0.51) compared to the actual use stage (M=3.34, SD=1.00) conditions; t(22)=3.04, p<0.01. These results suggest that the actual use of the logo quiz has a significant influence on the judgement of HQS compared to the anticipated use of the logo quiz app, meaning that people encounter less HQS in the actual use stage compared to the anticipated use stage.

The logo quiz has been judged extremely positive on the ATT (+40) compared to PQ, HQI and HQS. However, the ATT does not get better when actually using the logo quiz app, in fact there was no significant difference between the scores for the ATT of the logo quiz app (M=4.63, SD=0.80) in the anticipated use stage and to the actual use stage (M=4.52, SD=1.34) condition; t(22)=0.62, p=0.54. These results suggest that the actual use of the logo quiz app has no influence on the judgement of the attractiveness of these apps compared to the anticipated use of the logo quiz app.

There was no significant difference between the scores for the BI of the logo quiz app (M=3.58, SD=0.99) in the anticipated use stage compared to the actual use stage (M=3.53, SD=1.17) condition; t(22)=0.10, p=0.92. These results suggest that the actual use of the logo quiz app has no influence on the judgement of BI compared to the anticipated use.

4.6.2 User experience of the Song quiz app

As can be seen from table 17, PQ has been judged positively (+13) in the anticipated use stage. The perception of PQ turned out even more positive in the anticipated use stage and actual use stage. There was a significant difference between the scores for the song quiz app in the PQ anticipated use stage (M=3.33, SD=0.46) and the PQ actual use stage (M=5.57, SD=0.74) conditions; t(24)=-12.41, p<0.001. These results suggest that the actual use of the song quiz app has a positive influence on the judgement of PQ compared to the anticipated use.

Table 17
Significant user experience for the Song quiz app in 3 stages: first impression, anticipated use and actual use

Variable	First impression		Anticipated use		Actual use			
			M	*SD*	*M*	*SD*	*t*(24)	*p*
[a] PQ	Pos= 21 Neg=8	+13	3.33	0.46	5.57	0.74	-12.41	<.001***
[a] HQI	Pos= 6 Neg=25	-19	4.10	0.42	4.91	0.84	-5.09	<.001***
[a] HQS	Pos= 7 Neg=10	-3	4.08	0.54	4.33	0.99	-0.95	.35
[a] ATT	Pos= 125 Neg=11	+114	4.81	0.67	5.45	0.93	-4.22	<.001***
[b] BI	-----	------	3.36	1.33	3.09	1.09	1.29	.21

Note. [a] measured on a 7-point semantic differential scale ranging from the negative side of the variables to the positive side of the variables. [b] measured on a 5 – point likert scale ranging from 1=Completely probable to 5=Not at all probable. The overall BI has not been measured in the first impression stage, therefore no data can be provided. Pos= positive impressions and Neg=negative impressions. *** p < .001.

HQI has been perceived negative in the first impression stage(-19). However this negative perception has been converted positively when the song quiz app was used. There was a significant difference between the scores for song quiz app in the HQI anticipated use stage (M=4.10, SD=0.42) and the actual use stage (M=4.91, SD=0.84) conditions; t(24)=-5.09, p<0.001. These results suggest that the actual use of the song quiz app has a significant influence on the judgement of HQI compared to the anticipated use, meaning people are positively influenced in the actual use stage for HQI compared to the anticipated use stage for HQI.

For the HQS, participants perceived the song quiz as negative (-3) in the first impression stage. There was no significant difference between the scores in the anticipated use stage for the song quiz (M=4.08, SD=0.54) compared to the actual use (M=4.33, SD=0.99) conditions, Song quiz t(24)=-0.95, p=0.35. This means that the actual use of the app has no influence on the judgement of HQS compared to the anticipated use.

The song quiz app has been judged extremely positive on the ATT (+114) compared to the PQ, HQI and HQS perceptions. The ATT perception even gets more positive when actually using the song quiz app. There is a significant difference between the scores for the ATT of the song quiz app (M=4.81, SD=0.67) in the anticipated use stage compared to the actual use stage (M=5.45, SD=0.93) conditions; Song quiz t(24)=-4.22, p<0.001. These results suggest

that the actual use of the song quiz app has a positive influence on the judgement of ATT compared to the anticipated use.

There was no significant difference between the scores for the BI of the song quiz app (M=3.36, SD=1.33) in the anticipated use stage compared to the actual use stage (M=3.09, SD=1.09) condition; t(22)=1.29, p=0.21. These results suggest that the actual use of the song quiz app has no influence on the judgement of BI compared to the anticipated use.

4.6.3 User experience of the TechCrunch app

As can be seen from table 18, the PQ perceptions for the TechCrunch app in the first impression stage are negative (-59). However, participants become more positive when actually using the app, in fact there was a significant difference in the perception scores for the TechCrunch app in the PQ anticipated use stage (M=3.65, SD=0.98) and the PQ actual use stage (M=4.67, SD=1.11) conditions; t(24)=-2.70, p<0.01. These results suggest that the actual use of TechCrunch app has a positive influence on the judgement of PQ compared to the anticipated use.

HQI perceptions in the first impression stage were judged positively (+23). The participants are even more positive about the TechCrunch app when actually using it. There was a significant difference between the perception scores for TechCrunch app in the HQI anticipated use stage (M=3.72, SD=0.50) and the actual use stage (M=4.30, SD=0.99) conditions; t(24)=-3.00, p<0.01. These results suggest that the actual use of the TechCrunch app has a significant influence on the judgement of HQI compared to the anticipated use, meaning the perception of people is positively influenced in the actual use stage for HQI compared to the anticipated use stage for HQI.

In the first impression stage, the TechCrunch app has been perceived negative (-8). The perception of HQS does not get better in the actual use stage. There was no significant difference between the scores in the HQS anticipated use stage for the TechCrunch app (M=3.86, SD=0.59) and the actual use (M=3.46, SD=0.93) conditions; t(24)=1.58, p=0.13. This means that the actual use of the app has no influence on the judgement of HQS of the apps compared to the anticipated use.

Table 18

Significant user experience for the TechCrunch app in 3 stages: first impression, anticipated use and actual use

	First impression		Anticipated use		Actual use			
variable			*M*	*SD*	*M*	*SD*	*t*(24)	*p*
[a] PQ	Pos= 34 Neg=93	-59	3.65	0.98	4.67	1.11	-2.70	<.01**
[a] HQI	Pos= 30 Neg=7	+23	3.72	0.50	4.30	0.99	-3.00	<.01**
[a] HQS	Pos= 20 Neg=28	-8	3.86	0.59	3.46	0.93	1.58	.13
[a] ATT	Pos= 14 Neg= 27	-13	4.12	1.01	4.08	1.20	0.29	.77
[b] BI	-----	------	4.24	1.01	4.28	1.03	-0.23	.82

Note. [a] measured on a 7-point semantic differential scale ranging from the negative side of the variables to the positive side of the variables. [b] measured on a 5 – point likert scale ranging from 1=Completely probable to 5=Not at all probable. The overall BI has not been measured in the first impression stage, therefore no data can be provided. Pos= positive impressions and Neg=negative impressions. ** $p < .01$.

ATT perception of the TechCrunch app in the first impression stage is negative (-13). The ATT perceptions do not get better when actually using the app. There was no significant difference between the scores for the ATT of TechCrunch app (M=4.12, SD=1.01) in the anticipated use stage and the actual use stage (M=4.08, SD=1.04) conditions; t(24)=0.29, p=0.77. These results suggest that the actual use of the TechCrunch app has no influence on the judgement of ATT compared to the anticipated use.

There was no significant difference between the scores for the BI of the TechCrunch app (M=4.24, SD=1.01) in the anticipated use stage and the actual use stage (M=4.28, SD=1.03) condition; t(22)=-0.23, p=0.82. These results suggest that the actual use of the TechCrunch app has no influence on the judgement of BI compared to the anticipated use.

4.6.4 User experience of the The Verge app

As can be seen from table 19, PQ perceptions were negative in the first impression stage (-18). However, by using the The Verge app, PQ perceptions become more positive, in fact there was a significant difference between the scores for the The Verge app in the PQ anticipated use stage (M=3.83, SD=0.87) and the PQ actual use stage (M=4.69, SD=1.11) conditions; t(23)=-2.74, p<0.01. These results suggest that the actual use of TechCrunch app has a positive influence on the judgement of PQ compared to the anticipated use.

Table 19

Significant user experience for The Verge app in 3 stages: first impression, anticipated use and actual use

variable	First impression		Anticipated use		Actual use			
			M	*SD*	*M*	*SD*	*t*(23)	*p*
[a] PQ	Pos= 31 Neg=49	-18	3.83	0.87	4.69	1.11	-2.74	<.01**
[a] HQI	Pos= 46 Neg=3	+43	3.81	0.49	4.76	0.89	-4.88	<.001***
[a] HQS	Pos= 12 Neg=36	-24	4.10	0.80	3.58	1.24	1.28	.22
[a] ATT	Pos= 11 Neg=31	-20	4.07	0.72	4.53	1.04	2.41	<.05*
[b] BI	-----	------	4.01	0.99	3.70	1.21	1.65	.11

Note. [a] measured on a 7-point semantic differential scale ranging from the negative side of the variables to the positive side of the variables. [b] measured on a 5 – point likert scale ranging from 1=Completely probable to 5=Not at all probable. The overall BI has not been measured in the first impression stage, therefore no data can be provided. Pos= positive impressions and Neg=negative impressions. *p < .05, ** p < .01, *** p < .001.

HQI perceptions were positive in the first impression stage (+18). When using the The Verge app, HQI perceptions become even more positive, there was a significant difference between the scores for The Verge app in the HQI anticipated use stage (M=3.81, SD=0.49) and the actual use stage (M=4.76, SD=0.89) conditions; t(23)=-4.88, p<0.001. These results suggest that the actual use of the The Verge app has a significant influence on the judgement of HQI compared to the anticipated use, meaning people are positively influenced in the actual use stage for HQI compared to the anticipated use stage for HQI.

The first impressions of the The Verge app for the HQS perceptions were negative (-24). There was no significant difference between the scores in the HQS anticipated use stage for the The Verge app (M=4.10, SD=0.80) and the actual use (M=3.58, SD=1.24) conditions; t(23)=1.28, p=0.22. This means that the actual use of the app has no influence on the judgement of HQS of the apps compared to the anticipated use and perceptions do not get more positive compared to the first impressions.

ATT perceptions in the first impression stage are negative (-20). However, participants perceive the The Verge app more positive when using the app. There is a significant difference between the scores for the ATT of the The Verge app (M=4.07, SD=0.72) in the anticipated use stage and the actual use stage (M=4.53, SD=1.04) condition; t(23)=2.41,

p<0.02. These results suggest that the actual use of the The Verge app has a positive influence on the judgement of ATT compared to the anticipated use.

There was no significant difference between the scores for the BI of the The Verge app (M=4.01, SD=0.99) in the anticipated use stage and the actual use stage (M=3.70, SD=1.21) condition; t(23)=1.65, p=0.11. These results suggest that the actual use of the The Verge app has no influence on the judgement of BI compared to the anticipated use

4.7 Comparison between the overall UX and UX of individual apps

Table 20 shows the overall perception of the UX in all three stages compared to the perception of the UX in all three stages for the individual apps.

Table 20

Significance of the overall user experience and user experience for each individual app. Summary of table 15-19. Anticipated use and actual use.

	Logo quiz	Song quiz	Tech Crunch	The Verge	Overall UX
PQ	Significant increase	Significant increase	Significant increase	Significant increase	Significant increase
HQI	n.s.	Significant increase	Significant increase	Significant increase	Significant increase
HQS	Significant decrease	n.s.	n.s.	n.s.	Significant decrease
ATT	n.s.	Significant increase	n.s.	Significant increase	Significant increase
BI	n.s.	n.s.	n.s.	n.s.	n.s.

Note. n.s. = not significant

For all four apps, Logo quiz, Song quiz, TechCrunch and The Verge, there was a significant difference in the perception of PQ comparing the anticipated use stage with the actual use stage. This means that pragmatic quality perceptions become more positive when using the app. In the overall stage there was a significant difference in the perception of PQ comparing the anticipated use with the actual use. This means that when using the apps, the pragmatic qualities become more positive compared to the anticipated use of the app.

HQI perceptions became more positive for the Song quiz app, TechCrunch app and The Verge app and in the overall perception of the user experience. However perceptions of HQI stayed the same for the Logo quiz app in the actual use stage.

HQS perceptions for the logo quiz app resulted in a significant difference in the actual use stage compared to the anticipated use stage. In fact, participants perceived the app as less stimulating compared to their HQS anticipated use perceptions, while HQS perception stayed the same for the song quiz app, TechCrunch app and The Verge app in the actual use stage. In the overall perception of HQS there is a significant difference in the actual use stage compared to the anticipated use stage for all four apps. In the overall perception of HQS the apps are perceived as less stimulating compared to the perceptions of HQS in the anticipated use stage.

ATT perceptions were significant different in the actual use stage compared to the anticipated use stage for the Song Quiz app and the The Verge app, meaning that participants perceived the apps to be more attractive when using them, compared to their anticipated use perceptions. The perceptions of the apps, TechCrunch and the Logo Quiz app stayed the same in the actual use stage. In the overall perception of the UX from all apps, the attractiveness increases, there was a significant difference in the actual use stage compared to the anticipated use stage.

BI perceptions had no significant differences between the anticipated use stage and actual use stage for all four apps, meaning that even after using the app the BI perceptions stayed the same compared to the anticipated use. In Chapter 5, alternative explanations will be given for the incoherent differences between the apps.

4.8 Multiple linear regression anticipated use

To find out to what extent the apparent product character and personal factors influence the attractiveness in the anticipated use stage, a multiple stepwise linear regression will be performed to explain the variance of the attractiveness from the research model of this study. See figure 6.

As can be seen from Figure 6, factors that influence the attractiveness of an app (M=4.41, SD=.86) judged by the respondent in the anticipated use stage will be given a closer look. After performing a stepwise multiple linear regression analysis, it appears that including the moderator "type of apps" the anticipated attractiveness of an app is best predicted by PQ (β= -.38, t(96)=-4.11, p < .001) HQI (β= .28, t(96)=2.83, p < .01), HQS (β= -.21, t(96)=-2.66, p < .01) and download intention (β= -.45, t(96)=-5.39, p < .001). In total 54% (R^2 = .525, F(8, 88) = 12.16, p < .001) of the variances is explained by the variables of the attractiveness.
PQ, HQS and BI (download intention) have a negative beta (β) which means that the more positive PQ, HQS and BI is rated, the lower the perception on the attractiveness of the apps.

The moderator type of apps does not significantly influence the causal relation between the apparent product character, personal factors and demographics and the attractiveness. The personal factors subjective norm as well as smartphone self-efficacy and the demographics, gender and education, do not significantly influence the attractiveness in the anticipated use stage either. The model has also been tested on the type of apps being solely entertainment and information as moderator, without making the distinction between the four apps and this distinction has no significant influence on the causal relationship between the variables and the attractiveness either.

Even though the variables PQ, HQI, HQS and ATT correlate with each other according to Hassenzahl (2003), the variance (R^2) of each of these variables have been given a closer look and are measured individually. These variances can also be seen in Figure 6.

Figure 6. Stepwise multiple linear regression anticipated use

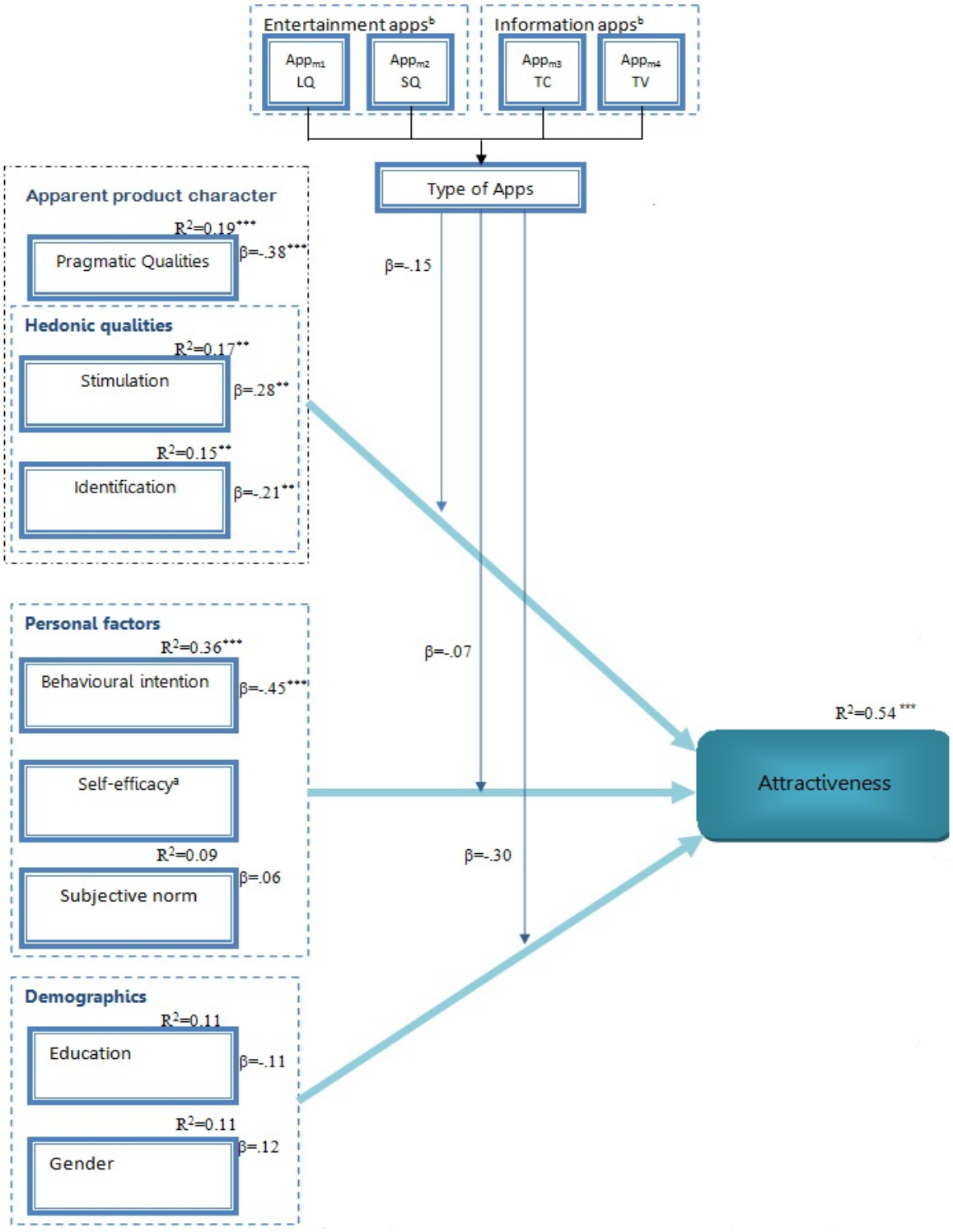


Figure 6. [a] only measured in the actual use stage. [b] model has been tested on category entertainment and category information, no significant results were found. *= p < .05, **= p < .01, ***= p < .001.

4.9 Multiple linear regression actual use

To find out to what extent the apparent product character and personal factors influence the attractiveness in the actual use stage, a multiple stepwise linear regression will be performed to explain the variance of the attractiveness from the research model of this study. See Figure 7.

For the actual use stage, factors that influence the attractiveness of an app (M=4.64, SD=1.23) judged by the respondent will be given a closer look. After performing a stepwise multiple linear regression analysis, see figure 7, it appears that including the moderator "type of apps" the anticipated attractiveness of an app is best predicted by PQ (β=.30, t(94)=5.54, $p < .001$) HQI (β= .55, t(94)=8.05, $p < .001$), HQS (β= .24, t(94)=3.94, $p < .001$) and behavioural intention BI to actually keep using the app (β= -.21, t(94)=-3.30, $p < .001$). In total 83% (R^2 = .834, F(9, 85) = 47.39, $p < .001$) of the variance is explained by the variables of the attractiveness.

The moderator type of apps does not significantly influence the causal relation between the apparent product character, personal factors and demographics and the attractiveness. The personal factors subjective norm as well as smartphone self-efficacy and the demographics, gender and education, do not significantly influence the attractiveness in the actual use stage either. The model has also been tested on the type of apps being solely entertainment and information as moderator, without making the distinction between the four apps and this distinction has no significant influence on the causal relationship between the variables and the attractiveness either. The variance (R^2) of each of these variables have been given a closer look and are measured individually as can be seen in Figure 7, even though Hassenzahl (2003) mentions that the variables correlate with each other. In the actual use stage the variance of PQ, HQI, HQS and BI increase remarkable and it should be said that HQI has the highest increase in variance (anticipated use stage 15% and actual use stage 74%).

BI (use intention) has a negative beta (β) which means that the more positive BI is rated, the lower the perception on the attractiveness of the apps. PQ, HQI and HQS have significant positive beta's (β) which means that the more positive these variables are rated, the more positive the attractiveness of the apps are perceived.

Figure 7. Stepwise multiple linear regression actual use

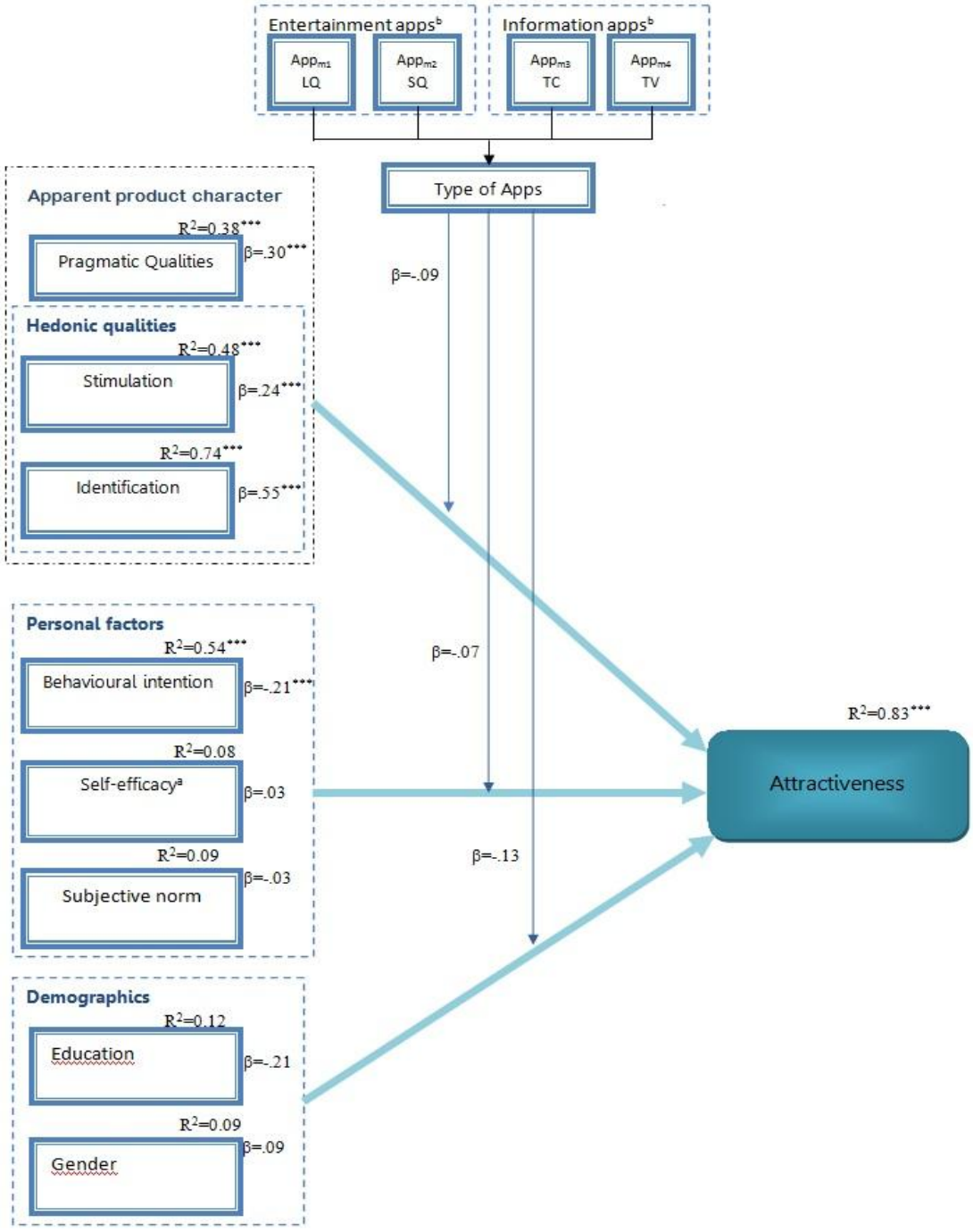


Figure 7. [a] only measured in the actual use stage. [b] model has been tested on category entertainment and category information, no significant results were found. *= $p < .05$, **= $p < .01$, *** = $p < .001$.

5. Conclusion and discussion

In this chapter conclusions will be drawn based on the results discussed in chapter 4. In section 5.1 the conclusion in relation to the first impressions is given. Section 5.2 will answer the main question "To what extent is the attractiveness of smartphone apps influenced by pragmatic and hedonic qualities and personal factors of the user , during a first impression, the anticipated use and the actual use?". Section 5.3 will give conclusions in relation to the sub question "To what extent is the attractiveness of each individual app influenced by pragmatic and hedonic qualities and the personal factors of the user during a first impression, the anticipated use and the actual use?. Section 5.4 will discuss the instrument of Hassenzahl (2003) and its limitations and 5.5 will provide the reader with other limitations of this study along with suggestions for future studies.

5.1 Influence of PQ, HQI, HQS and ATT first impression stage

The study of Lindgaard et al. (2006) shows that it takes 50 milliseconds to make a good first impression that is visually appealing to the user. The first impressions made in this study are judged high for entertainment apps on the attractiveness, compared to the functionality of it. This in comparison to information apps which are judged more on the functionality rather than the attractiveness. This result was to be expected since entertainment apps are seen as more fun and therefore judged higher on the attractiveness in comparison to information apps, which are seen as informative and enhancing knowledge and is therefore judged more on pragmatic qualities instead of attractive qualities. Relating these results to the study of Lindgaard et al. (2006), it can be said that the entertainment apps where visually more appealing compared to the information apps.

5.2 Overall UX between first impression, anticipated use and actual use

According to Hassenzahl and Tractinsky (2006), pragmatic qualities, hedonic qualities stimulation and identification are factors influencing the user experience. Based on the time span anticipated use and actual use, these user experiences can be different (Karapanos et al., 2009; Karaponas et al., 2008). This has also been proven in this study where the overall pragmatic qualities have a direct significant influence in the actual use stage compared to the anticipated use stage. This also counts for the overall hedonic identification and stimulation qualities and the overall attractiveness.

Pragmatic qualities overall are judged negative in the first impression stage. However, the overall pragmatic qualities become more positive in the actual use stage compared to the anticipated use stage. This can also be said as well for hedonic quality identification and the overall attractiveness compared to the anticipated use stage.

The overall hedonic quality stimulation is judged lower in the actual use stage, but is still significant compared to the anticipated use stage. Participants are less stimulated to use the app after making use of the app compared to the stage where the participants judged the app on what to expect. A conclusion can be made that participants are less curious to use the app after they have actually used the app.

The personal factors behavioural intention, self-efficacy and subjective norm are not significantly influenced in the actual use stage. A reason why behavioural intention was not significantly influenced in the anticipated use stage compared to the actual use stage is that the apps chosen in this study were not chosen freely by the respondents. For this reason, it could be that the apps used in this study were not interesting enough in the anticipated use stage for the respondents and even after use, the interest stayed low. A reason why self-efficacy has no causal relation to the attractiveness, could be that participants are skilled enough to perform tasks on smartphone apps, without any additional help. This is also proven in this study, 90 participants owned amusement apps and 81 participants owned information apps. A reason why subjective norm had no causal relation to the attractiveness of the app, is because the apps chosen in this study were unknown. For this reason, participants could not be influenced by their peer surroundings and could therefore in their perceived judgements about the attractiveness of the apps could not have been influenced.

5.3 Individual apps UX, first impression, anticipated use and actual use

As mentioned in the previous section, time can be of influence on the user experience according to Karaponas et al. (2008) and Karapanos et al. (2009). It has also been mentioned that pragmatic qualities, hedonic qualities identification and attractiveness are judged higher, more positively, in the actual use stage compared to the anticipated use stage.

For the individual apps, the judgment about the pragmatic qualities have a significant effect in the actual use stage compared to the anticipated use stage. This means that the judgements about the functionality, usability of the different apps become more positive after using the app.

The judgement about hedonic quality identification has a significant effect in the actual use stage compared to the anticipated use stage for the apps, Song quiz, TechCrunch and The Verge. This means that in the actual use stage, participants can identify with the app more compared to the anticipated use stage. However, for the Logo quiz app no significant difference was found between the actual use stage and anticipated use stage.

There was no significant effect on the judgment of the attractiveness for the Logo Quiz app and the TechCrunch app in the actual use stage compared to the anticipated use stage. A reason for this could be that the judgement about the attractiveness stays the same after using the app compared to the anticipated use.
There was no significant difference for the judgment on the behavioural intention to keep using the app in the actual use stage compared to downloading the app in the anticipated use stage for all four apps.

It was assumed that the type of apps used as a moderator in this study would be of influence on the causality of the apparent product character, personal characters and demographics. However, the "types of apps" (entertainment or information) used as a moderator in this study are not of direct influence on the causal relation between the apparent product character, personal character and demographics. A reason for this could be that participants were not influenced by their social surroundings when judging the apparent product character and rating their personal factors in relation to the user experience. Of course other factors could play a role as well, such as the sample size of each of the apps. The sample size of each of these apps varied between 22 and 24 participants. With a small sample size the chance of something being not significant is larger compared to the overall sample size for this study.

5.4 Instrument of Hassenzahl and future recommendations

This study proves that the independent variables, hedonic qualities stimulation and identification and pragmatic qualities have a significant influence on the perception of the attractiveness of an app. This means that in the first impression stage and the anticipated use stage the app is rated mostly on the looks of it and in the actual use stage the looks are taken into account as well, but the functionality also raises. In the actual use stage the variance (R^2=.83) on the user experience is higher compared to the anticipated use stage (R^2=.53) which can be proof that the perceived user experience is not only based on the looks of an app but also the functionality of it. In the actual use stage the feelings of the respondent about the app amplifies and it can therefore be that the variance is remarkably high, 83% in the actual use stage, compared to the anticipated use stage where the variance is 53%. This could mean that even though the user experience is a participants' perception that results from the anticipated use and actual use of the app, the instrument of Hassenzahl (2003) only measures the perceived user experience when using the app.

The use of the instrument of Hassenzahl (2003) has led to some limitations in this study. The face validity of the instrument was quite low for some of the semantic differential scales as

explained in the pre-test phase. From the factor analyses it appeared that there was some complexity, meaning some factors weigh high on one or more factors and therefore difficult to interpret. Based on the eigen value >1 and theoretical support, four factors were chosen after doing an extensive exploratory factor analyses.
In the anticipated use stage the pragmatic quality items weigh high in the same factor as the attractiveness. This could mean that the respondents relate the pragmatic qualities to the attractiveness of the app, because they have not actually used the app yet and can therefore not relate to the questions about the pragmatic qualities of the app.
In the actual use stage the hedonic quality identification weigh high in the same factor as the attractiveness. A reason for this could be that after using the app, the user relates to the questions about the hedonic quality identification of the app in a same way that the respondent does for the attractiveness of the app. It could also be that the respondent is not completely aware of what is being asked, because the respondent has difficulties in relating the questions to the app. It could also be that the respondent cannot relate to the semantic differentials for the app, because it does not fit the product. This was also mentioned in the pre-test phase, that some respondents had difficulties with some of the semantic differentials.
In the actual use stage the items technical-human and professional – unprofessional are the only factors that fall into factor 4, which could also be an indication that respondents find it difficult to relate to these semantic differentials when using the app. In fact it would be better if the first three factors would be used to research the user experience of an app. Meaning that hedonic quality identification and attractiveness are taken as one factor, hedonic quality stimulation as a second factor and pragmatic qualities as a third factor and the items technical – human and professional – unprofessional would be deleted from the instrument. This could be a recommendation for future studies to use these three factors instead of four.

Furthermore, significant differences could be found between the anticipated use stage and the actual use stage for the individual apps. All four apps had a significant difference between the anticipated use stage and actual use stage on PQ, however HQI, HQS and ATT only had a few significant differences within the apps. Chapter 4, table 20, displays these differences. A reason for the non significant differences and significant differences of the app in the actual use stage compared to the anticipated use stage could be that the sample size of this study is just too small. The sample size for each of the apps varies between 22 to 24 participants. Another reason could be, as mentioned in the factor analyses, that there is some complexity within the items and the participants could therefore not always relate to the semantic differentials when using the app compared to the anticipated use of the app.

Furthermore it could be that because of the powerful effect size (R^2=83%) that some variables, such as PQ having a significant effect on the actual use compared to the anticipated use. This can also give a contrast effect that some variables are not significant for some apps, while other items are significant. Concluding these reasons, it can also be that these incoherent results are influenced by the small sample size of the participants used in this study.

The demographics "gender" and "education" are of no significant influence in the anticipated use stage and actual use stage in relation to the attractiveness. These results could have been different if the sample size was bigger and participants from different education levels were approached for this study.

5.5 Limitations and recommendations for future research

In this research, the individual differences of participants have not been taken into account. According to Brock and Green (2005) there are individual differences amongst users. There are two types of individual differences. One is that an individual can be more dependent on their feelings and the other one is that an individual can be more dependent on the situation. In general, people who are more dependent on the situation are less consistent in their behaviour compared to people who listen to their feelings.

For this study, the apps were chosen based on the similarity of their looks for both android smartphones and iOS (apple) smartphones and because of the presumed unfamiliarity with the app. Some participants mentioned that the app did not fit them, meaning they perceived the app to be something that does not aim at the target group he or she is in. For example, some participants named the games to be childish and some participants named the information apps to be difficult because of the English language. Future studies should take into account whether result will be different when taking the target group into account. Another possibility could be that future studies can use smartphone apps that match their target group.

In this study, the user experience is measured during and after usage, which means that the real experience is not completely measured but partially an evaluation of all the experiences. Roto et al. (2011) call these the momentary and episodic user experiences. A follow-up study should be done to see what the real experience is for the cumulative user experience, which is done in the study of Roto et al. (2011) after four weeks. The real experience can be influenced by updates, social influences and other factors and could therefore result in a different user experience.

It should be concluded that the real limitation of this study is the sample size. Results such as the factor analyses and incoherent non-significant and significant differences of the variables from each app in the actual use stage and anticipated use stage could be the result of the small sample size. Therefore, future studies should use larger sample sizes to find enhanced results building on the findings of this study.

References

Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211.

Alben, L. (1996). Defining the criteria for effective interaction design. *Interactions, 3*(3), 11-15.

Ayeni, C. (2006). The impact of self-efficacy and prior computer experience on the creativity of new librarians in selected universities libraries in Southwest Nigeria. *Library Philosophy and Practice, 8*(2), 10.

Bandura, A. (1994). *Self-efficacy*: Wiley Online Library.

Brenner, J. (2012). Pew Internet: Mobile Retrieved 15-03-2013, 2013, from http://pewinternet.org/Commentary/2012/February/Pew-Internet-Mobile.aspx

Brock, T., & Green, M. (2005). Persuasion: Psychological insights and perspectives. *Sage Publications, Inc*.

Chen, Z., & Zhu, S. (2011). The research of mobile application user experience and assessment model. *International Conference on Computer Science and Network Technology*, 2832 - 2835.

Cheong, J. H., Park, M. C., & Hwang, J. H. (2004). *Mobile payment adoption: Switching from credit card.* Paper presented at the ITS Biennal Conference Berlin. http://userpage.fu-berlin.de/~jmueller/its/conf/berlin04/Papers/Hwang_paper.pdf

Choi, J. H., & Lee, H.-J. (2012). Facets of simplicity for the smartphone interface: A structural model. *International Journal of Human-Computer Studies, 70*, 129-142.

Compeau, D. R., & Higgins, C. A. (1995a). Application of social cognitive theory to training for computer skills. *Information Systems Research, 6*, 118–143.

Compeau, D. R., & Higgins, C. A. (1995b). Computer self-efficacy: Development of a measure and initial test. *MIS Quarterly, 19*, 189–211.

Deng, X., Doll, W., & Truong, D. (2004). Computer self-efficacy in an ongoing use context. *Behaviour & Information Technology, 23*(6), 395-412.

Emmanouilidis, C., Koutsiamanis, R.-A., & Tasidou, A. (2013). Mobile guides:Taxonomy of architectures, context awareness, technologies and applications. *Journal of Network and Computer Applications, 36*, 103 - 125.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*: Addison-Wesley.

Google. (2012). Our Mobile Planet: Nederland (pp. 1-42): Ipsos OTX MediaCT.

Hasan, B. (2003). The influence of specific computer experiences on computer self-efficacy beliefs. *Computers in Human Behavior, 19*(4), 443-450.

Hassenzahl, M. (2001). The effect of perceived hedonic quality on product appealingness. *International Journal of Human-Computer Interaction, 13*(4), 481-499.

Hassenzahl, M. (2003). The thing and I: Understanding the relationship between user and product. In M. A. Blythe, A. F. Monk, K. Overbeeke & P. C. Wright (Eds.), Funology: From Usability to Enjoyment, (pp. 31-42). Dordrecht: Kluwer Academic Publishers.

Hassenzahl, M. (2004). The interplay of beauty goodness and usability in interactive products. *Human Computer Interaction, 19*, 319-349.

Hassenzahl, M. (2008). User Experience (UX): Towards an experiential perspective on product quality. *IHM'08*, 11-15.

Hassenzahl, M., Burmeister, M., & Koller, F. (2003). Attrakdiff: Ein fragebogen zur Messung wahrgenommener hedonischer und pragmatischer Qualität.

Hassenzahl, M., Kekez, R., & Burmester, M. (2002). The importance of a software's pragmatic quality depends on usage modes. *Proceedings of the 6th International Conference on Work With Display Units*.

Hassenzahl, M., Platz, A., Burmester, M., & Lehner, K. (2000). Hedonic and ergonomic quality aspects determine a software's appeal. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, 2*(1), 201-208.

Hassenzahl, M., & Tractinsky, N. (2006). User experience - research agenda. *Behaviour & Information Technology, 25*(2), 91 - 97.

ISO/DIS. (2009). 9241-210: Ergonomics of human system interaction-Part 210, Human-centred design for interactive systems (formerly known as 13407). Geneva: International Organization for Standardization.

Jebril, N., Albæk, E., & de Vreese, C. H. (2013). Infotainment, cynicism and democracy: The effects of privatization vs personalization in the news. *European Journal of Communication, 28*(2), 105-121.

Karapanos, E., Zimmerman, J., Forlizzi, J., & Martens, J. (2009). User experience over time: an initial framework. *CHI 2009*.

Karaponas, E., Hassenzahl, M., & Martens, J. (2008). User experience over time. *CHI'09 Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* 729-738.

Klomp, A. (2011). *De invloed van merkervaring op user experience: eerste indruk vs gebruik.* Master, Unversiteit van Twente, Enschede.

Korhonen, H., Arrasvuori, J., & Väänänen-Vaino-Mattila, K. (2010). Analysing user experience of personal mobile products through contextual factors. *MUM'10*.

Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *biometrics*, 159-174.

Lavie, T., & Tractinsky, N. (2004). Assesing dimensions of perceived visual aesthetics of web sites. *International Journal of Human-Computer Studies, 60*, 269-298.

Leenen, J., & Sleijpen, G. (2013). Mobiel online vooral met de smartphone. *Centraal Bureau voor de Statistiek*.

Lindgaard, G., Fernandes, G., Dudek, C., & Brown, J. (2006). Attention web designers: you have 50 milliseconds to make a good first impression! . *Behaviour & Information Technology, 25*, 115-126.

Mahlke, S., & Thüring, M. (2007). *Studying Antecedents of Emotional Experiences in Interactive Contexts*. Paper presented at the Proceedings of the SIGCHI conference on Human factors in computing systems.

Massini, S. (2004). The diffusion of mobile telephony in Italy and the UK: An empirical investigation. *Economics of innovation and new technology, 13*(3), 251 - 277.

Oulasvirta, A., Wahlström, M., & Ericsson, A. K. (2010). What does it mean to be good at using a mobile device? An investigation of three levels of experience and skill. *International Journal of Human-Computer Studies, 69*, 155-169.

Pettey, C., & van der Meulen, R. (2012). Gartner Says Free Apps Will Account for Nearly 90 Percent of Total Mobile App Store Downloads in 2012. from Gartner Inc. http://www.gartner.com/newsroom/id/2153215

Phillips, C., & Chapparo, B. (2009). Visual Appeal vs. Usability: Which one Influences User Perception of a website more? *Usability News, 11*(2), 1-9.

Roto, Law, E., Vermeeren, A. P. O. S., & Hoonhout, J. (2011). *User experience white paper*. Paper presented at the Seminar on Demarcating User Experience.

Roto, & Rautava, M. (2008). User Experience Elements and Brand Promise.

Salmre, I. (2005). *Writing Mobile Code: Essential Software Engineering for Building Mobile Applications*: Addison-Wesley Professional

Schaik, P. v., & Ling, J. (2008). Modelling user experience with web sites: Usability, hedonic value, beauty and goodness. *Interacting with Computers, 20*, 419-432.

Spaccapietra, S., Al-Jadir, L., & Yu, S. (2005, 4 April 2005). *Somebody, sometime, somewhere, something [ubiquitous computing].* Paper presented at the Ubiquitous Data Management, 2005. UDM 2005. International Workshop on.

Telecompaper. (2012). Smartphone-penetratie in EU5 boven 50%, Nederland op 61%, *Telecompaper*. Retrieved from http://www.telecompaper.com/nieuws/smartphone-penetratie-in-eu5-boven-50-nederland-op-61--914561

Thatcher, J. B., Gundlach, M. J., McKnight, D. H., & Srite, M. (2007). Individual and human-assisted computer self efficacy: An empirical examination. *8. Internationale Tagung Wirtschaftsinformatik 2007-Band 1*, 841-858.

Tractinsky, N., Katz, A. S., & Ikar, D. (2000). What is beautiful is usable. *Interacting with Computers, 13*, 127-145.

Venkatesh, V., & Bala, H. (2008). Technology Acceptance Model 3 and a Research Agenda on Interventions. *Decision Sciences, 39*(2), 273 - 315.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science, 46*, 186 - 204.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. *Management Information systems research Center, 27*(3), 425 - 478.

Vlot, M. (2012). Presentation differences: does an ECA improve appreciation and quality of task performance? *17th Twente student Conference of IT*, 1 - 7.

von Wilamowitz-Moellendorff, M., Hassenzahl, M., & Platz, A. (2006). Dynamics of user experience: How the perceived quality of mobile phones changes over time.

Welmers, A. C. (2005). *Afstudeerverslag: Een aangepast UTAUT model voor digitale radio.* Master, University of Twente. Retrieved from http://essay.utwente.nl/57793/1/scriptie_Welmers.pdf

Zheng, P., & Ni, L. (2010). *Smart phone and next generation mobile computing*: Morgan Kaufmann.

Appendices

Appendix A questionnaire Logo quiz

Respnr:

Je krijgt 4 verschillende screenshots van mobiele applicaties te zien. Elk van deze screenshots krijg je 2 seconden te zien. Na deze 2 seconden, vraag ik je om 5 woorden op te schrijven die als eerst in je opkomen na het zien van de getoonde app.

Naam van app 1:

Kende je deze app al?

- ○ Ja
- ○ Nee

Noem 5 woorden die jou eerste indruk van de app beschrijft:

1.

2.

3.

4.

5.

Naam van app 2:

Kende je deze app al?

- ○ Ja
- ○ Nee

Noem 5 woorden die jou eerste indruk van de app beschrijft:

1.

2.

3.

4.

5.

Naam van app 3:

Kende je deze app al?

- ○ Ja
- ○ Nee

Noem 5 woorden die jou eerste indruk van de app beschrijft:

1.

2.

3.

4.

5.

Naam van app 4:

Kende je deze app al?

- ○ Ja
- ○ Nee

Noem 5 woorden die jou eerste indruk van de app beschrijft:

1.

2.

3.

4.

5.

Deel 2 vragenlijst

Je mag nu langer naar de app kijken met een maximum tijd van 1 minuut.

Je hebt de app nu langer mogen bekijken. Graag onderstaande items in te vullen wat je verwacht van de app alvorens je het in gebruik neemt.

1. De meest passende omschrijving van je verwachtingen van de Logo quiz app is:

Menselijk	0	0	0	0	0	0	0	technisch
Isolerend	0	0	0	0	0	0	0	verbonden
Aangenaam	0	0	0	0	0	0	0	onaangenaam
Conventioneel	0	0	0	0	0	0	0	origineel
eenvoudig	0	0	0	0	0	0	0	ingewikkeld
Professioneel	0	0	0	0	0	0	0	amateuristisch
lelijk	0	0	0	0	0	0	0	mooi
praktisch	0	0	0	0	0	0	0	onpraktisch
onsympathiek	0	0	0	0	0	0	0	sympathiek
duidelijk	0	0	0	0	0	0	0	omslachtig

2. De meest passende omschrijving van je verwachtingen van de Logo quiz app is:

Stijlloos /smakeloos	0	0	0	0	0	0	0	stijlvol
Voorspelbaar	0	0	0	0	0	0	0	onvoorspelbaar
Minderwaardig	0	0	0	0	0	0	0	waardevol
Betrokken	0	0	0	0	0	0	0	afgezonderd
Scheidt mij van mensen	0	0	0	0	0	0	0	Brengt mij naar mensen
toonbaar	0	0	0	0	0	0	0	niet toonbaar
afkeurend	0	0	0	0	0	0	0	uitnodigend
creatief	0	0	0	0	0	0	0	fantasieloos
slecht	0	0	0	0	0	0	0	goed

3. De meest passende omschrijving van je <u>verwachtingen</u> van de Logo quiz app is:

Overzichtelijk	0	0	0	0	0	0	0	Verwarrend
Afstotelijk	0	0	0	0	0	0	0	aantrekkelijk
Gedurfd	0	0	0	0	0	0	0	voorzichtig
Innovatief	0	0	0	0	0	0	0	conservatief
Saai	0	0	0	0	0	0	0	fascinerend
uitdagend	0	0	0	0	0	0	0	eenvoudig
ontmoedigend	0	0	0	0	0	0	0	motiverend
nieuw	0	0	0	0	0	0	0	gebruikt
onhandelbaar	0	0	0	0	0	0	0	handelbaar

4.	Zeer Waarschijnlijk	waarschijnlijk	Niet waarschijnlijk/ Niet onwaarschijnlijk	onwaarschijnlijk	zeer onwaarschijnlijk
Ik ga de logo quiz app downloaden, er van uitgaande dat ik toegang heb tot deze app	○	○	○	○	○
Ik voorspel de logo quiz app te gaan downloaden wanneer ik toegang heb tot deze app	○	○	○	○	○
Ik ben van plan de logo quiz app te downloaden in de komende ..... maanden →	○	○	○	○	○

↑

Deel 3 vragenlijst

Als de app is gedownload, graag de volgende taak voltooien:

<u>Speel een ronde in dit spel en raadt 3 vlaggen (max. 3 minuten)</u>

Na het voltooien van de ronde graag de volgende vragen invullen:

5. Kon je de opdracht uitvoeren?

○ Ja
○ Nee

Indien je de opdracht niet hebt kunnen uitvoeren ga verder met vraag 7

6. Ik vond de opdracht:

Erg moeilijk	0	0	0	0	0	0	0	Helemaal niet moeilijk

7. Zijn er technische problemen opgetreden tijdens het uitvoeren van de taak?

○ Ja
○ Nee

8. Je hebt de app nu <u>in gebruik</u> mogen nemen. Graag onderstaande items in te vullen wat je omschrijving is van de app nu je het hebt gebruikt.

	Helemaal niet	weinig	Neutraal/ Weet ik niet	Veel	Helemaal
Mijn verwachtingen van de app en het <u>werkelijke gebruik</u> van de app verschillen:	○	○	○	○	○

9. De meest passende omschrijving <u>tijdens het gebruik</u> van de Logo quiz app is:

Menselijk	0	0	0	0	0	0	0	technisch
Isolerend	0	0	0	0	0	0	0	verbonden
Aangenaam	0	0	0	0	0	0	0	onaangenaam
Conventioneel	0	0	0	0	0	0	0	origineel
eenvoudig	0	0	0	0	0	0	0	ingewikkeld
Professioneel	0	0	0	0	0	0	0	amateuristisch
lelijk	0	0	0	0	0	0	0	mooi
praktisch	0	0	0	0	0	0	0	onpraktisch
onsympathiek	0	0	0	0	0	0	0	sympathiek
duidelijk	0	0	0	0	0	0	0	omslachtig

10. De meest passende omschrijving <u>tijdens het gebruik</u> van de Logo quiz app is:

Stijlloos /smakeloos	0	0	0	0	0	0	0	stijlvol
Voorspelbaar	0	0	0	0	0	0	0	onvoorspelbaar
Minderwaardig	0	0	0	0	0	0	0	waardevol
Betrokken	0	0	0	0	0	0	0	afgezonderd
Scheidt mij van mensen	0	0	0	0	0	0	0	Brengt mij naar mensen
toonbaar	0	0	0	0	0	0	0	niet toonbaar
afkeurend	0	0	0	0	0	0	0	uitnodigend
creatief	0	0	0	0	0	0	0	fantasieloos
slecht	0	0	0	0	0	0	0	goed

11. De meest passende omschrijving tijdens het gebruik van de Logo quiz app is:

Overzichtelijk	0	0	0	0	0	0	0	Verwarrend
Afstotelijk	0	0	0	0	0	0	0	aantrekkelijk
Gedurfd	0	0	0	0	0	0	0	voorzichtig
Innovatief	0	0	0	0	0	0	0	conservatief
Saai	0	0	0	0	0	0	0	fascinerend
uitdagend	0	0	0	0	0	0	0	eenvoudig
ontmoedigend	0	0	0	0	0	0	0	motiverend
nieuw	0	0	0	0	0	0	0	gebruikt
onhandelbaar	0	0	0	0	0	0	0	Handelbaar

12.	Zeer Waarschijnlijk	waarschijnlijk	Niet waarschijnlijk/ Niet onwaarschijnlijk	onwaarschijnlijk	zeer onwaarschijnlijk
Ik ga de logo quiz app gebruiken, ervan uitgaande dat ik toegang heb tot deze app	○	○	○	○	○
Ik voorspel de logo quiz app te gebruiken wanneer ik toegang heb tot deze app	○	○	○	○	○
Ik ben van plan de logo quiz te gebruiken in de komende …… maanden →	○	○	○	○	○
Ik ben van plan de logo quiz app te verwijderen in de komende …..maanden →	○	○	○	○	○

Algemene Informatie

***13a*. Hoeveel apps heb je in totaal op je smartphone (inclusief vooraf geïnstalleerde apps)?**
Tip: tel deze op je smartphone
Aantal:_____

***13b*. Hoeveel van deze apps heb je zelf gedownload?**
Aantal:_____

Graag tabel op volgende pagina invullen. Let op! De getoonde categorieën bevatten verschillende *voorbeelden* van apps. Deze kunnen dus ook andere apps zijn. In de middelste kolom graag een kruisje zetten als je een app uit de gerelateerde categorie gebruikt en in de laatste kolom graag aanvinken hoe vaak je de apps uit de aangekruiste categorieën gebruikt.

14.	Kruis in deze kolom aan welke soort apps je hebt op je telefoon	Hoe vaak gebruik je deze apps?
Informatie apps vb: Nieuws en tijdschriften, Bibliotheken en demo		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Amusement apps vb: Comics, Communicatie (bellen, skype), Fotografie, Games, Interactieve achtergrond en personalisatie, Boeken en referentie, Lifestyle		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Social Media apps vb: Facebook, Instagram, Etc.		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Financieen vb: Online banking, Etc.		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Gezondheid en fitness vb: Nike app, Medisch, Etc.		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Onderwijs vb: Blackboard**,** DUO student, Etc.		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Productiviteit vb: Adobe, Dropbox , Etc.		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Reizen en lokaal vb: 9292ov.nl		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Media vb: Media en Video, Muziek en audio		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand

15.	**Helemaal mee eens**	**mee eens**	**Niet eens/ Niet oneens**	**mee oneens**	**Helemaal mee oneens**
Mensen die van invloed zijn op mijn gedrag vinden dat ik bepaalde apps moet gebruiken	○	○	○	○	○
Mensen die belangrijk zijn voor mij vinden dat ik bepaalde apps moet gebruiken	○	○	○	○	○
Als iedereen om mij heen een bepaalde app gaat gebruiken, zal ik dit waarschijnlijk ook gaan doen	○	○	○	○	○
Ik zal bepaalde apps gebruiken omdat mijn vrienden en familie dit ook doen	○	○	○	○	○
Mijn mening over bepaalde apps is meestal hetzelfde als van mijn naasten	○	○	○	○	○

16.	**Helemaal mee eens**	**mee eens**	**Niet eens/ Niet oneens**	**mee oneens**	**Helemaal mee oneens**
Ik zou de taak kunnen uitvoeren op de app:					
Als er niemand om mij heen zou zijn om mij te vertellen hoe ik de taak moet uitvoeren	○	○	○	○	○
Als er een ingebouwde hulp mogelijkheid zou zijn om mij hierin te assisteren	○	○	○	○	○
Als iemand het eerst zou voordoen	○	○	○	○	○
Als ik een soortgelijke app al eerder heb gebruikt om dezelfde taak uit te voeren	○	○	○	○	○

***17*. Geslacht**

○ Man
○ Vrouw

***18*. Opleidingsniveau en studierichting**

○ MBO Studierichting:_____
○ HBO/WO Studierichting: _____
○ Anders Uitleg:_____

***19*. Leeftijd:_____**

Eventuele opmerkingen:

_____
_____
_____
_____

Einde vragenlijst, Bedankt!

Appendix B questionnaire Song quiz

Respnr:

Je krijgt 4 verschillende screenshots van mobiele applicaties te zien. Elk van deze screenshots krijg je 2 seconden te zien. Na deze 2 seconden, vraag ik je om 5 woorden op te schrijven die als eerst in je opkomen na het zien van de getoonde app.

Naam van app 1:

Kende je deze app al?

- ○ Ja
- ○ Nee

Noem 5 woorden die jou eerste indruk van de app beschrijft:

1.

2.

3.

4.

5.

Naam van app 2:

Kende je deze app al?

- ○ Ja
- ○ Nee

Noem 5 woorden die jou eerste indruk van de app beschrijft:

1.

2.

3.

4.

5.

Naam van app 3:

Kende je deze app al?

- ○ Ja
- ○ Nee

Noem 5 woorden die jou eerste indruk van de app beschrijft:

1.

2.

3.

4.

5.

Naam van app 4:

Kende je deze app al?

- ○ Ja
- ○ Nee

Noem 5 woorden die jou eerste indruk van de app beschrijft:

1.

2.

3.

4.

5.

Deel 2 vragenlijst

Je mag nu langer naar de app kijken met een maximum tijd van 1 minuut.

Je hebt de app nu langer mogen bekijken. Graag onderstaande items in te vullen wat je verwacht van de app alvorens je het in gebruik neemt.

1. De meest passende omschrijving van je verwachtingen van de Song Quiz app is:

Menselijk	0	0	0	0	0	0	0	technisch
Isolerend	0	0	0	0	0	0	0	verbonden
Aangenaam	0	0	0	0	0	0	0	onaangenaam
Conventioneel	0	0	0	0	0	0	0	origineel
eenvoudig	0	0	0	0	0	0	0	ingewikkeld
Professioneel	0	0	0	0	0	0	0	amateuristisch
lelijk	0	0	0	0	0	0	0	mooi
praktisch	0	0	0	0	0	0	0	onpraktisch
onsympathiek	0	0	0	0	0	0	0	sympathiek
duidelijk	0	0	0	0	0	0	0	omslachtig

2. De meest passende omschrijving van je verwachtingen van de Song Quiz app is:

Stijlloos /smakeloos	0	0	0	0	0	0	0	stijlvol
Voorspelbaar	0	0	0	0	0	0	0	onvoorspelbaar
Minderwaardig	0	0	0	0	0	0	0	waardevol
Betrokken	0	0	0	0	0	0	0	afgezonderd
Scheidt mij van mensen	0	0	0	0	0	0	0	Brengt mij naar mensen
toonbaar	0	0	0	0	0	0	0	niet toonbaar
afkeurend	0	0	0	0	0	0	0	uitnodigend
creatief	0	0	0	0	0	0	0	fantasieloos
slecht	0	0	0	0	0	0	0	goed

3. De meest passende omschrijving van je <u>verwachtingen</u> van de Song Quiz app is:

Overzichtelijk	0	0	0	0	0	0	0	Verwarrend
Afstotelijk	0	0	0	0	0	0	0	aantrekkelijk
Gedurfd	0	0	0	0	0	0	0	voorzichtig
Innovatief	0	0	0	0	0	0	0	conservatief
Saai	0	0	0	0	0	0	0	fascinerend
uitdagend	0	0	0	0	0	0	0	eenvoudig
ontmoedigend	0	0	0	0	0	0	0	motiverend
nieuw	0	0	0	0	0	0	0	gebruikt
onhandelbaar	0	0	0	0	0	0	0	handelbaar

4.	Zeer Waarschijnlijk	waarschijnlijk	Niet waarschijnlijk/ Niet onwaarschijnlijk	onwaarschijnlijk	zeer onwaarschijnlijk
Ik ga de song quiz app downloaden, er van uitgaande dat ik toegang heb tot deze app	○	○	○	○	○
Ik voorspel de song quiz app te gaan downloaden wanneer ik toegang heb tot deze app	○	○	○	○	○
Ik ben van plan de song quiz app te downloaden in de komende ..... maanden →	○	○	○	○	○

Deel 3 vragenlijst

Als de app is gedownload, graag de volgende taak voltooien:

<u>Speel een ronde in dit spel en kies een genre om liedjes te raden (max. 3 minuten).</u>
<u>Graag aan de onderzoeker doorgeven welke genre dit is a.j.b.</u>

Na het voltooien van de ronde graag de volgende vragen invullen:

5. Kon je de opdracht uitvoeren?
○ Ja
○ Nee

Indien je de opdracht niet hebt kunnen uitvoeren ga verder met vraag 7

6. Ik vond de opdracht:

Erg moeilijk	0	0	0	0	0	0	0	Helemaal niet moeilijk

7. Zijn er technische problemen opgetreden tijdens het uitvoeren van de taak?
○ Ja
○ Nee

8. Je hebt de app nu in gebruik mogen nemen. Graag onderstaande items in te vullen wat je omschrijving is van de app nu je het hebt gebruikt.

	Helemaal niet	weinig	Neutraal/ Weet ik niet	Veel	Helemaal
Mijn verwachtingen van de app en het werkelijke gebruik van de app verschillen:	○	○	○	○	○

9. De meest passende omschrijving tijdens het gebruik van de Song Quiz app is:

Menselijk	0	0	0	0	0	0	0	technisch
Isolerend	0	0	0	0	0	0	0	verbonden
Aangenaam	0	0	0	0	0	0	0	onaangenaam
Conventioneel	0	0	0	0	0	0	0	origineel
eenvoudig	0	0	0	0	0	0	0	ingewikkeld
Professioneel	0	0	0	0	0	0	0	amateuristisch
lelijk	0	0	0	0	0	0	0	mooi
praktisch	0	0	0	0	0	0	0	onpraktisch
onsympathiek	0	0	0	0	0	0	0	sympathiek
duidelijk	0	0	0	0	0	0	0	omslachtig

10. De meest passende omschrijving tijdens het gebruik van de Song Quiz app is:

Stijlloos /smakeloos	0	0	0	0	0	0	0	stijlvol
Voorspelbaar	0	0	0	0	0	0	0	onvoorspelbaar
Minderwaardig	0	0	0	0	0	0	0	waardevol
Betrokken	0	0	0	0	0	0	0	afgezonderd
Scheidt mij van mensen	0	0	0	0	0	0	0	Brengt mij naar mensen
toonbaar	0	0	0	0	0	0	0	niet toonbaar
afkeurend	0	0	0	0	0	0	0	uitnodigend
creatief	0	0	0	0	0	0	0	fantasieloos
slecht	0	0	0	0	0	0	0	goed

11. De meest passende omschrijving tijdens het gebruik van de Song Quiz app is:

Overzichtelijk	0	0	0	0	0	0	0	Verwarrend
Afstotelijk	0	0	0	0	0	0	0	aantrekkelijk
Gedurfd	0	0	0	0	0	0	0	voorzichtig
Innovatief	0	0	0	0	0	0	0	conservatief
Saai	0	0	0	0	0	0	0	fascinerend
uitdagend	0	0	0	0	0	0	0	eenvoudig
ontmoedigend	0	0	0	0	0	0	0	motiverend
nieuw	0	0	0	0	0	0	0	gebruikt
onhandelbaar	0	0	0	0	0	0	0	handelbaar

12.	Zeer Waarschijnlijk	waarschijnlijk	Niet waarschijnlijk/ Niet onwaarschijnlijk	onwaarschijnlijk	zeer onwaarschijnlijk
Ik ga de song quiz app gebruiken, ervan uitgaande dat ik toegang heb tot deze app	○	○	○	○	○
Ik voorspel de song quiz app te gebruiken wanneer ik toegang heb tot deze app	○	○	○	○	○
Ik ben van plan de song quiz te gebruiken in de komende …… maanden	○	○	○	○	○
Ik ben van plan de song quiz app te verwijderen in de komende …..maanden	○	○	○	○	○

Algemene Informatie

***13a*. Hoeveel apps heb je in totaal op je smartphone (inclusief vooraf geïnstalleerde apps)?**
Tip: tel deze op je smartphone
Aantal:_____

***13b*. Hoeveel van deze apps heb je zelf gedownload?**
Aantal:_____

Graag tabel op volgende pagina invullen. Let op! De getoonde categorieën bevatten verschillende *voorbeelden* van apps. Deze kunnen dus ook andere apps zijn. In de middelste kolom graag een kruisje zetten als je een app uit de gerelateerde categorie gebruikt en in de laatste kolom graag aanvinken hoe vaak je de apps uit de aangekruiste categorieën gebruikt.

14.	Kruis in deze kolom aan welke soort apps je hebt op je telefoon	Hoe vaak gebruik je deze apps?
Informatie apps vb: Nieuws en tijdschriften, Bibliotheken en demo		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Amusement apps vb: Comics, Communicatie (bellen, skype), Fotografie, Games, Interactieve achtergrond en personalisatie, Boeken en referentie, Lifestyle		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Social Media apps vb: Facebook, Instagram, Etc.		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Financieen vb: Online banking, Etc.		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Gezondheid en fitness vb: Nike app, Medisch, Etc.		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Onderwijs vb: Blackboard**,** DUO student, Etc.		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Productiviteit vb: Adobe, Dropbox , Etc.		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Reizen en lokaal vb: 9292ov.nl		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Media vb: Media en Video, Muziek en audio		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand

15.	**Helemaal mee eens**	**mee eens**	**Niet eens/ Niet oneens**	**mee oneens**	**Helemaal mee oneens**
Mensen die van invloed zijn op mijn gedrag vinden dat ik bepaalde apps moet gebruiken	○	○	○	○	○
Mensen die belangrijk zijn voor mij vinden dat ik bepaalde apps moet gebruiken	○	○	○	○	○
Als iedereen om mij heen een bepaalde app gaat gebruiken, zal ik dit waarschijnlijk ook gaan doen	○	○	○	○	○
Ik zal bepaalde apps gebruiken omdat mijn vrienden en familie dit ook doen	○	○	○	○	○
Mijn mening over bepaalde apps is meestal hetzelfde als van mijn naasten	○	○	○	○	○

16.	**Helemaal mee eens**	**mee eens**	**Niet eens/ Niet oneens**	**mee oneens**	**Helemaal mee oneens**
Ik zou de taak kunnen uitvoeren op de app:					
Als er niemand om mij heen zou zijn om mij te vertellen hoe ik de taak moet uitvoeren	○	○	○	○	○
Als er een ingebouwde hulp mogelijkheid zou zijn om mij hierin te assisteren	○	○	○	○	○
Als iemand het eerst zou voordoen	○	○	○	○	○
Als ik een soortgelijke app al eerder heb gebruikt om dezelfde taak uit te voeren	○	○	○	○	○

***17*. Geslacht**

○ Man
○ Vrouw

***18*. Opleidingsniveau en studierichting**

○ MBO Studierichting:_____
○ HBO/WO Studierichting: _____
○ Anders Uitleg:_____

***19*. Leeftijd:_____**

Eventuele opmerkingen:

_____
_____
_____
_____

Einde vragenlijst, Bedankt!

Appendix C questionnaire The Verge

Respnr:

Je krijgt 4 verschillende screenshots van mobiele applicaties te zien. Elk van deze screenshots krijg je 2 seconden te zien. Na deze 2 seconden, vraag ik je om 5 woorden op te schrijven die als eerst in je opkomen na het zien van de getoonde app.

Naam van app 1:

Kende je deze app al?

- ○ Ja
- ○ Nee

Noem 5 woorden die jou eerste indruk van de app beschrijft:

1.

2.

3.

4.

5.

Naam van app 2:

Kende je deze app al?

- ○ Ja
- ○ Nee

Noem 5 woorden die jou eerste indruk van de app beschrijft:

1.

2.

3.

4.

5.

Naam van app 3:

Kende je deze app al?

- ○ Ja
- ○ Nee

Noem 5 woorden die jou eerste indruk van de app beschrijft:

1.

2.

3.

4.

5.

Naam van app 4:

Kende je deze app al?

- ○ Ja
- ○ Nee

Noem 5 woorden die jou eerste indruk van de app beschrijft:

1.

2.

3.

4.

5.

Deel 2 vragenlijst

Je mag nu langer naar de app kijken met een maximum tijd van 1 minuut.

Je hebt de app nu langer mogen bekijken. Graag onderstaande items in te vullen wat je verwacht van de app alvorens je het in gebruik neemt.

1. De meest passende omschrijving van je verwachtingen van The Verge app is:

Menselijk	0	0	0	0	0	0	0	technisch
Isolerend	0	0	0	0	0	0	0	verbonden
Aangenaam	0	0	0	0	0	0	0	onaangenaam
Conventioneel	0	0	0	0	0	0	0	origineel
eenvoudig	0	0	0	0	0	0	0	ingewikkeld
Professioneel	0	0	0	0	0	0	0	amateuristisch
lelijk	0	0	0	0	0	0	0	mooi
praktisch	0	0	0	0	0	0	0	onpraktisch
onsympathiek	0	0	0	0	0	0	0	sympathiek
duidelijk	0	0	0	0	0	0	0	omslachtig

2. De meest passende omschrijving van je verwachtingen van The Verge app is:

Stijlloos /smakeloos	0	0	0	0	0	0	0	stijlvol
Voorspelbaar	0	0	0	0	0	0	0	onvoorspelbaar
Minderwaardig	0	0	0	0	0	0	0	waardevol
Betrokken	0	0	0	0	0	0	0	afgezonderd
Scheidt mij van mensen	0	0	0	0	0	0	0	Brengt mij naar mensen
toonbaar	0	0	0	0	0	0	0	niet toonbaar
afkeurend	0	0	0	0	0	0	0	uitnodigend
creatief	0	0	0	0	0	0	0	fantasieloos
slecht	0	0	0	0	0	0	0	goed

3. De meest passende omschrijving van je verwachtingen van The Verge app is:

Overzichtelijk	0	0	0	0	0	0	0	Verwarrend
Afstotelijk	0	0	0	0	0	0	0	aantrekkelijk
Gedurfd	0	0	0	0	0	0	0	voorzichtig
Innovatief	0	0	0	0	0	0	0	conservatief
Saai	0	0	0	0	0	0	0	fascinerend
uitdagend	0	0	0	0	0	0	0	eenvoudig
ontmoedigend	0	0	0	0	0	0	0	motiverend
nieuw	0	0	0	0	0	0	0	gebruikt
onhandelbaar	0	0	0	0	0	0	0	handelbaar

4.	Zeer Waarschijnlijk	waarschijnlijk	Niet waarschijnlijk/ Niet onwaarschijnlijk	onwaarschijnlijk	zeer onwaarschijnlijk
Ik ga de Verge app downloaden, er van uitgaande dat ik toegang heb tot deze app	○	○	○	○	○
Ik voorspel de Verge app te gaan downloaden wanneer ik toegang heb tot deze app	○	○	○	○	○
Ik ben van plan de Verge app te downloaden in de komende ..... maanden	○	○	○	○	○

Deel 3 vragenlijst

Als de app is gedownload, graag de volgende taak voltooien *(max. 3 minuten)*:

Lees 5 artikelen uit de Entertainment sectie die jij leuk vindt en stuur vervolgens het meest boeiende artikel volgens jou naar je email (graag de namen van de artikelen doorgeven aan de onderzoeker a.j.b.).

Na het voltooien van de taak graag de volgende vragen invullen:

5. Kon je de opdracht uitvoeren?

○ Ja
○ Nee

Indien je de opdracht niet hebt kunnen uitvoeren ga verder met vraag 7

6. Ik vond de opdracht:

Erg moeilijk	0	0	0	0	0	0	0	Helemaal niet moeilijk

7. Zijn er technische problemen opgetreden tijdens het uitvoeren van de taak?
○ Ja
○ Nee

8. Je hebt de app nu in gebruik mogen nemen. Graag onderstaande items in te vullen wat je omschrijving is van de app nu je het hebt gebruikt.

	Helemaal niet	weinig	Neutraal/ Weet ik niet	Veel	Helemaal
Mijn verwachtingen van de app en het werkelijke gebruik van de app verschillen:	○	○	○	○	○

9. De meest passende omschrijving tijdens het gebruik van The Verge app is:

Menselijk	0	0	0	0	0	0	0	technisch
Isolerend	0	0	0	0	0	0	0	verbonden
Aangenaam	0	0	0	0	0	0	0	onaangenaam
Conventioneel	0	0	0	0	0	0	0	origineel
eenvoudig	0	0	0	0	0	0	0	ingewikkeld
Professioneel	0	0	0	0	0	0	0	amateuristisch
lelijk	0	0	0	0	0	0	0	mooi
praktisch	0	0	0	0	0	0	0	onpraktisch
onsympathiek	0	0	0	0	0	0	0	sympathiek
duidelijk	0	0	0	0	0	0	0	omslachtig

10. De meest passende omschrijving tijdens het gebruik van The Verge app is:

Stijlloos /smakeloos	0	0	0	0	0	0	0	stijlvol
Voorspelbaar	0	0	0	0	0	0	0	onvoorspelbaar
Minderwaardig	0	0	0	0	0	0	0	waardevol
Betrokken	0	0	0	0	0	0	0	afgezonderd
Scheidt mij van mensen	0	0	0	0	0	0	0	Brengt mij naar mensen
toonbaar	0	0	0	0	0	0	0	niet toonbaar
afkeurend	0	0	0	0	0	0	0	uitnodigend
creatief	0	0	0	0	0	0	0	fantasieloos

slecht	0	0	0	0	0	0	0	goed

11. De meest passende omschrijving tijdens het gebruik van The Verge app is:

Overzichtelijk	0	0	0	0	0	0	0	Verwarrend
Afstotelijk	0	0	0	0	0	0	0	aantrekkelijk
Gedurfd	0	0	0	0	0	0	0	voorzichtig
Innovatief	0	0	0	0	0	0	0	conservatief
Saai	0	0	0	0	0	0	0	fascinerend
uitdagend	0	0	0	0	0	0	0	eenvoudig
ontmoedigend	0	0	0	0	0	0	0	motiverend
nieuw	0	0	0	0	0	0	0	gebruikt
onhandelbaar	0	0	0	0	0	0	0	handelbaar

12.	Zeer Waarschijnlijk	waarschijnlijk	Niet waarschijnlijk/ Niet onwaarschijnlijk	onwaarschijnlijk	zeer onwaarschijnlijk
Ik ga de Verge app gebruiken, er van uitgaande dat ik toegang heb tot deze app	○	○	○	○	○
Ik voorspel de Verge app te gebruiken wanneer ik toegang heb tot deze app	○	○	○	○	○
Ik ben van plan de Verge app te gebruiken in de komende..... maanden →	○	○	○	○	○
Ik ben van plan de Verge app te verwijderen in de komende .....maanden →	○	○	○	○	○

Algemene Informatie

***13a*. Hoeveel apps heb je in totaal op je smartphone (inclusief vooraf geïnstalleerde apps)?**
Tip: tel deze op je smartphone
Aantal:_____

***13b*. Hoeveel van deze apps heb je zelf gedownload?**
Aantal:_____

Graag tabel op volgende pagina invullen. Let op! De getoonde categorieën bevatten verschillende *voorbeelden* van apps. Deze kunnen dus ook andere apps zijn. In de middelste kolom graag een kruisje zetten als je een app uit de gerelateerde categorie gebruikt en in de laatste kolom graag aanvinken hoe vaak je de apps uit de aangekruiste categorieën gebruikt.

14.	Kruis in deze kolom aan welke soort apps je hebt op je telefoon	Hoe vaak gebruik je deze apps?
Informatie apps vb: Nieuws en tijdschriften, Bibliotheken en demo		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Amusement apps vb: Comics, Communicatie (bellen, skype), Fotografie, Games, Interactieve achtergrond en personalisatie, Boeken en referentie, Lifestyle		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Social Media apps vb: Facebook, Instagram, Etc.		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Financieen vb: Online banking, Etc.		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Gezondheid en fitness vb: Nike app, Medisch, Etc.		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Onderwijs vb: Blackboard**,** DUO student, Etc.		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Productiviteit vb: Adobe, Dropbox , Etc.		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Reizen en lokaal vb: 9292ov.nl		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Media vb: Media en Video, Muziek en audio		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand

15.	**Helemaal mee eens**	**mee eens**	**Niet eens/ Niet oneens**	**mee oneens**	**Helemaal mee oneens**
Mensen die van invloed zijn op mijn gedrag vinden dat ik bepaalde apps moet gebruiken	○	○	○	○	○
Mensen die belangrijk zijn voor mij vinden dat ik bepaalde apps moet gebruiken	○	○	○	○	○
Als iedereen om mij heen een bepaalde app gaat gebruiken, zal ik dit waarschijnlijk ook gaan doen	○	○	○	○	○
Ik zal bepaalde apps gebruiken omdat mijn vrienden en familie dit ook doen	○	○	○	○	○
Mijn mening over bepaalde apps is meestal hetzelfde als van mijn naasten	○	○	○	○	○

16.	**Helemaal mee eens**	**mee eens**	**Niet eens/ Niet oneens**	**mee oneens**	**Helemaal mee oneens**
Ik zou de taak kunnen uitvoeren op de app:					
Als er niemand om mij heen zou zijn om mij te vertellen hoe ik de taak moet uitvoeren	○	○	○	○	○
Als er een ingebouwde hulp mogelijkheid zou zijn om mij hierin te assisteren	○	○	○	○	○
Als iemand het eerst zou voordoen	○	○	○	○	○
Als ik een soortgelijke app al eerder heb gebruikt om dezelfde taak uit te voeren	○	○	○	○	○

***17*. Geslacht:**

○ Man
○ Vrouw

18. Opleiding en studierichting:

○ MBO Studierichting:_____
○ HBO/WO Studierichting: _____
○ Anders Uitleg:_____

***19*. Leeftijd:_____**

Eventuele opmerkingen:

_____
_____
_____
_____

Einde vragenlijst, Bedankt!

Appendix D questionnaire TechCrunch

Respnr:

Je krijgt 4 verschillende screenshots van mobiele applicaties te zien. Elk van deze screenshots krijg je 2 seconden te zien. Na deze 2 seconden, vraag ik je om 5 woorden op te schrijven die als eerst in je opkomen na het zien van de getoonde app.

Naam van app 1:

Kende je deze app al?

- ○ Ja
- ○ Nee

Noem 5 woorden die jou eerste indruk van de app beschrijft:

1.

2.

3.

4.

5.

Naam van app 2:

Kende je deze app al?

- ○ Ja
- ○ Nee

Noem 5 woorden die jou eerste indruk van de app beschrijft:

1.

2.

3.

4.

5.

Naam van app 3:

Kende je deze app al?

- ○ Ja
- ○ Nee

Noem 5 woorden die jou eerste indruk van de app beschrijft:

1.

2.

3.

4.

5.

Naam van app 4:

Kende je deze app al?

- ○ Ja
- ○ Nee

Noem 5 woorden die jou eerste indruk van de app beschrijft:

1.

2.

3.

4.

5.

Deel 2 vragenlijst

Je mag nu langer naar de app kijken met een maximum tijd van 1 minuut.

Je hebt de app nu langer mogen bekijken. Graag items op de volgende pagina in te vullen wat je verwacht van de app alvorens je het in gebruik neemt.

1. De meest passende omschrijving van je verwachtingen van de TechCrunch app is:

Menselijk	0	0	0	0	0	0	0	technisch
Isolerend	0	0	0	0	0	0	0	verbonden
Aangenaam	0	0	0	0	0	0	0	onaangenaam
Conventioneel	0	0	0	0	0	0	0	origineel
eenvoudig	0	0	0	0	0	0	0	ingewikkeld
Professioneel	0	0	0	0	0	0	0	amateuristisch
lelijk	0	0	0	0	0	0	0	mooi
praktisch	0	0	0	0	0	0	0	onpraktisch
onsympathiek	0	0	0	0	0	0	0	sympathiek
duidelijk	0	0	0	0	0	0	0	omslachtig

2. De meest passende omschrijving van je verwachtingen van de TechCrunch app is:

Stijlloos /smakeloos	0	0	0	0	0	0	0	stijlvol
Voorspelbaar	0	0	0	0	0	0	0	onvoorspelbaar
Minderwaardig	0	0	0	0	0	0	0	waardevol
Betrokken	0	0	0	0	0	0	0	afgezonderd
Scheidt mij van mensen	0	0	0	0	0	0	0	Brengt mij naar mensen
toonbaar	0	0	0	0	0	0	0	niet toonbaar
afkeurend	0	0	0	0	0	0	0	uitnodigend
creatief	0	0	0	0	0	0	0	fantasieloos
slecht	0	0	0	0	0	0	0	goed

3. De meest passende omschrijving van je <u>verwachtingen</u> van de Tech Crunch app is:

Overzichtelijk	0	0	0	0	0	0	0	Verwarrend
Afstotelijk	0	0	0	0	0	0	0	aantrekkelijk
Gedurfd	0	0	0	0	0	0	0	voorzichtig
Innovatief	0	0	0	0	0	0	0	conservatief
Saai	0	0	0	0	0	0	0	fascinerend
uitdagend	0	0	0	0	0	0	0	eenvoudig
ontmoedigend	0	0	0	0	0	0	0	motiverend
nieuw	0	0	0	0	0	0	0	gebruikt
onhandelbaar	0	0	0	0	0	0	0	handelbaar

4.	Zeer Waarschijnlijk	waarschijnlijk	Niet waarschijnlijk/ Niet onwaarschijnlijk	onwaarschijnlijk	zeer onwaarschijnlijk
Ik ga de TechCrunch app downloaden, er van uitgaande dat ik toegang heb tot deze app	○	○	○	○	○
Ik voorspel de TechCrunch app te gaan downloaden wanneer ik toegang heb tot deze app	○	○	○	○	○
Ik ben van plan de TechCrunch app te downloaden in de komende …… maanden →	○	○	○	○	○

Deel 3 vragenlijst

Als de app is gedownload, graag de volgende taak voltooien *<u>(max. 3 minuten)</u>*:

Lees 5 artikelen uit de sectie <u>Social</u> die jij leuk vindt en stuur vervolgens het meest boeiende artikel volgens jou naar je email (graag de namen van de artikelen doorgeven aan de onderzoeker a.j.b.).

Na het voltooien van de taak graag de volgende vragen invullen:

5. Kon je de opdracht uitvoeren?

○ Ja
○ Nee

Indien je de opdracht niet hebt kunnen uitvoeren ga verder met vraag 7

6. Ik vond de opdracht:

Erg moeilijk	0	0	0	0	0	0	0	Helemaal niet moeilijk

7. Zijn er technische problemen opgetreden tijdens het uitvoeren van de taak?

○ Ja
○ Nee

8. Je hebt de app nu in gebruik mogen nemen. Graag onderstaande items in te vullen wat je omschrijving is van de app nu je het hebt gebruikt.

	Helemaal niet	weinig	Neutraal/ Weet ik niet	Veel	Helemaal
Mijn verwachtingen van de app en het werkelijke gebruik van de app verschillen:	○	○	○	○	○

9. De meest passende omschrijving tijdens het gebruik van de TechCrunch app is:

Menselijk	0	0	0	0	0	0	0	technisch
Isolerend	0	0	0	0	0	0	0	verbonden
Aangenaam	0	0	0	0	0	0	0	onaangenaam
Conventioneel	0	0	0	0	0	0	0	origineel
eenvoudig	0	0	0	0	0	0	0	ingewikkeld
Professioneel	0	0	0	0	0	0	0	amateuristisch
lelijk	0	0	0	0	0	0	0	mooi
praktisch	0	0	0	0	0	0	0	onpraktisch
onsympathiek	0	0	0	0	0	0	0	sympathiek
duidelijk	0	0	0	0	0	0	0	omslachtig

10. De meest passende omschrijving tijdens het gebruik van de TechCrunch app is:

Stijlloos /smakeloos	0	0	0	0	0	0	0	stijlvol
Voorspelbaar	0	0	0	0	0	0	0	onvoorspelbaar
Minderwaardig	0	0	0	0	0	0	0	waardevol
Betrokken	0	0	0	0	0	0	0	afgezonderd
Scheidt mij van mensen	0	0	0	0	0	0	0	Brengt mij naar mensen
toonbaar	0	0	0	0	0	0	0	niet toonbaar
afkeurend	0	0	0	0	0	0	0	uitnodigend

creatief	0	0	0	0	0	0	0	fantasieloos
slecht	0	0	0	0	0	0	0	goed

11. De meest passende omschrijving tijdens het gebruik van de TechCrunch app is:

Overzichtelijk	0	0	0	0	0	0	0	Verwarrend
Afstotelijk	0	0	0	0	0	0	0	aantrekkelijk
Gedurfd	0	0	0	0	0	0	0	voorzichtig
Innovatief	0	0	0	0	0	0	0	conservatief
Saai	0	0	0	0	0	0	0	fascinerend
uitdagend	0	0	0	0	0	0	0	eenvoudig
ontmoedigend	0	0	0	0	0	0	0	motiverend
nieuw	0	0	0	0	0	0	0	gebruikt
onhandelbaar	0	0	0	0	0	0	0	handelbaar

12.	Zeer Waarschijnlijk	waarschijnlijk	Niet waarschijnlijk/ Niet onwaarschijnlijk	onwaarschijnlijk	zeer onwaarschijnlijk
Ik ga de TechCrunch app gebruiken, er van uitgaande dat ik toegang heb tot deze app	○	○	○	○	○
Ik voorspel de TechCrunch app te gebruiken wanneer ik toegang heb tot deze app	○	○	○	○	○
Ik ben van plan de TechCrunch te gebruiken in de komende …..… maanden	○	○	○	○	○
Ik ben van plan de TechCrunch app te verwijderen in de komende ….maanden	○	○	○	○	○

Algemene Informatie

***13a*. Hoeveel apps heb je in totaal op je smartphone (inclusief vooraf geïnstalleerde apps)?**
Tip: tel deze op je smartphone
Aantal:_____

***13b*. Hoeveel van deze apps heb je zelf gedownload?**
Aantal:_____

Graag tabel op volgende pagina invullen. Let op! De getoonde categorieën bevatten verschillende *voorbeelden* van apps. Deze kunnen dus ook andere apps zijn. In de middelste kolom graag een kruisje zetten als je een app uit de gerelateerde categorie gebruikt en in de laatste kolom graag aanvinken hoe vaak je de apps uit de aangekruiste categorieën gebruikt.

14.	Kruis in deze kolom aan welke soort apps je hebt op je telefoon	Hoe vaak gebruik je deze apps?
Informatie apps vb: Nieuws en tijdschriften, Bibliotheken en demo		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Amusement apps vb: Comics, Communicatie (bellen, skype), Fotografie, Games, Interactieve achtergrond en personalisatie, Boeken en referentie, Lifestyle		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Social Media apps vb: Facebook, Instagram, Etc.		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Financieen vb: Online banking, Etc.		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Gezondheid en fitness vb: Nike app, Medisch, Etc.		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Onderwijs vb: Blackboard**,** DUO student, Etc.		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Productiviteit vb: Adobe, Dropbox , Etc.		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Reizen en lokaal vb: 9292ov.nl		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand
Media vb: Media en Video, Muziek en audio		○ Meerdere keren op een dag ○ Dagelijks ○ Wekelijks ○ Maandelijks ○ Minder dan 1x per maand

15.	**Helemaal mee eens**	**mee eens**	**Niet eens/ Niet oneens**	**mee oneens**	**Helemaal mee oneens**
Mensen die van invloed zijn op mijn gedrag vinden dat ik bepaalde apps moet gebruiken	○	○	○	○	○
Mensen die belangrijk zijn voor mij vinden dat ik bepaalde apps moet gebruiken	○	○	○	○	○
Als iedereen om mij heen een bepaalde app gaat gebruiken, zal ik dit waarschijnlijk ook gaan doen	○	○	○	○	○
Ik zal bepaalde apps gebruiken omdat mijn vrienden en familie dit ook doen	○	○	○	○	○
Mijn mening over bepaalde apps is meestal hetzelfde als van mijn naasten	○	○	○	○	○

16.	**Helemaal mee eens**	**mee eens**	**Niet eens/ Niet oneens**	**mee oneens**	**Helemaal mee oneens**
Ik zou de taak kunnen uitvoeren op de app:					
Als er niemand om mij heen zou zijn om mij te vertellen hoe ik de taak moet uitvoeren	○	○	○	○	○
Als er een ingebouwde hulp mogelijkheid zou zijn om mij hierin te assisteren	○	○	○	○	○
Als iemand het eerst zou voordoen	○	○	○	○	○
Als ik een soortgelijke app al eerder heb gebruikt om dezelfde taak uit te voeren	○	○	○	○	○

***17*. Geslacht:**

○ Man
○ Vrouw

18. Opleiding en studierichting:

○ MBO Studierichting:_____
○ HBO/WO Studierichting: _____
○ Anders Uitleg:_____

***19*. Leeftijd:**_____

Eventuele opmerkingen:

_____
_____
_____
_____

Einde vragenlijst, Bedankt!

Appendix E Recode list first impression

Hedonic quality – Identification (HQI)	
NEGATIEF	**Positief**
Isolerend	verbonden
Amateuristisch	professioneel
Stijlloos	stijlvol
Minderwaardig	waardevol
Afgezonderd	betrokken
Scheidt mij van mensen	brengt mij dichter bij mensen
Niet toonbaar	toonbaar

Hedonic quality – Stimulation (HQS)	
Negatief	**Positief**
Conventioneel	origineel
Fantasieloos	creatief
Voorzichtig	gedurfd
Conservatief	innovatief
Saai	fascinerend
Eenvoudig	uitdagend
Gebruikt	nieuw

Pragmatic quality (PQ)	
Negatief	**Positief**
Technisch	menselijk
Ingewikkeld	eenvoudig
Onpraktisch	praktisch
Omslachtig	duidelijk
Onvoorspelbaar	voorspelbaar
Verwarrend	overzichtelijk
Onhandelbaar	handelbaar

Attractiveness (ATT)	
Negatief	**Positief**
Lelijk	mooi
Slecht	goed
onaangenaam	Aangenaam
onsympathiek	Sympathiek
afkeurend	Uitnodigend
afstotelijk	Aantrekkelijk
ontmoedigend	Motiverend

0=missing	5=PQ positief
1=HQIdentificatie positief	6=PQ negatief
2=HQIdentificatie negatief	7= ATT positief
3=HQStimulatie positief	8= ATT negatief
4= HQStimulatie negatie	9= wat de respondent denkt te hebben gezien

Appendix F Protocol and Consent

Overview of the protocol

1.1 Checklist preparation before questionnaire

1.2 Recruiting participants

1.3 Explaining procedure to participant

1.4 Signing consent

1.5 Thanking participant

1.1. Checklist preparation before questionnaire

1. Before starting the questionnaire, pretest with a few (5) respondents to see whether the questions are clear and understandable. Adjust questionnaire if needed.

2. Every day before doing the questionnaires with the respondent, the four different apps will be visited to see whether something has changed.

3. While pretesting also explain to the participant the procedure, to see whether questions arise that can be avoided.

4. Start thinking of places were participants can be gathered. The chosen places will be HBO(higher school education in Nijmegen) and University library of Nijmegen.

5. Make sure all the material is ready for the participant. The consent form (twofold) and the questionnaire, coded with a respondent number and ballpoints. The consent form contains one form with a sticker for contact information from the researcher and one form the participant can keep.

6. Make sure all the material is ready for researcher. A consent form that needs to be signed by the participant. Also, a note book for the researcher to make notes during the questionnaire if the participants ask questions about what is said during the interview that was not already said in the introduction.

1.2 Recruiting participants

1. Start with greeting the potential respondent.

Hello. Followed immediately by step 2;

2. Creating an opening:

May I ask you something? (waiting for the answer to be yes). Would you like to participate in a study where you can use your own smartphone? (waiting for the answer to be yes). Further explanation if participant asks what is it about.

3. Goal
I am doing research about the user experience of smartphone apps for my master thesis

Communication Science at the university of Twente . The questionnaire will take about 20 to 25 minutes.

If the participant says yes: Introduce myself. Hello, My name is Rishna. I will explain what we will be doing for this questionnaire.

1.3 Explaining procedure to participant

1. The user experience of the smartphone apps will be measured in a few steps.

- First step
  You will get to see 4 apps in the first step. Each of these apps will be shown to you for a short time of two seconds. After seeing the app for two seconds you will need to write down 5 words that describe your first impression of the app. Thus, you see an app, two seconds, write down five words. This in total for four apps.
- Step 2
  After seeing the four apps, you will continue with only one of these four apps. You can look at the screenshot for a maximum time of one minute. During this time or after you may answer the questionnaire about what you expect from the app
- Step 3
  After filling in the questionnaire you will need to download an app. Do you have any objections against this? If no, further explanation. You, the respondent, will not be tested whether you are able to download an app, this is not part of my study. However you need to download the app so you are able to perform the task that is given in your questionnaire.
- Step 4
  Some personal information
- Step 5
  Each of the above steps are explained again when you get there, so no need to remember all of this now. This is just information so you know what is coming.
- Step 6
  Thank you for participating. You will now need to fill out a consent form. Please read carefully and if questions please do not hesitate to ask.

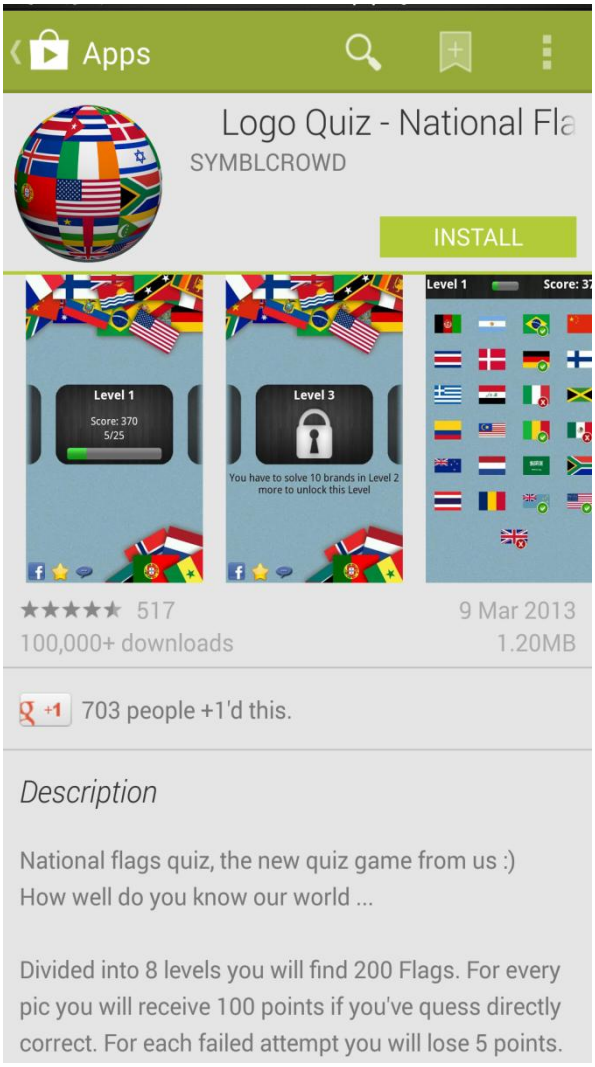
1.4 Signing consent
After agreeing with all previous steps this consent form will be given to the participant.

Introductie respondentnummer:	
Ik ben Rishna Achaibersing, student aan de universiteit van Twente. Ik doe onderzoek naar de gebruikerservaring van apps op smartphones voor mijn Masterscriptie richting Communicatiewetenschappen. Ik ben niet betrokken geweest bij het maken van de apps, ik test alleen de gebruikerservaring van deze apps. Mijn onderzoek zal helpen om apps op smartphones gebruiksvriendelijker te maken. Allereerst, bedankt voor het meedoen! Graag na het lezen van onderstaande items met betrekking tot mijn onderzoek, de rechter kolom aanvinken indien akkoord.	
Dankzij jou kan ik kijken waardoor de gebruikerservaring van apps wordt beïnvloed. <u>De gebruikerservaring die de app oplevert wordt getest, niet jij zelf.</u> Als jouw ervaring met de app vervelend of onprettig is, dan is dit geheel jouw eigen ervaring en kan dit liggen aan dat de app niet goed genoeg is. Deze onprettige ervaringen zijn eigenlijk juist handig voor mij, want dan kan ik goed zien wat er nog verbeterd moet worden en wat van belang is voor de gebruikerservaring	
<u>Vertrouwelijk:</u> Terwijl jij die opdrachten uitvoert, maak ik aantekeningen van wat er gebeurt. Deze aantekeningen worden ALLEEN gebruikt voor onderzoek, voor deze test en om te achterhalen wat de gebruikerservaring is met de app, dus nergens anders voor.	
Jij, de respondent, verklaart hierbij op een duidelijke wijze te zijn ingelicht over de aard en methode van het onderzoek, zoals uiteengezet in de bovenstaande toelichting van mij, de onderzoeker.	
Jouw vragen zijn naar tevredenheid beantwoord.	
Jij stemt geheel vrijwillig in met deelname aan dit onderzoek. Jij behoudt daarbij het recht deze instemming weer in te trekken zonder dat je daarvoor een reden hoeft op te geven en beseft dat je op elk moment mag stoppen met het experiment voor het einde van het onderzoek. Dit onderzoek heeft een maximale duur van 20 minuten.	
Indien jouw onderzoeksresultaten gebruikt zullen worden in wetenschappelijke publicaties, dan wel op een andere manier openbaar worden gemaakt, zal dit volledig geanonimiseerd gebeuren. Jouw persoonsgegevens zullen niet door derden worden ingezien zonder jouw uitdrukkelijke toestemming.	
Als jij nog verdere informatie over het onderzoek zou willen krijgen, nu of in de toekomst, kun jij je wenden tot mij, de onderzoeker (zie contact kaartje).	
<u>Geen hulp</u>. Misschien heb jij wel vragen tijdens het werken met de app. Als ze over de app gaan, kan en mag ik, de onderzoeker, die vragen misschien niet beantwoorden. Ik wil immers zien hoe jij met de app werkt en eventuele problemen oplost. Aarzel echter niet om jouw vragen toch te stellen.	
Handtekening onderzoeker	Handtekening respondent

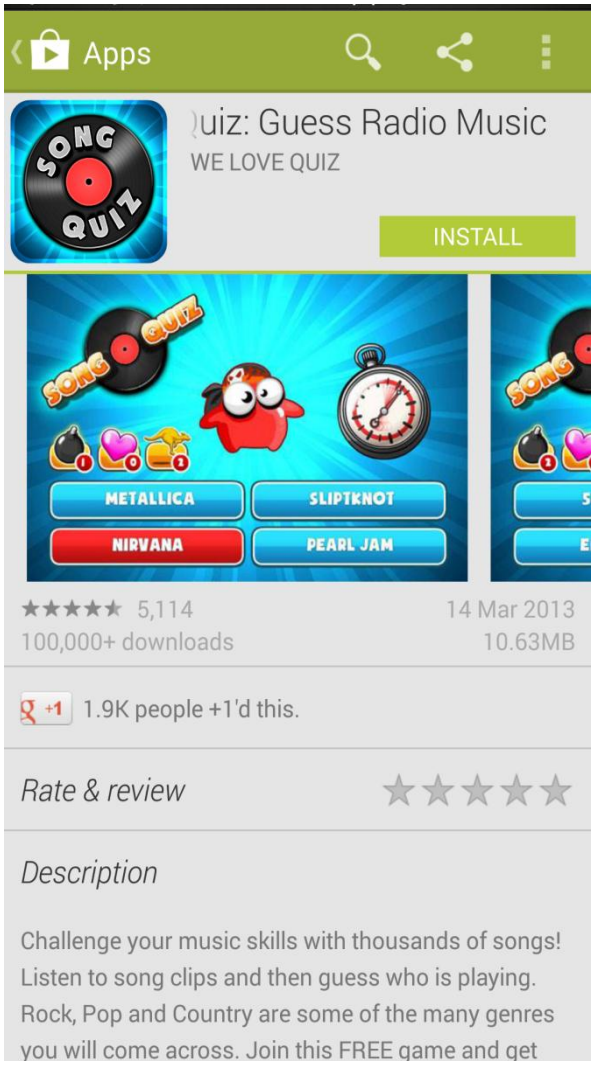
1.5 Thank you

The respondent will be thanked for participating in answering the questionnaires. If the respondent has a need to ask questions and get answers, a contact sticker with contact details is provided on the consent form. The respondent can use this contact information to ask questions. After this the respondent will be greeted and the researcher will go to the next potential participant.

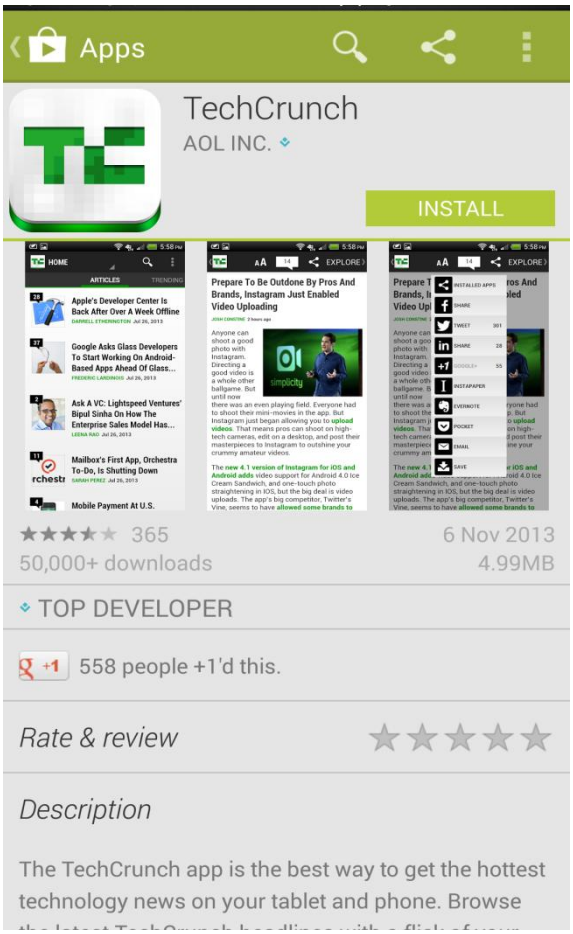
Appendix G Screenshots of Apps



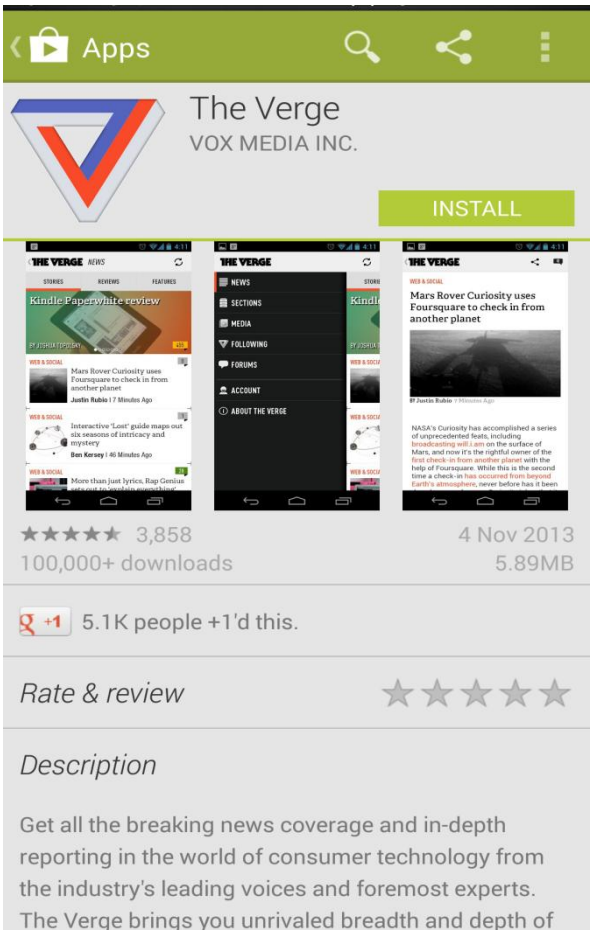
Logo quiz app screen shot



Song quiz app screenshot



TechCrunch app screenshot



The Verge app screenshot

Appendix H Questionnaire Hassenzahl german-Dutch

Questionnaire translation German – Dutch by (Klomp, 2011)

Hedonic quality – Identification (HQI)	
German Original (Hassenzahl et al., 2003)	**Dutch translation (Klomp, 2011)**
Isolierend – verbindend	Isolerend – verbonden
Laienhaft – fachmännisch	Amateuristisch – professioneel
Stillos – stilvoll	Stijlloos – stijlvol
Minderwertig – wertvoll	Minderwaardig – waardevol
Ausgrenzend – einbeziehend	Afgezonderd – betrokken
Trennt mich von Leuten – bringt mich den Leuten näher	Scheidt mij van mensen - brengt mij dichter bij mensen
Nicht vorzeigbar – vorzeigbar	Niet toonbaar – toonbaar

Tabel 2 Hedonic quality – Stimulation (HQS)	
German Original (Hassenzahl et al., 2003)	**Dutch translation (Klomp, 2011)**
Konventionell – originell	Conventioneel – origineel
Phantasielos – kreativ	Fantasieloos – creatief
Vorsichtig – mutig	Voorzichtig – gedurfd
Konservativ – innovative	Conservatief – innovatief
Lahm – fesselnd	Saai – fascinerend
Harmlos – herausfordernd	Eenvoudig – uitdagend
Herkömmlich – neuartig	Gebruikelijk – nieuw

Tabel 2 Pragmatic quality (PQ)	
German Original (Hassenzahl et al., 2003)	**Dutch translation (Klomp, 2011)**
Technisch – menschlich	Technisch – menselijk
Kompliziert – einfach	Ingewikkeld – eenvoudig
Unpraktisch – praktisch	Onpraktisch – praktisch
Umständlich – direkt	Omslachtig – duidelijk
Unberechenbar – voraussagbar	Onvoorspelbaar – voorspelbaar
Verwirrend – übersichtlich	Verwarrend – overzichtelijk
Widerspenstig – handhabbar	Onhandelbaar – handelbaar

Tabel 2 Attractiveness (ATT)	
German Original (Hassenzahl et al., 2003)	**Dutch translation (Klomp, 2011)**
Hässlich – schön	Lelijk – mooi
Schlecht – gut	Slecht – goed
Angenehm – unangenehm	Aangenaam – onaangenaam
Sympathisch – unsympathisch	Sympathiek – onsympathiek
Einladend – zurückweisend	Uitnodigend – afkeurend
Anziehend – abstoßend	Aantrekkelijk – afstotelijk
Motivierend – entmutigend	Motiverend – ontmoedigend